Atmosphere (NACOA) will meet Thursday and Friday, January 15–16, 1981. The Subgroup will meet in the B–100 conference room of Page Building No. 1, 2001 Wisconsin Avenue, NW., Washington, D.C.

The session, which will be open to the public, will convene at 9:00 a.m. and adjourn at 4:00 p.m. each day. The agenda for the meeting of the Marine Transportation Subgroup is as follows:

Ocean Problems and Transoceanic Shipping

A. U.S. merchant marine capabilities to meet national trade and defense needs.
B. Flags of convenience.
C. Other issues.

NACOA has initiated a study to formulate national goals and objectives for the oceans in the decade of the 1980's and beyond. To support the conduct of this study, the Secretary of Commerce has established the IATF for NACOA. The IATF will be responsible for the preparation of preliminary recommendations in the areas of energy, fisheries, marine transportation, ocean minerals, ocean operations and services, pollution, and waste management.

Persons desiring to attend will be admitted to the extent seating is available. Persons wishing to make formal statements should notify the Chairperson of the Subgroup on Marine Transportation, Dr. Don Walsh, in advance of the meeting. The Chairperson retains the prerogative to impose limits on the duration of oral statements and discussion. Written statements may be submitted before or after each session.

Additional information concerning this meeting may be obtained through the NACOA Executive Director, Mr. Steven N. Anastasion, or CDR Tom Nunes, the Staff Member for the Marine Transportation Subgroup. The mailing address is: NACOA, 3300 Whitehaven Street NW. (Suite 438, Page Building No. 1), Washington, D.C. 20235.

Steven N. Anastasion,

Executive Director.

[FR Doc. 80–40455 Filed 12–29–80; 8:45 am]

BILLING CODE 3510–12–M

NATIONAL SCIENCE FOUNDATION

Advisory Committee for Behavioral and Neural Sciences; Subcommittee for Psychobiology; Meeting

In accordance with the Federal Advisory Committee Act, Pub. L. 92–463, as amended, the National Science Foundation announces the following meeting:

Name: Subcommittee on Psychobiology of the Advisory Committee for Behavioral and Neural Sciences.
Date & Time: January 23–24, 1981, 8:30 a.m.–5:00 p.m. each day.
Place: Hilton Inn, Room 339, Salt Lake City, Utah.
Type of Meeting: Closed.
Contact Person: Dr. Fred Stollnitz Program Director, Psychobiology Program, Room 320, National Science Foundation, Washington, D.C. (202) 357–7949.
Purpose of Subcommittee: To provide advice and recommendations concerning support for research in psychobiology.
Agenda: To review and evaluate research proposals as part of the selection process for awards.
Reason for Closing: The proposals being reviewed include information of a proprietary or confidential nature, including technical information, financical data, such as salaries, and personal information concerning individuals associated with the proposals. These matters are within exemptions (4) and (6) of 5 U.S.C. 552b(c), Government in the Sunshine Act.
Authority To Close Meeting: This determination was made by the Committee Management Officer pursuant to provisions of Section 10(d) of Pub. L. 92–463. The committee Management Officer was delegated the authority to make such determinations by the Director, NSF, on July 6, 1979.

M. Rebecca Winkler,

Committee Management Coordinator.

December 22, 1980.

[FR Doc. 80–40458 Filed 12–29–80; 8:45 am]

BILLING CODE 7555–01–M

Advisory Committee for Physics; Subcommittee on Computational Facilities for Theoretical Research; Meeting

In accordance with the Federal Advisory Committee Act, Pub. L. 92–463, the National Science Foundation announces the following meeting:

Name: Advisory Committee for Physics—Subcommittee on Computational Facilities for Theoretical Research.
Date and Time: January 15–17, 1981; 9 a.m. to 5 p.m. each day.
Place: National Science Foundation, 1800 G Street, NW., Washington, D.C. 20550. Room 628 each day.
Type of Meeting: Open.
Contact Person: Dr. Richard A. Isaacson, Division of Physics, National Science Foundation, Washington, D.C. 20550. Telephone (202) 357–7979.
Summary of Minutes: Will be available as an attachment to the minutes of the full Committee meeting to be held in February, 1981.
Purpose of Subcommittee: To examine present and future trends for the usage of computers for university-based Theoretical Physics research and recommend an appropriate strategy for meeting the computational needs of this area of research.
Agenda:

January 15, 1981, 9 a.m. to 5 p.m.: Review of available studies on the usage of computers for theoretical research by university scientists. Preliminary discussion of Subcommittee recommendations.

January 16, 1981, 9 a.m. to 5 p.m.: Continuation of previous day's discussion.

January 17, 1981, 9 a.m. to 5 p.m.: Continuation of previous day's discussion.

M. Rebecca Winkler,

Committee Management Coordinator.

December 22, 1980.

[FR Doc. 80–40459 Filed 12–29–80; 8:45 am]

BILLING CODE 7555–01–M

Advisory Council; Task Group No. 15; Meeting

In accordance with the Federal Advisory Committee Act, Pub. L. 92–463, the National Science Foundation announces the following meeting:

Name: Task Group No. 15 of the NSF Advisory Council.
Place: Room 523, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20550.
Date: Friday, January 30, 1981.
Time: 9:00 a.m. till 5:00 p.m.
Type of Meeting: Open.
Contact Person: Ms. Jeanne Hudson, Executive Secretary of the NSF Advisory Council, National Science Foundation, Room 518, 1800 G Street, N.W., Washington, D.C. 20550. Telephone: 202/357–9433.
Purpose of Task Group: The purpose of the Task Group, composed of members of the NSF Advisory Council, is to provide the full Advisory Council with a mechanism to consider numerous issues of interest to the Council that have been assigned by the National Science Foundation.
Summary Minutes: May be obtained from the contact person at above stated address.
Agenda: The Task Group is asked to determine the role of NSF in the science education for the general public. The task Group will focus on mechanisms to encourage greater interagency cooperation and will suggest mechanisms to foster increased and/or expanded in-school as well as out-of-school programs for education in the sciences and technology.

M. Rebecca Winkler,

Committee Management Coordinator.

December 22, 1980.

[FR Doc. 80–40460 Filed 12–29–80; 8:45 am]

BILLING CODE 7555–01–M

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-389]

Florida Power & Light Co. (St. Lucie Nuclear Power Plant, Unit 2); Reconstitution of Atomic Safety and Licensing Appeal Board

Notice is hereby given that, in accordance with the authority conferred by 10 CFR 2.787(a), the Chairman of the Atomic Safety and Licensing Appeal Panel has assigned the following panel members to serve as the Atomic Safety and Licensing Appeal Board for this construction permit proceeding:

Richard S. Salzman, Chairman.
Dr. W. Reed Johnson.

Dated: December 19, 1980.

C. Jean Bishop,
Secretary to the Appeal Board.

[FR Doc. 80-40376 Filed 12-29-80; 8:45 am]
BILLING CODE 7590-01-M

[Docket Nos. 50-354 and 50-355]

Public Service Electric & Gas Co. and Atlantic City Electric Co. (Hope Creek Generating Station, Units 1 and 2); Reconstitution of Atomic Safety and Licensing Appeal Board

Notice is hereby given that, in accordance with the authority conferred by 10 CFR 2.787(a), the Chairman of the Atomic Safety and Licensing Appeal Panel has assigned the following Panel members to serve as the Atomic Safety and Licensing Appeal Board for this construction permit proceeding:

Richard S. Salzman, Chairman.
Dr. W. Reed Johnson.
Thomas S. Moore.

Dated: December 18, 1980.

C. Jean Bishop,
Secretary to the Appeal Board.

[FR Doc. 80-40377 Filed 12-29-80; 8:45 am]
BILLING CODE 7590-01-M

NUCLEAR REGULATORY COMMISSION

FEDERAL EMERGENCY MANAGEMENT AGENCY

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (NUREG-0654/FEMA-REP-1, Rev. 1)

In January 1980, NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," was issued for interim use and comment. Comments have been received and evaluated. The Nuclear Regulatory Commission and the Federal Emergency Management Agency have used the comments in revising the document. The revision process included close coordination with State and local planning groups.

As a result, Revision 1 of NUREG-0654/FEMA-REP-1 was published in November 1980. Wide distribution is being made to industry and to State and local officials who are responsible for radiological emergency planning and preparedness. This document is consistent with NRC and FEMA regulations and supersedes other previous guidance and criteria published by FEMA and NRC on this subject. It will be used by reviewers in determining the adequacy of State, local, and nuclear power plant licensee emergency plans and preparedness.

Single copies of this document are available free, to the extent of supply, by writing to the Director, Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555; or to Headquarters, Federal Emergency Management Agency, 1725 I Street NW., Washington, D.C. 20472, Attention: Administrative Services Division. Copies will also be available for review in the NRC Public Document Room, Washington, D.C.; the local NRC Public Document Rooms; at FEMA Headquarters, Administrative Services Division; and the FEMA Regional Offices.

Dated at Washington, D.C., this 17th day of December 1980.

For the Nuclear Regulatory Commission.

E. Kevin Cornell,
Deputy Executive Director for Operations.

For the Federal Emergency Management Agency.

Frank A. Camm,
Associate Director for Plans and Preparedness.

[FR Doc. 80-40378 Filed 12-29-80; 8:45 am]
BILLING CODE 7590-01-M

SECURITIES AND EXCHANGE COMMISSION

Cincinnati Stock Exchange; Application for Unlisted Trading Privileges and of Opportunity for Hearing

December 18, 1980.

The above named national securities exchange has filed an application with the Securities and Exchange Commission pursuant to Section 12(f)(1)(B) of the Securities Exchange Act of 1934 and Rule 12f-1 thereunder, for unlisted trading privileges in the common stock of:

Dart & Kraft Incorporated, Common Stock, $2.50 Par Value (File No. 7-5795).

This security is listed and registered on one or more other national securities exchanges and is reported on the consolidated transaction reporting system.

Interested persons are invited to submit on or before January 12, 1981 written data, views and arguments concerning the above-referenced application. Persons desiring to make written comments should file three copies thereof with the Secretary of the Securities and Exchange Commission, Washington, D.C. 20549. Following this opportunity for hearing, the Commission will approve the application if it finds, based upon all the information available to it, that the extension of unlisted trading privileges pursuant to such application is consistent with the maintenance of fair and orderly markets and the protection of investors.

For the Commission, by the Division of Market Regulation, pursuant to delegated authority.

George A. Fitzsimmons,
Secretary.

[FR Doc. 80-40383 Filed 12-29-80; 8:45 am]
BILLING CODE 8010-01-M

Philadelphia Stock Exchange, Inc.; Application for Unlisted Trading Privileges and of Opportunity for Hearing

December 18, 1980.

The above named national securities exchange has filed an application with the Securities and Exchange Commission pursuant to Section 12(f)(1)(B) of the Securities Exchange Act of 1934 and Rule 12f-1 thereunder, for unlisted trading privileges in the common stock of:

Paine Webber, Inc., Common Stock, $1 Par Value (File No. 7-5796).

This security is listed and registered on one or more other national securities exchanges and is reported on the consolidated transaction reporting system.

Interested persons are invited to submit on or before January 12, 1981 written data, views and arguments concerning the above-referenced application. Persons desiring to make written comments should file three copies thereof with the Secretary of the Securities and Exchange Commission,

Washington, D.C. 20549. Following this opportunity for hearing, the Commission will approve the application if it finds, based on all the information available to it, that the extension of unlisted trading privileges pursuant to such application is consistent with the maintenance of fair and orderly markets and the protection of investors.

For the Commission, by the Division of Market Regulation, pursuant to delegated authority.

George A. Fitzsimmons,

Secretary.

[FR Doc. 80-40382 Filed 12-29-80; 8:45 am]

BILLING CODE 8010-01-M

SYNTHETIC FUELS CORPORATION

Proposal Workshops

Action: Notice/Invitation.

Summary

The U.S. Synthetic Fuels Corporation will conduct two pre-proposal workshops on January 19 at the Hilton Hotel in New York City and on January 28 at the Fairmont Hotel in Denver. The purpose of these workshops is to provide prospective proposers and interested parties an opportunity to meet SFC officers and staff to discuss our solicitation, evaluation and selection process and the various forms of financial assistance available through the SFC.

Note.—The SFC is authorized to financially assist the commercial production of synthetic fuels from coal (including peat and lignite), shale, tar sands (including heavy oils), and water (as a source of hydrogen through electrolysis).

Inquiries: Lillian Clarke/Jim Ajello, Telephone 202/653-4400.

Address: 1200 New Hampshire Avenue, N.W., Suite 460, Washington, D.C. 20586.

United States Synthetic Fuels Corporation.

For the Board of Directors.

John C. Sawhill,

Chairman.

December 22, 1980.

[FR Doc. 80-40386 Filed 12-29-80; 8:45 am]

BILLING CODE 6450-01-M

DEPARTMENT OF THE TREASURY

[Supplement to Department Circular Public Debt Series No. 38-80]

Series H-1984 Notes; Interest Rate

December 22, 1980.

The Secretary announced on December 18, 1980 that the interest rate on the notes designated Series H-1984 described in Department Circular—Public Debt Series—No. 38-80 dated December 11, 1980, will be 14 percent. Interest on the notes will be payable at the rate of 14 percent per annum.

Paul H. Taylor,

Fiscal Assistant Secretary.

Supplementary Statement

The announcement set forth above does not meet the Department's criteria for significant regulations and, accordingly, may be published without compliance with the Departmental procedures applicable to such regulations.

[FR Doc. 80-40475 Filed 12-29-80; 8:45 am]

BILLING CODE 4810-40-M

Sunshine Act Meetings

Federal Register
Vol. 45, No. 251
Tuesday, December 30, 1980

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409) 5 U.S.C. 552b(e)(3).

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NATIONAL CREDIT UNION ADMINISTRATION.

TIME AND DATE: 10 a.m., Tuesday, December 30, 1980.

PLACE: 1776 G. Street, NW., Washington, D.C., 7th Floor Board Room.

STATUS: Closed.

MATTERS TO BE CONSIDERED:

1. Merger. Closed pursuant to examptions (8) and (9)(A)(ii).
2. Establishment of Special Reserves under Section 201 of the Federal Credit Union Act or Alternatively Administrative Actions under Section 206 of the Federal Credit Union Act. Closed pursuant to exemptions (8), (9)(A)(ii) and (10).
3. Requests from federally insured credit unions for special assistance under Section 208 of the Federal Credit Union Act. Closed pursuant to exemptions (8) and (9)(A)(ii).

FOR MORE INFORMATION CONTACT: Joan O'Neill, Program Assistant, telephone (202) 357-1100.

[S-2356-80 Filed 12-29-80; 8:45 am]

BILLING CODE 7535-01-M

2

NATIONAL CREDIT UNION ADMINISTRATION.

Notice of Change in Subject of Meeting

The National Credit Union Administration Board determined that its business required that the previously announced open meeting on December 18, 1980, include an additional item, which was open to public observation.

Consideration of DIDC Actions of December 12, 1980.

The previously announced items were:

1. Review of Central Liquidity Facility Lending Rate.
2. Consideration of a waiver of the regular reserve transfer for the fourth quarter of 1980.
3. Consideration of a revision of the regulations applying to retirement accounts.
4. Consideration of Advance Notice of Proposed Rulemaking for revising Regulation 721, Federal Credit Union insurance and group purchasing activities.
5. Consideration of Interpretive Ruling and Policy Statement regarding the use of statistical sampling for the verification of members' accounts that is required by Section 115 of the Federal Credit Union Act and Section 741.2 of the NCUA Rules and Regulations.
6. Final Rule on Premiums.
7. Adoption of an NCUA System of Grievance Records.
8. Publication of Fifth Semi-Annual Agenda in Federal Register.
9. Report on actions taken under delegations of authority.
10. Applications for charters, amendments to charters, bylaw amendments, mergers as may be pending at that time.

The meeting was held at 9:30 a.m., in the 7th Floor Board Room, 1776 G St., NW., Washington, D.C.

FOR MORE INFORMATION CONTACT: Rosemary Brady, Secretary of the Board, telephone (202) 357-1100.

[S-2357-80 Filed 12-29-80; 8:45 am]

BILLING CODE 7535-01-M

3

NATIONAL CREDIT UNION ADMINISTRATION.

Notice of Change in Subject of Meeting

The National Credit Union Administration Board determined that its business required that the previously announced closed meeting on December 18, 1980, include an additional item, which was closed to public observation.

Personnel Action. Closed pursuant to examption (2).

The previously announced items were:

1. Proposed mergers. Closed pursuant to exemptions (8) and (9)(A)(ii).
2. Report of action taken under Section 201(c)(2) of the Federal Credit Union Act. Closed pursuant to exemption (9)(A)(ii).
3. Administrative Actions under Section 120 of the Federal Credit Union Act. Closed pursuant to exemptions (8), (9)(A)(ii) and (10).
4. Administrative Action under Section 206 of the Federal Credit Union Act. Closed pursuant to exemptions (8), (9)(A)(ii) and (10).
5. Administrative Actions under Section 207 of the Federal Credit Union Act. Closed pursuant to exemptions (8), (9)(A)(ii) and (9)(B).
6. Requests from federally insured credit unions for special assistance under Section 208 of the Federal Credit Union Act. Closed pursuant to exemptions (8) and (9)(A)(ii).
7. Division of Assets, Liabilities and Capital. Closed pursuant to exemptions (8) and (9)(A)(ii).
8. Request for special assistance under Section 208 and purchase and assumption under Sections 107 and 205 of the Federal Credit Union Act. Closed pursuant to exemptions (8) and (9)(A)(ii).
9. Allocations of Executive Positions and Noncareer Appointment Authority. Closed pursuant to exemptions (2) and (6).
10. Consideration of change to NCUA policy regarding share-to-Loan Transfers in involuntary liquidations. Closed pursuant to exemption (9)(B).
11. Delegation of 208 Assistance to assist in the voluntary liquidation of solvent insured credit unions. Closed pursuant to exemption (2).
12. Consideration of Policy change to permit the use of collection agencies. Closed pursuant to exemption (9)(B).
13. Consideration of Policy change to allow Finance companies to bid on loan portfolios. Closed pursuant to exemption (9)(B).

The meeting was held at 10:30 a.m., in the 7th Floor Board Room, 1776 G Street, NW., Washington, D.C.

FOR MORE INFORMATION CONTACT: Rosemary Brady, Secretary of the Board, telephone (202) 357-1100.

[S-2358-80 Filed 12-29-80; 8:45 am]

BILLING CODE 7535-01-M

4

NATIONAL MEDIATION BOARD.

TIME AND DATE: 2 p.m., Wednesday, January 7, 1981.

PLACE: Board Hearing Room, 8th Floor, 1425 K Street, NW., Washington, D.C.

STATUS: Open.

MATTERS TO BE CONSIDERED:

(1) Ratification of Board actions taken by notation voting during the month of December, 1980.

(2) Other priority matters which may come before the Board for which notice will be given at the earliest practicable time.

SUPPLEMENTARY INFORMATION: Copies of the monthly report of the Board's notation voting actions will be available from the Executive Secretary's office following the meeting.

CONTACT PERSON FOR MORE INFORMATION: Mr. Rowland K. Quinn, Jr., Executive Secretary, Tel: (202) 523-5920.

DATE OF NOTICE: December 22, 1980.

[S-2359-80 Filed 12-29-80; 8:45 am]

BILLING CODE 7550-01-M

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Vol. 45, No. 251

Tuesday, December 30, 1980

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AGENCY PUBLICATION ON ASSIGNED DAYS OF THE WEEK

The following agencies have agreed to publish all documents on two assigned days of the week (Monday/Thursday or Tuesday/Friday). This is a voluntary program. (See OFR NOTICE 41 FR 32914, August 6, 1976.)

Monday	Tuesday	Wednesday	Thursday	Friday
DOT/SECRETARY	USDA/ASCS		DOT/SECRETARY	USDA/ASCS
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DOT/SLSDC			DOT/SLSDC	
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Documents normally scheduled for publication on a day that will be a Federal holiday will be published the next work day following the holiday.
Comments on this program are still invited.
Comments should be submitted to the Day-of-the-Week Program Coordinator, Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D.C. 20408

NOTE: As of September 2, 1980, documents from the Animal and Plant Health Inspection Service, Department of Agriculture, will no longer be assigned to the Tuesday/Friday publication schedule.

REMINDERS

The "reminders" below identify documents that appeared in issues of the **Federal Register** 15 days or more ago. Inclusion or exclusion from this list has no legal significance.

Rules Going Into Effect Today

Note: There were no items eligible for inclusion in the list of **Rules Going Into Effect Today.**

List of Public Laws

Last Listing December 30, 1980

This is a continuing listing of public bills from the current session of Congress which have become Federal laws. The text of laws is not published in the **Federal Register** but may be ordered in individual pamphlet form (referred to as "slip laws") from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (telephone 202–275–3030).

H.J. Res. 615 / Pub. L. 96–563 Providing for appointment of David C. Acheson as a citizen regent of the Board of Regents of the Smithsonian Institution (December 22, 1980; 94 Stat. 3304) Price $1.

S. 2227 / Pub. L. 96–564 To grant the consent of the United States to the Red River Compact among the States of Arkansas, Louisiana, Oklahoma, and Texas (December 22, 1980; 94 Stat. 3305) Price $1.25.

H.R. 7217 / Pub. L. 96–565 To establish the Kalaupapa National Historical Park in the State of Hawaii, and for other purposes (December 22, 1980; 94 Stat. 3321) Price $1.

H.J. Res. 642 / Pub. L. 96–566 Providing for convening of the first regular session of the Ninety-seventh Congress on January 5, 1981, and for other purposes (December 22, 1980; 94 Stat. 3328) Price $1.

H.R. 7865 / Pub. L. 96–567 Nuclear Safety Research, Development, and Demonstration Act of 1980 (December 22, 1980; 94 Stat. 3329) Price $1.

S. 3027 / Pub. L. 96–568 Disaster Relief Act Amendments of 1980 (December 22, 1980; 94 Stat. 3334) Price $1.

S. 2726 / Pub. L. 96–569 Environmental Research, Development, and Demonstration Authorization Act of 1981 (December 22, 1980; 94 Stat. 3335) Price $1.

H.R. 2111 / Pub. L. 96–570 To extend the service area for the Sacramento Valley Canals, Central Valley project, California, and for other purposes (December 22, 1980; 94 Stat. 3339) Price $1.

S. 1784 / Pub. L. 96–571 Alaska Federal-Civilian Energy Efficiency Swap Act of 1980 (December 22, 1980; 94 Stat. 3341) Price $1.

S. 1148 / Pub. L. 96–572 To reauthorize title I of the Marine Protection, Research, and Sanctuaries Act, and for other purposes (December 22, 1980; 94 Stat. 3344) Price $1.

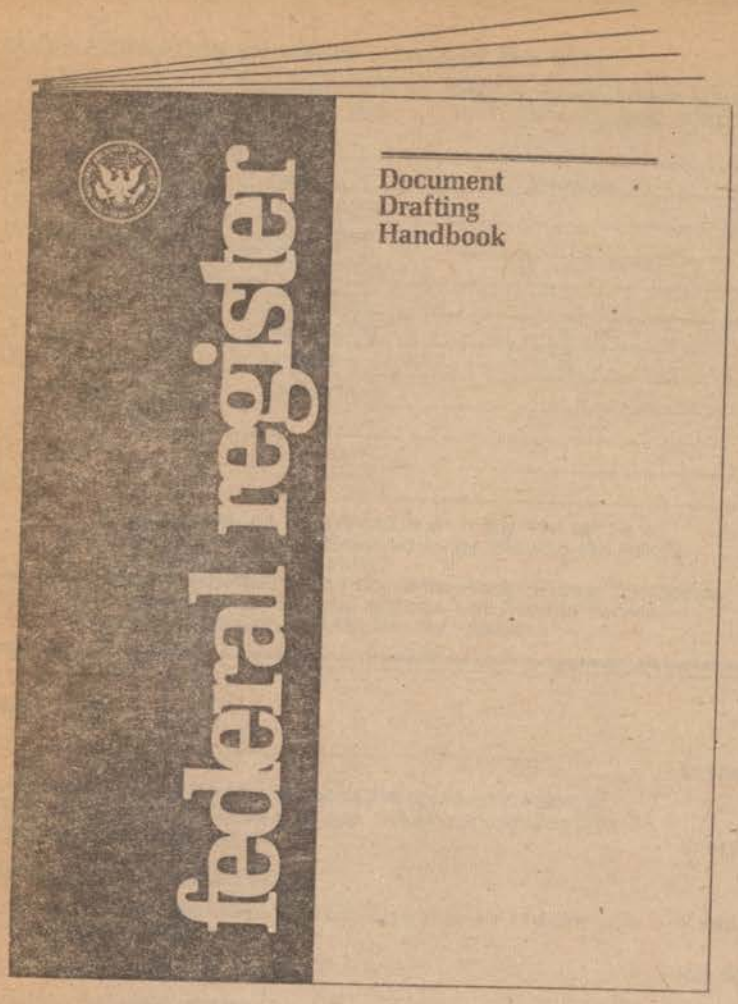
S. 2189 / Pub. L. 96–573 Low-Level Radioactive Waste Policy Act (December 22, 1980; 94 Stat. 3347) Price $1.

H.R. 999 / Pub. L. 96–574 To amend the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to clarify its provisions, and for other purposes (December 22, 1980; 94 Stat. 3350) Price $1.

H.R. 4941 / Pub. L. 96–575 To name a dam and reservoir on the San Gabriel River, Texas, as the "North San Gabriel Dam" and "Lake Georgetown", respectively (December 22, 1980; 94 Stat. 3353) Price $1.

H.R. 8345 / Pub. L. 96–576 To name the United States Customs House in Ogdensburg, New York, the "Robert C. McEwen United States Customs House" (December 22, 1980; 94 Stat. 3355) Price $1.

H. J. Res. 337 / Pub. L. 96–577 Designating February 11, 1981, "National Inventors' Day" (December 22, 1980; 94 Stat. 3357) Price $1.



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International Trade Administration

Publication of Advisory Notes, the Commodity Control List and Commodity Interpretations in the Code of Federal Regulations

DEPARTMENT OF COMMERCE

International Trade Administration

15 CFR Parts 385 and 399

Publication of Advisory Notes, the Commodity Control List and Commodity Interpretations in the Code of Federal Regulations

AGENCY: International Trade Administration, U.S. Department of Commerce.

ACTION: Final rule.

SUMMARY: This revision makes technical changes in the regulations which are necessary to include the full text of the following sections in the Code of Federal Regulation (CFR): Advisory Notes for Selected CCL Entries (Supplement No. 1 to Part 385), Commodity Control List (§ 399.1), and Commodity Interpretations (§ 399.2). In prior years these documents were incorporated by reference. This document also revises the authority citation for Part 399 by updating it to reflect the latest statutory and departmental authorizations.

EFFECTIVE DATE: December 30, 1980.

FOR FURTHER INFORMATION CONTACT: Richard J. Isadore, Acting Director, Operations Division, Office of Export Administration, Room 1617M, Washington, D.C. 20230, 202–377–4738.

SUPPLEMENTARY INFORMATION:

Advisory Notes for Selected CCL Entries

The Advisory Notes appear in Supplement 1 to Part 385. They were printed in the **Federal Register** on June 25, 1980 (45 FR 43012–43054). They are revised and set out in full text in today's document. The Advisory Notes will be included in the next edition of Title 15 of the CFR, revised as of January 1, 1981.

Commodity Control List (CCL)

The Commodity Control List was printed in the **Federal Register** on June 25, 1980 (45 FR 43060–43138). Today, the Department announces its intention to include the CCL in full text in the next revision of Title 15 of the CFR. The CCL is designated Supplement 1 to § 399.1. In addition, replacement pages issued since the June 25, 1980, publication are printed in today's document and the authority section is revised and updated.

Commodity Interpretations

The Department has decided to include the Commodity Interpretations in the next revision of Title 15 of the CFR. Therefore, the full text of the interpretations is included in today's document as Supplement 1 to § 399.2.

Rulemaking Requirements

Section 13(a) of the Export Administration Act of 1979 ("the Act") exempts regulations promulgated thereunder from the public participation in rulemaking procedures of the Administrative Procedure Act. Section 13(b) of the Act, which expresses the intent of Congress that where practicable "regulations imposing controls on exports" be published in proposed form, is not applicable because these regulations do not impose controls on exports. It has been determined that these regulations are not "significant" within the meaning of Department of Commerce Administrative Order 218–7 (44 FR 2082, January 9, 1979) and International Trade Administration Administrative Instruction 1–6 (44 FR 2093, January 9, 1979) which implement Executive Order 12044 (43 FR 12661, March 23, 1978), "Improving Government Regulations." Therefore these regulations are issued in final form. Although there is no formal comment period, public comments on the regulations are welcome on a continuing basis.

In consideration of the reasons set out in the preamble, 15 CFR Chapter III is amended as set forth below.

(Secs. 4, 5, 6, 7, 13, 15, 17(d) and 21, Pub. L. 96–72 (50 U.S.C. app. 2401 *et seq.*); Executive Order 12214 (45 FR 29783, May 6, 1980); Departmental Organization Order 10–3 (45 FR 6141, January 25, 1980); International Trade Administration Organization and Function Order 41–1 (45 FR 11862, January 30, 1980))

Kent N. Knowles,

Director, Office of Export Administration.

1. Supplement 1 to Part 385 is revised to read as follows:

Supplement No. 1 to Part 385—Advisory Notes for Selected CCL Entries

2018A Specialized machinery, equipment, gear, and specially designed parts and accessories therefor, specially designed for the examination, manufacture, testing, and checking of the arms, ammunition, appliances, machines, and implements of war.

Note.—Licenses are likely to be approved for export to satisfactory end-users of equipment used to determine the safety data of explosives, as required by the International Convention on the Transport of Dangerous Goods (C.I.M.), articles 3 and 4 in Annex 1 RID, provided that such equipment will be used only by the railway authorities of current C.I.M. members, or by Government accredited testing facilities in those countries, for the testing of explosives to transport safety standards, as follows:

(a) Equipment for determining the ignition and deflagration temperatures;

(b) Equipment for steel-shell tests;

(c) Drop hammers not exceeding 20 kg in weight for determining the sensitivity of explosives to shock;

(d) Equipment for determining the friction sensitivity of explosives when exposed to charges not exceeding 36 kg in weight.

1081A Machinery for use in the manufacture of aircraft, as follows:

(a) Machinery specially designed for the working or forming of aircraft sheet, plate or extrusion; or

(b) Machinery specially designed for the milling of aircraft skin.

Note.—Licenses are likely to be approved for export to satisfactory end-users provided that the machinery does not present an improvement on machinery in production before the 1st January of the year ten years preceding the year of the proposed export.

1091A (a) Units for numerically controlling simultaneously coordinated (contouring and continuous path) movements of machine tools and dimensional inspection machines in two or more axes, *except units having all of the following characteristics:*

(1) Hardwired (not softwired, i.e., not Computerized Numerical Control (CNC));

(2) No more than two contouring interpolating axes can be simultaneously coordinated (interpolating is understood to be any mathematical function including linear and circular; the units may have one or more positioning axes in addition to two contouring axes. The units may have more than one set of two contouring axes (e.g. units controlling two independent railheads on a vertical turret lathe), provided a separate feedrate number is required for each set of two contouring axes, and a single feedrate number (standard or optional) does not control more than two contouring axes);

(3) Minimum programmable increment equal to or greater (coarser) than 0.001 mm (0.0004 in.); and

(4) Without interface to allow direct computer input;

(b) Machine tools and dimensional inspection machines, which according to the manufacturer's technical specifications can be equipped with controls described in sub-entry (a) above, *except:*

(1) Boring mills, milling machines, and machining centers, having all of the following characteristics:

(i) Maximum slide travel in any axis equal to or less than 3,000 mm (10 ft.);

(ii) Positioning accuracy of any axis equal to or greater than ±0.01 mm per 300 mm (0.0004 in./ft.) and 0.005 mm for each additional 300 mm (.0002 in./additional ft.);

(iii) Spindle horsepower equal to or less than 20 kW (25 hp);

(iv) Single-working spindle;

(v) Axial and radial axis motion measured at the spindle axis in one revolution of the spindle equal to or greater than $D \times 2 \times 10^{-5}$ TIR (peak-to-peak) where D is the spindle diameter; and

(vi) Not more than 3 axes capable of simultaneously coordinated contouring motion regardless of the NC unit connected to the machine;

(2) Machine tools (other than the machines described in sub-entry (1) above) and dimensional inspection machines having all of the following characteristics:

(i) Positioning accuracy of any axis equal to or greater than ±0.01 mm per 300 mm

(0.0004 in./ft.) and 0.005 mm for each additional 300 mm (0.0002 in./additional ft.);

(ii) Radial axis motion measured at the spindle axis equal to or greater than 0.0008 mm (0.00003 in.) TIR (peak-to-peak) in one revolution of the spindle (for lathes and other turning machines); and

(iii) Not more than 3 axes capable of simultaneously coordinated contouring motion regardless of the NC unit connected to the machine; (the machines in sub-entry (b)(*1*)(*iv*) above may have multiple tool heads or turrets, but only one working spindle (standard or optional) may be operative at a time; the machines defined in sub-entries (b)(*1*)(*vi*) and (b)(*2*)(*iii*) above may have more than one work station, but each station shall be limited to 2-axes contouring (e.g. vertical turret lathes with two independent railheads). The machines may have one or more discrete positioning mode axes (e.g. discrete positioning index table) in addition to the three contouring axes. Secondary contouring axes parallel to primary contouring axes (e.g. W-axis of a boring mill that has a primary Z-axis) are not to be considered when determining the number of contouring axes; the value of the positioning accuracy described in sub-entries (b)(*1*)(*ii*) and (b)(*2*)(*i*) above does not include the width of blacklash. This value is determined by the usual statistical methods (random tests), i.e. by approaching from only one direction a minimum of five measurement points up to a maximum of twenty-five measurement positions as random tests along one axis. National standards, e.g. the German VDI standards No. 2354, sheet 1 and/or the United States NMTBA standard ("Definition and Evaluation of Accuracy and Repeatability for Numerically-controlled Machine-Tools," August 1972), can be taken as binding standards for this measuring method);

(c) Direct Numerical Control (DNC) systems consisting of a dedicated stored program computer acting as a host computer and controlling, on-line or off-line, one or more numerically-controlled machine tools or inspection machines, as defined in sub-entry (b) above, related software, and interface and communication equipment for data transfer between the host computer memory, the interpolation functions, and the numerically-controlled machine tools; and

(d) Specially designed sub-assemblies which, according to the manufacturer's technical specifications, can upgrade the capabilities of numerical control units and machine tools to meet the specifications described in sub-entries (a), (b), or (c) above.

Note.—Licenses are likely to be approved for export to satisfactory end-users of Computer Numerical Control (CNC) units for uses other than aerospace, provided that:

(a) At the time of export, the units are mounted on non-controlled machine tools or equipment;

(b) The CNC units are designed to have all of the following characteristics:

(1) No more than two contouring interpolating axes can be simultaneously coordinated ("Interpolating" is understood to be any mathematical function including linear and circular. Units may not have additional positioning axes);

(2) The cabinet shall be designed for only 2-axes operation (i.e. there shall be no additional card rack locations, wiring provisions for more than two servo-loops, nor physical space for later additions of these types of items);

(3) Memory is limited to and not capable of being extended beyond that enabling a maximum of two-axes simultaneous velocity and path generation, plus 400 characters (8-bit) of part program storage;

(4) Power supply is limited to two-axes operation;

(5) Minimum programmable increment equal to or greater (coarser) than 0.001 mm; and

(6) Without interface to enable data exchange with another computer;

(c) The information exported with and pertaining to the control unit shall:

(1) Be limited to machine language, binary format, control software enabling a maximum of two-axes simultaneous velocity and path generation;

(2) Not include flow charts, logic diagrams, nor source program documentation for the control software;

(3) Reflect only two-axes parameters in all electrical/mechanical installation, operation, or maintenance of documentation.

2120A Cryogenic equipment, the following:

(a) * * *

(b) Electrical, magnetic, and electronic equipment or components, and electrical conductors, specially designed for operation continously or discontinuously at ambient temperatures below −274° F (−170° C), as follows:

(1) Superconductive metals, alloys, compounds, composites, and intercalate materials, *except:*

(i) Superconductive wire having a filament cross-sectional area of 4.42 x 10^{-3} sq.mm. (or 75 microns diameter) or greater; or

(ii) Superconductive niobium-titanium wire having a filament cross-sectional area of 1.26 x 10^{-3} sq.mm. (or 40 microns diameter) or greater in a copper matrix;

(2) * * *

(3) * * *

(4) * * *

(c) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of individual shipments of niobium-titanium wire covered by sub-entry (b)(1) above having a filament cross-sectional area of 9.5 x 10^{-5} sq.mm. (or 11 microns diameter) or greater in a copper matrix, in quantities not exceeding 10 kg.

1131A Pumps (except vacuum pumps listed under entry No. 1129) having *any* of the following characteristics:

(a) * * *

(b) Having all flow contact surfaces made of 90 percent or more tantalum, titanium, or zirconium, either separately or combined, *except when such surfaces are made of materials containing more than 97 percent and less than 99.7 percent titanium; and*

(c) * * *

Note.—Licenses are likely to be approved for export of pumps covered by sub-entry (b) above to bona fide civil end-users for non-aerospace end-uses.

1133A Valves, cocks and pressure regulators having all flow contact surfaces made of 90% or more tantalum, titanium or zirconium, either separately or combined, *except when such surfaces are made of materials containing more than 97% and less than 99.7% titanium.*

Note.—Licenses are likely to be approved for export of valves, cocks and pressure regulators to bona fide civil end-users for non-aerospace end-uses.

1205A Electro-chemical, semi-conductor, and radioactive devices for the direct conversion of chemical, solar, or nuclear energy to electrical energy, as follows:

(a) Electro-chemical devices, as follows:

(1) Fuel cells operating at temperatures of 392° F (200° C) or less, including regenerative cells, i.e., cells for generating electric power, to which all the consumable components are supplied from outside the cell (the temperature of 392° F (200° C) or less is intended to refer to the fuel cell and not the fuel conditioning equipment, which may be either an ancillary or an integral part of the fuel cell battery and which may operate at over 392° F (200° C));

(2) * * *

(3) * * *

(4) * * *

(b) * * *

(c) Power sources other than nuclear reactors based on radioactive materials systems, *except:*

(1) *Those having an output power of less than 0.5 Watt and a total weight of more than 200 lbs. (90.7 kg); or*

(2) *Those specially designed and developed for medical use within the human body; and*

(d) * * *

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of fuel cells covered by sub-entry (a)(1) above, having a maximum output power level greater than 10 kW using gaseous pure hydrogen and oxygen/air reactants, alkaline electrolytic, and a catalyst support by carbon either pressed on a metal mesh electrode, or attached to a conducting porous plastic.

2. Licenses are likely to be approved for export to satisfactory end-users of devices covered by sub-entry (c) above, having an output power of 0.5 Watt or more and an overall efficiency of 6 percent or less. (The overall efficiency is obtained by dividing the electrical output, expressed in watts, by the thermal input, expressed in watts. It is understood that this efficiency is to be measured at the beginning of life.)

3261A Neutron generator systems, including tubes, designed for operation without an external vacuum system and utilizing electrostatic acceleration to induce a tritium-deuterium nuclear reaction; and specially designed parts therefor.

Note.—Licenses are likely to be approved for the export to satisfactory end-users of tubes and systems whose technical specifications are essentially the same as those for previously approved exports, provided that they are for civil use.

1312A Presses and specialized controls, accessories, and parts therefor, as follows:

(a) * * *

(b) Hydraulic presses, as follows:

(1) Vertical presses having a total rated force of over 10,000 tons; or

(2) Horizontal presses having a total rated force of over 5,000 tons;

(c) Isostatic presses, as follows (isostatic presses are those capable of pressurizing a closed cavity through various media (gas, liquid, solid particles, etc.) to create equal force in all directions within the cavity upon a workpiece or material):

(1) Capable of achieving a maximum working pressure of 20,000 psi (1,406 kg/cm²) or greater and possessing a chamber cavity with an inside diameter in excess of 16 inches (40.6 cm); or

(2) Capable of achieving a maximum working pressure of 5,000 psi (351 kg/cm²) or greater and having a controlled thermal environment within the closed cavity, *except those possessing a chamber cavity with an inside diameter of less than 5 inches (127 mm) and which are also capable of achieving and maintaining a controlled thermal environment only between +176° F (+80° C) and −31° F (−35° C);* and

(d) Control equipment, accessories, and parts which are specially designed for the above presses.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of hydraulic presses covered by sub-entry (b) above, provided that:

(i) The total rated force is less than 30,000 tons for vertical presses, and 10,000 tons or less for horizontal presses;

(ii) The presses are not specially designed for use in forming aircraft, missile or space vehicle parts, in powder metallurgy or in ceramics production; and

(iii) The presses could not reasonably be used for strategic purposes.

2. Licenses are likely to be approved for export to satisfactory end-users of isostatic presses covered by sub-entry (c) above, provided that:

(i) Isostatic presses having a controlled thermal environment within the closed cavity are limited as follows:

(a) Maximum working pressure not exceeding 20,000 psi (1,406kg/cm²);

(b) Chamber cavity with an inside diameter not exceeding 10 inches (25.4 cm);

(c) Capable of achieving and maintaining a controlled thermal environment within the closed cavity of no greater than 1,200° C;

(ii) Isostatic presses, other than those dealt with under sub-paragraph (i) above, are limited as follows:

(a) Maximum working pressure not exceeding 30,000 psi (2,109 kg/cm²);

(b) Chamber cavity with an inside diameter not exceeding 20 inches (50.8); and provided the equipment will be used for specific non-strategic applications and will not be used for any nuclear or aerospace applications.

3. Licenses are likely to be approved for export to satisfactory end-users of normal amounts of equipment covered by sub-entry (d) above to service presses licensed for export under Note 1 above.

1353A Equipment specially designed for the manufacture of communication cable described in entry No. 1526.

Note.—Licenses are likely to be approved for export to satisfactory end-users of equipment specially designed for the manufacture of cable covered by entry No. 1526 sub-entry II (b).

1355A Machinery and equipment for the manufacture of electronic equipment, components and materials; related test gear; parts and specialized controls and accessories thereof, as follows:

(a) * * *

(b) Equipment for the manufacture of semi-conductor, acoustic wave and film memory devices, of electronic equipment and components covered by sub-entry 1564II (b) and (c), and of parts, materials and subassemblies thereof, as follows:

(1) Equipment for the processing of semi-conductor materials for the manufacture of devices, equipment and components specified in the heading of this sub-entry as follows:

(i) * * *

(ii) Crystal pullers, furnaces, and gas systems, as follows:

(a) * * *

(b) * * *

(c) * * *

(d) * * *

(e) Crystal pullers having any of the following characteristics:

(1) * * *

(2) Capable of operation at pressures above 10^5 pascals (1 atmosphere absolute);

(3) * * *

(f) * * *

(iii) * * *

(iv) * * *

(v) * * *

(vi) * * *

(vii) * * *

(viii) * * *

(ix) * * *

(2) * * *

(3) * * *

(4) * * *

(5) * * *

(6) * * *

Note.—Licenses are likely to be approved for satisfactory civil end-users of crystal pullers covered by subparagraph (b)(1)(ii)(e)(2) above which can be operated at pressures up to 2.5×10^5 pascals (2.5 atmospheres absolute).

1361A Wind tunnels, as follows:

(a) Supersonic (Mach 1.4 to Mach 5), hypersonic (Mach 5 to Mach 15) and hypervelocity (above Mach 15) wind tunnels, *except wind tunnels specially designed for educational purposes and having a test section size (measured internally) of less than 10 in.* (25 cm). (By "test section size" is understood the diameter of the circle, or the side of the square, or the longest side of the rectangle constituting possible shapes of the test section.);

(b) * * *

(c) * * *

(d) Specially designed parts and accessories.

Notes.— 1. Licenses are likely to be approved for export to satisfactory end-users of supersonic wind tunnels which are capable of Mach velocities of 1.4 or more but less than 5, and are not specially designed for or fitted with means of preheating the air.

2. Licenses are likely to be approved for export to satisfactory end-users of specialized parts and assemblies covered by sub-entry (d) for wind tunnels previously exported under Note 1, provided that such parts and assemblies will not upgrade the performance of the wind tunnel and, for normally-consumable replacement parts, will not exceed a 6-month supply.

1371A Anti-friction bearings, as follows:

(a) Ball and roller bearings having an inner bore diameter of 10 mm or less and tolerances of ABEC 5, RBEC 5 (or national equivalents) or better and either of the following characteristics:

(1) Made of special materials, *i.e.* with rings, balls or rollers made from any steel alloy or other material including, but not limited to high-speed tool steels, Monel metal, beryllium, metaloids, ceramic, and sintered metal composites, *except the following: low-carbon steel; SAE–52100 high carbon chromium steel; SAE–4615 nickel molybdenum steel; AISI–440C (SAE 51440C) stainless steel; or national equivalents; and/or*

(2) Manufactured for use at normal operating temperatures over 302° F (150° C) either by use of special materials or by special heat treatment;

(b) Ball and roller bearings *except separable ball bearings and thrust ball bearings,* having an inner bore diameter exceeding 10 mm and having tolerances of ABEC 7, RBEC 7 (or national equivalents) or better (ABEC 5 in the case of hollow bearings) and either of the following characteristics:

(1) Made of special materials, *i.e.* with rings, balls or rollers made from any steel alloy or other material including, but not limited to high-speed tool steels, Monel metal, beryllium, metaloids, ceramic, and sintered metal composites, *except the following: low-carbon steel; SAE–52100 high carbon chromium steel; SAE–4615 nickel molybdenum steel; AISI.440C (SAE 51440C) stainless steel; or national equivalents;* and or

(2) Manufactured for use at normal operating temperatures over 302° F (150° C) either by use of special materials or by special heat treatment;

(c) Ball and roller bearings having tolerances better than ABEC 7 (or national equivalents); and

(d) Bearing parts usable only for bearings covered by this entry, as follows: outer rings, inner rings, retainers, balls, rollers, and sub-assemblies. (See § 376.7.)

Note.—Licenses are likely to be approved for export of reasonable quantities of bearings covered by this item to satisfactory civil end-users which have furnished assurances that the bearings will be incorporated in equipment previously imported from Canada or countries in Country Group T or V.

1485A Compasses, gyroscopes, accelerometers, and inertial equipment, as follows:

(a) * * *

(b) Integrated flight instrument systems for aircraft which include gyrostabilizers and/or automatic pilots (An integrated flight instrument system is a primary instrument display system of attitude and azimuth with facilities for giving maneuver guidance information to the pilot and often integrated with an autopilot to the extent of embodying a common unit for setting up the required demands);

(c) * * *

(d) Gyrostabilizers used for other purposes than aircraft control, *except those for stabilizing an entire surface vessel;*

(e) * * *

(f) Accelerometers with a threshold of 0.005 g or less, or a linearity error within 0.25 percent of full scale output or both, which are designed for use in intertial navigation systems or in guidance systems of all types;

(g) Gyros with a rated free directional drift rate (rated free precession) of less than 0.5 degree (1 Sigma or r.m.s.) per hour in a 1 g environment;

(h) * * *

(i) Specially designed parts and components, and test, calibration, and alignment equipment for the above.

Note.—Licenses are likely to be approved for export to satisfactory end-users of equipment, as follows:

(a) Types and series covered by sub-entry (b) above, provided the equipment has been in normal civil use for more than two years, is standard equipment of aircraft excluded from control under entry No. 1460, and is, or is to be, installed in civilian aircraft.

(b) Types and series covered by sub-entry (d) above, provided the equipment has been in normal civil use for more than two years and is intended for a clearly civil application in the importing country.

(c) Parts, components and equipment covered by sub-entry (i) above, provided they are not also covered by sub-entries (f) and (g) above, and are intended for use with exports meeting the conditions of sub-paragraphs (a) and (b) of this Note.

1501A Navigation, direction finding, radar and airborne communication equipment, as follows: (See also entry No. 1485 sub-entries (b) and (h), and entry No. 2120 sub-entries (b) and (c).)

(a) Airborne communication equipment and specialized parts and components therefor, having *any* of the following characteristics:

(1) Designed to operate at frequencies greater than 156 MHz;

(2) Incorporating facilities for:

(i) The rapid selection of more than 200 channels per equipment, or

(ii) Equipment using frequency synthesis techniques (see also entry No. 1531), *except equipment operating in the frequency range of 108 to 136 MHz with 720 channels or fewer at not less than 25 kHz spacing, and which has been in normal civil use for at least one year;*

(3) Pressurized throughout;

(4) Rated for continuous operation over a range of ambient temperatures extending from below −55° C to +55° C; or

(5) Designed for modulating methods employing any form of digital modulation using time and frequency redundancy such as "Quantized Frequency Modulation" (QFM);

(b) Navigation and direction finding equipment (and specialized parts and accessories, specialized testing or calibrating equipment and training or simulating equipment therefor), as follows:

(1) Airborne navigation equipment and direction finding equipment, as follows:

(i) Designed to make use of "Doppler" frequency phenomena;

(ii) Utilizing the constant velocity and/or rectilinear propagation characteristics of electromagnetic waves having frequency less than 4×10^{14} Hz (0.75 micron);

(iii) Radio altimeters, the following:

(*a*) Pulse modulated;

(*b*) Frequency modulated having a displayed electrical output accuracy better than ±3 feet (±0.914 m) over the range between 0 and 100 feet (30.4 m) or better than ±3 percent above 100 feet (30.4 m); or

(*c*) Frequency modulated which have been in normal civil use for less than one year;

(iv) Direction finding equipment operating at frequencies greater than 5 MHz, *except equipment specially designed for search and rescue purposes, provided that the receiver operates on a crystal controlled fixed frequency of 121.5 MHZ or an alternating frequencies of 121.5 MHz and 243 MHz;*

(v) Pressurized throughout; or

(vi) Rated for continuous operation over a range of ambient temperatures extending from below −55° C to above +55° C;

(2) Ground and marine equipment for use with airborne navigation equipment utilizing the constant velocity and/or the rectilinear propagation characteristics of electromagnetic waves having frequency less than 4×10^{14} Hz (0.75 micron); or

(3) Ground and marine direction finding equipment operating at frequencies greater than 30 MHz; and

(c) Radar equipment and specialized parts and accessories, specialized testing or calibrating equipment and training or simulating equipment therefor, as follows: (For Lidar Equipment see entry No. 1522.)

(1) Airborne radar equipment; or

(2) Ground and marine radar equipment having one or more of the following features:

(i) Operating at a frequency not in normal civil use or at a frequency of more than 10.5 GHz;

(ii) Operating at a frequency of less than 1.5 GHz and having a peak output power from the transmitter greater than 2.5 MW; or operating at a frequency within the range of 1.5 to 3.5 GHz and having a peak output power from the transmitter greater than 1.5 MW; or operating at a frequency within the range of 3.5 to 6 GHz and having a peak output power from the transmitter greater than 1 MW; or operating at a frequency within the range of 6 to 10.5 GHz and having a peak output power from the transmitter greater than 500 kW;

(iii) Operating at a frequency of less than 3.5 GHz and having an 80 percent or better probability of detection for a 10 sq. m. target at a free space range of 250 nautical miles; or operating at a frequency within the range of 3.5 to 10.5 GHz and having an 80 percent or better probability of detection for a 10 sq. m. target at a free space range of 100 nautical miles;

(iv) Utilizing other than pulse modulation with a constant and/or staggered pulse repetition frequency, in which the carrier frequency of the transmitted signal is not changed deliberately between groups of pulses, from pulse to pulse or within a single pulse, *except civil commercial airport radars using a carrier frequency that may change from pulse to pulse between two fixed frequencies separated in time and in frequency by constant magnitudes;*

(v) Utilizing a Doppler technique for any purpose, other than M.T.I. systems using a conventional double or triple pulse delay line cancellation technique *except those utilized for surveillance and control radar for aerial navigation in civil airports;*

(vi) Including any digital signal processing techniques used for automatic target tracking, or having a facility for electronic tracking;

(vii) Including signal processing techniques other than those covered by sub-entry (c)(2)(vi) above, which have been in normal civil use for a period of less than two years; or

(viii) In the case of ground radar, having been in commercial use for a period of less than one year.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of commercial airborne equipment needed to equip civil aircraft, or as normal standard equipment incorporated in civil aircraft being exported for civil commercial use, and not containing characteristics in sub-entry (a)(5) above.

2. Licenses are likely to be approved for export to satisfactory end-users of navigation equipment covered by sub-entry (b)(1)(i) above, provided that it is to be installed in civil aircraft or helicopters, and is normal standard equipment of a type installed in civil aircraft or helicopters in TV country groups.

3. Licenses are likely to be approved for export to satisfactory end-users of standard commercial airborne equipment listed in sub-entries (b)(1) (ii) and (iii) above, needed to equip civil aircraft, or as normal standard equipment incorporated in civil aircraft being exported for civil commercial use, provided that such equipment is equivalent in all characteristics and performance to standard equipment of aircraft not subject to control, and which:

(a) For equipment covered by sub-entry (b)(1)(ii) above, is in conformity with ICAO standards and assures no function exceeding those resulting from such standards, and is not designed to make use of hyperbolic grids at frequencies greater than 3 MHz. (Standard commercial airborne equipment designed to make use of hyperbolic grids at frequencies of less than 3 MHz may be exported if coordinate conversion equipment, which has been in normal civil use for less than one year, or which could not be shipped under the provisions of entry No. 1565, is not included and is not separately supplied), and

(b) For equipment covered by sub-entry (b)(1)(iii) above, are frequency modulated radio altimeters which have been in normal civil use for a period of more than one year.

4. Licenses are likely to be approved for export to satisfactory end-users of ground equipment for use at civil airports or for civil use in association with airborne equipment which meets the criterion of Note 3 to sub-entry (b)(1)(ii) above, and approved for export, provided that such equipment:

(a) is in conformity with ICAO standards and assures no function exceeding those resulting from such standards;

(b) is not designed to make use of hyperbolic grids at frequencies greater than 3 MHz.

5. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by sub-entry (b)(3) above, provided:

(a) The equipment is to be installed at civil airports or for use on civil air routes;

(b) The equipment is designed to operate at frequencies between 30 MHz and 157 MHz, excluding single side band equipment;

(c) The equipment employs a loop system or a system employing a number of spaced vertical aerials uniformly disposed around the circumference of a circle, excluding electronically commutated types.

6. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by sub-entry (c) above, when it is to be installed in civil aircraft, provided that this equipment:

(a) Has been in normal commercial service for at least one year;

(b) Is specially designed for use as a commercial weather radar;

(c) Is a normal and reasonable equipment for such civil aircraft; and

(d) Does not contain significant advanced technology of strategic value for other applications.

7. Licenses are likely to be approved for export to, satisfactory end-users of secondary radar equipment covered by sub-entry (c) above, designed specifically for civil air traffic identification and control purposes.

8. Licenses are likely to be approved for export to satisfactory end-users of the following:

(a) Radar equipment covered only sub-entries (c)(2) (i), (ii) and/or (iii) above, provided that both of the following conditions are met:

(i) It is specially designed for the surveillance and coordination of airfield surface traffic; and

(ii) It is to be installed at airports operating scheduled commercial flights.

(b) Radar equipment covered only by sub-entries (c)(2) (ii) or (iii) above, or by both, provided that all the following conditions are met:

(i) Operating at a frequency of not more than 1.5 GHz and having a peak output power from the transmitter not greater than 5 MW; or operating at a frequency within the range of 1.5 to 3.5 GHz and having a peak output power not greater than 2.5 MW;

(ii) Having an 80 percent or better probability of detection for a 10 sq. m. target at a free space range of 270 nautical miles;

(iii) Having a pulse repetition frequency exceeding 300 pulses per second; and

(iv) It is to be installed for air traffic control of scheduled international commercial flights;

(c) Radar equipment covered only by sub-entries (c)(2) (iv) and/or (v) above, provided it is to be installed for air traffic control purposes in international airports and has been in normal civil use for a period of not less than three years;

(d) Radar equipment covered by sub-entry (c)(2)(vi) above, provided it is specially designed for marine, harbor or meteorological use, or has been in normal civil use for not less than three years;

(e) Radar equipment covered only by sub-entry (c)(2)(vii) above, provided it is specially designed for marine (or harbor) use, or radar equipment covered only by sub-entries (c)(2) (vii) or (viii) above, or both, provided it is specially designed for meteorological observation.

1502A Communication, detection or tracking equipment of a kind using ultra-violet radiation, infrared radiation or ultrasonic waves; *except ultrasonic devices which operate in contact with a controlled material to be inspected, or which are used for industrial cleaning, sorting or materials handling, industrial and civilian intrusion alarm, traffic and industrial movement control and counting systems, medical applications, emulsification, homogenisation, or simple educational or entertainment devices; underwater ultrasonic communications equipment designed for operation with amplitude modulation and having a communications range of 500 m or less (sea state 1), a carrier frequency of 40 to 60 kHz and a carrier power supplied to the transducer of 1 W or less; industrial equipment employing cells not described in entry Nos. 1548 or 1550; industrial and civilian intrusion alarm, traffic and industrial movement control and counting systems; medical equipment; industrial equipment used for inspection, sorting or analysis of the properties of materials; simple educational or entertainment devices which employ photo cells; flame detectors for industrial furnaces; equipment for non-contact temperature measurement for laboratory or industrial purposes utilizing a single detector cell with no scanning of the detector; or instruments capable of measuring radiated power or energy having a response time constant exceeding 10 milliseconds;* and specialized parts therefor.

Note.—Licenses are likely to be approved for export to satisfactory end-users of infra-red geodetic equipment covered by this entry, provided that the equipment uses a lighting source other than a laser and is manually operated, or that it uses a lighting source (other than a laser or a light-emitting diode) remote from the measuring equipment.

1510A Acoustic and/or ultrasonic systems or equipment specially designed for detecting or locating underwater or subterranean objects or features, and specially-designed components of such systems or equipment (including but not limited to hydrophones and transducers, towed hydrophone arrays, software therefor, and beamformers), *except:*

(i) *Marine systems or equipment, as follows:*

(A) * * *

(B) Passive (receiving, whether or not related in normal application to separate active equipment) acoustic hydrophones and/or transducers having *all* of the following characteristics:

(1) Incorporating sensitive elements made of piezoelectric ceramics or crystal, and with a sensitivity no greater than −192 dB (reference 1 volt per micropascal);

(2) Not designed for operation at depths greater than 100 meters;

(3) Independently mounted or configured and not reasonably capable of assembly by the users into a towed hydrophone array;

(ii) * * *

Notes.—1. Licenses are likely to be approved for export for civil end-use by civil end-users of acoustic hydrophones and transducers which have all of the other characteristics of sub-entry (i)(B), but which either:

(a) Have a sensitivity no greater than −204 dB (reference 1 volt micropascal), and are designed for operation at greater than 100 meters depth but not greater than 1,000 meters depth; or

(b) Are not acceleration compensated, have a sensitivity no greater than −180 dB (reference 1 volt per micropascal) and are not designed for operation at depths greater than 100 meters.

2. Licenses are likely to be approved for export for civil end-use by civil end-users of towed acoustic hydrophone arrays having all of the following characteristics:

(a) Not specially designed for operation at greater than 100 meters depth or at tow speeds in excess of 8 knots;

(b) Not incorporating temperature or heading sensors;

(c) Having hydrophone groups uniformly spaced at not less than 25 meters and not more than 60 meters;

(d) Having an assembled diameter of 40 mm or greater and using metallic strength members only;

(e) Not having multiplexed hydrophone group signals;

(f) Not having a configuration for multiple or overlapping acoustic aperture operation;

(g) Not having characteristics better than those specified in sub-entries (i)(B) (1) and (2) above;

(h) Not having associated processing equipment which provides any of the following features:

(1) Electronically-steerable beamforming capabilities;

(2) Side-lobe suppression techniques such as shading coefficients;

(3) On-line real-time processing or off-line batch pre-processing capabilities exceeding the limits specified in entries 1529 and 1565.

1519A Single and multi-channel communications transmission equipment, including terminal, intermediate amplifer or repeater equipment and multiplex equipment used for communications (line, cable, optical fiber cable, or radio) systems, and data modems making use of the aforementioned communication systems and associated multiplex equipment, *except telemetering, telecommand and telesignalling equipment designed for industrial purposes, together with data transmission equipment not intended for the transmission of written or printed text and specialized parts, accessories and test equipment therefor (by telemetering, telecommand and telesignalling equipment is meant: sensing heads for the conversion of information into electrical information, the systems used for its long-distance transmission, the processes used to translate electrical information into coded data (telemetering), into control signals (telecommand), and into display signals (telesignalling)); facsimile equipment other than that employing cipher, cryptographic and/or coding devices and equipment that are designed to ensure the secrecy of communications and thus prevent clear reception by anyone other than the intended receiver (see Supplement No. 2 to Part 370);*

equipment employing exclusively the direct current transmission technique; electronic measuring equipment, suitable for use with PCM transmission equipment defined in CCITT recommendation series G 700 (ITU Geneva), as follows:

(a) Employing analog transmission techniques with analog input and output, designed to deliver, carry or receive baseband frequencies higher than 19 MHz into, or in, a communications system, but only higher than 300 kHz for equipment suitable for use with submarine cable (analog transmission techniques include, inter alia, frequency division multiplex (FDM));

(b) Employing digital transmission techniques designed for operation at a data signalling rate exceeding 2.1 Megabits per second, with analog input and output, designed for use on communications circuits (digital transmission techniques include, inter alia, pulse code modulation (PCM));

(c) Data communications equipment employing digital transmission with digital input and output, including telegraphic and data transmission, having any of the following characteristics:

(1) Designed for operation at a data signalling rate in bits per second, excluding servicing and administrative channels, numerically exceeding either:

(i) 4,800; or

(ii) 160 percent of the channel (or sub-channel) bandwidth in Hertz;

(2) Employing an automatic error detection and correction system having both of the following characteristics:

(i) Retransmission is not required for correction; and

(ii) A data signalling rate exceeding 300 bits per second; and

(d) Components, accessories, and sub-assemblies specially designed for the above equipment, and test equipment specially designed for the equipment covered by sub-entry (b) above, except connectors for use with optical fibers or cable with a repeatable coupling loss of 0.5 dB or more.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by sub-item (a) above, and components, accessories and sub-assemblies thereof, as follows:

(a) Equipment specially designed for the transmission of television signals by cable between camera and studio or between studio and television transmitter not exceeding 50 miles (80 km) for a link with respect to any one installation. (For radio relay links see entry No. 1520.)

(b) Equipment to be used for closed circuit television or television distribution (community aerial systems and cable television systems) with an upper frequency limit of 960 MHz.

(c) Equipment designed to deliver, carry or receive baseband frequencies up to and including 62 MHz.

2. Licenses are likely to be approved for the export to satisfactory end-users of equipment covered by sub-item (b) above, and components, accessories and sub-assemblies and cable therefor, provided that it is for other than submarine use, is to be permanently installed in a circuit operated by the civilian authorities of the importing country, and is to be used for general commercial traffic, as follows:

(a) A total digital bit rate at the highest level multiplex point of 8.5 million bits per second or less; and either

(b) A total number of voice channels per each physical bearer (wire or radio) of 120 or less; or

(c) A monochrome or color television channel with a maximum nominal bandwidth of 6 MHz, and associated sound channels.

3. Licenses are likely to be approved for the export to satisfactory end-users of the data modems described in sub-entry (c)(1) above, conforming to CCITT recommendations and/or specially designed for civil end-use, and operating at speeds up to 9,600 bits per second or 320% of the channel (or sub-channel) bandwidth in hertz, provided they are to be permanently installed in a circuit operated by the civilian authorities of the importing countries for general commerical traffic.

1520A Radio relay communications equipment designed for use at frequencies exceeding 960 MHz, and components, accessories and sub-assemblies therefor.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by this item, and components, accessories and sub-assemblies therefor, specially designed for the transmission of television signals between camera and studio or between studio and television transmitter, and not exceeding a line of sight distance with respect to any one installation.

2. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by this item, and components, accessories and sub-assemblies therefor, as follows:

(a) Ground communication radio equipment for use with temporary fixed services operated by the civilian authorities of the importing country and designed to be used at fixed frequencies not exceeding 13.5 GHz with a power output of not more than 5 watts;

(b) Equipment to be permanently installed in a circuit operated by the civilian authorities of the importing country for civil television transmission nor for general commerical traffic, provided that:

(1) Associated multiplex equipment is considered separately under the provisions of entry No. 1519; and

(2) No equipment with a base bandwidth exceeding the limits set forth in Note 3 to entry No. 1519 is included.

3. Licenses are likely to be approved for export to satisfactory end-users of equipment covered by this item, for communications satellite earth stations provided that it is to be installed for operation in the framework of an INTELSAT satellite communications system.

4. Licenses are likely to be approved for export to satisfactory end-users of equipment with a maximum capacity of 300 voice channels of 4 kHz each, components, accessories, sub-assemblies and specialized test equipment for industrial use, e.g. remote supervision, control and metering of oil and gas pipelines, public utility services (e.g. electricity networks) including telephone channels for the operation of such networks and the engineering service circuits required for the maintenance of telecommunications links.

5. Licenses are likely to be approved for the export to satisfactory end-users of tropospheric scatter communication equipment, and components, accessories and sub-assemblies therefor, covered by this entry, provide that it will be permanently installed at specified sites for civil communication purposes and has all of the following characteristics:

(a) Fixed frequency of 2.7 GHz or less;

(b) Frequency modulation;

(c) Power amplifier output of 10 kW or less.

1522A Lasers and laser systems (including active and passive components in semi-fabricated forms as well as in fabricated forms) and equipment containing them, as follows:

(a) Lasers and specially designed components and parts therefor, including amplification stages, *except the following when not contained in equipment:*

(i) * * *

(ii) * * *

(iii) * * *

(iv) * * *

(v) * * *

(vi) Nd: YAG lasers having an output wavelength of 1.06 micrometers with either of the following characteristics:

(1) A pulsed output not exceeding 0.5 joule per pulse and a maximum rated average single- or multi-mode output power not exceeding 10 watts or a continuous wave maximum rated single- or multi-mode output power not exceeding 50 watts;

(2) * * *

(vii) Nd: Glass lasers with both of the following characteristics:

(1) An output wavelength of 1.06 micrometers;

(2) A pulsed output not exceeding 0.5 joule per pulse;

(viii) * * *

(ix) * * *

(x) * * *

(b) Equipment containing lasers and laser systems, *except equipment listed below containing lasers listed in (a) above as exceptions:*

(i) Specially designed for industrial and civilian intrusion detection and alarm systems;

(ii) Specially designed for medical applications;

(iii) Equipment for educational and laboratory purposes;

(iv) Specially designed for traffic and industrial movement control and counting systems;

(v) Specially designed for detection of environmental pollution;

(vi) Optical spectrometers and densitometers;

(vii) Equipment containing continuous wave helium-neon gas lasers but see sub-entries (c) and (d) below;

(viii) Textile-cutting and textile-bonding equipment;

(ix) Paper cutting equipment;

(x) Equipment containing lasers for drilling diamond dies for the wire drawing industry;

(xi) Electronic daylight scanning equipment with auxiliary electronic

screening units especially designed for printing processes;

(xii) Laser-radar (lidar) equipment specially designed for surveying or meteorological observation;

(xiii) Consumer, disc-type video and audio recorders and reproducers;

(xiv) Price scanners (point of sale); and

(xv) Systems designed for surveying purposes; provided there is no capability of measuring range;

(c) * * *

(d) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of equipment listed in sub-entry (b) containing lasers described in (a) (vi)(1) and (vii) provided the lasers have a maximum pulsed output not exceeding 2 joules per pulse. The shipment of spare laser rods for equipment exported under this Note will be restricted to rods having no greater output power and/or energy capability than those originally exported with the equipment.

1526A Cable, as follows:

I. * * *

II. Communications cable, as follows:

(a) Submarine cable, as follows:

(1) Reversed-twist, double-armored cable used for towing or suspending and communicating with submerged devices;

(2) Unarmored or single-armored ocean cable having an attenuation of 1.8 dB per nautical mile (0.97 dB/km) or less, measured at a frequency of 600 kHz;

(b) Coaxial cable using a dielectric aired by discs, beads, spiral, screw, or any other means, with an inner diameter of the outer conductor of the cores greater than 14 mm (0.551 in.);

(c) Graded index or single-mode step index optical fiber communications cable and optical fibers therefor, having either of the following characteristics:

(1) An attenuation at any operating wavelength of 5 dB/km or less;

(2) A tensile strength greater than 7×10^9 N/m^2; or

(d) * * *

Notes.—1. Licenses are likely to be approved for the export to satisfactory end-users of cable covered by sub-entry II(a)(1) above when used for civil applications in oceanographic research or in natural resources exploration.

2. Licenses are likely to be approved for the export to satisfactory end-users of cable covered by sub-entries II (a)(2), (b) and (c) above, provided that:

(a) The cable is for a specific civil end-use;

(b) The quantities of cable required are normal for the purpose; and

(c) (applicable to sub-entry II(c) above only) The cable is not specially designed for underwater use.

1529A Electronic measuring, calibrating, counting, testing, and/or time interval measuring equipment, whether or not incorporating frequency standards, having any of the following characteristics:

(a) Equipment, as follows:

(1) * * *

(2) Designed for fixed ground use and containing frequency standard(s), with a stability over 24 hours of 1 part in 10^9 or better; or

(3) * * *

(b) Instruments, as follows:

(1) * * *

(2) * * *

(3) * * *

(4) Spectrum analyzers employing time compression of the input signal or FFT (Fast Fourier Transform) techniques;

(5) Incorporating computing facilities with user accessible reprogramming capability and an alterable memory of more than 8,192 bits;

(6) * * *

(c) * * *

(d) * * *

(e) * * *

(f) * * *

(g) * * *

(h) * * *

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of items covered only by sub-entry (a)(2) above, provided that:

(a) The stability over 24 hours is not better than 5 parts in 10^{10}; and

(b) The equipment is a reasonable requirement for the stated legitimate civil end-use.

2. Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entry (b)(4) above, having either of the following characteristics:

(a) Capable of computing 512 complex spectral lines in 200 milliseconds or more;

(b) Capable of computing 512 real spectral lines in 100 milliseconds or more;

3. Licenses are likely to be approved for export to satisfactory end-users of instruments covered by sub-entry (b)(5) above, provided that:

(a) The instruments have been designed for non-strategic use and by nature of design, software, microprogram control (firmware), specialized logic control (hardware) or performance are substantially restricted to the particular application for which they have been designed.

(b) The instruments are not covered by any other part of this entry and do not exceed the limits of Note 4 to entry No. 1565.

1531A Frequency synthesizers (and equipment containing such frequency synthesizers), as follows (frequency synthesizer means any kind of frequency source or signal generator, regardless of the actual technique used, providing a multiplicity of simultaneous or alternative output frequencies, from one or more outputs, controlled by, derived from or disciplined by a lesser number of standard (or master) frequencies):

(a) * * *

(b) Instrument frequency synthesizers and synthesized signal generators designed for ground laboratory use, producing output frequencies whose accuracy and short and long term stability are controlled by, derived from or disciplined by the input frequency or internal master standard frequency, and having any of the following characteristics:

(1) * * *

(2) * * *

(3) Electrically programmable (in that the output frequency can be controlled or selected by the injection of digitally coded electrical signals from an external control source) with a switching speed from one selected output frequency to another selected output frequency less than 10 milliseconds;

(4) * * *

(5) * * *

(6) * * *

(7) * * *

(c) * * *

(d) * * *

(e) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of equipment covered by sub-entry (b)(3) above, with a switching speed not less than 5 milliseconds.

1532A Precision linear and angular measuring systems and components, as follows:

(a) Contact-type systems and linear voltage differential transformers (LVDT) therefor, as follows:

(1) Systems having all of the following characteristics:

(i) Range equal to or less than 5 mm;

(ii) Linearity equal to or less than 0.1 percent;

(iii) Drift equal to or less than 0.1 percent per day at standard ambient test room temperatures ±1° C;

(2) Linear voltage differential transformers with no compensation networks and having either of the following characteristics:

(i) Range equal to or less than 5 mm;

(ii) Linearity equal to or less than 0.2 percent; (linearity measurements are made in the static mode);

(b) Linear measuring machines, *except optical comparators,* with two or more axes having both of the following characteristics:

(1) Range in any axis greater than 200 mm;

(2) Accuracy (including any compensation) less (finer) than 0.0008 mm per any 300 mm segment of travel;

(c) Angular measuring systems having an accuracy equal to or less than 1 second of arc, *except optical instruments, such as autocollimators, using collimated light to detect angular displacements of a mirror;*

(d) Non-contact type systems having either of the following characteristics:

(1) Effective probe measurement diameter less than 0.5 mm and drift less than 0.5 percent per day at standard ambient test room temperatures ±1° C;

(2) Linearity less than 0.3 percent and drift less than 0.5 percent per day at standard ambient test room temperature ±1° C.

Note.—Licenses are likely to be approved for export of equipment covered by this item to civil end-users not engaged in aerospace activities.

1533A Radio spectrum analyzers (i.e. apparatus capable of indicating the single-frequency components of multi-frequency signals), specialized components, accessories and parts therefor, as follows (for spectrum analyzers employing time compression of the input signal or FFT techniques, see entry No. 1529(b)(4)):

(a) * * *

(b) * * *

(c) * * *

(d) Incorporating computing facilities with user accessible reprogramming capability and an alterable memory of more than 8,192 bits;

(e) * * *
(f) * * *
(g) * * *

Note.—Licenses are likely to be approved for export to bona fide civil end-users for civil end-use of equipment covered by sub-entry (d) above.

1534A Flatbed microdensitometers, *except cathode-ray types*, specially designed parts, components and assemblies therefor, having any of the following characteristics:

(a) A recording or scanning rate exceeding 5,000 data points per second;

(b) A figure of merit better (less) than 0.1, defined as the product of the density resolution (expressed in density units) and the spatial resolution (expressed in micrometers);

(c) An optical density range greater than 0 to 4.

Notes.—1. Licenses are likely to be approved for export of equipment specially designed for medical applications, provided the equipment is a reasonable requirement for the stated application.

2. Licenses are likely to be approved for export to civil end-users for civil end-uses of equipment covered only by sub-entry (b) above, provided the spatial resolution is not better (less) than 2 micrometers and the density resolution is not better (less) than 0.01 in density units.

1537A Microwave equipment, including parametric amplifiers, capable at frequencies over 1 GHz (other than microwave equipment covered by entries 1501, 1517, 1520, 1526(I), 1529 and Supplement No. 2 to part 370), as follows:

(a) * * *
(b) * * *
(c) Waveguide components, as follows:
(1) * * *
(2) * * *

(3) Magnetic including gyro-magnetic waveguide components;

(d) TEM mode device using magnetic including gyro-magnetic properties;

(e) TR and anti-TR tubes and components therefor *except those designed for use in waveguides and having any of the following characteristics, which are in normal civil use for ground or marine radar:*

(i) Operating at a peak power not exceeding 3 MW and at a frequency of 1.5 GHz or less;

(ii) Operating at a peak power not exceeding 1.2 MW and at a frequency over the range of 1.5 GHz to 6 GHz; or

(iii) Operating at a peak power not exceeding 300 kW and at a frequency over the range of 6 GHz to 10.5 GHz;

(f) Assemblies and sub-assemblies in which the isolating base material functions as a dielectric (as used in stripline, microstrip or slotline) except for those items specifically designed for use in civil television systems to meet ITU standards and using as an isolating material paper base phenolics, glass cloth melamine, glass epoxy resin, polyethylene terephthalate or other isolating material with an operating temperature not exceeding 302° F (150° C);

(g) * * *

(h) Microwave assemblies and sub-assemblies having circuits fabricated by the same processes used in integrated circuit technology, which include active circuit elements (for acoustic wave devices, see entry No. 1586) (see also entry No. 1564);

(i) * * *

(j) Amplifiers (see also entry No. 1521);

(k) * * *

(l) * * *

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entries (c)(3) and (d) above, required as replacement parts in specific civil equipment not exceeding the capability of that which could be exported under entry No. 1501 or entry No. 1520, provided such parts do not upgrade the initial performance of that equipment.

2. Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entry (e) above required as replacement parts in specific civilian equipment not exceeding the capability of that which could be exported under entry No. 1501, provided such parts do not upgrade the initial performance of that equipment.

3. Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entry (f) above, designed and intended for use in civil telecommunications systems at frequencies allocated by the ITU for that purpose.

4. Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entry (h) above, for use at frequencies between 1 GHz and 3 GHz.

5. Licenses are likely to be approved for export to satisfactory end-users of equipment containing parametric amplifying or paramagnetic amplifiers covered by sub-entry (j) above;

(a) Specially designed for medical applications or for use in simple educational devices and operating at ISM frequencies; or

(b) Having an output power of not more than 10 watts, which is specially designed for industrial and civilian intrusion detection and alarm systems, traffic and industrial movement control and counting systems, environmental pollution of air or water detection systems, or for simple educational devices.

1541A Cathode-ray tubes having any of the following characteristics:

(a) * * *

(b) With traveling wave or distributed deflection structure using delay lines, or incorporating other techniques to miminize mismatch of fast phenomena signals to the deflection structure; or

(c) * * *
(d) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of cathode-ray tubes covered by sub-entry (b) above, which utilize segmented plate (sectioned Y-plate) structures.

1544A Semi-conductor diodes and dice and wafers therefor (*except those made from germanium, selenium or copper oxide*), designed or rated for use at input or output frequencies above 12.5 GHz or having any of the following characteristics:

(a) (i) * * *

(ii) Schottky diodes designed or rated for mixer use at input or output frequencies of:

(a) 3 GHz or less and having a noise figure of more than 6 dB; or

(b) Greater than 3 GHz and less than 12.5 GHz and having a noise figure of more than 6.5 dB;

(iii) Schottky diodes designed or rated for detector use at input or output frequencies of less than 12.5 GHz and having a minimum rated tangential sensitivity of either worse than −45 dBm under unbiased conditions to worse than −50 dBm under biased conditions;

(b) * * *
(c) * * *
(d) * * *
(e) * * *

(f) Non-coherent light-emitting diodes with a peak radiant intensity at a wavelength of greater than 1,000 nanometers (for coherent light-emitting diodes, see entry No. 1522).

(g) * * *

Notes.—1. Licenses are likely to be approved for the export to satisfactory end-users of shipments for civil use containing up to 200 of the Schottky diodes mentioned in sub-entries (a) (ii) and (iii) above, having a maximum frequency not exceeding 3 GHz irrespective of noise level or tangential sensitivity.

2. Licenses are likely to be approved for the export to satisfactory end-users of non-coherent light-emitting diodes covered by sub-entry (f) above, for use in identifiable civilian communications systems.

1545A Transistors and dice and wafers therefor (for phototransistors see entry No. 1548) as follows:

(a) * * *

(b) Using silicon as the bulk semi-conductor material and having any of the following characteristics:

(1) * * *

(2) An operating frequency of 1.5 MHz or below and a maximum collector dissipation exceeding 300 watts, or an operating frequency greater than 1.5 MHz and a maximum collector dissipation exceeding 250 watts;

(3) An operating frequency greater than 200 MHz and a product of the operating frequency (in GHz) and the maximum collector dissipation (in watts) exceeding 5;

(4) Majority carrier devices, including but not limited to junction field-effect transistors and metal-oxide semi-conductor transistors, *except field-effect transistors having a maximum power dissipation of 500 mW or less and a maximum operating frequency of 1 GHz or less.*

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of transistors covered by sub-entries (b) (2) and (3) above, specially designed for television transposers or for civil mobile communication equipment, and having a product of the operating frequency (in GHz) and the maximum collector dissipation (in watts) not exceeding 20.

2. Licenses are likely to be approved for export to satisfactory end-users of transistors covered by sub-entry (b)(4) above which are suitable for and will be used in civil TV, AM or FM receivers or audio frequency equipment.

1547A Thyristors and dice and wafers therefor, as follows:

(a) Designed for use in pulse modulators having a rated turn-on time of less than 1

microsecond where the rated peak current exceeds 150 Amperes;

(b) Having a rated turn-off time of less than 1 microsecond;

(c) Having a rated turn-off time of from 1 microsecond to less than 2.3 microseconds *except those having a rated peak current of 50 Amperes or less and encapsulated in non-hermetically sealed packages;*

(d) Having a rated turn-off time of from 2.3 to 10 microseconds and a figure of merit greater than 25 (the figure of merit is defined as the product of the repetitive peak off-state voltage (V DRM) in kilovolts and the repetitive peak on-state current (I TRM) in Amperes as shown on the thyristor data sheets; and

(e) Specially designed parts and accessories therefor.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of thyristors required as replacement parts in specific civil equipment provided they do not upgrade the initial performance of that equipment.

2. Licenses are likely to be approved for export to satisfactory end-users of thyristors covered by this entry, provided that they have been designed and are intended for civil applications other than in radar or laser modulators.

1548A Photosensitive components and dice and wafers therefor, as follows:

(a) Photosensitive components (including photodiodes, phototransistors, photothyristors, photoconductive cells and similar photosensitive components) with a peak sensitivity at a wavelength longer than 1,200 nanometers or shorter than 190 nanometers;

(b) Semi-conductor photodiodes and phototransistors with a response time constant of 0.25 microsecond or less measured at the operating temperature for which the time constant reaches a minimum.

Notes.—1. Licenses are likely to be approved for the export to satisfactory end-users of infra-red single-element encapsulated photoconductive cells or pyroelectric detectors intended for civil applications and using any of the following:

(a) Evaporated lead sulphide;

(b) Triglycine sulphate with a surface area of 20 mm^2 or less;

(c) Lead-lanthanum-zirconium titanate ceramic.

2. Licenses are likely to be approved for the export to satisfactory end-users for civil applications of semi-conductor photodiodes covered by sub-entry (b) above, with a response time constant of 0.5 nanosecond or more and with a peak sensitivity at a wavelength neither longer than 920 nanometers nor shorter than 300 nanometers.

1549A Photomultiplier tubes, as follows:

(a) For which the maximum sensitivity occurs at wavelengths longer than 0.75 micrometer or shorter than 0.3 micrometer; or

(b) * * *

(c) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of non-ruggedized tubes covered by sub-entry (a) above, required as replacement parts for specific civil equipment not exceeding the capability of that which could be exported under the Commodity Control List, provided that these parts do not upgrade the initial performance of such equipment.

1555A Electron tubes and specialized components and parts therefor, *except commercial standard television camera tubes not having fiber optic faceplates and commercial standard X-ray amplifier tubes,* as follows:

(a) Image intensifiers and image converters incorporating fiber-optic faceplates and/or microchannel-plate electron multipliers, and camera tubes incorporating or coupled with such intensifiers or converters;

(b) Electronic storage tubes, including memory transformers of radar pictures, *except signal converter storage tubes specially designed for television purposes;*

(c) Camera tubes with fiber optic faceplates and/or microchannel-plate electron multipliers;

(d) Ruggedized camera tubes having a maximum length-to-bulb diameter ratio of 5:1 or less.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of reasonable quantities of non-ruggedized tubes covered by this entry, provided that the tubes will be used for bona fide medical applications.

2. Licenses are likely to be approved for export to satisfactory end-users of non-ruggedized direct view storage tubes covered by sub-entry (b) above, having an effective diameter or diagonal not exceeding 280 mm, for civil radar or oscilloscope applications.

3. Licenses are likely to be approved for export to satisfactory end-users of camera tubes covered by sub-entries (c) and (d) incorporating fiber optic faceplates but not microchannel-plate electron multipliers, provided that the tubes will be used for bona fide civil television applications.

1558A Electronic vacuum tubes (valves), and specialized parts, as follows:

(a) Tubes in which space charge control is utilized as the primary functional parameter, including but not limited to triodes and tetrodes, as follows:

(1) Tubes rated for continuous wave operation having either of the following characteristics:

(i) Above 4 GHz at maximum rated anode dissipation; or

(ii) Within the frequency range 0.3 to 4 GHz and for which, under any condition of cooling, the product of the maximum rated anode dissipation (expressed in watts) and the square of the maximum frequency (expressed in GHz) at the maximum rated anode dissipation is greater than 10^4, *except for tubes specially designed for television transmitters operating in the frequency range of 0.47 to 0.96 GHz and rated for operation without a grid current, for which the product of the rated anode dissipation (expressed in watts) and the square of the maximum frequency (expressed in GHz) may reach* 2×10^4;

(2) Tubes rated only for pulse operation having either of the following characteristics:

(i) Above 1 GHz at the peak pulse output power; or

(ii) Between 0.3 and 1 GHz and for which, under any condition of cooling, the product of the peak pulse output power (expressed in watts) and the square of the maximum frequency (expressed in GHz) is greater than 4.5×10^4;

(3) Tubes specially designed for use as pulse modulators for radar or similar applications, having a peak anode voltage rating of 100 kV or more, or rated for a peak pulse power of 6 MW or more (see also entry No. 1514);

(b) Tubes which utilize interaction between a beam of electrons and microwave elements and in which the electrons travel in a direction perpendicular to the applied magnetic field, including but not limited to magnetrons, crossed-field amplifier tubes and crossed-field oscillator tubes, *except:*

(1) Fixed frequency and tunable pulsed magnetrons and crossed-field amplifier tubes which are in normal civil use in equipment which may be exported under the terms of this List as follows:

(i) Magnetrons designed to operate at frequencies below 3 GHz with a maximum rated peak output power of 1.5 MW or less, or between 3 and 12 GHz with the product of the maximum rated peak output power (expressed in kW) and the frequency (expressed in GHz) less than 4,200;

(ii) Crossed-field amplifier tubes designed to operate at frequencies below 4 GHz with a maximum rated peak output power of 1.2 MW or less and with less than 15 dB gain;

(2) Fixed frequency continuous wave magnetrons designed for medical use or for industrial heating or cooking purposes operating at a frequency of 2.375 GHz ±0.05 GHz or 2.45 GHz ±0.05 GHz with a maximum rated power not exceeding 6kW or at a frequency lower than 1 GHz with a maximum rated power not exceeding 25 kW;

(c) Tubes which utilize interaction between a beam of electrons and microwave elements or cavities and in which the electrons travel in a direction parallel to the applied magnetic field, including but not limited to klystrons and traveling wave tubes, *except:*

(1) Continuous wave tubes for use in civil communications designed for octave or lesser bandwidth (where the highest operating frequency is equal to or less than two times the lowest operating frequency) having the following characteristics:

(i) Designed to operate below 20 GHz;

(ii) The product of the rated output power (expressed in watts) and the frequency (expressed in GHz) is less than 800;

(2) Pulsed tubes for civil applications designed for octave or less bandwidth and having either of the following characteristics:

(i) Peak saturated output power not exceeding 1 kW and average power not exceeding 40 watts at or below 10 GHZ;

(ii) Peak saturated output power not exceeding 100 watts and average power not exceeding 20 watts between 10 and 20 GHz;

(3) Pulsed tubes for civil applications designed for fixed frequency operation at frequencies below 3.5 GHz, peak output power of 1.6 MW or less, and operating bandwidth less than 1 percent;

(4) Low power oscillator tubes designed to operate at frequencies below 20 GHz with maximum output power of less than 3 watts;

(d) * * *

(e) * * *

(f) * * *
(g) * * *
(h) * * *
(i) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of the following:

(a) Tubes covered by sub-entries (a) and (c) above, specially designed for television purposes and which are to be used in television transmitters, the precise location of which is known, for civil telecasting according to CCIR or OIR standards;

(b) Tubes covered by sub-entries (a), (b) and (c) above required as replacement parts for specific civilian equipment not exceeding the capability of that which could be exported under other Commodity Control List entries, provided that these parts do not upgrade the initial performance of that equipment;

(c) Pulsed amplifier klystrons and fixed frequency and mechanically tunable pulsed magnetrons covered by sub-entries (b) and (c) above intended for civil radar equipment previously exported, provided that they do not upgrade the initial performance of that equipment.

1559A Hydrogen thyratrons of ceramic-metal construction rated for a peak pulse power output of 12.5 MW or more; and specially designed parts and accessories therefor.

Note.—Licenses are likely to be approved for export to satisfactory end-users of ceramic-metal structured hydrogen thyratrons to replace such thyratrons in specific civil radar equipment previously exported, provided that they do not upgrade the initial performance of that equipment.

1564A Electronic component assemblies, sub-assemblies, printed circuit boards, and microcircuits:

I. * * *

II. Listed as follows:

(a) Printed circuit boards (single sided, double sided, or multilayer) designed to mount and provide interconnection between electronic components, *except those manufactured from any of the following insulating materials:*

(i) Paper base phenolics;

(ii) Glass cloth melamine;

(iii) Glass epoxy resin;

(iv) Polyethylene terephthalate; or

(v) Any insulating material with a maximum continuous rated operating temperature not exceeding 150° C;

(b) Assemblies, modules and printed circuit boards with mounted components, as follows:

(1) Those including printed circuit boards covered by sub-entry II(a) above;

(2) Those which contain microprocessor, microcomputer or memory microcircuits or embargoed components, *except:*

(i) Assemblies, not containing microprocessor, microcomputer, or memory circuits, whose only embargoed components are capacitors;

(ii) Power supply assemblies;

(c) Microcircuits (monolithic integrated circuits, microprocessor, microcomputer, multichip, hybrid, film or integrated optical types), *except:*

(i) Encapsulated passive networks; or

(ii) Encapsulated micro-circuits which are not designed or rated as radiation hardened, which are not rated for operation below −40° C or above +85° C, which are packaged in TO–5 outline cases (0.305 inch to 0.370 inch diameter) or in non-hermetically sealed cases and which are:

(1) Bipolar types designed for operation as digital logic circuit elements but limited to gates, inverters, buffers, bilateral switches, drivers, counters, latches, adders, comparators, parity generators, multiplexers, expanders, flip-flops, multivibrators, code converters, registers, encoders, decoders, demultiplexers, diode matrices, multipliers and Schmidt-triggers, and having all of the following characteristics:

(a) A product of the typical basic gate propagation delay time (in nanoseconds) and the power dissipation per basic gate (in milliwatts) not less than 30pJ (i.e. speed-power product/gate not less than 30pJ);

(b) A typical propagation delay time not less than 3 nanoseconds; and

(c) Encapsulated in a package having 24 terminals or less;

(2) CMOS types designed for operation as digital logic circuit elements but limited to gates, inverters, buffers, flip-flops, latches, multivibrators, bilateral switches, display drivers, fixed counters, fixed frequency dividers, storage registers, decoders, voltage translators, encoders, and Schmidt-triggers, and having both of the following characteristics:

(a) A minimum propagation delay time under any rated conditions of not less than 10 nanoseconds;

(b) Encapsulated in a package having 24 terminals or less;

(3) Silicon single-chip microcomputer microcircuits that are mask programmed for a civil application prior to export and having all of the following characteristics:

(a) A word size/speed ratio of less than or equal to a 0.4 bit per microsecond;

(b) A speed-power dissipation product of greater than or equal to 4 microjoules;

(c) An on-chip read-only memory (ROM), not including the microcode, of less than or equal to 2,048 bytes;

(d) An on-chip random-access memory (RAM) of less than or equal to 512 bits;

(e) An operand (data) word length of less than or equal to 8 bits;

(f) Not capable of addressing off-chip program memory;

(g) Not rated for operation below −20° C or above +75° C;

(Speed is defined as the time (in microseconds) to add C to D where C and D are both in memory, and put the result back in C.)

(4) Silicon microprocessor microcircuits having all of the following characeristics:

(a) A word size/speed ratio of less than or equal to 0.4 bit per microsecond;

(b) A speed-power dissipation product of greater than or equal to 4 microjoules;

(c) Containing no on-chip ROM or on-chip RAM;

(d) An operand (data) word length of less than or equal to 8 bits;

(e) Capable of addressing off-chip program memory of less than or equal to 32,768 bytes;

(f) Not rated for operation below −20° C or above +75° C;

(5) Memory microcircuits as follows:

(a) MOS dynamic RAM's having all of the following characteristics:

(i) A maximum number of bits per package of 1,024 bits and an access time of no less than 250 nanoseconds;

(ii) Not rated for operation below −20° C or above +75° C;

(b) Mask programmed ROMs not rated for operation below −20° C or above +75° C, as follows:

(i) With a maximum number of bits per package of 2,048 bits and an access time of no less than 450 nanoseconds;

(ii) PMOS or NMOS types with a maximum number of bits per package of 4,096 bits and an access time of no less than 700 nanoseconds;

(c) MOS static RAM's having both of the following characteristics:

(i) A maximum number of bits per package of 256 bits;

(ii) An access time of no less than 450 nanoseconds;

(d) Bipolar RAM's as follows:

(i) With a maximum number of bits per package of 64 bits and an access time of no less than 30 nanoseconds;

(ii) With a maximum number of bits per package of 256 bits and an access time of no less than 40 nanoseconds;

(iii) With a maximum number of bits per package of 1,024 bits and an access time of no less than 45 nanoseconds;

(6) (a) Non-reprogrammable microcircuits, not capable of addressing external memory, specially designed for, and which by virtue of circuit design are normally limited to use only for simple calculators which perform a single function in response to a keystroke, capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in no less than 0.02 second;

(b) Programmable microcircuits specially designed for, and which by virtue of circuit design are normally limited to use only for simple key programmable calculators having both of the following characteristics:

(i) Capable of executing a sequence of no more than 256 program steps introduced into a program memory on the chip by a sequence of keystrokes;

(ii) Capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in no less than 0.02 second;

(c) P-channel or N-channel MOS microcircuits specially designed as, and which by virtue of circuit design are normally limited to use only as, serial digital shift registers with a maximum clock rate of 2.5 MHz, and a maximum number of bits per package of 1,024;

(7) (a) Unturned AC amplifier microcircuits having a bandwidth of less than 3 MHz and a maximum rated power dissipation of 5 watts or less at a case temperature of 25° C;

(b) Audio amplifier microcircuits having a maximum rated continuous power output of 25 watts or less at a case temperature of 25° C;

(8) Operational amplifier microcircuits having all of the following characteristics:

(a) A typical unity-gain open-loop bandwidth of not more than 4MHz;

(b) A typical open-loop voltage gain of not ore than 500,000 or 115 dB;

(c) A maximum intrinsic rated input offset voltage of not less than 2.5 mV; and

(d) A typical slew rate at unity gain not exceeding 2.5 volts/microsecond;

(9) Analog multiplier and/or divider microcircuits having both of the following characteristics:

(a) A best case rated non-linearity of not better than 0.5 percent of full scale;

(b) A −3 dB small-signal bandwidth of not more than 500 kHz;

(10) Isolation amplifier microcircuits;

(11) Instrumentation amplifier microcircuits having all of the following characteristics:

(a) A best case rated non-linearity of not better than 0.02 percent at a gain of 100;

(b) A maximum gain-bandwidth product not greater than 5 MHz (e.g., a maximum band width of 50 kHz at −3 dB and at a gain of 100);

(c) A typical slew rate at unity gain not exceeding 1 volt/microsecond;

(12) Voltage regulator microcircuits, as follows:

(a) Linear types, having both of the following characteristics:

(i) A rated nominal output voltage of 40 volts or less;

(ii) A maximum output current of 1 A or less;

(b) Switching types, having both of the following characteristics:

(i) A rated nominal output voltage of 40 volts or less;

(ii) A maximum output current of 150 mA or less;

(For voltage regulators, the +85° C upper temperature limit specified in II(c)(ii) is not applicable. The lower limit of −40° C is applicable.)

(13) Voltage comparator microcircuits, having both of the following characteristics:

(a) A maximum input offset voltage of not less than 2 mV; and

(b) A typical switching speed or typical response time of not less than 30 nanoseconds;

(14) Bipolar microcircuits designed for operation in civil applications as externally controlled (by inductive, magnetic or optical means) electronic switches, or as threshold value switches with switching times of 0.5 microsecond or greater;

(15) Non-coherent light-emitting alphanumeric displays not incorporating an integrated circuit;

(16) Non-coherent light-emitting alphanumeric displays incorporating an integrated circuit used for decoding, controlling and/or driving that display, provided that the integrated circuit is not integral with the actual display device;

(17) Simple encapsulated photo-coupler (transoptor) assemblies with electrical input and output and which incorporate non-coherent light-emitting diodes;

(18) Interface microcircuits, as follows:

(a) Line drivers and line receivers having a typical propagation delay time from data input to output of not less than 15 nanoseconds;

(b) Sense amplifiers, having both of the following characteristics:

(i) A typical propagation delay time from data input to output of not less than 15 nanoseconds;

(ii) A typical input threshold voltage of not less than 10 millivolts;

(c) Memory and clock drivers, having all of the following characteristics:

(i) A maximum rated output current of 500 milliamperes or less;

(ii) A maximum rated output voltage of 30 volts or less;

(iii) A typical propagation delay time from data input to output of not less than 20 nanoseconds;

(d) Peripheral and display drivers, having all of the following characteristics:

(i) A maximum rated output current of 500 milliamperes or less;

(ii) A typical propagation delay time from data input to output of not less than 20 nanoseconds;

(iii) A maximum rated output voltage of 80 volts or less;

(When propagation delay time is not specified, typical turn-on or turn-off time, whichever is less, should be used.)

(19) Voltage-to-frequency converter microcircuits not employing delta or delta/sigma modulation techniques, having both of the following characteristics:

(a) A rated non-linearity of not better than 0.01 percent of full scale;

(b) A settling/response time of not less than 20 microseconds for a full scale input change;

(20) Rms-to-dc voltage converter microcircuits having both of the following characteristics:

(a) A rated conversion accuracy, with or without external adjustment, of not better than 0.2 percent of full scale;

(b) A ±1 percent amplitude error bandwidth of not greater than 100 kHz;

(21) Analog-to-digital and digital-to-analog converter microcircuits as follows:

(a) Analog-to-digital converter microcircuits having both of the following characteristics:

(i) A conversion time to maximum resolution of not less than 20 microseconds;

(ii) A rated non-linearity of not better than 0.05 percent of full scale over the specified operating temperature range;

(b) Digital-to-analog converter microcircuits having both of the following characteristics:

(i) A settling time to rated linearity of not less than 5 microseconds for "voltage output", and not less than 300 nanoseconds for units not incorporating an output amplifier;

(ii) A rated non-linearity of not better than 0.05 percent of full scale over the specified operating temperature range;

(22) Non-reprogrammable microcircuits which are specially designed for and by virtue of circuit design are normally limited to use for functional purposes in the following applications:

(a) Automotive, including safety, comfort, operations and pollution;

(b) Home electronics, including radio and television, appliances, clocks, watches, audio and video tape recorders, safety, comfort and amusement;

(c) Personal communications up to 150 MHz, including amateur radio communications and intercom;

(d) Unembargoed cameras (including cine cameras) but excluding imaging microcircuits;

(e) Cardiac pacemakers;

(A microcircuit whose function cannot be altered by accepting or executing instructions from any external source is non-reprogrammable.)

(Programmed microcircuits are only eligible for export if the program is unalterably stored at the time of manufacture and the performance of the function has been established for the intended end-use.)

(The temperature limits specified in the heading of II(c)(ii) above do not apply to sub-sections II(c)(ii)(22)(a) or (d).)

(23) Timing microcircuits having both of the following characteristics:

(a) A typical timing error of not less than 0.5 percent;

(b) A typical rise time of not less than 100 nanoseconds;

(iii) Unencapsulated monolithic integrated circuits which are not designed or rated as radiation hardened, and which are:

(1) Bipolar types designed for operation as digital logic circuit elements but limited to gates, inverters, buffers, bilateral switches, drivers, counters, latches, adders, comparators, parity generators, multiplexers, expanders, flip-flops, multivibrators, code converters, registers, encoders, decoders, demultiplexers, diode matrices, multipliers and Schmidt-triggers, and having both of the following characteristics:

(a) A product of the typical basic gate propagation delay time (in nanoseconds) and the power dissipation per basic gate (in milliwatts) not less than 70 pJ (i.e., speed-power product/gate not less than 70 pJ);

(b) A typical propagation delay time not less than 5 nanoseconds;

(2) Operational amplifiers, having all of the following characteristics:

(a) A typical unity-gain open-loop bandwidth of not more than 5 MHz;

(b) A typical open-loop voltage gain of not more than 100,000 or 100 dB;

(c) A maximum intrinsic rated input offset voltage of not less than 5 mV;

(d) A typical slew rate at unity gain not exceeding 1 volt/microsecond;

(3) Audio amplifiers having a maximum rated power output of 10 watts or less at a case temperature of 25° C;

(4) Non-reprogrammable types which are specifically designed for and by virture of circuit design are normally limited to civil uses in television and radio receivers, having all of the following characteristics:

(a) Rated for operation at 11 MHz or less;

(b) Not specially designed for station scanning applications;

(c) Not utilizing charge-coupled device (CCD) technology;

(d) Not intended for beam lead bonding;

(e) Not intended for video and/or luminance amplifiers with maximum rated supply voltages exceeding 30 volts or with typical bandwidths greater than 7.5 MHz.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users for civil applications of assemblies, modules and printed circuit boards with mounted components (excluding those containing microprocessor, microcomputer and memory

microcircuits) covered by sub-entry II(b)(2) above, if the components are likely to be approved for export to satisfactory end-users.

2. Licenses are likely to be approved for export to satisfactory end-users of devices covered by sub-entry II(b), and not released by sub-entries II(c) (i) and (ii) above, when they consist of, or are incorporated in, plug-in printed circuit boards or plug-in modules for use in specifically identified equipment previously exported, and which do not upgrade the initial performance of that equipment, provided that the plug-in printed circuit boards or plug-in modules cannot operate independently from the equipment to which they are likely to be connected or inserted.

3. Licenses are likely to be approved for export to satisfactory end-users of integrated circuits covered by sub-entry II(c)(ii) above only by virture of being encased in hermetically sealed dual-in-line packages, provided that the stated legitimate civil end-use requires such a package.

4. Licenses are likely to be approved for export to satisfactory end-users of devices, encapsulated or unencapsulated, covered by sub-entries II (b) and (c) above, provided the devices have been designed specifically for identifiable civil applications and, by nature of design or performance, are substantially restricted to the particular application for which they have been designed.

1565A Electronic computers and related equipment, as follows:

(a) Analog computers designed or modified for use in airborne vehicles, missiles or space vehicles and rated for continuous operation at temperatures from below −45° C to above +55° C; and equipment or systems incorporating such computers;

(b) Other analog computers capable of accepting, processing and putting out data in the form of one or more continuous variables and capable of incorporating a total of at least 20 summers, integrators, multipliers or function generators with facilities for readily varying the interconnection of these components;

(c) Digital computers and digital differential analyzers (incremental computers), as follows:

(1) Designed or modified for use in airborne vehicles, missiles, or space vehicles and rated for continuous operation at temperatures from below −45° C to above +55° C;

(2) Designed or modified to limit electromagnetic radiation to levels much less than those required to meet appropriate government civil interference specifications;

(3) Designed as ruggedized equipment and capable of meeting military specifications for ruggedized equipment or modified for military use;

(4) Designed or modified for "data (message) switching" or those incorporating equipment, devices, or techniques, including software, microprogram control (firmware) and/or specialized logic control (hardware), for accepting, storing, processing and retransmitting data groups ("Data (message) switching" is the technique (including but not limited to store and forward or packet switching) for accepting data groups (including messages, packets or other digital or telegraphic information groups that are transmitted as a composite whole), storing (buffering) data groups as necessary, processing part or all of the data groups for control (routing, priority, formatting, code conversion, error control, retransmission or journaling), transmission or multiplexing purposes as necessary, and retransmitting (prccessed) data groups when transmission and/or receiving facilities are available); and

(5) Equipment or systems incorporating such computers;

(d) Digital computers with one or more of the following characteristics:

(1) Floating point operations are implemented by hardware or microprogram control (firmware);

(2) The computer is equipped with peripherals (other than those free from control under sub-entry (h) below);

(3) The computer is equipped with cathode-ray tube or other displays (other than those free from control under sub-entry (h) below), as follows:

(i) Used to display alphanumeric, graphic and/or similar data or information; or

(ii) With light gun or other graphic input devices;

(e) Other digital computers operated by one or more common control units and capable of all of the following:

(1) Accepting, storing, processing, and producing an output in numerical or alphabetical form;

(2) Storing in fixed or alterable (writable) storage devices more than 512 numerical and/or alphabetical characters or having an internal fixed or alterable memory of more than 2,048 bits;

(3) Performing a stored sequence of operations that are modifiable by means (including replacement of fixed storage devices) other than a physical change in wiring or interconnections; and

(4) Selecting a sequence from a pluality of stored operations based upon data or an internally computed result;

(f) Computers capable of operating both analog and digital modes and related equipment, as follows:

(1) Equipment whose analog portion meets the conditions of sub-entry (b) and whose digital portion meets the conditions of sub-entry (e) and which also provides facilities for processing in the digital section numeric data from the analog section and/or vice versa;

(2) Equipment for interconnecting the analog and digital portions of computers as defined in sub-entry (f)(1); and

(3) Digital or analog computers containing interconnecting equipment as defined in sub-entry (f)(2);

(g) Related equipment for the above (including that also described in entry Nos. 1572 and 1588), designed or modified as described in sub-entry (a) or (c), i.e. specialized parts, components, peripherals, displays, sub-assemblies, accessories, and spare parts; and

(h) Other related equipment for the above (including that also described in entry Nos. 1572 and 1588), i.e., specialized parts, components, peripherals, displays, sub-assemblies, accessories, and spare parts.

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of analog computers covered by sub-entry (b) above, and related equipment therefore covered by sub-entry (h) above, provided that:

(a) The equipment is primarily used in non-strategic applications;

(b) The equipment will be used primarily for the specific non-strategic applications for which the export would be approved and that the number, type and characteristics of such equipment are normal for the approved use;

(c) The computers and related equipment are not covered by and would not thereby become covered by sub-entry (a), (f), or (g) above, or exceed the limits of this Note:

(d) The analog computers are limited as follows:

(1) The rated errors for summers, inverters and integrators are not less than (i) Static: 0.01%; (ii) Total at 1 kHz: 0.15%.

(2) The rated errors for multipliers are not less than (i) Static: 0.025%; (ii) Total at 1 kHz: 0.25%.

(3) The rated error for fixed function generators (log x and sine/cosine) is not less than Static: 0.1%.

(4) No more than 350 operational amplifiers; and

(5) No more than four integrator time scales switchable during one program;

Technical Notes.—(1) The percentage for Note 1(d)(1)(i) above applies to the actual output voltage; all other percentages apply to full scale, that is from maximum negative to maximum positive reference voltages.

(2) Total errors at 1 kHz for Note 1(d) (1)(ii) and (2)(ii) above, are to be measured with those resistors incorporated in the inverter, summer or integrator which provide the least error.

(3) Total error measurements include all errors of the unit resulting from, for example, tolerances of resistors and capacitors, tolerances of input and output impedances of amplifiers, the effect of loading, the effects of phase shift, and the generating of functions.

2. Favorable consideration for export to satisfactory end-users of digital computers covered by sub-entry (c)(4) above will depend in part upon the degree of conformity with the following:

(a) The equipment is specially designed to meet the requirements of CCITT recommendation F–31 or ICAO recommendations for civilian aviation communication networks;

(b) The equipment will be used primarily for the specified civil application and will be operated by the civil authorities of the importing country for general civil traffic, or for traffic with links with Western countries, or for an international Service to fulfill a commitment to ITU, ICAO, or any other inter-governmental organization which includes Western countries;

(c) The computers are not covered by the remainder of sub-entry (c) above, or by sub-entries (f) or (g) above, or do not exceed the limits of this Note;

(d) The number, type and characteristics of such equipment are normal for the approved use and that the equipment will be limited as follows:

(1) Suitable combinations of circuits not exceeding:

(i) 250 circuits with "data signaling rates" of less than 150 bits per second;

(ii) 60 circuits with "data signaling rates" of 150 to 1,000 bits per second; and/or

(iii) 8 circuits with "data signaling rates" of greater than 1,000 to 4,800 bits per second;

(2) The maximum "data signaling rate" of any circuit does not exceed 4,800 bits per second;

(3) The sum of the "data signaling rates" of all circuits does not exceed 27,500 bits per second;

(4) The sum of the "data signaling rates" of all circuits with "data signaling rates" greater than 1,000 bits per second does not exceed 19,200 bits per second;

Technical Note.—"Data signaling rate" is as defined in ITU Recommendation 53–36, taking into account that, for non-binary modulation, "bauds" and "bits per second" are not equal. Bits for coding, checking and synchronization functions are to be included.

(e) The disclosure of software and technical information for the equipment exported is held to the minimum necessary for the application, operation and maintenance of the equipment in the stated civil end-use.

3. Favorable consideration for export to satisfactory end-users of digital computers covered by sub-entries (d) (1) or (2), or (e) above, and related equipment therefor covered by sub-entry (h) above, will depend in part upon the degree of conformity with the following:

(a) The equipment is primarily used in "telephone circuit switching" or "telegraph (telex) circuit switching" systems designed for fixed civil applications;

(b)(1) The equipment will be installed in "telephone circuit switching", or "telegraph (telex) circuit switching" systems designed for fixed civil applications;

(2) The equipment in total represents no more than 30 percent of the value of the switching system (during the initial installation of a partially-equipped system, this total may approach 50 percent); and

(3) The switching system will be either:

(i) Operated by civil authorities of the importing country for general civil traffic, or for traffic with links with Western countries, or for an international service to fulfill a commitment to ITU, ICAO or any other inter-governmental organization which includes Western countries; or

(ii) Used in a private exchange or private branch exchange (in each case of no more than 5,000 lines) which will be used in a civil installation situated in a densely-populated industrial area in a proscribed destination, and for which a responsible representative of the end-user or importing agency has furnished a signed statement describing the end-use and the location of the exchange and certifying that the equipment will only be used for that specific end-use;

(c) The computers and related equipment are not covered by and would not thereby become covered by sub-entires (c), (f), or (g) above, or exceed the limits of this Note;

(d) The number, type and characteristics of such equipment are normal for the approved use and that the equipment will be limited to the minimum system configuration necessary to control a 50,000 line exchange for the uses cited in sub-paragraph (b)(3)(i) above, or to control a 5,000 line exchange for the uses cited in sub-paragraph (b)(3)(ii) above;

(e) For the interface equipment with which the digital computer is equipped (to be provided only for administrative and control communications purposes):

(1) The "total effective bit transfer rate" of remote "terminal devices" does not exceed 2,400 bits per second;

(2) The "effective bit transfer rate" of any interfaced "communication channel" does not exceed 2,400 bits per second;

(3) The interface equipment is located within the "computer operating area" and limits the "effective bit transfer rate" to those specified in sub-paragraphs (1) and (2) above; and

(4) All interfaced "communication channels" are dedicated full time to the given application;

(f) The disclosure of software and technical information for the equipment exported is held to the minimum necessary for the application, operation and maintenance of the equipment in the stated civil end-use.

Technical Notes.—(1) "Telephone Circuit Switching" is the technique for establishing within an exchange, on demand and until released, an exclusive direct or PCM (CCITT Recommendations G–11, G–732 and G–733) connection between calling and called telephone circuits based solely on subscriber-type of telephone dialing information derived from the calling circuit. The telephone circuits may carry any type of signal, e.g. telephony, telegraph or telex, compatible with a voice channel bandwidth of 3,100 Hz. No information available on the circuit other than the subscriber dialing information is utilized for any other function.

(2) "Telegraph (Telex) Circuit Switching" utilizes techniques essentially identical to "Telephone Circuit Switching" for establishing connections between telegraph (telex) circuits based on the same type of dialing information. The telegraph (telex) circuits (which may be telephone circuits) may carry any telegraph (telex) signal compatible with a voice channel bandwidth of 3,100 Hz or less. No information available on the circuit other than the subscriber dialing information is utilized for any other function.

4. Licenses are likely to be approved for export to satisfactory end-users of digital computers and/or devices covered by sub-entries (d)(1) or (2) or (e) above, and related peripherals covered by sub-entry (h) above, provided that:

(a) The digital computers and/or devices have been designed for identifiable office and personal use and, by nature of design, software, microprogram control (firmware), specialized logic control (hardware) or performance, are substantially restricted to the particular application for which they have been designed;

(b) The digital computers and/or devices and the related peripherals and displays are not covered by sub-entries (c), (f) or (g) above, or do not exceed the limits of this Note;

(c) The digital computers and/or devices are limited as follows:

(1) The "CPU data handling rate" does not exceed 2 million bits per second;

(2) The "CPU numerical processing rate" for units capable of arithmetic operations does not exceed 0.1 million bits per second;

(3) The "total internal memory available to the user" does not exceed 32,768 bits;

(4) For peripheral devices with which the computer is equipped:

(i) No more than one magnetic tape transport which does not exceed:

(a) 1,600 bits per inch per track;

(b) 9 tracks per ½ inch (12.7mm) tape width;

(c) ½ inch (12.7mm) tape width; and

(d) 25 inches (65.6cm) per second tape read/write speed;

(ii) Cassette/cartridge tape drives described in sub-paragraph (d) below;

(iii) Digital computer peripherals and displays free from control under sub-entry (h) above; and

(iv) Digital recording and reproducing equipment specially designed to use magnetic card, tag, label or bank check recording media free from control under entry No. 1572 sub-entry (a)*(ii)*;

(d) The related peripherals are limited as follows:

Cassette/cartridge tape drives operating serially one track at a time, provided they have:

(i) No more than 800 bits per inch per track; and

(ii) No more than 6,000 bits per second maximum bit transfer rate.

Technical Notes.—(1) "CPU data handling rate" is defined as the maximum number of bits that can be accessed in parallel from an internal memory divided by the minimum time (including access time) for the execution of any instruction operating on this number of bits.

(2) "CPU numerical processing rate" is defined as the number of bits used to represent an arithmetic operand divided by the average time required for execution of a multiplication operation, assuming the most efficient arithmetic data coding and the fastest hardware, microprogram control (firmware) and/or software multiplication technique available to the user.

(3) "Total internal memory available to the user" is defined as the sum of the storage capacities of all user-alterable internal storage devices plus all user-replaceable fixed storage devices that may be incorporated in the equipment at one time and that may be used to store microprogram control (firmware) and/or software instructions and data.

5. Licenses are likely to be approved for export to satisfactory end-users of related specialized parts, components, sub-assemblies, accessories and spare parts covered by sub-entry (h) above, for equipment previously exported pursuant to Note 4, provided that:

(a) The related specialized parts, components, sub-assemblies, accessories and spare parts:

(1) Will not upgrade the equipment beyond the limits of Note 4;

(2) Are in reasonable quantities based on the quantity of equipment previously exported from the country; and

(3) Are only for equipment previously exported from the country;

(b) Advanced technology components (microprocessors, arithmetic logic units (ALUs), fixed or alterable storage devices,

programmed logic arrays (PLAs), etc.) covered by entry No. 1564 or 1588 are held to the minimum performance and quantity appropriate for the type and quantity of equipment they are intended for, assuming normal usage patterns.

6. Licenses are likely to be approved for export to satisfactory end-users of related specialized parts, components, sub-assemblies, accessories and spare parts covered by sub-entry (h) above, for tape drives previously exported pursuant to Note 4 (c)(4)(ii) and (d), provided that they will not upgrade the tape drives beyond the limits of Note 4.

7. Licenses are likely to be approved for export to satisfactory end-users of digital computers covered by sub-entries (d) (1) or (2) or (e) above, and related equipment therefor covered by sub-entry (h) above, provided that:

(a) The equipment is primarily used in non-strategic applications;

(b) The equipment will be used primarily for the specific non-strategic applications for which the export would be approved and that the number, type and characteristics of such equipment are normal for the approved use;

(c) The computers and related equipment are not covered by and would not thereby become covered by sub-entries (c), (f) or (g) above, or exceed the limits of this Note;

(d) The digital computers are limited, as follows:

(1) The sum of either the "I/O bus rate" or the "total effective bit transfer rate", whichever is less, and the "CPU bus rate" does not exceed 45 million bits per second;

(2) The "processing data rate" for CPUs which implement floating point operations by hardware or microprogram control (firmware) does not exceed 8 million bits per second;

(3) The internal memory total connected capacity (excluding parity, word marker and flag bits) does not exceed 2.36 million bits;

(4) For peripheral devices with which the computer is equipped:

(i) The "total effective bit transfer rate" (excluding data channels not equipped with peripheral memory units) does not exceed 8 million bits per second;

(ii) The "effective bit transfer rate" of any peripheral memory or data channel does not exceed 1.6 million bits per second;

(iii) No more than 12 magnetic tape transports;

(iv) Magnetic tape transports which do not exceed:

(a) 1,600 bits per inch per track;

(b) 9 tracks per ½ inch (12.7 mm.) tape width; and

(c) ½ inch (12.7 mm.) tape width;

(v) For peripheral memory devices other than magnetic tape transports:

(a) Total connected "net capacity" does not exceed 960 million bits;

(b) For each independent device with an "average access time" of less than 30 milliseconds, the "memory performance factor" does not exceed 8,000;

(c) For each independent device with an "average access time" of 30 milliseconds or greater, the "memory performance factor" does not exceed 43,000;

(d) "Total number of access" does not exceed 150 per second;

(5) The "effective bit transfer rate" of any "terminal device" located remote from the "computer operating area" does not exceed 2,400 bits per second;

(6) For interface equipment with which the computer is equipped:

(i) The "total effective bit transfer rate" (excluding parity, word marker and flag bits) of remote "terminal devices" does not exceed 4,800 bits per second;

(ii) The "effective bit transfer rate" of any interfaced "communication channel" does not exceed 1,200 bits per second;

(iii) The interface equipment is located within the "computer operating area" and limits the "effective bit transfer rates" to those specified in sub-paragraphs (i) and (ii) above; and

(iv) All interfaced "communication channels" are dedicated full time to the given application.

8. Licenses are likely to be approved for export to satisfactory end-users of additional internal memory or peripheral memory devices covered by sub-entry (h) above, for equipment previously exported pursuant to Note 7, provided that:

(a) Two years have elapsed since the initial installation of the equipment;

(b) The equipment would not thereby exceed the limits of Note 7(d) with the following modified limits on internal memory and peripheral memory devices:

(1) The internal memory total connected capacity (excluding parity, word marker and flag bits) does not exceed 4.72 million bits;

(2) For peripheral memory devices other than magnetic tape transports:

(i) Total connected "net capacity" does not exceed 1,400 million bits;

(ii) "Total number of accesses" does not exceed 200 per second;

(c) The conditions of Note 7 continue to be met.

9. Licenses are likely to be approved for export to satisfactory end-users of reasonable quantities of peripherals covered by sub-entry (h) above, as follows:

(a) Disc drives utilizing non-rigid magnetic media, provided they have:

(1) No more than a 7.88 in. (201 mm.) disc;

(2) No more than 3.2 million bit "net capacity";

(3) No more than 250,000 bits per second maximum bit transfer rate; and

(4) No less than 250 millisecond "average access time";

(b) Cassette/cartridge tape drives operating serially one track at a time, provided they have:

(1) No more than 1,600 bits per inch per track;

(2) No more than 48,000 bits per second maximum bit transfer rate;

(c) Non-impact line printers operating at 2,000 lines per minute or less and non-impact character printers operating at 300 characters per second or less;

(d) Graphic displays specially designed for signature security checking having an active display area not exceeding 150 sq.cm.

10. Licenses are likely to be approved for export to satisfactory end-users of additional internal memory and peripheral memory devices covered by sub-entry (h) above, for equipment previously exported, provided that the equipment would not thereby exceed the limits with the following additional limits on peripheral memory devices with which the computer is equipped:

(a) The "effective bit transfer rate" of any peripheral memory or data channel does not exceed 1.6 million bits per second;

(b) For peripheral memory devices other than magnetic tape transports:

(1) Total connected "net capacity" does not exceed 1,900 million bits;

(2) For each independent device with an "average access time" of 30 milliseconds or greater, the "memory performance factor" does not exceed 64,000.

1568A Equipment, as follows:

(a) * * *

(b) * * *

(c) * * *

(d) * * *

(e) * * *

(f) * * *

(g) Precision potentiometers, *except potentiometers using only switched elements* (for the purpose of this sub-entry, a precision potentiometer means one having a rated conformity better than 0.25 percent for a linear potentiometer; or 1 percent for a non-linear potentiometer), and special instruments rated to have the same characteristics as potentiometers in (1) and (2) below, such as Vernistats, as follows:

(1) Linear potentiometers having a constant resolution and a rated linearity of better than 0.05 percent absolute;

(2) Non-linear potentiometers having a variable resolution and a rated conformity of:

(i) 1 percent or less when the resolution is inferior to that obtained with a linear potentiometer of the same type and of the same track length; or

(ii) 0.5 percent or less when the resolution is better than or equal to that obtained with a linear potentiometer of the same type and of the same track length; or

(3) * * *

(h) * * *

(i) * * *

(j) * * *

(k) * * *

(l) * * *

(m) * * *

Note.—Licenses are likely to be approved for export to bona fide end-users of potentiometers covered by subentries (g) (1) and (2) above, provided they have been designed for civil use, and have been in use in civil equipment for a period of not less than five years.

1572A Recording and/or reproducing equipment as follows (for equipment which may be exported in conjunction with computer shipments, see entry No. 1565.):

(a) Using magnetic techniques, *except:*

(i) Those specifically designed for voice or music;

(ii) Those specifically designed to use magnetic card, tag, label or bank check recording media with a magnetic surface area not exceeding 10 sq. in. (65 sq. cm.); or

(iii) Digital recording and reproducing equipment operating serially with a packing density not exceeding 800 bits per inch per track specially designed for use with, and incorporated in, typewriter systems used for preparing, correcting and/or composing text;

(b) Using electron beam(s) operating in a vacuum, and/or laser-produced light beams (see also entry No. 1522) that produce patterns or images directly on the recording surface, and specialized equipment for image development, *except equipment specifically designed for television recording and/or reproducing on discs;*

(c) Graphic instruments capable of continuous direct recording of sinusoidal waves at frequencies exceeding 20 kHz; and

(d) Specialized parts and components for the above and recording media used in equipment covered by subentries (a) and (b). (The term "recording media" is intended to include all types and forms of specialized recording media used in such recording techiques, including but not limited to tapes, drums, discs and matrices.)

Notes.—1. Licenses are likely to be approved for export to satisfactory end-users of reasonable quantities of equipment covered by sub-entry (a) above, and specialized parts, components and recording media therefor covered by sub-entry (d) above, for use with the exported equipment, as follows:

(a) Video magnetic tape recorders, specially designed for television recording, using a signal registered with the C.C.I.R., or specifically designed or adapted for use with medical equipment, and having all of the following characteristics:

(1) 3 dB recording bandwidth not exceeding 6 MHz;

(2) Maximum length of time of a single scan not exceeding 20 milliseconds;

(3) Not ruggedized;

(b) Analog magnetic tape recorders having all of the following characteristics:

(1) Bandwidth capability at maximum design speed not exceeding 100kHz per track;

(2) Recording density not exceeding 5,000 magnetic flux sine waves per linear inch (25.4 mm) per track;

Technical Note.—Recording density is, for direct recorders, the recording band width divided by the tape speed; and, for FM recorders, the sum of the carrier frequency and the deviation divided by the tape speed;

(3) Not ruggedized;

(4) Not rated for continuous operation in ambient temperatures from below −20° C to above +55° C;

(5) Not specifically designed for underwater use;

(6) Not including recording and/or reproducing heads of the rotary or floating types or designed for use in equipment with characteristics superior to those designed in subparagraph (b) (1) and (2) above;

(7) Tape speed not exceeding 60 inches (152.4 cm) per second;

(8) Number of recording tracks (excluding audio voice track) not exceeding 16;

(9) Start-stop time not less than 25 milliseconds;

(10) Equipped with tape-derived (off-tape) servo speed control and with a time displacement (base) error of not less than ±25 microseconds at a tape speed of 60 inches (152.4 cm) per second and not less than ±50 microseconds at any lower tape speed measured in accordance with IRIG document 118–71, paragraph 5.2.2.5, or document EIA RS–413/ANSI C 83.94–1973;

(c) Systems for use in civil aircraft or helicopters to record flight data for safety and/or maintenance purposes, and having all of the following characteristics:

(i) In normal civil use for more than one year;

(ii) Not exceeding 100 input channels;

(iii) Sum of the individual channel recording bandwidths not exceeding 500 Hz;

(d) Recording equipment not intended for use in conjuction with equipment or materials covered by other items, provided that the capability of the recorder is limited to both:

(1) A tape width not exceeding ¼ inch (6.35 mm);

(2) Digital recording techniques in serial form with a packing density not exceeding 800 bits per inch.

Technical Note.—Packing density is, for digital recorders, the number of bits per second per track divided by the tape speed;

(e) Incremental recorders and/or reproducers (i.e. equipment designed for discontinuous sampling and/or collection of data in an incremental manner) having all of the following characteristics:

(1) The maximum tape speed, at the maximum stepping rate, does not exceed 2 inches (50.8 mm) per second;

(2) The equipment has all the characteristics specified in sub-paragraphs (3) to (6) inclusive in Note 1(b) above;

(f) Digital magnetic recorders specially designed for seismic/geophysical applications, operating in the frequency range of 5 to 800 Hz and limited to the following operational parameters:

(1) A maximum bit packing density of 1,600 bits per inch (63 bits per mm) per track;

(2) A maximum bit transfer rate of 0.96 million bits per second;

(3) A maximum tape read-write speed of 75 inches (190.5 cm) per second.

Technical Note.—Packing density is, for digital recorders, the number of bits per second per track divided by the tape speed.

2. Licenses are likely to be approved for export to satisfactory end-users of reasonable quantities of magnetic tape and flexible disc cartridge recording media covered by sub-entry (d) above, for use in civil television recording and reproducing applications or with computers as appropriate, provided that:

(a) The base material consists only of polyethylene terephthalate or cellulose acetate;

(b) The magnetic coating material consists only of undoped gamma-ferric (iron) oxide with a rated intrinsic coercitivity not exceeding 350 oersteds (video tape considered under subparagraph (c)(1) below, may also include chromium dioxide-coated tape with a rated intrinsic coercitivity not exceeding 500 oersteds and a width not exceeding 1 inch (25.4 mm)); and

(c) The magnetic recording media is limited to the following types and characteristics:

(1) Video tape designed for television recording and reproduction with a tape width not exceeding 2 inches (50.8 mm);

(2) Computer tape designed for digital longitudinal recording and reproduction and having all of the following characteristics:

(i) A magnetic coating certified for a maximum packing density of 6,250 bits per inch (9,042 flux changes per inch) along the length of the tape;

(ii) A magnetic coating thickness not less than 0.40 mil (10.2 microns);

(iii) A tape width not exceeding 1 inch (25.4 mm);

(iv) A tape length not exceeding 3,600 feet (1,097.3 meters);

(3) Computer tape in cassettes/cartridges designed for digital longitudinal recording and reproduction and having all of the following characteristics:

(i) A magnetic coating certified for a maximum packing density of 1,600 bits per inch (3,200 flux changes per inch) along the length of the tape;

(ii) A magnetic coating thickness not less than 0.17 mil (4.32 microns);

(iii) A tape width not exceeding ¼ inch (6.35 mm);

(iv) A tape length not exceeding 900 feet (274.3 meters);

(4) Computer flexible disc cartridges designed for digital recording and reproduction and having all of the following characteristics:

(i) A magnetic coating certified for a maximum packing density of 13,262 flux changes per radian (3,268 bits per inch at a radius of 2.029 inches (51.536 mm)) around the disc;

(ii) A magnetic coating thickness not less than 0.1 mil (2.54 microns);

(iii) A disc thickness not exceeding 0.003 inch (80 microns);

(iv) A disc outer diameter not exceeding 7.88 inches (201 mm);

(v) A disc inner diameter of 1.5 inch (38.1 mm).

3. Licenses are likely to be approved for export to satisfactory end-users of reasonable quantities of recording media covered by sub-entry (d) above, specially designed for digital recording and reproducing equipment operating serially with a packing density not exceeding 800 bits per inch per track specially designed for use with, and incorporated in, typewriter systems used for preparing, correcting and/or composing text. (The digital recording and reproducing equipment described in this Note is not covered by sub-entry (a) above.)

1584A Cathode-ray oscilloscopes and specialized parts therefor, including associated plug-in units and external amplifiers, preamplifiers, and sampling devices, having any of the following characteristics:

(a) An amplifier bandwidth greater than 100 MHz (defined as the band of frequencies over which the deflection on the cathode-ray tube does not fall below 70.7 percent of that at maximum point measured with a constant input voltage to the amplifier);

(b) Containing or designed for use with cathode-ray tubes covered by entry 1541 (b) or (c);

(c) * * *

(d) * * *

(e) * * *

(f) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of oscilloscopes (including mainframe/amplifier systems) and probes therefor, covered only by sub-entries (a) and (b) above, provided that:

(a) The oscilloscope or system bandwidth is not rated in excess of 200 MHz;

(b) In the case of systems, the characteristics of individual plug-ins or mainframes are not in excess of what is required for the overall system performance;

(c) The equipment is a reasonable requirement for the stated legitimate civil end-use; and

(d) The cathode-ray tube contains no electron multiplier.

1586A Acoustic wave devices and specialized parts therefor, as follows:

(a) Surface acoustic wave and surface skimming acoustic wave devices (*i.e.*, signal processing devices employing elastic waves in materials, including but not limited to, lithium niobate, lithium tantalate, bismuth germanium oxide, silicon, quartz, yttrium garnet, aluminum oxide and magnesium aluminum oxide) which permit direct processing of signals, including but not limited to, amplifiers, correlators (fixed, programmable and memory), oscillators, bandpass filters (transversal and resonator), multiplexers, dispersive expansion and compression filters, delay lines (fixed and tapped) and non-linear devices, having any of the following characteristics:

(1) A carrier frequency of greater than 400 MHz;

(2) * * *

(b) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of devices covered by sub-entry (a)(1) above, which are specially designed for use in civil television equipment and which operate at frequencies below 1 GHz.

1587A Quartz crystals and assemblies thereof in any stage of fabrication (i.e. worked, semi-finished or mounted), *except optical grade quartz crystals*, as follows:

(a) For use as filter elements, and having either of the following characteristics:

(1) Designed for operation over a temperature range wider than 125° C; or

(2) Crystals or assemblies of crystals which use the trapped energy phenomenon (i.e. those which have more than one series or parallel resonance on a single quartz element);

(b) * * *

(c) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of items covered by sub-entry (a) above, which have either of the following characteristics:

(a) Designed for operation as intermediate frequency filters operating from 10.5 to 11 MHz or from 21 to 22 MHz with 3 dB bandwidths not exceeding 40 kHz; or

(b) Designed for operation as single sideband filters operating at from 1 to 10 MHz with 3 dB bandwidths not exceeding 4kHz.

1588A Materials composed of crystals having spinel, hexagonal, orthorhombic or garnet crystal structures; thin film devices; assemblies of the foregoing; and devices containing them, as follows (for equipment which may be exported in conjunction with computer shipments, see entry No. 1565):

(a) * * *

(b) Single aperture forms possessing either of the following characteristics:

(1) Switching speed of 0.3 microsecond or faster at the minimum field strength required for switching at 104° F (40° C); or

(2) A maximum dimension less than 30 mils (0.76 mm);

(c) * * *

(d) * * *

(e) * * *

(f) * * *

(g) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of single aperture forms covered by sub-entry (b) above, provided they have a switching speed of slower than 0.3 microsecond and a maximum dimension of 14 mils (0.36 mm) or more.

1595A Gravity meters (gravimeters), and specialized parts therefor, designed or modified for airborne or marine use.

Note.—Licenses are likely to be approved for export to civil end-users for civil end-uses of marine gravimetric systems having a static accuracy of 1 milligal or above, or an in-service (operational) accuracy of 1 milligal or above with a time to steady-state registration of two minutes or greater under any combination of attendant corrective compensations and motional influences.

3604A Zirconium metal; alloys containing more than 50% zirconium by weight; and compounds in which the ratio of hafnium content to zirconium content is less than one part to five hundred parts by weight; manufacturers wholly thereof; *except*

(i) Zirconium metal and alloy in shipments of 5 kg or less;

(ii) Zirconium in the form of foil or strip having a thickness not exceeding 0.025 mm (0.00095 in.) and specially fabricated and intended for use in photo flash bulbs, in shipments of 200 kg or less.

Note.—Licenses are likely to be approved for export to satisfactory end-users of:

(a) Finished parts made of zirconium metal or alloys, specially designed for an identified civil research or power reactor, such as cladding tubes and plugs and separators therefor, liner tubes, thermal insulating tubes, pressure tubes and calandria tubes, provided that:

(1) None of the parts contains fissile materials; and

(2) The importing country has agreed to the application of the Safeguards of the International Atomic Energy Agency (IAEA) in connection with the nuclear reactor facility;

(b) Contained zirconium metal, or parts made therefrom, in individual shipments not exceeding 100 kg, when intended for use in, or in support of, an identified civil research or power reactor facility, in connection with which it is contemplated that IAEA Safeguards would be applied.

3605A Nickel powder and porous nickel metal, as follows:

(a) Powder with a nickel content of 99 percent or more, and a particle size of less than 100 micrometers; and

(b) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of:

(a) Nickel powder in uncompacted powder form not made by the carbonyl process; or

(b) Nickel powder in uncompacted powder form made by the carbonyl process, in quantities of 50 kg or less.

1673A Artificial graphite having an apparent relative density of 1.90 or greater when compared with water at 60° F (15.50° C), *except artificial graphite which has been impregnated or composited with inorganic materials for the purpose of improving only its electrical conductivity, its mechanical resistance or its mechanical friction properties; and electrical resistors, artificial loads for microwave applications, cable waveguide terminations, brush stock, special joints for electrodes, boats and crucibles and high density graphite optical elements.*

Note.—Licenses are likely to be approved for export to satisfactory end-users of the following:

(a) Pyrolitic graphite (e.g. graphite made by vapor deposition at temperatures exceeding 2,732° F. (1,500° C)) in crude or semi-fabricated forms, the dimension of any one of which does not exceed 4 inches (10. cm) in any direction, in individual shipments not exceeding 55 pounds (25 kg);

(b) Non-pyrolitic graphite, having a relative density of less than 1.95 which has not been coated or composited with other elements or compounds to improve its performance at elevated temperatures or reduce its permeability to gases.

1754A Fluorocarbon compounds and manufactures, as follows:

(a) Monomeric and polymeric materials, as follows:

(1) Polychlorotrifluoroethylene, oily and waxy modifications only;

(2) * * *

(3) * * *

(4) * * *

(5) * * *

(b) Greases, lubricants and dielectric, damping and flotation fluids made wholly of any of the materials in sub-entry (a) above;

(c) * * *

Note.—Licenses are likely to be approved for export to satisfactory end-users of up to 5 US gallons (18.9 liters) of polychlorotrifluoroethylene-based lubricating oils covered jointly by sub-entries (a)(1) and (b) above, for bona fide civil uses.

1755A Silicone fluids and greases, as follows:

(a) * * *

(b) Silicone lubricating grease capable of operating at temperatures of 356° F (180° C) or higher and having a drop point (method of test being ASTM or ITP) of 428° F (220° C) or higher.

Note.—Licenses are likely to be approved for export to satisfactory end-users of silicone lubricating greases covered by sub-entry (b) above, provided they are not capable of operating at temperatures of 400° F (205° C) or higher.

1763A Fibrous and filamentary materials which may be used in composite structures or laminates and manufactures thereof, as follows:

(a) Having both of the following characteristics:

(1) Specific modulus greater than 1.25×10^6, and

(2) Specific tensile strength greater than 3×10^6;

(b) Having both of the following characteristics:

(1) Specific modulus greater than 1×10^8, and

(2) Melting or sublimation point higher than 3,000° F (1,649° C) in an inert environment; *except carbon fibers having a specific modulus of less than 2×10^8 and a specific tensile strength of less than 1×10^6;*

(c) * * *

Note.—Licenses are likely to be approved for export for bona fide civil end-uses, of carbon fibers covered by sub-entries (a) and (b) above having both of the following characteristics:

(a) Specific modulus less than 4.5×10^8, and

(b) Specific tensile strength less than 4×10^6.

1767A Preforms of glass or any other material specially designed for the fabrication of optical transmission fibers intended for the manufacture of cable covered by entry No. 1526 II(c).

Note.—Licenses are likely to be approved for export to satisfactory end-users of the preforms described in this entry.

2. The authority citation for Part 399 is revised to read as follows:

Authority: Sec. 4, Pub. L. 96–72 (50 U.S.C. app. 2403); (E.O. 12214, 45 FR 29783, May 6, 1980), Department Organization Order 10–3, (45 FR 6141, January 25, 1980) and International Trade Administration Organization and Function Order 41–1 (45 FR 11862, January 30, 1980).

3. Section 399.1 is revised to read as set forth below. The Commodity Control List printed in the **Federal Register** of June 25, 1980 (45 FR 43060–43138) is reconfirmed and is designated Supplement 1 to § 399.1. Supplement 1 is amended by removing pages CCL–5, 10, 19, 21, 22, 23, 24, 28, 66, 70, 72, 77 and 79 printed at 45 FR 43064, 43069, 43078, 43080, 43081, 43082, 43083, 43087, 43125, 43129, 43131, 43136, and 43138, and inserting in their place replacement pages CCL–5, 10, 19, 21, 22, 23, 24, 28, 66, 70, 72, 77 and 79 set forth below.

§ 399.1 The commodity control list and how to use it.

(a) *Commodity Coverage.* The Commodity Control List (CCL) includes all commodities except those specifically controlled for export by another department or agency of the U.S. Government. For example, arms, ammunition, and implements of war are controlled for export by the Office of Munitions Control, U.S. Department of State. See § 370.10 for a listing of exports controlled by other U.S. Government departments and agencies.

(b) *Commodity Categories.* The commodities under OEA jurisdiction are grouped on the CCL under 10 general categories. Each CCL entry is preceded by a four-digit Export Control Commodity Number (ECCN). The first digit relates to the strategic level of control; the second digit identifies the Group to which the commodity belongs; and the remaining two digits identify related commodities within a Group.

Group	Types of commodities
0	Metal-working machinery
1	Chemical and petroleum equipment
2	Electrical and power-generating equipment
3	General industrial equipment
4	Transportation equipment
5	Electronics and precision instruments
6	Metals, minerals, and their manufactures
7	Chemicals, metalloids, petroleum products, and related materials
8	Rubber and rubber products
9	Miscellaneous

Within the ten general categories, specific CCL entries define the commodities under control to the destinations included in the country groups specified in the CCL column headed "Validated License Required." See Supplement No. 1 to Part 370 for a listing of the countries included in each country group.

(c) *Embargo Destinations.* Almost all CCL entries include Country Groups S and Z, embargo destinations, in the column headed "Validated License Required." Generally, the last entry in each commodity category is a "basket" entry asserting control over exports to destinations in Country Groups S and Z of commodities that are not elsewhere specified in that commodity category. In a few instances, however, certain entries are excepted from the general embargo policy and are specifically identified. The commodities so excepted may be exported under General License *G-DEST*. Certain other General Licenses may also apply, *e.g.*, General License *GIFT*. With these exceptions, no commodity may be exported or reexported to a destination in Country Group S or Z unless an export license application (Form ITA–622P) or request to reexport (Form ITA–699P) has been filed with the Office of Export Administration and a validated export license or reexport approval covering the proposed transaction has been issued to the exporter. See § 385.1 for general policy statements with respect to embargo destinations.

(d) *All Other Destinations, except Canada.* If a commodity is intended for export to a destination in Country Group P, Q, T, V, W, or Y and is covered by a CCL entry that includes P, Q, T, V, W, or Y, as appropriate, in the column headed "Validated License Required," an export license application or reexport request will generally have to be filed with the OEA and a validated export license or reexport authorization covering the proposed transaction will generally have to be issued prior to shipment. If a commodity is covered by a CCL entry but is intended for export to a country that is *not* included in a country group for which control is indicated, the commodity may be shipped under authority of General License *G-DEST*, provided none of the parties involved is currently denied export privileges (see Supplement No. 1 to Part 388) and the export is not restricted by the special licensing requirements summarized in (f)(3) below. A small value shipment of a commodity included in a CCL entry may be eligible for export to a destination in Country Group Q, T, or V under the authority of General License *GLV*. In addition, one of the other, more specialized, General Licenses set forth in Part 371 may be applicable. Exporters should review the General License provisions in Part 371 prior to filing an application to ascertain whether any apply to the proposed shipment or conversely require a validated license.

(e) *Canada.* Canada is not included in any of the Country Groups, and most commodities may be exported to Canada for consumption or use in that country without a validated export license. In the few instances where a validated license is required, Canada is specifically named. See § 385.6 for a general policy statement with respect to exports to Canada. Note also the special licensing requirements summarized in (f)(3) below.

(f) *How To Use the CCL.*—(1) *General categories.* The first step is to identify which CCL entry covers the commodity proposed for export. This can usually be determined by reviewing the appropriate general category within which the commodity is most likely to be included. If the exporter is uncertain of the proper CCL entry, he should consult the Office of Export Administration.

Once the CCL entry has been located, the Export Control Commodity Number (ECCN) should be noted. This consists of a four-digit number that must appear on your export license application or reexport request, if one is required. The four-digit number will be followed by a code letter. This code letter is a key to the documentation requirements of Part 375, and is used elsewhere in the Regulations to indicate the country group level of control for CCL entries. This code letter need not appear on the export license application or reexport request. The letters used and the respective country groups are:

Code letters	Country groups for which validated license is required
A	PQSTVWYZ (Multilaterally controlled to all destinations.) Only "A" commodities are subject to IC/DV procedure (see § 375.1).
B	PQSTVWYZ (Unilaterally controlled to all destinations.)
C	PQSWYZ and certain other countries.
D	PQSWYZ only.
E	PSWYZ.
F	SZ and certain other countries.
G	SZ only.
I	None.
M	Various (Country Group control level is governed by another entry on the CCL.)

(2) *Country of destination and value of shipment.* Having located the ECCN for a commodity that is to be exported, the next step is to determine if a validated export license is required for *the particular shipment* in question. This is determined by reference to the column of the CCL headed "Validated License Required" and, in certain cases, by the value of the shipment.

(i) If the code letter following the ECCN is A or B, and the country of destination is in Country Group T or V, a validated export license is required if the value of the shipment exceeds the value shown in the column of the CCL headed "GLV $ Value Limit." However, see § 371.5 for restrictions on the use of General License *GLV.*

(ii) If the code letter following the ECCN is A and the country of destination is in Country Group P, Q, S, W, Y, or Z, a validated export license is required *regardless of the value of the shipment.*

(iii) If the code letter following the ECCN is B, C, D, or E, and the country of destination is in Country Group P, S, W, Y or Z or specifically named in the column of the CCL headed "Validated License Required," a validated export license *is* required, regardless of the value of the shipment. If the country of destination is in Country Group Q, a validated export license is required unless the code letter is E, F, G or I, or there is a GLV $ value shown in a footnote to the entry and the value of the shipment does not exceed the GLV $ value. The GLV $ value limit for Country Group Q is "0" unless stated otherwise in a footnote for the entry. However, see § 371.5 for restrictions on the use of General License *GLV.*

(iv) If the code letter following the ECCN is F or G, and the country of destination is in Country Group S or Z or is specifically named in the column of the CCL headed "Validated License Required," a validated export license *is* required, regardless of the value of the shipment.

(3) *Special licensing requirements.* Under certain circumstances, a commodity may not be exported under a General License even though, from an examination of the CCL, it appears to meet the requirements for export under a General License. Exporters should review, in particular, Parts 376, 378, and 385. For example—

(i) The commodity is related to nuclear weapons, nuclear explosive devices, nuclear testing, the chemical processing of irradiated special nuclear or source materials, the production of heavy water, the separation of isotopes of source and special nuclear material, or the fabrication of nuclear reactor fuel containing plutonium, as described in § 378.3, or the technical data are related to any of these activities, as described in § 379.4(c)(1), unless the technical data may be exported under the provisions of General License *GTDA;*

(ii) An individual validated export license is required to export any commodity or technical data (except data meeting the conditions of General License *GTDA*) where the exporter knows or has reason to know that the commodity, the data, or any product of the data, will be sold to or used by or for military or policy entities in the Republic of South Africa or Namibia. See also § 385.4 with respect to controls over other commodities for export to the Republic of South Africa or Namibia.

(g) *Commodity Control List Headings.* The Commodity Control List contains two headings designed to inform applicants of information that must be included on an export license application or reexport request, and one heading to inform applicants of the reason for control of the commodity.

(1) *Unit of quantity.* The quantity classification given for each commodity in the "Unit" column of the CCL must be shown on the export license application. If dashes (——) are shown in this column, the license is issued in terms of dollar value, unless a specific unit of quantity is required by a footnote in this column. However, if another unit of quantity is commonly used in the trade, the application should show the quantity in terms of that unit. If a unit of weight or measure is listed in the unit column, a shipping tolerance is allowed. (See § 386.7.)

(2) *Processing code.* For each entry on the Commodity Control List, a processing code, *i.e.,* CD, EE, MG, or SS, appears in the "Processing Code" column. These processing codes must be shown on the application for export license or reexport request, since they are used to facilitate the routing and processing of export license applications within the Office of Export Administration. These processing codes stand for Computer Division (CD), Electronic Equipment Division (EE), Capital Goods and Production Material Division (MG), and Short Supply Division (SS). Only those entries on the CCL that have the same processing code may be entered on a single application for export license. (For complete information the inclusion of related commodities on a single application, see § 372.4 (d).)

(3) *Reason for control.* The reason for control for each entry is specified in the last column[1], using the following number code—

Code No.	Reason for control
1	National security [1]
2	Short supply [2]
3	Foreign policy [3]
4	Nuclear non-proliferation [4]
5	Crime control (foreign policy) [5]

[1] Export Administration Act of 1979, Section 5, Pub. L. 96–72, 93 Stat. 507, to be codified at 50 U.S.C. app. § 2404.
[2] Export Administration Act of 1979, Section 7, Pub. L. 96–72, 93 Stat. 515, to be codified at 50 U.S.C. app. § 2406. Other statutes controlling petroleum and other commodities include: Energy Policy and Conservation Act, Section 103, Pub. L. 94–163, 89 Stat. 877, 42 U.S.C. § 6212; Trans-Alaska Pipeline Authorization Act, Section 101, Pub. L. 93–153, 87 Stat. 576, amending 30 U.S.C. § 185; Naval Petroleum Reserve Production Act of 1976, Section 201(10), Pub. L. 94–258, 90 Stat. 309, amending 10 U.S.C. § 7430.
[3] Export Administration Act of 1979, Section 6, Pub. L. 96–72, 93 Stat. 513, to be codified at 50 U.S.C. app. § 2405.
[4] Export Administration Act of 1979, Sections 5, 6, and 17(d), Pub. L. 96–72, 93 Stat. 507, to be codified at 50 U.S.C. app. § 2416(d), Nuclear Non-Proliferation Act of 1978, Section 309(c), Pub. L. 95–242, 92 Stat. 141, to be codified at 42 U.S.C. § 2139a.
[5] Export Administration Act of 1979, Section 6(j), Pub. L. 96–72, 93 Stat. 515, to be codified at 50 U.S.C. app. § 2405(j).

In some cases, more than one reason for control is given for one entry. If an entry is controlled for more than one reason, but not to an identical list of countries, the lesser degree of control is explained in a footnote. Also, all entries (except those showing "none" in the "Validated License Required" column) are controlled for foreign policy reasons to Country Groups S and Z due to certain embargo programs, and all entries having both a "V" in the "Validated License Required" column and a "1" in the "Reason for Control" column are controlled for foreign policy reasons to Syria, Iraq, Libya, and the People's Democratic Republic of Yemen. In some cases, sub-entries of a CCL entry are controlled for different reasons. In these cases, a dash (—) will be shown in the first line of the entry, and the code number is shown in the "Reason for Control" column exactly opposite each sub-entry (a), (b), etc. (For example, see CCL entry No. 1110.)

(h) *The Abbreviation "n.e.s."* The abbreviation "n.e.s." appearing in various CCL entries means "not elsewhere specified." If a commodity intended for export appears to be covered by a CCL entry and the

[1] In accordance with section 5(c)(1) and 6(k) of the Export Administration Act of 1979.

commodity description carries the limitation "n.e.s.," that CCL entry should not be used until a check has been made to determine whether another CCL entry specifically covers the commodity.

(i) *Commodity Description on Applications or Reexport Requests.* Phrases such as "specify by name," "specify by name and model number," "give full specifications," etc., are included in various CCL entries. This information is required by the OEA on export license applications or reexport requests in order to evaluate the proposed export. Failure to provide the requested information may delay processing or result in the application or reexport request being returned without action.

(j) *Commodity Groups.* Export control commodity classifications are divided into major groups of related commodities. Below are the titles appearing on the Commodity Control List and initial page number of each group.

(k) *Control Over End Products.* Certain commodities that are under export control to all destinations for national security reasons may be used as components in end products that, because of their peaceful use, are under control only to embargo destinations. Where a controlled component is the principal element in such an end product, however, and can feasibly be removed or used for other purposes, the object of the control program is defeated unless the end product is subject to the same control as the component. This explains why, in some instances, commodities that do not appear to qualify for control for national security reasons are under validated license control to all destinations.

Note.—The foregoing portion of this § 399.1 is explanatory only and does not modify or supersede other Parts of the *Export Administration Regulations.*

BILLING CODE 3510-25-M

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
4094B Mandrels and bellows forming dies, as follows:		PQSTVWYZ and Canada	0	MG	4
(a) Mandrels or forming dies, two piece cylindrical having a single indented circumferential convolution bisected by the two halves and having the following dimensions:					
(1) 3 in. to 16 in. outside diameter;					
(2) ½ in. or more in length; and					
(3) Single convolution depth more than 2 mm; and					
(b) Mandrels or forming dies, hollow two piece cylindrical having a single internal indented circumferential convolution bisected by the two halves and having the following dimensions:					
(1) 3 in. to 16 in. inside diameter;					
(2) ½ in. or more in length; and					
(3) Single convolution depth more than 2 mm.					
6098F Other machinery and equipment (including tools, fixtures, and jigs) specially designed or modified for the manufacture of equipment utilized in the exploration for, or production of, petroleum or natural gas, and specially designed parts and accessories therefor, as follows:		SZ, Afghanistan and the USSR [1, 2]	—	MG	3
Dowel hole drilling machines, Cone bit drilling machines, Cone bit milling machines, Bit-arm milling machines, Pipe perforating machines, Liner mills, Casing mills, Cone buster mills,					
Collar mills, Packer mills, and Machinery and equipment, n.e.s., specially designed or modified for the manufacture of equipment utilized in the exploration for, or production of, petroleum or natural gas.					
6099G [2,3] Other metal-working machinery, n.e.s.; and parts and accessories, n.e.s.		SZ [2, 3]	—	MG	3
GROUP 1—CHEMICAL AND PETROLEUM EQUIPMENT [4]					
1110A Gas liquefying equipment, as follows:	[5]	PQSTVWYZ	500	MG	—
(a) Equipment for the production of liquid hydrogen, *except plants with a capacity of less than 1½ tons per 24-hour day and not designed for, or capable of, the production of hydrogen slush;*					1
(b) Equipment for the production of liquid fluorine; and					1, 4 [6]
(c) Specially designed parts and acessories therefor.					1, 4 [6]

[1] Including Estonia, Latvia, and Lithuania.
[2] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See §§ 371.2(c)(11) and 385.4(a).
[3] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[4] See § 370.10 for commodities which require export authorization from other U.S. Government Departments and Agencies.
[5] Report equipment in "number."
[6] The countries to which commodities in this entry are controlled for nuclear reasons are those *not* listed in Supp. No. 2 or Supp. No. 3 to Part 373.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
1206A Electric arc devices for generating a flow of ionized gas in which the arc column is constricted, *except devices wherein the flow of gas is for isolation purposes only and devices of less than 100 kW for cutting, welding, melting, plating, and/or spraying;* equipment incorporating such devices; and specially designed parts, accessories, and control or test equipment for such devices.		PQSTVWYZ	500	MG	4 [1]
3240A Now covered by entry No. 3261.					
4240B Now covered by entry No. 4261.					
3261A Neutron generator systems, including tubes, designed for operation without an external vacuum system, and utilizing electrostatic acceleration to induce a tritium-deuterium nuclear reaction; and specially designed parts therefor.	[2]	PQSTVWYZ	0	EE	1, 4
4261B Particle accelerators having *all* of the following specifications:	[3]	PQSTVWYZ	500	EE	4
(a) Peak beam power exceeding 500 MW;					
(b) Output energy exceeding 500 kV; and					
(c) An output beam intensity exceeding 2,000 amperes with a pulse width of 0.2 microsecond or less; and					
(d) Specially designed parts and accessories therefor.					
6299G [4,5] Other electrical and power generating equipment, n.e.s.; and parts and accessories, n.e.s.		SZ [4, 5]	—	MG	3
GROUP 3—GENERAL INDUSTRIAL EQUIPMENT [6,7]					
1305A Metal rolling mills, as follows:		PQSTVWYZ	1,000	MG	1
(a) Mills specially designed or re-designed for the rolling of metals and alloys with a melting point exceeding 1,900°C; and					
(b) Specialized controls, parts, and accessories for the above mills.					
1312A Presses and specialized controls, accessories, and parts therefor, as follows:	[8]	PQSTVWYZ	1,000	MG	—
(a) Presses specially designed or re-designed for the working or forming of metals, alloys, or other materials with a melting point exceeding 3,452°F (1,900°C);					1
(b) Hydraulic presses, as follows:					1
(1) Vertical presses having a total rated force of over 10,000 tons; or					
(2) Horizontal presses having a total rated force of over 5,000 tons;					
(c) Isostatic presses, as follows (isostatic presses are those capable of pressurizing a closed					1, 4

[1] The countries to which commodities in this entry are controlled for nuclear reasons are those *not* listed in Supp. No. 2 or Supp. No. 3 to Part 373.
[2] Report systems and tubes in "number."
[3] Report accelerators in "number."
[4] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c)(11) and § 385.4(a).
[5] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[6] See § 370.10 for commodities which require export authorization from other U.S. Government Departments and Agencies.
[7] For mechanical measuring instruments, see entry No. 1532.
[8] Report machines in "number."

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
4563B Nuclear reactor and nuclear power plant related equipment as follows:	--------	PQSTVWYZ [1]	0	MG	4
(a) Reactor and power plant simulators, models or mock-ups;					
(b) Process control systems intended for use with nuclear reactors;					
(c) Generators, turbine-generator sets, steam turbines, heat exchangers, and heat exchanger type condensers designed or intended for use in a nuclear reactor; and					
(d) Commodities, parts and accessories specially designed or prepared for use with nuclear plants (*e.g.*, snubbers, airlocks, reactor inspection equipment) *except* items licensed by the NRC pursuant to 10 CFR 110.					
1370A Turning machines for generating optical quality surfaces using a single point cutting tool, and components and accessories therefor, as follows:	No.	PQSTVWYZ	500	MG	1, 4
(a) Turning machines having all of the following characteristics:					
(1) Slide positioning accuracy less (finer) than 0.0005 mm per 300 mm of travel, TIR (peak-to-peak);					
(2) Slide positioning repeatability less (finer) than 0.00025 mm per 300 mm of travel, TIR (peak-to-peak);					
(3) Spindle runout (radial and axial) less than 0.0004 mm TIR (peak-to-peak);					
(4) Angular deviation of the slide movement (yaw, pitch and roll) less (finer) than 2 seconds of arc (peak-to-peak) over full travel;					
(5) Slide perpendicularity less than 0.001 mm per 300 mm of travel, TIR (peak-to-peak); (Turning machines will be evaluated under the conditions yielding the most accurate values, including but not limited to the incorporation of control systems which permit mechanical, electronic and software compensation.)					
(b) Components, as follows:					
(1) Spindle assemblies, consisting of spindles and bearings as a minimal assembly, *except those assemblies with axial and radial axis motion measured along the spindle axis in one revolution of the spindle equal to or greater (coarser) than 0.0008 mm TIR (peak-to-peak);*					
(2) Linear induction motors used as drives for slides, having all of the following characteristics:					
(i) Stroke greater than 200 mm;					
(ii) Nominal force rating greater than 45 N; and					
(iii) Minimum controlled incremental movement less than 0.001 mm; or					
(c) Accessories, *i.e.*, single point diamond cutting tool inserts having all of the following characteristics:					
(1) Flawless and chip-free cutting edge when magnified 400 times in any direction;					
(2) Cutting radius between 0.1 and 5 mm; and					
(3) Cutting radius out-of-roundness less than 0.002 mm TIR (peak-to-peak); and					
(d) Specially designed parts and components therefor.					
1371A Anti-friction bearings, as follows:	--------	PQSTVWYZ	500	MG	1
(a) Ball and roller bearings having an inner bore diameter of 10 mm or less and tolerances of ABEC 5, RBEC 5 (or national equivalents) or better and either of the following characteristics:					
(1) Made of special materials, *i.e.*, with rings, balls or rollers made from any steel alloy or other material including, but not limited to high-speed tool steels, Monel metal, beryllium, metaloids, ceramic, and					

[1] A validated license is *not* required for export of these commodities [illegible] to Part 373.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
GROUP 4—TRANSPORTATION EQUIPMENT [1]					
2404A Rockets and missiles, guided or unguided, as follows:	--------	PQSTVWYZ	500	MG	1
(a) Meteorological sounding rockets;					
(b) Non-irritant smoke flares, canisters, grenades, and charges;					
(c) Other pyrotechnic articles having dual military and commercial use;					
(d) Rocket launching ramps, towers, and associated equipment for meteorological rockets; and					
(e) Specially designed parts for the above.					
2406A Vehicles specially designed for military purposes, as follows:	-------- [2]	PQSTVWYZ	0	MG	1, 3, 5
(a) Specially designed military vehicles, excluding vehicles listed in Supplement No. 2 to Part 370;					
(b) Pneumatic tire casings *(excluding tractor and farm implement types)*, of a kind specially constructed to be bullet proof or to run when deflated;					
(c) Engines for the propulsion of the vehicles enumerated above, specially designed or essentially modified for military use; and					
(d) Specially designed components and parts therefor.					
(See § 399.2, Interpretation 19, for aid in determining whether your commodity is covered by this entry.)					
5406D [3] Diesel engines, nonmagnetic, 50 brake horsepower and over, having a nonmagnetic content exceeding 50 percent, up to but not exceeding 75 percent of total weight; and parts and accessories, n.e.s. (Specify brake hp at rated rpm.)	-------- [4]	PQSWYZ [5] and Afghanistan	—[6]	MG	1
2409A Naval equipment as follows:	-------- [4]	PQSTVWYZ	1,000	MG	1
(a) Diesel engines of 1,500 hp and over with rotary speed of 700 rpm or over specially designed for submarines;					
(b) Electric motors specially designed for submarines, *i.e.*, over 1,000 hp, quick reversing type, liquid cooled, and totally enclosed;					
(c) Nonmagnetic diesel engines, 50 hp and over, specially designed for military purposes (An engine shall be presumed to be specially designed for military purposes if it has nonmagnetic parts other than crankcase, block, head, pistons, covers, end plates, valve facings, gaskets, and fuel, lubrication and other supply lines, or its nonmagnetic content exceeds 75 percent of total weight.);					
(d) Other magnetic, pressure, and acoustic underwater detection devices specially designed for military purposes; and controls and components thereof;					
(e) Marine boilers designed to have *any* of the following characteristics: (1) Heat release rate (at maximum rating) equal to or in excess of 190,000 BTU's per hour per cubic foot of furnace volume; or (2) Ratio of steam generated in pounds per hour (at maximum rating) to the dry weight of the boiler in pounds equal to or in excess of 0.83; and					
(f) Components, parts, accessories, and attachments for the above.					

[1] See § 370.10 for commodities which require export authorization from other U.S. Government Departments and Agencies.
[2] Report vehicles, and engines in number.
[3] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(e)(11) and § 385.4(a).
[4] Report engines in number.
[5] The GLV $ value limit for Country Group Q is $100.
[6] Report engines and motors in number.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
4409B Water tube boilers, marine type, designed to have a heat release rate (at maximum rating) equal to 180,000 BTU, up to but not including 190,000 BTU per hour per cubic foot of furnace volume; boiler superheaters, feedwater heaters, and economizers therefor; and parts and accessories therefor.	----------	PQSTVWYZ	1,000	MG	1
2410A Pressure refuellers, pressure refuelling equipment, and equipment specially designed to facilitate operations in confined areas and ground equipment, not elsewhere specified, developed specially for aircraft and helicopters, and specially designed parts and accessories, n.e.s	----------	PQSTVWYZ	500	MG	1, 3
1416A Vessels, as follows:	-------[1]	PQSTVWYZ	1,000	MG	1
(a) Hydrofoil vessels with automatically controlled foil systems which are capable of speeds of above 40 knots in rough water (Sea State Five);					
(b) Vessels incorporating any item included in a CCL entry beginning with the numeral 2 or listed in Supplement No. 2 to Part 370, any item described in entry Nos. 1485, 1501, 1502, and 1510 (*except all types of fish-finding or whale-finding equipment*), or incorporating degaussing facilities; and					
(c) Specially designed parts and accessories for the above. (Also see §§ 370.10(a) and (f).)					
1418A Deep submergence vehicles, manned or unmanned, tethered or untethered, capable of operating at depths exceeding 1,000 meters, and specially designed equipment, components and materials therefor, including but not limited to pressure housings or pressure hulls specially designed for normal operating pressures of more than 101 bars. (For syntactic foam, see entry No. 1759.)	-------[1]	PQSTVWYZ	500	MG	1
1431A Gas turbine engines for marine propulsion of 3,500 rated shaft hp and above, whether originally designed as such or adapted for such use from aero-engines; and specially designed parts, n.e.s.	-------[2]	PQSTVWYZ	1,000	MG	1
4431B Other marine propulsion steam turbines specially designed for naval use; and parts and accessories, n.e.s. (Specify hp or kW.)	----------	PQSTVWYZ	1,000	MG	1
5431D[3] Compressors, fans, and blowers, any type, specially designed or modified for military or naval shipboard use; and parts and attachments, n.e.s. (Specify by name.)	----------	PQSWYZ[3] and Afghanistan	—[4]	MG	1
1460A Nonmilitary aircraft and helicopters, aero-engines, and aircraft and helicopter equipment, as follows:	-------[5]	PQSTVWYZ	1,000	MG	—
(a) Helicopters over 10,000 lbs. (4,530 kg) empty weight, and power transmission systems therefor (empty weight is understood to include normal installation and normal minimum crew, but does not include fuel or payload);					1, 3[6]
(b) Other nonmilitary aircraft and helicopters, *except those which do not contain equipment listed in Supplement No. 2 to Part 370 or entry No. 1485 or 1501 and which are of types which are in a bona fide normal civil use;* (specify make and model of aircraft and type of avionic equipment on aircraft) and					1, 3[7]

[1] Report vessels or vehicles in number.
[2] Report engines in number.
[3] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c)(11) and § 385.4(a).
[4] The GLV $ value limit for Country Group Q is $500.
[5] Report aircraft, helicopters, and engines in "number."
[6] Foreign policy controls apply to helicopters over 10,000 lbs. empty weight for Libya, Syria, Iraq, the People's Democratic Republic of Yemen, the Republic of South Africa, and Namibia.
[7] Foreign policy controls apply to the Republic of South Africa and Namibia, for both aircraft and helicopters regardless of value, and to Libya, Syria, Iraq, and the People's Democratic Republic of Yemen for fixed-wing aircraft valued at $3,000,000 or more. Foreign policy controls do not apply to parts or engines.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
Entry No. 1460 (cont.)					
(c) Aero-engines and specially designed parts and accessories, n.e.s., *except:*					1
(1) Piston engines;					
(2) Jet engines of less than 5,000 lbs. (2,265 kg) thrust; or					
(3) Turbo-prop or turbo-shaft engines of less than 2,500 hp or with a residual thrust of less than 1,000 lbs. (453 kg).					
(Specify make, model and pound thrust or horsepower.) (Also see § 399.2, Interpretation 20.)					
4460B Nonmilitary aircraft and helicopters, aero-engines, and aircraft and helicopter equipment, as follows:	-------[1]	PQSTVWYZ	1,000	MG	1
(a) Other jet, turbo-prop, turbo-shaft, and gas turbine aircraft engines, as follows:					
(1) Under development for nonmilitary use, experimental or non-certified; or					
(2) Certified engines which have been in civil use for 3 years or less; and					
(3) Parts and accessories, n.e.s., therefor;					
(Specify make, model and pound thrust or horsepower); and					
(b) Parts and accessories, n.e.s., specially designed for nonmilitary:					
(1) Helicopters over 10,000 pounds weight; or					
(2) Helicopters 10,000 pounds or less empty weight or fixed-wing aircraft, of types which have been in normal civil use and containing one or more of the items listed in entry No. 1485 or 1501, or Supplement No. 2 to Part 370.					
(Specify make and model of aircraft, and type of avionic equipment on aircraft.) (Also see § 399.2, Interpretation 20.)					
5460F[2] Other nonmilitary aircraft and demilitarized military aircraft valued at $3,000,000 each or more.	----------	SZ[2] and Syria, Iraq, Libya, People's Dem. Rep. of Yemen, Rep. of South Africa & Namibia	—	MG	3
6460F[2] Other aircraft and helicopters, as follows:	-------[1]	SZ[2] and the Rep. of South Africa & Namibia	—	MG	3
(a) Military aircraft, demilitarized (not specifically equipped or modified for military operations), *the following only:*					
(1) Cargo, "C-45 through C-118" inclusive, and "C-121",					
(2) Trainers, bearing a "T" designation and using piston engines,					
(3) Utility, bearing a "U" designation and using piston engines,					
(4) Liaison, bearing an "L" designation, and					
(5) Observation, bearing an "O" designation and using piston engines; and					
(b) Other nonmilitary helicopters and aircraft.					

[1] Report aircraft, helicopters and engines in number.
[2] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
Entry No. 6460 (cont.)					
(Specify make and model of aircraft and type of avionic equipment on aircraft. See § 399.2, Interpretation 20. Also see Supplement No. 2 to Part 370 or entry No. 1485 or 1501 for aircraft which are not covered under this entry.)					
5480B [1] Nonmilitary mobile crime science laboratories; and parts and accessories, n.e.s. (See § 376.14.)	--------	PQSTVWYZ [1]	0	MG	5
1485A Compasses, gyroscopes, accelerometers, and inertial equipment, as follows:	--------	PQSTVWYZ	1,000	MG	1
(a) Gyro compasses with provision for determining and transmitting ship's level reference data (roll, pitch) in addition to own ship's course data;					
(b) Integrated flight instrument systems for aircraft which include gyrostabilizers and/or automatic pilots (An integrated flight instrument system is a primary instrument display system of attitude and azimuth with facilities for giving maneuver guidance information to the pilot and often integrated with an autopilot to the extent of embodying a common unit for setting up the required demands.);					
(c) Gyro-astro compasses and other devices which derive position and/or orientation by means of automatically tracking celestial bodies;					
(d) Gyrostabilizers used for other purposes than aircraft control, *except those for stabilizing an entire surface vessel;*					
(e) Automatic pilots used for other purposes than aircraft control *except marine types for surface vessels;*					
(f) Accelerometers with a threshold of 0.005 g or less, or a linearity error within 0.25 percent of full scale output or both, which are designed for use in inertial navigation systems or in guidance systems of all types;					
(g) Gyros with a rated free directional drift rate (rated free precession) of less than 0.5 degree (1 Sigma or r.m.s.) per hour in a 1 g environment;					
(h) Inertial or other equipment using accelerometers described in sub-entry (f) above and/or gyros described in sub-entry (g) above, and systems incorporating such equipment; and					
(i) Specially designed parts and components, and test, calibration, and alignment equipment for the above.					
5485D Now covered by entry No. 6499.					
6490F [2,3] Off-highway wheel tractors of carriage capacity 10 tons or more; and parts and accessories, n.e.s.	-------- [4]	SZ [2,3] and Libya	—	MG	3
6499G [4] Other transportation equipment, n.e.s.; and parts and accessories, n.e.s.	--------	SZ [2, 4]	—	MG	3
9499M Vehicles mounted with telecommunications equipment (including radar). (See Group 5—Electronics and Precision Instruments.) (Specify mounted equipment.) (Report telecommunications equipment, including radar, exported as replacements or accessories under appropriate Export Control Commodity Number.)	No.	Export controls applicable to vehicles included in this entry are those which apply to the equipment mounted on the vehicle.		EE	— [5]

[1] A validated license *is not* required for export of these commodities to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey, and the United Kingdom.
[2] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c)(11) and § 385.4(a).
[3] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[4] Report tractors in number.
[5] The reasons for control applicable to vehicles included in this entry are those which apply to the equipment mounted on the vehicle.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
Entry No. 1510 (cont.)					
(1) Incorporating sensitive elements made of piezoelectric ceramics or crystal, and with a sensitivity no greater than −192 dB (reference 1 volt per micropascal);					
(2) Not designed for operation at depths greater than 100 meters;					
(3) Independently mounted or configured and not reasonably capable of assembly by the user into a towed hydrophone array;					
(ii) Terrestrial systems or equipment not reasonably capable of conversion by the user to underwater or marine applications as embargoed above.					
(Passive hydrophone sensitivities in this entry are based on sensitivity being defined as 20 times the logarithm to the base 10 of the ratio of rms output voltage to a 1 volt reference, when the hydrophone sensor is placed in a plane wave acoustic field having an rms pressure of 1 micropascal. For example, a hydrophone of −160 dB (reference 1 volt per micropascal) would yield an output voltage of 10^{-8} volts in such a field, while one of −180 dB sensitivity would yield only 10^{-9} volts ouptut.)					
5510D [1] Doppler sonar navigation equipment; and parts and accessories therefor.	--------	PQSWYZ [1] and Afghanistan	— [2]	MG	1
1514A Pulse modulators capable of providing electric impulses of peak power exceeding 6 MW or of a duration of less than 0.1 microsecond, or with a duty cycle in excess of 0.002; and pulse transformer, pulse-forming equipment or delay lines being specialized parts of such modulators; and specially designed parts and accessories therefor. (Specify by name and type number.)	-------- [3]	PQSTVWYZ	1,000	EE	1
1516A Receivers, and specialized parts and accessories therefor, as follows:	-------- [4]	PQSTVWYZ	0 [5]	EE	1, 5
(a) Panoramic radio receivers (which search or scan automatically a part of the electromagnetic spectrum and indicate or identify the received signals); *except ancillary equipment for commercial receivers with which the frequency spectrum searched does not exceed either ±20 percent of the intermediate frequency of the receiver or ±2 MHz;*					
(b) Digitally-controlled radio receivers, whether or not computer controlled, which search or scan automatically a part of the electromagnetic spectrum, in which the switching operation takes less than 10 milliseconds, and which indicate or identify the received signals, *except non-ruggedized digitally-controlled pre-set type radio receivers designed for use in civil communications which have 200 selective channels or fewer* (For digitally-controlled radio receivers using frequency synthesizers see also entry No. 1531.); or					
(c) Receivers for spread spectrum and frequency agile systems having a total transmitted bandwidth which is:					
(1) 100 or more times greater than the bandwidth of any one information channel; and					
(2) In excess of 50 kHz.					
("Spread spectrum" is defined as the technique whereby energy in a relatively narrow-band communications channel is spread over a much wider energy spectrum under the control of a random or pseudo-random bit stream. On receipt, the signal is correlated with the same bit stream to achieve the reverse process of					

[1] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c)(11) and § 385.4(a).
[2] The GLV $ value limit for Country Group Q is $500.
[3] Report modulators in "number."
[4] Report receivers in "number."
[5] The GLV $ value limit for the following countries is $500: Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
5597B [1] Polygraphs (except biomedical recorders designed for use in medical facilities for monitoring biological and neurophysical responses); fingerprint equipment and analyzers; fingerprint cameras and equipment; automated fingerprint and identification retrieval systems (whether or not computerized); psychological testing machines; infrared and ultraviolet film and plates and other photo anodized plates, sensitized and unexposed; and specially designed parts and accessories, n.e.s.	-------[2]	PQSTVWYZ [1]	0	EE	5
6598F Geophysical and mineral prospecting instruments; and other instruments and equipment specially designed or modified for the examination or testing of equipment utilized in the exploration for, or production of, petroleum or natural gas; and specially designed parts and accessories therefor. (See § 399.2, Interpretation 30 for illustrative list of commodities included in this entry.)	--------	SZ, Afghanistan and the USSR [3]	—	MG	3
6599C [4, 5] Other electronic and precision instruments, including photographic equipment and film, n.e.s.; and parts and accessories, n.e.s.	--------	SZ [4, 5]	—	EE	3
7599I Exposed and developed microfilm reproducing in whole or in part, the content of printed books, pamphlets, and miscellaneous publications including newspapers and periodicals, children's picture and painting books, music books, sheet music, and calendars; motion picture film and sound track, exposed and developed, and advertising printed matter exclusively related thereto.	--------	None	—	MG	—

GROUP 6—METALS, MINERALS, AND THEIR MANUFACTURES [6]

1601A Now covered by entry No. 1371.						
4601B Aircraft landing mats	Sq. ft.	PQSTVWYZ	1,000 [7]	MG	1
2603A Specifically designed components and parts for ammunition, *except cartridge cases, powder bags, bullets, jackets, cores, shells, projectiles, boosters, fuses and components, primers, and other detonating devices and ammunition belting and linking machines.* (Specify by name.)	--------	PQSTVWYZ	0 [8]	MG	1, 3, 5
3604A Zirconium metal; alloys containing more than 50 percent zirconium by weight; compounds in which the ratio of hafnium content to zirconium content is less than one part to five hundred parts by weight; manufactures wholly thereof; and waste and scrap; *except zirconium metal and alloy in shipments of 5 kilograms or less; and zirconium in the form of foil or strip having a thickness not exceeding 0.025 mm (0.00095 in.) and specially fabricated and intended for use in photo flash bulbs, in shipments of 200 kilograms or less.*	Lb.	PQSTVWYZ	500	MG	1, 4
3605A Nickel powder and porous nickel metal, as follows:	Lb.	PQSTVWYZ	100	MG	1, 4
(a) Powder with a nickel content of 99 percent or more, and a particle size of less than 100 micrometers; and					

[1] A validated license is *not* required for export of these commodities to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.
[2] Report instruments and equipment in "number."
[3] Including Estonia, Latvia, and Lithuania.
[4] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c) (11) and § 385.4(a).
[5] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[6] See § 370.10 for commodities which require export authorization from other U.S. Government Departments and Agencies.
[7] The GLV $ value limit for Country Group Q is $500.
[8] The GLV $ value limit for the following countries is $500; Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits T&V	Processing Code	Reason for Control
4676B Cylindrical rings, or single convolution bellows, made of high-strength steels having all of the following characteristics:	--------	PQSTVWYZ and Canada	0	MG	4
(a) Tensile strength of greater than or equal to 150,000 psi;					
(b) Wall thickness of 3 millimeters or less;					
(c) Diameter of 3 inches or more.					
4677B Cylindrical discs, in raw, semifabricated, or finished form, having all of the following characteristics:	--------	PQSTVWYZ and Canada	0	MG	4
(a) Having a ½ to 2 inch peripheral lip;					
(b) Having a diameter of 3 inches or more;					
(c) Made of maraging steel or aluminum alloy (7000 series).					
4678B Corrosion-resistant sensing elements of nickel, nickel alloys, phosphor bronze, stainless steel, or aluminum specially designed for use with equipment which measures pressures to 100 Torr or less.	--------	PQSTVWYZ [1]	0	MG	4
5680B [2] Nonmilitary protective vests, helmets, leg irons, shackles, handcuffs, thumbcuffs, thumbscrews, and saps.	--------	PQSTVWYZ [2]	0	MG	5
6699C [2,6,8] Other metals, minerals, and their manufactures, n.e.s.	--------	SZ [4, 6, 8]	—	MG	3

GROUP 7—CHEMICALS, METALLOIDS, PETROLEUM PRODUCTS AND RELATED MATERIALS [6]

1701A Lead azide and primary explosives or priming compositions (mixtures) containing azides and/or azide compounds or complexes (for example, orthofluorophenyl azide, silver chlorazide, cuprammonium azide).	Lb.	PQSTVWYZ	500	MG	1
1702A Hydraulic fluids which are or which contain as the principal ingredients petroleum (mineral) oils or synthetic hydrocarbon oils and which have all of the following characteristics:	Bbl.	PQSTVWYZ	500	MG	1
(a) A pour point of −30°F (−34°C) or lower;					
(b) A viscosity index of 75 or greater; and					
(c) Are thermally stable at +650°F (+343°C).					
(See § 377.6(d)(6) and § 377.6(e)(2) for special documentation requirements. Also see § 371.5(d) for special provisions regarding shipments under General License *GLV*.)					

[1] A validated license is not required for export of these commodities to the countries listed in Supps. No. 2 and No. 3 to Part 373.
[2] A validated license *is not* required for export of these commodities to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.
[3] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c) (11) and § 385.4(a).
[4] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[5] Aluminum powder, or aluminum-magnesium alloy powder, atomized or spherical, with an average particle diameter of 100 microns or less with a purity of 97.0 percent or greater, and aluminum alloy plates, sheets, and other wrought forms of Temper H alloy and all 5083 alloys, *except "O" temper form*, require export authorization from the U.S. Department of State, Office of Munitions Control. See Supplement No. 2 to Part 370.
[6] See § 370.10 for commodities which require export authorization frrom other U.S. Government Departments or Agencies.

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Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits TAV	Processing Code	Reason for Control
3709A Beryllium oxide ceramic and refactory tubes, pipes, crucibles, and other shapes in semi-fabricated or fabricated form, *except forms specially designed for electronic component parts or as substrates for electronic circuits.*	Lb.	PQSTVWYZ	500	MG	1, 4 [1]
3711A Chlorine trifluoride, *except shipments of 5 kilograms or less.*	Lb.	PQSTVWYZ	50	MG	1, 4
4712B Now covered by entry No. 3709.					
1715A Boron, as follows:	Lb.	PQSTVWYZ	500	MG	1, 4 [2]
(a) Boron element, boron compounds and mixtures in which the boron–10 isotope comprises more than 20 percent of the total boron content;					
(b) Boron element (metal) all forms; and					
(c) Boron compounds, mixtures and composites containing 5 percent or more of boron, *except pharmaceutical specialties packaged for retail sale,* as follows:					
(1) Boron carbide, *except powder,* having a boron content of 70 percent or more by weight and composites thereof in crude or semi-fabricated forms;					
(2) Boron nitride (hexagonal close-packed structure, white form) and composites thereof in crude or semi-fabricated forms; other boron-nitrogen compounds (*e.g.*, borazanes, borazines, and boropyrazoyls);					
(3) Boron hydrides (*e.g.*, boranes), *except sodium boron hydride, potassium boron hydride, monoborane, diborane and triborane;*					
(4) Organoboron compounds; including metalloorganoboron compounds; and					
(5) Borides with purities above 98.5 percent and having melting points of 3,632°F (2,000°C) or higher and composites thereof in crude or semi-fabricated forms.					
3715A Now covered by entry No. 3711.					
4720B Radioisotopes, cyclotron-produced or naturally occurring, *except those having an atomic number 3 through 83,* and compounds and preparations thereof. (Specify by name and isotope number.)	MC	PQSTVWYZ	100 [3]	MG	4
4721B Helium isotopically enriched in the helium–3 isotope, in any form or quantity, and whether or not admixed with other materials, or contained in any equipment or device.	Liters	PQSTVWYZ and Canada	1,000	MG	1
1746A Polymeric substances and manufactures thereof, where the value of the polymeric component, either alone or in combination with other materials included on the Commodity Control List under an Export Control Commodity Number that is followed by the code letter "A", is 50 percent or more of the total value of the materials, as follows:	Lb.	PQSTVWYZ	100 [4]	MG	1

[1] The countries to which commodities are controlled for nuclear reasons are those *not* listed in Supp. No. 2 or Supp. No. 3 to Part 373.
[2] Nuclear controls apply to all of this entry except sub-entries (c)(2)(5), (4) and (5).
[3] The GLV $ value limit for Country Group Q is $100.
[4] For protective vests and devices manufactured of aromatic polyamides described in sub-entry (d), General License *GLV* applies only to exports to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	GLV $ Value Limits TAV	Processing Code	Reason for Control
4781B Petroleum, crude or partly refined, including tar sands, shale oil and topped crudes, listed in Supplement No. 2 to Part 377.	Bbl.	PQSTVWYZ and Canada	0 [1]	SS	2
4782B Other petroleum products listed in Supplement No. 2 to Part 377. (See §§ 371.16 and 371.5(d) for special provisions regarding shipments under General Licenses *G–NNR* and *GLV*.)		PQSTVWYZ and Canada	250 [2, 6]	SS	2
4783B Natural gas liquids and other natural gas derivatives listed in Supplement No. 2 to Part 377. (See §§ 371.16 and 371.5(d) for special provisions regarding shipments under General Licenses *G–NNR* and *GLV*.) [4]	Bbl.	PQSTVWYZ and Canada	250 [2]	SS	2
4784B Manufactured gas and synthetic natural gas (except when commingled with natural gas and thus subject to export authorization from the Department of Energy) listed in Supplement No. 2 to Part 377. (See §§ 371.16 and 371.5(d) for special provisions regarding shipments under General Licenses *G–NNR* and *GLV*.)	MCF	PQSTVWYZ and Canada	250 [2]	SS	2
6794F [5] Phosphate rock; phosphoric acid of all concentrations; and processed phosphatic fertilizers of all concentrations (as listed in § 399.2, Interpretation 27). [7]	[6]	SZ, Afghanistan and the USSR [5]	—	SS	3
4799B [8, 9] Chemical agents, including tear gas formulations containing 1 percent or less of ortho-chlorobenzalmalononitrile (CS), or 1 percent or less of chloracetophenone (CN), and smoke bombs; and fingerprint powders, dyes and inks. (Specify by name.) (See § 376.14.)		PQSTVWYZ [4, 9]	0	MG	5
5799D [10] Other chemicals, chemical materials and products, plastic materials, regenerated cellulose, artificial resins, and miscellaneous related materials and products, n.e.s., *except those listed in § 399.2, Interpretation 24.*		PQSWYZ [10] and Afghanistan	— [11]	MG	1
6799G [10, 12] Chemicals, chemical materials and products, plastic materials, regenerated cellulose, artificial resins, and miscellaneous related materials and products, n.e.s., listed in § 399.2, Interpretation 24.		SZ [10, 12]	—	MG	3
GROUP 8—RUBBER AND RUBBER PRODUCTS [13]					
1801A Synthetic rubber, as follows:	Lb.	PQSTVWYZ	500	MG	1

[1] The GLV $ value limit for exports to Canada is the same as the value limit for Country Groups T and V.
[2] The GLV $ value limit for exports to Canada and to Country Group Q is $250.
[3] The GLV dollar value limit for petroleum asphalt and paving mixtures is $5,000.
[4] Natural gas, and liquified natural gas (L.N.G.) and synthetic natural gas commingled with natural gas require export authorization from the U.S. Department of Energy. See § 370.10(g).
[5] Including Estonia, Latvia, and Lithuania.
[6] Report unit of quantity for each commodity as specified in Statistical Classification of Domestic and Foreign Commodities Exported from the United States, Schedule B.
[7] These commodities are subject to control under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979.
[8] A validated license is *not* required for export of these commodities to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Portugal, Turkey, and the United Kingdom.
[9] All other forms of tear gas are controlled by the U.S. Department of State, Office of Munitions Control.
[10] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in those destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c)(11) and §385.4(a).
[11] The GLV $ value limit for Country Group Q is $100.
[12] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity, except medicine and medical supplies, is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 6 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.
[13] See § 370.10 for commodities which require export authorization from other U.S. Government Departments and Agencies.

Export Control Commodity Number and Commodity Description	Unit	Validated License Required	G.L.V. $ Value Limits T&V	Processing Code	Reason for Control
6998F [1,4] Shotgun shells, and parts.		SZ [1, 2] and the Rep. of South Africa, Namibia, Botswana, Lesotho, and Swaziland	—	MG	3
4999B Horses for export by sea.		PQSTVWYZ and Canada	0	SS	2
5999B [3,4] Saps; straight jackets; bullet and blast resistant garments, helmets and shields; and parts and accessories, n.e.s.		PQSTVWYZ [3]	0	MG	5
6999G [1,3] Other commodities, n.e.s.; and parts and accessories, n.e.s.		SZ [1, 3]	—	MG	3
7999I Prerecorded phonograph records reproducing in whole or in part, the content of printed books, pamphlets, and miscellaneous publications, including newspapers and periodicals; printed books, pamphlets, and miscellaneous publications, including bound newspapers and periodicals; children's picture and painting books; newspapers and periodicals, unbound, excluding waste; music books; sheet music; calendars and calendar blocks, paper; maps, hydrographical charts, atlases, gazeteers, globe covers, and globes (terrestrial or celestial) and advertising printed matter exclusively related thereto.		NONE	—	MG	—
9999M Technical models for demonstration.		The validated export license control applicable to each model is the same as the control which is applicable to the full size commodity represented by the model as exercised by Commerce (OEA and/or Maritime Administration), State (OMC), or Nuclear Regulatory Commission.			—

[1] A validated license also is required for export to the Republic of South Africa and Namibia if intended for delivery to or for use by or for military or police entities in these destinations or for use in servicing equipment owned, controlled, or used by or for these entities. See § 371.2(c) (11) and § 385.4(a).

[2] A validated license is also required for export or reexport to the U.S.S.R. if the exporter knows or has reason to know the commodity, except medicine and medical supplies, is for any use directly in preparation for, in conduct of, in support of, or visually identified with the 1980 Summer Olympic Games scheduled to commence in Moscow on July 19, 1980. These commodities are subject to controls under the authority of the foreign policy provisions contained in section 5 of the Export Administration Act of 1979. This commodity control list entry as well as the other entries in this Group are subject to controls on the basis of the above criteria.

[3] A validated license is not required for export of these commodities to Australia, Belgium, Denmark, France, the Federal Republic of Germany (including West Berlin), Greece, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Turkey and the United Kingdom.

[4] Gas masks designed for protection against tear gas and other chemical agents are controlled by the Office of Munitions Control. See § 370.10.

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4. Section 399.2 and Supp. 1 to § 399.2 are revised to read as follows:

§ 399.2 Commodity Interpretations

The commodity interpretations set forth in Supplement No. 1 to this §399.2 are for use in determining (1) the appropriate Export Control Commodity Numbers under which certain commodities are classified, or (2) the validated license requirements for these commodities. They are intended to clarify the question of control where it has been demonstrated that such clarification may prove helpful to the export community, and where such control is not readily apparent from the Commodity Control List and the Export Administration Regulations.

Supplement No. 1 to § 399.2—Interpretations

Interpretation 1: Electronic Computers and Related Equipment (ECCN 1565)

The following equipment is subject to nuclear non-proliferation controls and requires a validated license for Country Groups P, Q, S, T, V, W, Y, and Z, and in the case of (a) (1) through (4) below to Canada:

(a) Electronic computers intended for ultimate consignees engaged directly or indirectly in any of the following activities:

(1) Designing, developing or fabricating nuclear weapons or nuclear explosive devices; or devising, carrying out, or evaluating nuclear weapons tests or nuclear explosions;

(2) Designing, assisting in the design of, constructing, fabricating or operating facilities for the chemical processing of irradiated special nuclear material, for the production of heavy water, for the separation of isotopes of any source or special nuclear material, or specially designed for the fabrication of nuclear reactor fuel containing plutonium;

(3) Designing, assisting in the design of, constructing, fabricating or furnishing equipment or components specially designed, modified or adapted for use in such facilities; or

(4) Training in any of the above activities; and

(b) Advanced electronic digital computers with a bus rate of 60 million bits per second or more, or a processing data rate of 20 million bits per second or more (including digital differential analyzers), *except*

(1) *Electronic computers that do not exceed either a CPU bus rate of 500 million bits per second or a processing data rate of 225 million bits per second are not subject to nuclear non-proliferation controls for destinations listed in Supplement No. 2 to Part 373 of the Export Administration Regulations unless the activities cited in (a) above are involved; or*

(2) *Electronic computers that do not exceed either a CPU bus rate of 200 million bits per second or a processing data rate of 60 million bits per second are not subject to nuclear non-proliferation controls for destinations listed in Supplement Nos. 2 and 3 to Part 373 of the Export Administration Regulations unless the activities cited in (a) above are involved.*

Interpretation 2: Ball and Roller Bearings and Specially Designed Parts

(a) A ball or roller bearing physically incorporated in a segment of a machine or in a complete machine prior to shipment loses its identify as a bearing and the machine or segment of machinery *containing the bearing* is the item subject to export license requirements.

(b) A ball or roller bearing *not* incorporated in a segment of a machine prior to shipment but shipped as a component of a complete unassembled (knocked-down) machine is considered a component of the machine, and the *complete machine* is the item subject to export license requirements.

(c) Ball or roller bearings shipped as spares or replacements are classified under ECCN 1371 and 6699 (ball, roller, or needle-roller bearings and parts). This applies to separate shipments of ball or roller bearings *and* ball or roller bearings shipped with machinery or equipment for which they are intended to be used as spares or replacement parts.

Interpretation 3: Gear Making and Finishing Machinery

Certain Types of gear-making and gear-finishing machines, Export Control Commodity No. 1088, require a validated license for shipments to all destinations except Canada if they are capable of producing gears finer than 48 diametral pitch. In order to clairfy the meaning of the term "diametral pitch finer than 48," examples are given of how diametral pitch is computed. In addition, there is also given below an explanation of how to distinguish between "geartooth grinding machines, generating types" and "nongenerating types of grinding machines."

(a) *Diametral pitch* of a gear is the ratio of the number of teeth to the number of inches in the pitch diameter. It indicates the number of teeth in the gear for each inch of pitch diameter. ("Pitch diameter" is the diameter of the pitch circle which is the circle through the pitch point having its center at the axis of the gear.) *Module* (British or metric) is the ratio of the pitch diameter in millimeters to the number of teeth. The larger the proportion of teeth to pitch diameter, the finer the diametral pitch. Example of diametral pitch: If a gear has a 1-inch pitch diameter and has 48 teeth, the ratio would be 48:1, or a 48 diametral pitch gear. Additional teeth in the same pitch diameter gear, *i.e.*, 49, would result in a finer diametral pitch; fewer teeth, *i.e.*, 47, would result in a gear of coarser diametral pitch. Examination of a gear making or finishing machine may not disclose whether it is capable of producing a gear of finer than 48 diametral pitch. If the exporter has no information on the ability of the machine to be exported for making gears of finer than 48 diametral pitch, he should obtain the information from the manufacturer or distributor.

(b) *Generating type geartooth grinding machines* are those in which the grinding wheel and the gear are both power-driven for continuous circular motion while grinding, rather than an intermittent or indexing operation as with the non-generating type.

Interpretation 4: Classification of "Parts" of Machinery, Equipment, or Other Items

(a) *Where an assembled machine or unit of equipment is being exported.* Where one or more assembled machines or units of equipment are being exported, the individual component parts which are physically incorporated into the machine or equipment do not require a separate validated export license. The validated license or the general license under which the complete machine or unit of equipment is exported will also cover its component parts, *provided* that the parts are normal and usual components of the machine or equipment being exported; or that the physical incorporation is not used as a device to evade the requirement for a validated export license.

(b) *Where parts are exported as spares, replacements, for resale, or for stock.* Where parts are exported as spares, replacements, for resale or for stock, a validated export license is required only if the appropriate entry for the part specifies that a validated license is required for the intended destination.

Interpretation 5: Wire or Cable Cut to Length

(a) Wire or cable may be included as a component of a system or piece of equipment, whether or not the wire or cable is cut to length and whether or not it is fitted with connectors at one or both ends so long as it is in normal quantity necessary to make the original installation of the equipment and is necessary to its operation.

(b) Wire or cable shipped as replacement or spares, or for further manufacture overseas, shall be reported under the applicable wire or cable classification only. This includes wire or cable, whether or not cut to length or fitted with connectors at one or both ends.

Interpretation 6

[Reserved]

Interpretation 7: Numerical Control Systems

(a) Numerical control systems for machine tools are systems in which actions are controlled by the direct insertion of numerical data at some point. The system must automatically interpret at least some portion of this data. Units defined in 1091 include:

(1) Units consisting of fixed and dedicated circuits of discrete logic elements and storage devices (referred to as hardwired units);

(2) Units consisting of and including stored instructions (routines and/or programs), defined as logic states of alterable and nondedicated logic elements which determine various control functions of the machine(s), such as slide movements, cutter compensation, readout, adaptive control, part program editing and tool offsets (softwired or stored program units);

(3) Hardwired unit—a numerical control system wherein fixed and dedicated circuit interconnections of discrete, decision elements are used for primary system control. These circuits may include, but not necessarily, freely programmable memory devices which would be limited to use for data files, part program storage, or output control of machine tool interfacing;

(4) Softwired Unit (Computer Numerical Control (CNC))—a numerical control system

which includes: (*a*) Computer—a dedicated stored program computer to perform some or all of the basic numerical control functions which include, but may not be limited to, velocity and path generation. A stored program computer is further defined as a computer processor controlled by stored instructions that can synthesize, store, and in some cases, alter instructions as though they were data and subsequently execute these instructions, (*b*) Software—a control program (routines and/or programs) stored in the read/write memory of the computer which implements the basic numerical control functions, (*c*) Interface—the means by which the data is transmitted between the stored program computer and the machine;

(5) Direct Numerical Control (DNC)—a system connecting a set of numerically controlled machines to a common memory within a computer for part program or machine program storage with provision for on-demand distribution of data to the machines. Direct Numerical Control systems typically have additional provisions for collection, display, or editing of part programs, operator instructions, or data related to the numerical control process;

(6) Software—control programs, used with CNC and DNC systems, which are stored in a read/write memory of a computer and implement numerical functions, including but not limited to, velocity and path generation, on-line adaptive control and special purpose data distribution, recall, and editing programs for DNC applications. Software used in part programming, *e.g.*, APT, EXAPT, IFAPT, post processors, and similar programs are not considered among these control programs used for CNC and DNC systems.

Where the system is shipped complete (machine and controls) it shall be reported as a complete machine under the appropriate Export Control Commodity Number for the machine. Where a control system for a machine tool is not shipped as part of the original installation of the machine it shall be reported under Export Control Commodity No. 1091.

Note.—When preparing an *export license application* for a numerical control system, the machine and the control unit are classified separately. If either the machine or the control unit requires a validated license, then the entire system requires a license. If either a machine or a control unit is exported separately from the system, it is classified on the export license application without regard to the other parts of a possible system.

When preparing the *Shipper's Export Declaration* (SED), however, a system being shipped complete (*i.e.*, machine and control unit), should be reported under the Schedule B number for the machine. When either a control unit or a machine is shipped separately, it should be reported under the Schedule B number appropriate for the individual item being exported.

(b) Units for numerically controlling machine tools and dimension inspection machines having *all* of the following characteristics:

(1) Hardwired (not softwired, *i.e.*, Computerized Numerical Control (CNC)),

(2) No more than 2 contouring interpolating axes can be simultaneously coordinated,

(3) Minimum programmable increment equal to or greater (coarser) than 0.001 mm, *and*

(4) Without interface to enable direct computer input.

(c) Boring mills, milling machines, and machining centers, having *all* of the following characteristics:

(1) Maximum slide travel in any axis equal to or less than 3,000 mm,

(2) Positioning accuracy of any axis equal to or greater than plus or minus 0.01 mm per 300 mm and 0.005 mm for each additional 300 mm,

(3) Spindle power equal to or less than 20 kw,

(4) Single working spindle,

(5) Axial and radial axis motion measured at the spindle axis in one revolution of the spindle equal to or greater than $D \times 2 \times 10^{-5}$ mm TIR (peak-to-peak) where D is the spindle diameter in millimeters, *and*

(6) Not more than 3 axes capable of simultaneously coordinated contouring motion regardless of the NC unit connected to the machine.

(d) Machine tools, other than the machines described in (c) above, and dimensional inspection machines, which according to the manufacturer's technical specifications can be equipped with controls covered by paragraph (b) above, having *all* of the following characteristics:

(1) Positioning accuracy of any axis equal to or greater than plus or minus 0.01 mm per 300 mm and 0.005 mm for each additional 300 mm,

(2) Radial axis motion measured at the spindle axis equal to or greater than 0.008 mm TIR (peak-to-peak) in one revolution of the spindle (for lathes and other turning machines), *and*

(3) Not more than 3 axes capable of simultaneously coordinated contouring motion regardless of the NC unit connected to the machine.

Interpretation 8

[Reserved]

Interpretation 9

[Reserved]

Interpretation 10: Parts, Accessories, and Equipment Exported as Scrap

Parts, accessories, or equipment which are being shipped as scrap should be described on the Shipper's Export Declaration in sufficient detail to be identified under the proper Commodity Control List Number. When commodities declared as parts, accessories, or equipment are shipped in bulk, or are otherwise not packaged, packed, or sorted in accordance with normal trade practices, the Customs Officer may require evidence that the shipment is not scrap. Such evidence may include, but is not limited to, bills of sale, orders and correspondence indicating whether the commodities are scrap or are being exported for use as parts, accessories, or equipment. Exporters should consult the Exporters' Service Staff, Office of Export Administration, Room 1623, U.S. Department of Commerce, Washington, D.C. 20230, when in doubt regarding the proper Commodity Control List Number of commodities, as parts, accessories, equipment or as scrap.

Interpretation 11

[Reserved]

Interpretation 12: Scrap Arms, Ammunition, and Implements of War

Arms, ammunition, and implements of war, as defined in the U.S. Munitions List (see Supplement No. 2 to Part 370), are under the jurisdiction of the U.S. Department of State, with the following exceptions:

(a) Cartridge and shell cases which have been rendered useless beyond the possibility or restoration to their original identity by means of excessive heating, flame treatment, mangling, crushing, cutting, or by any other method are "scrap" and under the jurisdiction of the U.S. Department of Commerce.

(b) Cartridge and shell cases which have been sold by the armed services as "scrap" are under the jurisdiction of the U.S. Department of Commerce, whether or not they have been heated, flame-treated, mangled, crushed, cut, or reduced to scrap by any other method.

(c) Other commodities on the Munitions List are "scrap" and under the jurisdiction of the U.S. Department of Commerce if they have been rendered useless beyond the possibility of restoration to their original identify *only* by means of mangling, crushing, or cutting. When in doubt as to whether a commodity covered by the Munitions List has been rendered useless, exporters should consult the Office of Munitions Control, U.S. Department of State, Washington, D.C. 20520, or the Exporter's Service Staff, Office of Export Administration, Room 1623, U.S. Department of Commerce, Washington, D.C. 20230, before reporting a shipment as metal scrap.

Interpretation 13–18

[Reserved]

Interpretation 19: Military Automotive Vehicles

(a) *Military automotive vehicles.* (1) For purposes of U.S. export controls, military automotive vehicles "possessing or built to current military specifications differing materially from normal commercial specifications" may include, but are not limited to, the following characteristics:

(i) Special fittings for mounting ordnance or military equipment,

(ii) Bullet-proof glass,

(iii) Armor plate,

(iv) Fungus preventive treatment,

(v) Twenty-four volt electrical systems,

(vi) Shielded electrical system (electronic emission suppression), or

(vii) Puncture-proof or run-flat tires.

(2) These automotive vehicles fall into two categories:

(i) *Military automotive vehicles on the Munitions List, new and used.* Automative vehicles in this category are primarily combat (fighting) vehicles, with or without armor and/or armament, "designed for specific fighting function." These automotive vehicles are licensed by the U.S. Department of State. See list with descriptions, Supplement No. 2 to Part 370, Category VII.

(ii) *Military automotive vehicles not on the U.S. Munitions List, new and used.* Automotive vehicles in this category are primarily transport vehicles designed for non-combat military purposes (transporting cargo, personnel and/or equipment, and/or for towing other vehicles and equipment over land and roads in close support of fighting vehicles and troops). These automotive vehicles are licensed by the U.S. Department of Commerce.

(b) *Parts for military automotive vehicles.* Functional parts are defined as those parts making up the power train of the vehicles, including the electrical system, the cooling system, the fuel system, and the control system (brake and steering mechanism), the front and rear axle assemblies including the wheels, the chassis frame, springs and shock absorbers.

Parts specifically designed for military automotive vehicles on the Munitions List are licensed for export by the U.S. Department of State.

(c) *General instructions.* Manufacturers of non-Munitions List automotive vehicles and/or parts will know whether their products meet the conditions described above. Merchant exporters and other parties who are not sure whether their products (automotive vehicles and/or parts) meet these conditions should check with their suppliers for the required information before making a shipment under general license or submitting an application to the Office of Export Administration for an export license.

Interpretation 20: Aircraft, Parts, Accessories and Components

(a) *Aircraft, and parts, accessories and components therefor.*[1]

Aircraft, parts, accessories, and components defined in Categories VIII and IX of the Munitions List (see supplement No. 2 to Part 370) are under the export licensing authority of the U.S. Department of State. All other aircraft, and parts, accessories and components therefor, are under the export licensing authority of the U.S. Department of Commerce.

The following aircraft, parts, accessories and components are under the licensing authority of the U.S. Department of Commerce:

(1) Any aircraft (except an aircraft that has been demilitarized, but including aircraft specified in paragraph (2) below) that conforms to a Federal Aviation Agency type certificate in the normal, utility, acrobatic, transport, or restricted category, provided such aircraft has not been equipped with or modified to include military equipment, such as gun mounts, turrets, rocket launchers, or similar equipment designed for military combat or military training purposes.

(2) Military aircraft, demilitarized (aircraft not specifically equipped, reequipped, or modified for military operations), *the following only:*

(i) Cargo, bearing designations "C–45 through C–118 inclusive, " and "C–121";

(ii) Trainers, bearing a "T" designation and using piston engines;

(iii) Utility, bearing a "U" designation and using piston engines;

(iv) Liaison, bearing an "L" designation; and

(v) Observation, bearing an "O" designation and using piston engines.

(3) All reciprocating engines.

(4) Other aircraft engines not specifically designed or modified for military aircraft.

(5) Parts, accessories, and components (including propellers), designed exclusively for aircraft and engines described in (1), (2), (3), and (4) above.

(6) General purpose parts, accessories, and components usable interchangeably on either military or civil aircraft.

(b) *Normal civil use.* Aircraft listed on the Commodity Control List under No. 1460 are those that are in normal civil use *and* contain one or more of the following:

(1) Any item on the Munitions List (see Supplement No. 2 to Part 370),

(2) Inertial navigation or other inertial equipment,

(3) Integrated flight instrument systems that have been in normal civil use for less than two years,

(4) Airborne communications equipment having *any* of the following characteristics:

(i) Designed to operate at frequencies greater than 156 MHz,

(ii) Incorporating facilities for (a) the rapid selection of more than 200 channels per equipment, *except equipment operating in frequency range 108–136 MHz with 720 or fewer channels at not less than 25 kHz spacing and which has been in normal civil use for at least one year,* or (b) using frequency synthesis techniques with a speed of switching from one selected output frequency to another selected output frequency less than 10 milliseconds,

(iii) Pressurized throughout,

(iv) Rated for continuous operation over a range of ambient temperatures extending from below minus 55° C to above plus 55° C, and/or

(v) Designed for modulating methods employing any form of digital modulation using time and frequency redundancy such as "Quantized Frequency Modulation" (QFM).

(5) Airborne navigation and direction finding equipment having *any* of the following characteristics:

(i) Pressurized throughout,

(ii) Rated for continuous operation over a range of ambient temperatures extending from below minus 55° C to above plus 55° C,

(iii) Frequency modulated radio altimeters which have been in normal civil use for less than one year,

(iv) Pulse modulated radio altimeters.

(v) Is not in conformity with ICAO standards or provides a function exceeding those resulting from such standards,

(vi) Is designed to make use of hyperbolic grids at frequencies greater than 3 MHz, and/or

(vii) Direction finding equipment operating at frequencies greater than 5 MHz, other than equipment designed for search and rescue.

(6) Airborne radar having *any* of the following:

(i) In normal commercial service for less than one year, and/or

(ii) Specially designed for use other than as a commercial weather radar,

(iii) Incorporating any digital signal processing technique used for automatic target tracking, or having a facility for electronic tracking.

Interpretations 21–23

[Reserved]

Interpretation 24: Chemicals

The commodities listed below require a validated license for export to Country Groups S and Z.

Organic chemicals

Acenapthene
Acenapthenequinone
Acetal
Acetaldehyde
Acetamide
3-Acetamido-4 hydroxybenzene-arsonic acid
2-Acetamidoethyl (p-chlorophenyl) (m-trifluoro methyl phenoxy) acetate
Acetanilide
Acetic acid
Acetic anhydride
Acetin
Acetoacetic acid
Acetobromopropyl lactate
Acetone
Acetone cyanohydrin
Acetonitrile
Acetonylacetone
Acetophenetidin
Acetophenone
Acetoxime
Acetylacetone
para-Acetylaminophenol
para-Acetylaminophenyl salicylate
Acetyl chloride
Acetylene tetrabromide
N-Acetyleneuraminic acid
Acetylhistamine
N-Acetyl-L-tyrosine
N-Acetyl-L-tyrosine ethyl ester
Acetylpyridine
Acetylsalicylic acid
Acetyl triallyl citrate
Acetyl tributyl citrate
Acetyl triethyl citrate
Acetyl tri-2-ethyl hexyl citrate
Aconitic acid
Acrolein
Acrylamide
Acrylic acid
Acrylonitrile
Actase
Adenine
Adenine sulfate
Adenosine
Adenosine-2,3-cyclophosphate
Adenosine-3,5-cyclophosphate
Adenosine-5-diphosphate
Adenosine-5-monophosphate
Adenosine-5-triphosphate disodium
Adenosine-5-triphosphate trihydrate
Adenosyl-L-methionine iodide
Adenylic acid
Adipic acid
Adiponitrile
Adrenalone
Adrenalone hydrochloride
Agarose
Alanine
beta-Alanine
Aldol
Alginic acid

[1] This interpretation does not refer to electronic communication and navigational commodities usable on aircraft.

Alkyl aryl phosphate diphenyl, 2-ethyl hexyl phosphate
Alkyl dicyclophosphate
Allantoin
Allene
Alloxane
Allylamine
Allyl bromide
Allyl chloride
Allyl iodide
Allyl isocyanate
Allyl isothiocyanate
N-Allyl-morpholine
Aluminum acetate
Aluminum dihydroxyaminoacetate
Aluminum ethylhexoate
Aluminum formate solutions
Aluminum isopropylate
Aluminum lactate
Aluminum octoate
Aluminum oxyquinolate
Aluminum stearate solution
Ambrettolide
Ambutonium bromide
N-Amidino 3,5-diamino-6-chlorophyazine carboxamide and its salts
Amino-acetophenone
Aminoanthraquinone
p-Aminobenzamidine HCl
Aminobenzoic acid
para-Aminobenzoic acid
2-Amino-1-butanol
Aminobutyric acid
Aminodiazine
para-Aminodiethylaniline
para-Aminodiethylaniline hydrochloride
para-Aminodimethylaniline
para-Aminodiphenylamine
2-Aminoethanethiol
PTH (PTC-S-Aminoethyl) cysteine
3-(2-Aminoethyl) indole hydrochloride
N-Aminoethylpiperazine
Aminoethylpyrimidine
L-Amino-beta-guanidinopropionic acid
4-Amino-5-imidazole carboxamide
5-Amino-4-imidazole carboxamide
Aminoisobutyric acid
2-Amino-2-methyl-1-propanol
Aminomethylpyrimidine
Aminonapthol sulfonic and disulfonic acids
O-Aminonitrobenzene
2-Amino-5-nitrothiazole
Aminopentamide
meta-Aminophenol
ortho-Aminophenol
para-Aminophenol
ortho-Aminophenol hydrochloride
para-Aminophenol hydrochloride
2-Amino-1-phenol-4-sulfonic acid
Aminophenylacetic acid
Aminophylline
beta-Aminopropionitrile
2-Aminopyrimidine
Aminopyrine
4-Aminosalicylic acid
5-Aminosalicylic acid
2-Aminothiazole
L-3-Aminotyrosine dihydrochloride
Ammonium acetate
Ammonium benzoate
Ammonium bitartrate
Ammonium ferric oxalate
Ammonium gluconate
Ammonium mandelate
Ammonium oxalate
Ammonium thioglycollate
Amprolium
Amyl acetate
Amyl alcohol
n-Amyl alcohol, primary
tert-Amyl alcohol
Amylase
n-Amyl bromide
tert-Amyl bromide
tert-Amyl chloride
alpha-Amyl cinnamic aldehyde
Amyl mercaptan
tert-Amyl mercaptan
Amyl nitrate
Amyl nitrite
Amyl salicylate
Amylopectin
Amylose
ortho-sec-Amylphenol
para-tert-Amylphenol
Amyl salicylate
n-Amyl sebacate
Amyl ziram
Anethole
Aniline hydrochloride
Aniline oil
Aniline salt
Aniline sulfate
Anisic acid
Anisic aldehyde
ortho-Anisidine
para-Anisidine
Anthracene
Anthranilic acid
Anthraquinone
Anthrone
Antimony lactate
Antimony potassium tartrate
Antimony triacetate
Antipyrine
Apiol
Apoferritin
Apolysin
Arabinose
Arachidic acid
Arachidonic acid
Arginine
Arginine hydrochloride
Arrhenal
Asparagine
Asparagine hydrate
Aspartic acid
Aubepine
Aurothioglucose
5-Azacytidine
8-Azaguanine
6-Azathymine
6-Azauracil
6-Azauridine
Azelaic acid
d-Azetidine-2 carboxylic acid
Azetylcholine chloride
1-Aziridineethanol
Azobenzene
Azocoll
Azosulfamide
Banana oil
Barbital
Barbital sodium
Barbituric acid
Barium styphnate
Behenic acid
Benzaldehyde
Benzalkonium chloride
Benzanthrone
Benzene
Benzenesulfonic acid
Benzhydrol
Benzhydroxylamine HCl
Benzidine
Benzidine sulfate
Benzil
Benzoguanamine
Benzoic acid
Benzonitrile
3,3',4,4'-Benzophenone tetracarboxylic dianhydride
Benzotriazole
Benzotrichloride
Benzotrifluoride
N-alpha-Benzoyl-L-arginine ether ester hydrochloride
Benzoyl chloride
Benzoyl peroxide
2-Benzoyl pyridine
4-Benzoyl pyridine
Benzthiazide
Benztropin mesylate
Benzyl acetate
Benzyl alcohol
Benzyl amine
N-Benzyl-para-amino phenol
Benzyl benzoate
Benzyl bromide
Benzyl chloride
Benzyl cinnamate
Benzyl cyanide
Benzyl formate
Benzylidene acetate
Benzyl salicylate
Benzyl succinate
Benzyltriphenylphosphonium chloride
Betaine
Betaine hydrochloride
Bilirubin
2-(4-Biphenyl)-6 phenyl benzoxazole
N,N-Bis-(3-aminopropyl) methylamine
2,5-Bis-2-(5-tert-butylbenzoxazolyl)-thiophene
Bis-(2-dimethylaminoethyl) ether
Bis (2-ethylhexyl) peroxydicarbonate
N,N-Bis-(2-hydroxyethyl) alkylamine
N,N-Bis-(2-hydroxyethyl) glycine sodium salt
N,N-Bis (2-hydroxypropyl) aniline
1,4-Bis [2-(4-methyl-5-phenyloxazolyl)] benzene (methyl POPOP)
Bismuth citrate
Bismuth subgallate
Bismuth tannate
Bisphenol A
1,4-Bis-2-(5-phenyloxazolyl) benzene
N-N-Bis (trimethylsilyl) acetamide
Bis (trimethylsilyl) trifluoroacetamide
Bis-triphenylsilyl chromate
Bithionol
Borneol
Bornyl acetate
Bornyl formate
Bromelain-Pure
N-Bromoacetamide
Bromoactic acid
Bromobenzene
sym-Bromochloroethane
Bromochloromethane
1-Bromo-3-chloropropane
5-Bromodeoxyuridine
N-(2-Bromoethyl) phthalimide
Bromomethylethyl ketone
Bromoform
Bromomonochlorodifluoromethane
alpha-Bromonapthalene
Bromosuccinic acid
N-Bromosuccinimide
Bromostyrol

Bromotrifluoromethane
Butabarbital acid
Butabarbital sodium salt
Butacaine sulfate
1.4 Butanediamine dihydrochloride
Butanediol succinate
2,3-Butanedione monoxime
1-Butoxyethoxy-2-propanol
Butoxytriglycol
Butyl acetate
Butyl acetyl ricinoleate
n-Butyl acrylate
tert-Butyl acrylate
N-Butyl alcohol
n-Butylamine
tert-Butylamine
(-)-1-(tert-Butylamino)-3-[(4-morpholino-1,2,5 thiadiazol-3yl)oxy]-2 propanol maleate (1:1) and its salts
Butylate hydroxyanisole
n-Butyl benzene
sec-Butyl benzene
tert-Butyl benzene
Butyl benzyl phthalate
n-Butyl Bromide
sec-Butyl bromide
tertiary Butyl bromide
p-tert-Butyl catechol
n-Butyl chloride
sec-Butyl chloride
tert-Butyl chloride
6-tert-Butyl-meta-cresol
Butyl-meta-cresol methyl ethers
n-Butyl diethyl malonate
Butylene glycol
1,2-Butylene oxide
2,3-Butylene oxide
Butyl ether
tert-Butyl hydroperoxide
Butyl isocyanate
n-Butyl lactate
Butyl methacrylate
n-Butyl myristate
Butyl octyl phthalate
tert-Butyl perbenzoate
di-tert-Butyl peroxide
di (sec-Butyl) peroxydicarbonate
Butylphenol
o-sec-Butyl phenol
tert-Butyl phenol 2,2,4-trimethyl dihydroquinoline
2-(4-t-Butylphenyl)-5-(4-biphenyl)-1,3,4-oxdiazole
Butyl phthalyl butyl glycollate
n-Butyl propionate
tert-Butylquinoline
Butyl stearate
Butyne diol
Butyraldehyde
Butyric acid
Butyrolactone
Cadmium acetate
Cadmium octoate
Cadmium salicylate
Caffeine
Caffeine sodium benzoate
Calcium acetate
Calcium benzoate
Calcium citrate
Calcium cyanamide
Calcium cyclamate
Calcium formate
Calcium gluconate
Calcium glycerophosphate
Calcium lactate
Calcium levulinate
Calcium linoleate
Calcium mandelate
Calcium phenosulfonate
Calcium propionate
Calcium salicylate
Calcium stearate
Calcium succinate
Calcium tannate
Calcium tartrate
Calcium undecylenate
Camphene
Camphor (natural or synthetic)
Camphor bromate
Camphoric acid
Camphorsulfonic acid
Camphosulfuric acid
Capric acid
Caproic acid
Caprolactam
epsilon-Caprolactone
Caprylic acid
Canavanine sulfate
N-Carbamoylarsanilic acid
Carazole
Carbinoxamie antihistamines
Carbodiimide (cyanamide)
Carbon tetrachloride
Carbonyl chloride (phosgene)
Carbonyl cyanide, m-chlorophenylhydrazone
Carbosine
Carboxylic acid anhydride
Carisoprodol (n-isopropyl-2-methyl-2-propyl-1,3-propanediol discarbamate)
Carvacrol
Carvone
Cedryl acetate
Cellulase
Cerotic acid
Cerous oxalate
Cetyl alcohol
Cetylpyridinium chloride
Chloral
Chloral formamide
Chlorbetamide
Chlorendic acid
Chlormrodrin
meta-Chloroaniline
ortho-Chloroaniline
para-Chloroaniline
Chloroacetic acid
Chlorobenzene
para-Chlorobenzhydrol
meta-Chlorobenzoic acid
ortho-Chlorobenzoic acid
para-Chlorobenzoic acid
Chlorobenzotriazole
otho-Chlorobenzotrichloride
para-Chlorobenzotrichloride
meta-Chlorobenzotrifluoride
ortho-Chlorobenzotrifluoride
para-Chlorobenzotrifluoride
1-(p-Chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid
Chlorobiphenyl
Chlorobutanol
3'Chloro-4'-(p-chlorophenoxy)-3,5-diiodosalicyanilide
1-Chloro-2,4-dinitrobenzene
Chlorogenic acid
Chlorohydroquinone
p-Chloromercuribenzoate
2-Chloro-4-nitroaniline
4-Chloro-2-nitroaniline
4-Chloro-3-nitroaniline
meta-Chloronitrobenzene
ortho-Chloronitrobenzene
para-Chloronitrobenzene
2-Chloro-6-nitrotoluene
4-Chloro-2-nitrotoluene
Chloropentafluoroethane
meta-Chlorophenol
ortho-Chlorophenol
para-Chlorophenol
p-Chlorophenylalanine
Chlorophyll, dry
Chlorophyll, solution in oil
Chloroprene
Chloroquine base
Chloroquine phosphate
N-Chlorosuccinimide
6-Chloro-7-sulfamyl-1,2,4-benzothidiazine-1,1-dioxide
6-Chloro-7-sulfamyl-3,4-dihydro-1,2,4-benzothiadiazine-1,1-dioxide
Chlorothen citrate anti-histamines
Chlorothymol
alpha-Chlorotoluene
meta-Chlorotoluene
ortho-Chlorotoluene
para-Chlorotoluene
Chlorotrifluoromethane
Cholesterol
Cholic acid
Choline
Choline bitartrate
Choline chloride
Chondroitin sulfate
Chromic acetate
Chymar
Chymotripsin, pure
Cinnamic acid
Cinnamic alcohol
Cinnamic aldehyde
Citral
Citrazinic acid
Citric acid
Citronella
Cobalt salts, n.e.s.
Cobinamide cyanide phosphate 3'-ester with 5,6 dimethyl-1-a-D-ribofuranosylbenzimidazole inner salt
Cobinamide hydroxide phosphate 3'-ester with 5,6 dimethly-1-a-D-ribofuranosylbenzimidazole inner salt
Cocarboxylase
Colace
Colchicine
2,4,6-Collidine (2,4,6 trimethylpyridine)
Compound N (Conmel) granulation
Copper acetate
Corticosterone
Coumarin
Coumarone
Creatine
Creatinine
m-Cresol
o-Cresol
p-Cresol
Cresotic acid
Cresyl diphenyl phosphate
Cresylic acid
Crotonic acid
Crontonaldehyde
Cumene
Cumidine
Cyanacetamide
3-Cyanopyridine
4-Cyanopyridine
Cyanuric acid
Cyanuric chloride
Cyclizine antihistamines
Cyclocyamine

Cyclohexane
Cyclohexanol
Cyclohexanone
Cyclohexene
Cyclohexylamine
1-Cyclohexyl-3-(2-morpholinoethyl)-carbodiimide metho-p-toluene sulfonate
para-Cyclohexylphenol
N-Cyclohexyl para toluene sulfonamide
Cyclopentamine hydrochloride
Cyclopentane
Cyclopentanol
Cyclopentanone
Cyclopentene
Cyclopentyl bromide
Cymene
Cystathionine
Cysteic acid
Cysteine
Cystine
Cytidine
Cytidine-5-diphosphate trisodium
Cytidine-5-monophosphate
Cytidine-5-monophosphate hydrate
Cytidine-3,2-phosphoric
Cytidine-5-triphosphate
Cytidine-5-triphosphate hexahydrate
Cytidylic acid
Cytidylyl 3'-5' adenosine
Cytidylyl 3'-5'-cytidine
Cytidylyl 3'-5'-guanosine
Cytidylyl 3'-5'-uridine
Cytosine beta-d-arabinofuranoiside HCl
Cytosine hemihydrate
Decahydronapthalene
1-Decanol
Dehydroabietylamine
Dehydroabietylamine acetic acid salt
Dehydroabietylamine ethylene oxide
Dehydroacetic acid
trans-Dehydroandrosterone acetate semicarbazone
Dehydrocholic acid
Dehydrothio-para-toluidine
Deoxyadenosine
Deoxyadenosine-5-triphosphate
Deoxyadenylic acid
Deoxycytidine
Deoxycytidine-5-triphosphate
Deoxyguanosine
Deoxyguanosine monohydrate
Deoxyguanosine-5-triphosphate
Deoxyguanylic acid
Deoxyinosine
Deoxyribonucleic acid
Desoxyadenosine monohydrate
Diacetone alcohol
Diacetyl
Diallylbarbituric acid
Diallyl maleate
Diallyl phthalate
1,2-Diaminopropane
1,3-Diaminopropane
Diaminoazoxytoluene
L-2,4-Diaminobutyric acid hydrochloride
2,4-Diaminodiphenylamine
Diamthazole dihydrochloride
Diamylphenol
Dianisidine
ortho-Dianisidine dihydrochloride
Diastase
Diastatic enzymes
Diastefor
Diazoaminobenzene
Diazodinitrophenol
4-(5H-Dibenzo (a,d) cyclohepten-5-ylidene)-1-methylpiperidine and its salts
2,5-Debiphenyloxazole
Dibromodifluoromethane
1,3-Dibromo-5,5,-Dimethylhydantoin
Dibromoethylbenzene
Dibromomonochlorotrifluoroethane
alpha, beta-Dibromopropionic acid
Dibutylamine
Dibutylamine Pyrophosphate
4,6-Di-tert-butyl-meta-cresol
2,6-Di-tert-butyl-para-cresol
2,6-Di-tert-butyl-alpha-dimethyl-amino-para-cresol
Di-tert-butyl disulfide
Dibutyl fumarate
Dibutyl itaconate
Dibutyl maleate
Dibutyl phosphate
Dibutyl phthalate
Dibutyl sebacate
Dibutyl tetrachlorophthalate
Dibutylthiourea
Dibutyl tin compounds
Dibutyryladenosine
Dicapryl adipate
Dicapryl phthalate
Dicapryl sebacate
3,4-Dichloroaniline
Dichlorobenzene
meta-Dichlorobenzene
ortho-Dichlorobenzene
para-Dichlorobenzene
2,5-Dichlorobenzenesulfonic acid
3,3'-Dichlorobenzidine
3,3'-Dichlorobenzidine dihydrochloride
2,4-Dichlorobenzoic acid
3,4-Dichlorobenzoic acid
2,4-Dichlorobenzoyl peroxide
Dichlorodifluoromethane
Dichlorodiphenyl sulfone
Dichloroethylene
Dichloroethylether
Dichloroisocyanuric acid
Dichloroisopropyl ether
[2,3-Dichloro-4-(2-methylene-butyryl) phenoxy] acetic acid
2,3-Dichloro-1,4-napthoquinone
2,6-Dichloro-4-nitroaniline
2,4-Dichlorophenol
Dichloropropane
Dicumyl peroxide
Dicyanodiamide
Dicyclohexylamine
Dicyclohexyl phthalate
Dicyclomine hydrochloride
Dicyclopentadiene
Dienestrol
Diethanolamine
Diethylaluminum ethoxide
Diethylaluminum hydride
Diethylamine
Diethylaminoethanol
meta-Diethylaminophenol
N,N-Diethylaniline
Diethylbarbituric acid
Diethylbenzene
Di-(2-ethylbutyl) phthalate
Diethylcarbamazine
Diethylcarbamazine citrate
Diethyl carbonate
diethyl chromium (chromocene)
Diethylene dichloride
Diethylene glycol
Diethylene glycol adipate
Diethylene glycol bis (allyl carbonate)
Diethylene glycol-n-butyl ether
Diethylene glycol dibenzoate
Diethylene glycol dibutyl ether
Diethylene glycol diethyl ether
Diethylene glycol dimethyl ether
Diethylene glycol ethyl ether
Diethylene glycol mono-butyl ether
Diethylene glycol mono-butyl ether acetate
Diethylene glycol mono-ethyl ether acetate
Diethylene glycol mono-methyl ether
Diethylene glycol mono-methyl ether acetate
Diethylene glycol succinate
Diethylene triamine
Di (2-ethylhexyl) adipate
Di (2-ethylhexyl) isophthalate
Di (2-ethylhexyl) phosphoric acid
Di (2-ethylhexyl) phthalate
Di (2-ethylhexyl) sebacate
Diethyl ketone
Diethyl malonate
3,3-Diethyl-5-methyl-2,4-piperidinedione
Diethyl phosphate
O,O-Diethyl phosphorochloridothioate
Diethyl phthalate
Diethylstilbestrol
Difluoroethane
Digitalin
Dihydrocholic acid USP
10,11-Dihydro-N,N-dimethyl-5H-dibenzo (a,d) cycloheptene-delta-5-gamma-propylamine and its salts
Dihydrouracil
1,2-Dihydroxyanthraquinone
1,4-Dihydroxyanthraquinone
1,5-Dihydroxyanthraquinone
1,8-Dihydroxyanthraquinone
Dihydroxy diphenyl sulfone
dl-3,4-Dihydroxyphenylalanine levo-3-(3,4-Dihydroxyphenyl)-2-methylalanine and its salts and esters
Dihydroxyuridine-2,3,-monophosphate
Diiodo-tyrosine
Diisoamyl phthalate
Diisobutylcarbinol
Diisobutyl ketone
Diisobutyl phthalate
Diisodecyl adipate
Diisodecyl phthalate
Diisooctyl adipate
Diisooctyl phthalate
Diisooctyl sebacate
Diisopropanolamine
Diisopropylamine
Diisopropyl benzene
meta-Diisopropyl benzene
para-Diisopropyl benzene
Diisopropyl benzene hydroperoxide
Diisopropyl carbinol
Diisopropyl fluophosphates
Diketene
2,5-Dimethoxybenzaldehyde
2,6-Dimethoxybenzoic acid
Dimethoxytetraglycol
Dimethyl acetal
Dimethyl acetamide
Dimethyl adipimide dihydrochloride
Dimethylallylamine
Dimethyl aluminum chloride
Dimethyl aluminum hydride
Dimethyl amine
para-Dimethylaminobenzaldehyde
2-Dimethylaminoethanol
Dimethylaminomethylphenol
5-Dimethylamino-1-naphthalene sulfonyl chloride
Dimethylaminopropylamine
5-(3-Dimethylaminopropylidene)-dibenzo (a,d) (1,4) cycloheptadiene pamoate

6-Dimethylamino purine
2,4-Dimethylaniline
N,N-Dimethylaniline
Dimethylbenzenesulfonic acid
N,N-Dimethylbenzylamine
Dimethylbenzyl carbinol acetate
2,5-Dimethyl-2,5-bis, (tert-butyl peroxy) hexyne-3
2,5-Dimethyl-2,5-Di (tert-butyl peroxy) hexane
Dimethyl dioctadecyl ammonium bentonite
2,5-Dimethyl-2,5-Diperbenzoxyhexane
2,5-Dimethyl-2,5-Diperoctoxyhexene
Dimethyl ether
Dimethylformamide
Dimethyl glyoxime
Dimethyl isophthalate
Dimethyl itaconate
Dimethyl malonate
2,6-Dimethylmorpholine
Dimethyl-alpha-napthylamine
Dimethyl-beta-napthylamine
N,N-Dimethyl-para-nitrosoaniline
3,6-Dimethyl-3-octanol
3,7-Dimethyl-1-octanol
Dimethylolpropionic acid
Dimethylphenylbenzyl ammonium hydroxide
Dimethyl phthalate
Dimethyl stearamide
Dimethyl sulfate
Dimethyl sulfolane
Dimethyl sulfoxide
Dimethyl terephthalate
2,4-Dimethyl tetrahydrothiophene-1,1-Dioxide
Dinitrobenzene
4,4' Dinitrocarbanilide and 2-Hydroxy-4,6-Dimethyl pyrimidine complex
Dinitromethylbutylacetophenone
Dinitronapthalene
Dinitrophenol
3,5-Dinitro-o-toluamide (zoalene)
Dinitrotoluene
Dinonyl phthalate
Di (n-octyl, n-decyl) adipate
Di (n-octyl, n-decyl) phthalate
Dioctyl phthalate
Diorgano siloxanes
1,4-Dioxane
Dipentaerythritol acetate
Dipentaerythritol hexabutyrate
Dipentaerythritol hexapropionate
Diphemanil methyl sulfate
Diphenic acid
Diphenyl
Diphenylamine
Diphenyldichlorosilane
Diphenylhydantoin sodium
Diphenylmethane
Diphenylmethane 4,4'-Diisocyanate
2,5-Diphenyloxazole
Diphenyl oxide
Diphenyl phthalate
Diphenylsilanediol
4,4-Diphenylstilbene
Diphosphopyridine nucleotide
Dipropylene glycol
Dipropylene glycol dibenzoate
Dipropylene glycol methyl ether
p-(Dipropylsulfamyl) benzoic acid
alpha, alpha-Dipyridyl
2,2-Dipyridylamine
2,2'-Dithiodibenzoic acid
5,5-Dithio-bis-(2-nitrobenzoic acid)
Dithiothreitol (cleland's reagent)
Ditridecyl phthalate
Diundecyl phthalate
Divinyl benzene
Djenkolic acid
1-Dodecene
Dodecenylsuccinic acid
Dodecenylsuccinic anhydride
Dodecylaniline
Dodecylphenol
Dulcitol
Durene
1-Eicosanol
Elaidic acid
Epichlorhydrin
Epinephrine
Ergosterol
Erucic acid
Erythorbic acid
Erythrityl tetranitrate
Ethanolamine
Ethanolformamide
Ethoheptazine
Ethoheptazine citrate
P-[(p-Ethoxybenzylidene)-amino] benzonitrile
2-Ethoxy-3,4-dihydro-2H-pyran
Ethoxy triglycol
Ethyl acetate
Ethyl acetoacetate
Ethylacetylene
Ethylacrylate
Ethylalcohol
Ethyl aluminum dichloride
Ethyl aluminum sesquichloride
Ethyl amine
Ethyl amyl ketone
N-Ethyl aniline
ortho-Ethyl aniline
Ethyl benzene
Ethyl benzoate
Ethyl bromide
2-Ethylbutyl acetate
2-Ethylbutyl alcohol
Ethyl butyl ketone
2-Ethyl-2-butylpropanediol-1,3
2-Ethylbutyraldehyde
Ethylbutyrate
2-Ethylbutyric acid
Ethylchloride
Ethylchloroacetate
Ethylchlorocarbonate
Ethylcyanoacetate
Ethylene carbonate
Ethylene chlorohydrin
Ethylene cyanohydrin
Ethylenediamine
Ethylenediamine dihydroiodide
Ethylenediamine tetraacetic acid
Ethylene dibromide
Ethylene dichloride
Ethylene glycol
Ethylene glycol n-butyl ether
Ethylene glycol diacetate
Ethylene glycol dibutyl ether
Ethylene glycol ethyl ether
Ethylene glycol methyl ether
Ethylene glycol monoacetate
Ethylene glycol monobutyl ether
Ethylene glycol monobutyl ether acetate
Ethylene glycol monohexyl ether
Ethylene glycol monomethyl ether
Ethylene glycol monomethyl ether acetate
Ethylene glycol monoethyl ether acetate
Ethylene glycol phenyl ether
Ethylene glycol succinate
Ethylene glycol tetrachlorophthalate
Ethyleneimine
Ethylene maleic anhydride
Ethylene oxide
Ethylene thiourea
Ethyl estragole cinnamate
Ethy ether
1-Ethyl-2-[3(1-ethylnaptho[1,2d)-thiazolin-2-ylidene)-2-methyl-propenyl]naptho[1,2d] thiazolium bromide
Ethyl fluid
Ethyl formate
2-Ethyl-hexaldehyde
2,2'-(2-Ethylhexamido) diethyl Di(2-Ethyl hexoate)
2-Ethylhexanediol-1,3
2-Ethylhexoic acid
2-Ethylhexyl acetate
2-Ethylhexyl acrylate
2-Ethylhexyl alcohol
2-Ethylhexyl isodecyl phthalate
Ethyl Hydrogen sulfate
5-Ethylidene-2-norbornene
Ethyl iodoacetate
Ethyl lactate
Ethyl malonate
Ethyl mercaptan
N-Ethylmorpholine
Ethylnitrite
Ethyl orthoacetate
Ethyl phenylacetate
Ethyl phthalyl ethyl glycollate
Ethyl silicate
Ethyl sulfide
Ethyl stearate
Ethyl thioethanol
N-Ethyl para-toluenesulfonamide
Ethyl vanillin
Eucatropine hydrochloride
Eugenol
Exol
Fenchone
Ferric ammonium citrate
Ferric ammonium oxalate
Ferric glycerophosphate
Ferrous gluconate
Ferrous oxalate
Ferulic acid
Ficin, pure
Fluoranthene
Fluorescein
9-Fluoro-11 beta, 17,21-trihydroxy-16a-methylpregna—1,4-diene-3,20 dione and its salts and esters
dl-p-Fluorophenylalanine
5-Fluorotryptophan
6-Fluorotryptophan
5-Fluorouracil
Folic acid
Formaldehyde
Formamide
Formic acid
Fructose
Fructose-1,6-diphosphate sodium salt
Fructose-1-phosphate
D-Fucose
L-Fucose
Fumaric acid
Furan
Furazolidone
Furfural
Furfuryl alcohol
Furfuryl mercaptan
Galactose
Gallic Acid
Gentiobiose
Geranyl cinnamate
Gluconic acid
Glucono-delta-lactone
D-Glucosamine
Glucose, pharmaceutical

Glucose-6-phosphate, disodium salt
Glucuronic acid
Glucuronolactone
Glutamic acid
Glutamine
Glutaraldehyde
Glutaric acid
Glutaric anhydride
Glutaronitrile
Glutathione
Glycerin
Glycerol monooleate
Glycerophosphates
Glycerophosphoric acid and salts
Glyceryl monostearate
Glyceryl tri-(acetyl ricinoleate)
Glyceryl tributyrate (tributyrin)
Glycidyl acrylate
Glycine
Glycylglycine
Glycocholic acid (cholylglycine)
Glyoxal
Guaiacol
Guaiacol carbonate
Guaiacol glyceryl ether
Guaiamar
Guanidine
gamma-Guanidinobutyric acid
Guanidinopropionic acid
Guanine
Guanosine
Guanosine-2,3-cyclic
Guanosine-3,5-cyclic phosphate
Guanosine dihydrate
Guanosine-5-diphosphate
Guanosine-5-monophosphate
Guanosine-5-triphosphate
Guanosine-5'-triphosphate trilithium tetrahydrate
3-Guanylic acid
5-Guanylic acid
Guanylyl-3,5-adenosine
Guanylyl-3,5-cytidine
Guanylyl-3',-5'-guanosine
Guanylyl-3',5'-uridine
Heliotropine
Hemimellitene (1,2,3-trimethylbenzene)
Hemin (chlorohemin; hemin chloride)
Heparin sodium (heparin)
n-Heptadecanoic acid
n-Heptadecanol
Heptafluorobutyric acid (perfluorobutyric acid)
n-Heptanoic acid
1-Heptanol
Heptylic acid
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloroethane
n-Hexadecane
1-Hexadecanol
Hexa-2-ethylbutoxydisiloxane
Hexafluoroacetone
Hexahydrobenzoic acid
Hexahydrophthalic anhydride
Hexamethonium chloride
Hexamethylene diammonium adipate (nylon salt)
Hexamethylenediamine
Hexamethyleneimine
Hexamethylenetetramine
1-Hexanol
Hexestrol NNR
n-Hexyl bromide
n-Hexyl chloride
Hexylene glycol
Hexylresorcinol
Hippuric acid
Histamine
Histamine phosphate
Histidine
Histidine hydrochloride
Homatropine and its salts
Homocystine
Homoserine
Hyaluronidase
Hydantoin
(-)-l-a-Hydrazino-3,4-dihydroxy-a-methyl-hydrocinnamic acid monohydrate
Hydrazobenzene
Hydrindantin, including hydrated forms
Hydrocholin
Hydrolase powder
Hydroorotic acid
Hydroquinone
Hydroquinone monobenzyl ether
Hydroxyacetic acid
meta-Hydroxybenaldehyde
para-Hydroxybenzaldehyde
meta-Hydroxybenzoic acid
ortho-Hydroxybenzoic acid
para-Hydroxybenzoic acid
3-Hydroxy-2-butanone
dl-Hydroxybutyric acid sodium salt
p-Hydroxychlorobenzene
Hydroxycitronella
2-Hydroxy-4n dodecyloxybenzophenone
Hydroxyethyl cellulose
Hydroxyethylethylenediamine
N-Hydroxyethylpiperazine
N-2-Hydroxyethylpiperazine-N'-2'-ethanesulfonic acid
Hydroxylapatite
Hydroxylsine hydrochloride
Hydroxymethyl 6-(2-amino-2-phenylacetamido)-3,3-dimethyl-7-oxo-4-thia-l-azabicylo (3,2,0) heptane-2-carboxylate pivalate and its salts and esters
5-Hydroxymethylcytosine
5-Hydroxymethyl deoxyuridine
3-Hydroxy-2-napthoic acid
2-Hydroxyphenylmercuric chloride
Hydroxyproline
Hydroxyquinoline and oxyquinoline anti-infective agents
Hydroxystearic acid
5-Hydroxytryptophan
3-Hydroxytyramine hydrochloride
Hydroxyzine
Hypoxanthine
3-3'-Iminobispropylamine
Iminodiacetonitrile
Indene
Indole
3-Indoleacetic acid
3-Indolebutyric acid
Indolyl-3 acetyl-L-aspartic acid
Indomethacin
Inosine
Inosine-5'-diphosphate
Inosine-5'-monophosphate
Inosine-5'-triphosphate
Inosinic acid
alpha-Iodoacetamide
5-Iododeoxyuridine
Iodoform
Ionones
Irisone ketone
Iron protoxalate
Iron sodium oxalate
Isatoic anhydride
Isoamyl alcohol, primary
Isoamyl bromide
Isoamyl butyrate
Isoamyl chloride
Isoamyl phthalate
Isoamyl valerate
Isoborneol
Isobutene
Isobutyl acetate
Isobutyl acrylate
Isobutyl alcohol
Isobutyl allyl barbituric acid
Isobutylamine
Isobutyl benzene
Isobutyl benzoate
Isobutyl bromide
Isobutyl chloride
Isobutyl methacrylate
Isobutyl phenyl acetate
Isobutyl quinoline
N-Isobutylundecyleneamide
Isobutyraldehyde
Isobutyric acid
Isobutyronitrile
dl-Isocitrate trisodium
Isoctyl thioglycolate
Isodecanol
Isoeugenol
Isoleucine
Isoniazid
Isooctyl alcohol
Isooctyl isodecyl phthlate
Isopentanoic acid
Isophorone
Isophthalic acid
Isopropenyl acetate
Isopropyl acetate
Isopropyl alcohol (isopropanol)
Isopropyl ethyl thionocarbamate
Isopropylamine
Isopropyl bromide
Isopropyl chloride
Isopropyl ether
Isopropyl iodide
Isopropyl palmitate
Isopropyl phenol
Isopropyl 2-(4 thiazolyl)-5-benzimidazole carbamate
Isosafrole
Itaconic acid
beta-Ketoglutaric acid
Khellin
Kinetin-6-furfurylaminopurine
Kojic acid
Lactic acid and salt(s)
Lactonitrile
Lanthionine
Lauric acid
Lauroyl peroxide
Lauryl alcohol
Lauryl aldehyde
Lauryl chloride
Lauryl mercaptan
Lead acetate
Lead formate
Lead maleate tribasic
Lead stearate
Lead styphnate
Lead tetraacetate
Lecithin, n.e.c.
Leucine
Leucenol leucenine
Levulinic acid
Lignoceric acid
D-Limonene
Linalool

Linalyl acetate
Linoleic acid
Linolinic acid
Linalyl acetate
Lithium benzoate
Lithium salts
Lutidine
2,4-Lutidinic acid
Lysine
Lysine hydrochloride
Lysozyme
D-Lyxose
Magnesium benzoate
Magnesium citrate
Magnesium citrate, dibasic
Magnesium p-(dipropylsulfamoyl) benzoate
Magnesium glycerophosphate
Magnesium salicylate
Magnesium stearate
Magnesium sulfate
Magnesium oxyphenyl arsenate
Maleic acid
Maleic anhydride
Malic acid
Malonic acid
Malt diastase
Maltose
Mandelic acid
Manganese acetate
Manganese citrate
Manganese glycerophosphate
Mannitol
D-Mannose
Margaric acid
Meclizine
Melamine
Melissic acid
Menadione (2-methyl-1,4-naphthoquinone)
para-Menthane hydroperoxide
Menthol
Mephentermine
Mephentermine sulfate
Mercaptobenzothiazole
Mercaptoethanol
beta-Mercaptopropionic acid
6-Mercaptopurine
Mercuric acetate
Mercuric salicylate
Mesityl oxide
Mesitylene (1,3,3-trimethylbenzene)
Metamine (trolnitrate phosphate)
Metanilic acid
Methacrylic acid
Methacrylonitrile
Methallyl chloride
Methanesulfonyl chloride (mesyl chloride)
Methantheline bromide
Methapyralene antihistamines
Methenamine anti-infective agents
Methionine
Methionine hydroxy analogue
Methionine sulfone
Methoxyphenamine hydrochloride
Methoxytriglycol
Methoxytriglycol acetate
Methyl acetate
Methyl-4-acetamido-2-ethoxy benzoate
Methyl acetanilide
Methyl acetone
Methyl acetophenone
Methyl acetylene
Methyl acetyl ricinoleate
Methyl acrylate
Methyl alanine
Methylallyl alcohol
Methylaluminum sesquibromide
Methylaluminum sesquichloride
Methylamine
Methylamyl acetate
Methyl amyl alcohol
Methyl-n-amyl carbinol
Methyl amyl ketone
N/Methylaniline (monomethylaniline)
alpha-Methylanthracene
Methyl antranilate
Methyl anthraquinone
Methyl arachidate
alpha-Methylbenzyl alcohol
alpha-Methylbenzyl ether
Methyl-bicyclo (2,2,1) heptene-2,3-dicarboxylic anhydride isomers
2-Methyl-l-butanol
Methyl butynol
Methyl caproate (methyl hexanoate)
Methyl chavicol
Methyl chloride
Methyl cinnamate
Methylcyclohexane
Methylcyclohexanol
Methylcyclohexanol acetate
Methylcyclohexanone
Methylcyclopentane
N-Methyl-5H-dibenzo (a,d) cycloheptene-5-propyl-amine and its salts
Methyl dichloroacetate
Methyldiethanolamine
Methyl di-hydrogenated tallow tertiary amine
Methylelaidate
N,N-Methylene bisacrylamide
Methylene blue
Methylene bromide
Methylene chloride
Methylene iodide
N-Methylethanolamine
2-Methyl-2-ethyl-1,3-dioxolane
Methylethylketone
Methylethylketone and cyclohexanone peroxide
Methylethylketone peroxide
2-Methyl-5-ethylpyridine
N-Methylglucamine
Methyl glutamate
Methyl glycolate
Methyl heneicosanoate
Methyl heptine carbonate
Methyl hexyl ketone
Methyl histidine
Methyl alpha-hydroxy behenate
Methyl alpha-hydroxy eicosanoate
Methyl alpha-hydroxy-lignocerate
Methyl alpha-hydroxy myristate
Methyl alpha-hydroxy palmitate
Methyl alpha-hydroxy stearate
Methylinoacetaldehyde
Methyl iodide
Methyl ionone
Methyl isoamyl ketone
Methyl isobutyl ketone
Methyl isopropenyl ketone
Methyl laurate
Methyl linoleate
Methyl linolenate
Methyl mercaptan
Methyl methacrylate monomer
N-Methyl morpholine
Methyl myristate
alpha-Methylnapthalene
beta-Methylnapthalene
(1-Methyl-5-nitroimidazol-2-yl)methyl carbamate
Methyl nonadecanoate
Methyl oleate
Methyl palmitate
Methyl palmitoleate
Methylparaben
2-Methylpentaldehyde
2-Methyl-1-pentanol
3-Methyl-1-pentyn-3-ol
Methylphenyldichlorosilane
3-Methyl-1-phenyl-2-pyrazolin-5-one
n-Methyl-o-phenylenediamine dihydrochloride
Methyl phthalate
Methyl phthalyl ethylglycollate
N-Methylpiperazine
2-Methyl piperidine
Methyl propyl ketone
n-Methyl-2-pyrrolidine
Methyl salicylate
Methyl stearate
alpha Methyl styrene
N-Methyltaurine and aqueous solutions
N-Methyltaurine slurry
Methyl tricosanoate
Methyl tridecanoate
dl-5-Methyl-tryptophan-2,5-hydrate
beta-Methylumbelliferone
2-Methyl-5-vinylpyridine
Mimosine
Monobutylamine
Monochlorodifluoroethane
Monochlorodifluoromethane
Monoethanolamine
Monoethylamine
Monoisopropanolamine
Monopentaerythritol diacetate dibutyrate
Monopentaerythritol tetrabutyrate
Monosodium glutamate
Montanic acid
Morpholine
Musk ambrette
Musk ketone
Musk xylene
Myristic acid
Myristoleic acid
Myristyl alcohol
Myristyl bromide
Nalidixic acid
Naphazoline hydrochloride
Napthalene
Napthalenesulfonic and disulfonic acids
Napthionic acid
alpha-Napthol
beta-Napthol
Napthol sulfonic and disulfonic acids and salts
1,2-Napthoquinone
1,4-Napthoquinone
alpha-Napthylamine
beta-Napthylamine
Napthylamine sulfonic, disulfonic and trisulfonic acids
2-Napthyl benzoate
Napthyl ethyl ether
Napthyl methyl ether
2-(l-Napthyl)-5-phenyl oxazole
Neopentyl glycol
Neopentyl glycol adipate
Neopentyl glycol sebacate
Neopentyl glycol succinate
Neotridecanoic
Nerol
Nialamide
Nicarbazin
Nickel acetate
Nickel formate
Nikethamide
Ninhydrin

Nithiazide
meta-Nitroaniline
ortho-Nitroaniline
para-Nitroaniline
meta-Nitroanisole
ortho-Nitroanisole
para-Nitroanisole
3-Nitrobenzaldehyde
Nitrobenzene
n-Nitrobenzenesulfonyl chloride
p-Nitrobenzenesulfonamide
meta-Nitrobenzoic acid
ortho-Nitrobenzoic acid
para-Nitrobenzoic acid
meta-Nitrobenzoyl chloride
para-Nitrobenzoyl chloride
ortho-Nitrobiphenyl
meta-Nitrochlorobenzene
ortho-Nitrochlorobenzene
para-Nitrochlorobenzene
Nitroethane
Nitrofurantoin
Nitromersol
Nitromethane
l-Nitronapthalene
para-Nitrophenetole
Nitrophenide
meta-Nitrophenol
ortho-Nitrophenol
para-Nitrophenol
p-Nitrophenyl-B-D-glucuronide
p-Nitrophenyl phosphate
p-Nitrophenyl-thymidine-5-phosphate
N-Nitrosodiphenylamine
beta-Nitrostyrene
meta-Nitrotoluene
ortho-Nitrotoluene
para-Nitrotoluene
Nitroxylene
Nonadecylic acid
Nonanal
n-Nonyl alcohol
Nonyl bromide
l-Nonylene
Nonyl phenol
Nordihydroguaiaretic acid
Norleucine
Norvaline
Nucleosides
Nucleotides or mono nucleotides
l-Octadecanol
Octafluorocyclobutane
Octanoic acid
1-n-Octanol
2-n-Octanol
n-Octyl bromide
n-Octyl chloride
n-Octyl, n-decyl adipate
n-Octyl, n-decyl phthalate
Octylene glycol titanate
2 Octyl iodide
Octyl phenol
alpha-Olefins
Oleic acid
Olein (Triolein, Glyceryl trioleate)
Ornithine
Orotic acid (Uracil-6-carboxylic acid; 6-Carboxyuracil)
Oxalic acid
Oxamide
Oxphencyclimine
Oxyalkylated alkylene glycol
beta, beta'-Oxydipropionitrile
Pamaquine naphthoate
Palmitelaidic acid
Palmitic acid
Palmitoleic acid
Palmitoyl chloride
Pancreatin
Papain
Paradichlorobenzene
Paraffin, chlorinated
Paraformaldehyde
Paraldehyde
Pelargonic acid
dl-Penicillinamine acetone
Penicillinase
Pepsin
Pepsin, spongy
Pentachloroethane
Pentadecylic acid
Pentaerythritol
Pentaerythritol tetrastearate
Pentamethylene dibromide
Pentane diol
2,4-Pentane dione
Pentanol
2-Pentanol
3-Pentanol
Pentazocine
Pentobarbital sodium
Pentobarbituric acid
Peracetic acid
Perchloroethylene
Perchloropentacyclodecane
Perpinyl acetate
Phenacetin
Phenanthrene
Phenanthrenequinone
Phenazine
ortho-Phenetidine
para-Phenetidine
Phenetsal
Phenhydramine hydrochloride antihistamine
Pheniramine maleate antihistamines
Phenobarbital
Phenobarbital sodium
Phenol
Phenolphthalein
Phenolphthalein glucaronide
Phenolsulfonephthalein (phenol red)
Phenosulfonic acid
Phenyl acetate
Phenyl acetic acid
Phenyl aceticaldehyde
Phenylalanine
Phenyl-2-amino-5-napthol-7-sulfonic acid
Phenyl-2-amino-8-napthol-6-sulfonic acid
N-Phenylanthranilic acid
Phenylazo diamino pyridine
1,3,4-Phenyl-biphenyloxadiazole
Phenylbutazone
1-Phenyl-3-carbethoxy-pyrazolone-5
Phenyl carbinol
Phenyldiethanolamine
Phenyldimethylpyrazolomethyl amino methane
Phenylephrine hydrochloride
m-Phenylenediamine
o-Phenylenediamine
Phenylethanolamine
Phenylethyl acetate
Phenylethyl alcohol
Phenylethyl barbituric acid
Phenyl ethyl salicylate
N-Phenyl glycine
alpha-Phenyl glycine
Phenyl glycine
Phenyl isocyanate
Phenyl isothiocyanate
Phenyl magnesium bromide
Phenylmethyl sulfonyl fluoride
N-Phenyl-alpha-napthylamine
N-Phenyl-beta-napthylamine
Phenylneopentyl phosphite
Phenyl nerol
o-Phenyl phenol
N-Phenylpiperazine
Phenylpropanolamine
Phenyl propylacetate
Phenyl salicylate
Phenyl sulfide (diphenyl sulfide)
Phenyl sulfone (diphenyl sulfone)
Phenyl sulfoxide (diphenyl sulfoxide)
Phenyl trichlorosilane
alpha-Pinene
beta-Pinene
Phloroglucinol
Phosphatase, alkaline
Phosphate diethylacetal
Phosphatidyl inositol
Phosphatidyl serine
2-Phosphoenol pyruvic acid
2-Phosphoglyceric acid
o-Phospho-dl-serine
Phthalamide
Phthalic acid
Phthalic anhydride
ortho-Phthalimide
Phthalonitrile
Phthaloyl chloride
Phytol
alpha-Picoline
beta-Picoline
gamma-Picoline
Picramic acid
Picric acid
Pimelic acid
d-Pipecolic acid
dl-Pipecolic acid
l-Pipecolic acid
Pipecolic acid hydrochloride
d-Pipecolic anhydride
dl-Pipecolic anhydride
l-Pipecolic anhydride
Piperazine
Piperazine adipate
Piperazine calcium edetate
Piperazine citrate
Piperazine dihydrochloride
Piperazine hexahydrate
Piperidine
Piperonal
Pivaloyloxymethyl-D-a-aminobenzyl penicillinate
Polyadenylic acid
Polycytidylic acid
Polyethylene glycol dibenzoate
Polyethylene glycols
Polyethyleneimine
Polyglycerol
Polyglycol distearate
Polymeric isocyanate
Polymethylene polyphenylisocyanate
Polyoxypropylene triol
Polypropylene diols
Polypropylene glycol
Polytetramethylene ether glycol
Polythiazide
Polythiazide, non-sterile
Polyuridylic acid
Polyuridylic acid potassium
Pontalin granulation
Pontalin powder
Potassium acetate
Potassium amyl xanthate
Potassium biphthalate
Potassium bitartrate

Potassium chloride
Potassium citrate
Potassium dichloroisocyanurate
Potassium ethyl xanthate
Potassium hexyl xanthate
Potassium oxalate
Potassium oxichinolin sulfonate
Potassium salicylate
Potassium tetroxalate
Proline
Prominal
Propargyl alcohol
Propargyl bromide
Propenyl guaethol
Prophenpyridamine maleate
beta-Propiolactone
Propionaldehyde
Propionic acid
Propionic anhydride
Propionyl chloride
Propiophenone
d-Propoxyphene hydrochloride
n-Propyl acetate
n-Propyl alcohol
Propyl amine
n-Propyl bromide
n-Propyl chloride
Propylene carbonate
Propylene chlorohydrin
Propylene dichloride
1,2-Propylene glycol
Propylene glycol methyl ether
Propylene oxide
Propyl gallate
Propylhexadrine
n-Propyl iodide
Propylparaben
Protamine sulfate
Protoporphyrin
Pseudocumene (1,2,4-trimethylbenzene)
Pseudocumidine
Pseudouridine (salmine)
Purine
Pyramidon
Pyranisamine maleate
Pyrene
Pyridine (refined)
3,4-Pyridinecarboxylic acid
Pyridium
Pyrilamine maleate (benzal)
Pyrilamine maleate N.N.R.
Pyrocatechol
Pyrogallol acid
Pyroligneous acid
Pyromellitic acid and dianhydrides
Pyruvic acid
Pyruvic aldehyde
Quinacrine hydrochloride
Quinaldine
Quinhydrone
Quinic acid
Quinizarin
Quinoline
Quinone
N^1-(2-Quinoxalinyl) sulfanilamide
Racephedrine
Raffinose
Rennet
Rennin
Resorcinol
Resorcinol acetate
Resorcinol dimethyl ether
Resorcinol monobenzoate
alpha-Resorcylic acid
beta-Resorcyclic acid
Rhamnose
Rhodinol
Ricinoleic acid and salts
Ristocetin
Rochelle salts
Saccharin
Saffrole
Salicin
Salicylaldehyde
Salicylamide
Salicylic acid, technical grade
Salicylic acid, USP grade
Salol
Salophen
Santalol
Santonin
Sarcosine
Sebacic acid
Secobarbital sodium salicylate
Selenium diethylthiocarbonate
Serine
Serotonin
Serotonin creatinine sulfate
Serotonin creatin sulfate complex
Shikimic acid (3,4,5,–trihydroxyl;–1–carboxylic acid)
Silanes
Skatole
Sodium acetate
Sodium allyl arsenate
Sodium para-aminobenzoate
Sodium para-aminosalicylate
Sodium arsanilate
Sodium benzoate
Sodium bitartrate
Sodium biphthalate
Sodium-sec-butyl xanthate
Sodium chloride
Sodium-4-chlorophthalate
Sodium citrate
Sodium dehydroacetate
Sodium diacetate
Sodium dibutyl napthalene sulfonate
Sodium dichloro isocyanurate
Sodium dimethyl-S-sulfo isophthalate
Sodium dodecyl benzene sulfonate
Sodium erythorbate
Sodium formate
Sodium gentisate
Sodium gluconate
Sodium glycolate
Sodium isobutyl xanthate
Sodium isopropyl xanthate
Sodium lactate
Sodium N-lauroyl sarcosinate
Sodium lignosulfonate
Sodium methylate
Sodium methyl siliconate
Sodium oxalate
Sodium phenolsulfonate
Sodium potassium tartrate
Sodium proprionate
Sodium saccharin
Sodium saccharinate
Sodium salicylate
Sodium tetroxalate
Sodium undecylenate
Sodium zirconium lactate
Sorbic acid
Sorbitol
Sorbose
Spermidine trihydrochloride
Spermidine tetrahydrochloride
Sphingomyelin
Squalane
Squalene
Stannous 2-ethylhexoate
Stearic acid
Stearin
Stearyl alcohol
Stilbestrol
Strontium acetate
Strontium lactate
Strontium oxalate
Streptokinase
Styrene oxide
Suberic acid
Succinic acid
Succinic acid disodium salt
Succinic anhydride
Succinimide
Sucrose
Sucrose acetate butyrate
Sulfanilic acid
meta-Sulfobenzoic acid
ortho-Sulfobenzoic acid
Sulfonamide drugs
4,4-Sulfonyldianiline
4-Sulfophthalic acid
Tartar emetic
Tartaric acid
Taurine
Terephthalic acid
Terephthaloyl chloride
para-Terphenyl
Terpin hydrate
Terpineol
Terpinyl acetate
Tetrabutyl titanate
Tetrachlorodifluoroethane
sym-Trachloroethane
Tetrachlorophthalic acid
Tetrachlorophthalic anhydride
5-Tetradecenoic acid
1,1,3,3-Tetraethoxypropane
Tetraethylene glycol
Tetraethylene pentamine
Tetraethyl lead
Tetrafluoroethylene
Tetrafluoromethane
Tetrahydrofuran
Tetrahydrofurfuryl alcohol
Tetrahydrofurfuryl oleate
Tetrahydrolinalool
Tetrahydronapthalene
Tetrahydrophthalic anhydride
Tetrahydropyran-2-methanol
Tetrahydrothiophene 1,1-dioxide (sulfolane)
Tetrahydroxyethylethylenediamine
Tetrahydrozoline
Tetrahydrozoline hydrochloride
Tetraisopropyl titanate
N,N,N,N,-Tetramethyl-1,3-butane diamine
Tetramethyldiaminobenzhydrol
Tetramethyldiaminobenzophenone
Tetramethyldiaminodiphenylmethane
N,N,N,N,-Tetramethylene diamine
Tetramethyl lead
1,1,4,4,-Tetraphenylbutadiene
Tetraphenyltin
Tetrapropylene
Tetrazene
2-(4'-Thiazolyl) benzimidazole
beta-2-Thienylalanine
2-Thiobarbituric acid
Thiodiglycol
Thiodipropionic acid
Thioglycerol
Thioglycolic acid
Thiophene
alpha-Thiophenealdehyde
Thiophenol
Thiosalicylic acid

Thiothixene
2-Thiouracil
Thiourea
Threonine
Thrombin topical
Thromboplastin
Thymidine
Thymidine-3,5-diphosphate
Thymidine-5-diphosphate
Thymidine-5-monophosphate
Thymidine-5-triphosphate
Thymine (5-methyluracil)
Thymol
Thymol blue
Thymol iodide
Titanium potassium oxalate
Titanyl acetylacetonate
ortho-Tolidine
ortho-Tolidine dihydrochloride
Toluene
Toluene-2,4-diamine
Toluene diisocyanates, except the 2–4 isomer with 85 percent purity and above.
Toluene sulfonamide
ortho-Toluenesulfonamide
para-Toluenesulfonamide
ortho-Toluenesulfonic acid
para-Toluenesulfonic acid
p-Toluenesulfonylchloride
para-Toluene sulfonyl-L-arginine methyl ester, HCl
o-Toluidine
Tolyl acetate
ortho-Tolyl biguanide
para-Tolyl-1-napthyl-amine-8-sulfonic acid
Triacetin
N-Triacontane (Melissic acid)
Triallyl cyanurate
Tribromoacetic acid
Tribromoethanol
Tributoxyethyl phosphate
Tri-n-butyl aconitate
Tributyl citrate
Tributyl phosphate
Tributyl phosphite
Trichloroacetic acid
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
Trichloroisocyanuric acid
Trichloromethane (chloroform)
Trichloromethyl chloroformate (diphosgene)
Trichloropropane
Tricresyl phosphate
Tridecyl alcohol
Tri-n-decylaluminum
Tridecylic acid
2,4,6-Tri(dimethylaminomethyl) phenol
Triethanolamine
Triethanolamine titanate
1,1,3-Triethoxyhexane
Triethyl aluminum
Triethylamine
Triethyl citrate
Tri-2-ethylhexyl phosphate
Triethyl phosphate
Triethylenediamine
Triethylene glycol
Triethylene glycol dibenzoate
Triethylene glycol di(2-ethylbutyrate)
Triethylene glycol di(2-ethylhexoate)
Triethylene glycol monobutyl ether phosphate
Triethylenetetramine
Trifluoroacetic acid
Trifluoromonochloroethylene
Tri-n-hexylaluminum
Triisobutylaluminum
Triisohexylaluminum
Triisopropanolamine
Trilinolein
Trimellitic acid and anhydrides
Trimethyl aluminum
3,4,5-Trimethylcyclohexanol-1
Trimethylene bromide
Trimethylene chlorohydrin
Trimethylene glycol
2,6,8-Trimethyl-4-nonanone
2,6,8-Trimethylnonyl-4-alcohol
Trimethylolethane
Trimethylolpropane
2,2,4-Trimethyl-1,3-pentanediol
2,2,4-Trimethyl-1,3-pentanediol di-isobutyrate
2,2,4-Trimethyl-1,3, pentanediol mono-isobutyrate
2,4,4-Trimethylpentene
Tri-2-methylpentylaluminum
2,4,6-Trinitrobenzene sulfonic acid
Trinonylphenyl phosphite
Tri-n-octylaluminum
Tripalmitin (Palmitin, glyceryl tripalmitate)
Tripelennamine anti-histamines
Triphenyl phosphate
Triphenyl phosphite
Triphenyl phosphorus
Triphosphopyridine nucleotide
Tripropylene
Tripropylene glycol methyl ether
Tris-B-chloroethyl phosphate
Tris (2,3-dibromopropyl) phosphate
Tris dichloropropyl phosphate
Tris (hydroxymethyl) aminomethane
Trixylenyl phosphate
Trypsin powder
Trypsin pure
Tryptar trypsin
Tryptophan
Tyramine
Tyrosine
Undecalactone
Undecanaldehyde
1-Undecanol
2-Undecanol
Undecylic acid
Undecylenic acid
Uracil
Uranine
Urea
Urease
Uric acid
Uridine
Uridine-5-diphosphate
Uridine-5-diphosphogalactose
Uridine-5-diphosphomannose
Uridine-5-monophosphate
Uridine-5-triphosphate
Uridylic acid
Uridylyl-3',5'-cytidine
Uridylyl-3',5'-uridine
n-Valeraldehyde
Valeric acid
Valine
d Valine
dl Valine
l Valine
Vanadium ethylate
Vannilin
Varidase streptokinase-streptodornase
Veratraldehyde
Vetivert acetate
Vinyl acetate
Vinyl benzene (styrene)
Vinyl bromide
Vinyl-n-butyl ether
Vinyl chloride
Vinyl-2-chloroethyl ether
Vinyl ether
Vinyl ethyl ether
Vinylidene chloride
Vinyl isobutyl ether
Vinyl methyl ether
Vinyl methyl ketone
Vinyl pyridine
1-Vinyl-2-pyrrolidone
Vinyltoluene
Wintodon granulation
Xanthine
Xanthophyll feed supplement
Xanthosine
Xanthosine-5-phosphate
Xanthydrol
Xylene
ortho-Xylene
para-Xylene
Xylenol
Xylidine
Xylenyl phosphate
Xylose
Yttrium salts
Zinc acetate
Zinc 1,4-phenosulfonate
Zinc stearate
Zinc undecylenate

Plastic Materials and Artificial Resins, as Follows:

Acetal resins
Acrylic acid esters
Acrylic polymers
Acrylonitrile-butadiene-styrene copolymer (ABS resin)
Alkyd resins
Amino resins
Ammonium alginate
Carboxy vinyl polymers, water soluble [1]
Cellulose, chemical derivatives
Cellulose, regenerated
Chlorendic alkyd resins
Chlorinated polyether resins
Composites or laminates n.e.s., containing polyimides, polybenzimidazoles, polyimidazopyrrolones, aromatic polyamides, polyparxylylenes, polyimide-polyamide, silica, quartz, carbon or graphite fibers, polytetrafluoroethylene, polyvinylfluoride, or solid forms of polychlorotrifluoroethylene
Copolymer of tetrafluoroethylene and perfluoroalkyl-vinyl ether
Coumarone-indene resins
Epoxy resins, n.e.s.
Ethylene oxide polymers, water soluble [1]
Ethylene maleic anhydride resins
Ethylene-propylene
Ethylene-vinyl acetate
Flocculating agents [1]
Floor tile and flooring, plastic or plastic composition
Furan resins
High styrene resins masterbatches
Hydroxyvinyl resins
Ion exchange liquids, membranes, and resins

[1] A validated license is required for export of these commodities to the USSR, Estonia, Latvia, and Lithuania.

Ionomer resins
Laminates (including metal-clad) composed of two or more products included in Commodity Interpretation 24
Melamine-formaldehyde resins
Methacrylic acid esters
Methyl methacrylate, n.e.s.
Modified natural resins, including ester gum
Natural rubber, chemical derivatives
Nylon 6, 66, 610, and 612
Pentaerythritol resins
Phenol-formaldehyde adhesive and resins
Phenolic resins, n.e.s.
Phenoxy resins
Pipe and tubing made of, or lined and covered with, fluororcarbon polymers or copolymers, n.e.s.[1]
Polyallomer resins
Polyamide resins, n.e.s.
Polybutadiene resins
Polybutene resins
Polycaprolactone resins
Polycarbonate film, n.e.s.
Polycarbonate resins, molding and extrusion forms
Polychlorotrifluoroethylenem, solid forms
Polydivinylbenzene
Polyester resins, n.e.s.
Polyester tapered filaments
Polyethylene film, sheeting, laminates or wax containing any boron
Polyethyleneimine
Polyethylene, n.e.s.
Polyethylene oxide-based resins
Polyethylene terephthalate film
Polyimide-polyamide resins
Fully cured polyimide or polyimide-based film, sheet, tape, or ribbon having a maximum thickness of 10 mils (0.010 inch or 0.254 mm) whether or not coated or laminated with heat- or pressure-sensitive resinous substances of an adhesive nature, which contain no fibrous reinforcing materials, and which have not been coated or laminated with carbon, graphite, metals, or magnetic substances
Polymethylpentene resins
Polypropylene
Polystyrene
Polysulfone resins, n.e.s.
Polyterpene resins
Polytetrafluoroethylene, coagulated dispersion grades only; polyvinylidenefluoride; the copolymers of tetrafluoroethylene and hexafluoropropylene; and dibromotetrafluorethane having a purity of 99.8 percent or less and containing at least 25 particles of 200 microns or larger in size per 100 ml; and damping, dielectric, or flotation fluids wholly made thereof
Polytetrafluoroethylene, nondispersion grades
Polyurethane resins
Polyvinyl acetal resins
Polyvinyl acetate resins
Polyvinyl alcohol
Polyvinyl butyral
Polyvinyl chloride
Polyvinylidine chloride resins
Polyvinyl ether resins
Polyvinylfluoride
Polyvinyl formal
Polyvinyl pyrrolidone
Potassium alginate
Products, n.e.s., made of flurorcarbon polymers or copolymers [1]
Proteins, hardened
Resorcinol-formaldehyde resins
Silicone diffusion pump fluids having the capacity for producing ultimate pressures of 10^{-8} torr and greater
Silicone rubber and compounds, n.e.s.
Sodium alginate
Styrene-acrylonitrile copolymers
Styrene-butadiene copolymers
Sulfonamide-formaldehyde resins
Urea-formaldehyde resins
Vinylidene chloride acrylonitrile copolymers
Vulcanized fiber

Chemical preparations and compounds, miscellaneous related materials and products, n.e.s., as follows:

Acetone oil
Acid cupric chromate solution
Activated carbon for petroleum or chemical processing
Activated natural mineral products
Additives for fuel oils
Adhesives or cements containing polyimides, polybenzimidazoles, polyimidazopyrrolones, aromatic polyamides, polyparaxylylenes, or polyimide-polyamide, n.e.s.
Albumins, albuminates, and other albumin derivatives
Alkane sulfonic acid; mixed
Alkyl aryl phosphate
Alkyl aryl phthalate blend with alkyl benzene
Alkyl benzenes (detergent alkylates) with straight-chain alkyl groups containing 8 or more carbon atoms
Animal black, except activated
Articles, finished, of artificial plastic materials, n.e.s.
Artificial graphite, n.e.s.
Aryl-modified butyl benzyl phthalate ester
Auxiliary preparations for soldering, brazing, or welding (fluxes, powders, pastes) containing metal and other constituents
Azeotropic mixture of trifluoromethane and monochlorotrifluoromethane (R–503)
Boiler feed water compounds
Boric acid esters
Brewers' tank coating compounds pH Buffer salt and solution mixtures
Calcium lignosulfate
Calcium naphthenate
Carnauba wax, micronized
Calcium sulfate impregnated silica gel adsorbent carbon or graphite fibers, n.e.s.
Casein
Catalysts, n.e.s.
Cementing preparations not of fish, animal or vegetable origin, *the following only:* cementing preparations for pyroxylin watch glasses; film cement with paraffin; floor cement; floor patch, concrete; iron cement; linoleum cement except rubber; linoleum paste except rubber; polishing wheel cement; roofing cement; running board cement; soil pipe cementing preparation; solder glue; automobile top sealer; wall board cementing preparation; thread lubricant and seal compound; acrylic based glues, adhesives, or cement; and tire cut filler
Charges for fire extinguishers
Chemical compounds for manufacturing ice cream
Chill proofing compounds
Chlorinated hydrocarbon wax preparations
Clarifier for beer or ale
Clarifying powder for wines
Collecting reagents (preparations) for concentration of ores, metals, or minerals
Compounds and mixtures of rare earth metals, yttrium, or scandium n.e.s.
Composite solvents, paint removers, thinners, and other similar products, n.e.c.
Concrete hardeners
Concrete plasticizer compounds
Concrete waterproofing compounds
Conversion coating compounds
Copper naphthenate
Corrosion-inhibiting compounds
Cyanoacrylate adhesives and glues
Dental impression compounds and modelling pastes in plates, sticks, and similar forms
Dental plasters and preparations
Dextrins
Diethyl chromium (Chromocene) in toluene
Digestive enzymes (Glycerol Red Bone Marrow)
Diphenyl and diphenyl oxide heat transfer mixtures
N,N-Diphenyl-meta-phenylene-diamine
N,N-Diphenyl-para-phenylene-diamine
Dyeing, tanning, and coloring materials, natural and synthetic, n.e.s.
pH Electrode electrolyte solution mixtures
Epoxy-based adhesives or cements
Essential oils and perfume materials
Esters of saturated aliphatic monohydric alcohols containing more than six carbon atoms with adipic or azelaic or sebacic acids
Esters of dibasic saturated aliphatic acids combined with polyglycols, where one or both of the two constituents contain six or more carbon atoms, or saturated monohydric alcohols with dibasic saturated aliphatic acids where both of the two constituents contain six or more carbon atoms
Esters of trimethylol propane or trimethylol ethane or pentaerythritol with saturated monobasic acids containing more than six carbon atoms
Explosives and pyrotechnic products, n.e.s.
Ferrocerium and other pyrophoric alloys
Film developers
Flocculating agents, n.e.s.[1]
Glues and adhesives of fish, animal, or vegetable origin
Gluten and gluten flour
Glyceride kit MDT
Glycerol stearate
Glyceryl tri-(12-hydroxystearate)
Graphite, artificial and colloidal, n.e.s.
Gum rosin
Gum turpentine
Hat finishing powders
Herbicidal or antiplant preparations, n.e.s.
Hydraulic fluids, oils, and lubricants, n.e.s.
Hydrocarbon N-paraffin mixes
Hydrogenated tallow primary amine
Indicating pastes
Ink conditioners or eradicators
Ink thinners for cellophane printing
Inorganic and organic insecticides, pesticides, defoliants, herbicides, fumigants,

[1] A validated license is required for export of these commodities to the USSR, Estonia, Latvia, and Lithuania.

agricultural chemicals [2] and similar products n.e.s. *except organic phosphate insecticides and pesticidal compounds containing more than 75 per cent by weight of organic phosphates.*
Inulin
Iron oxide suspension
Laundry sour
Lead naphthenate
Leather binding compounds
Lipstick bases and waxes
Magnesium silicate impregnated silica gel adsorbent
Manganese naphthenate
Manufactured fertilizers
Meat curing compounds
Medicinal and pharmaceutical products in bulk, in dosage form, or as preparations, mixtures, or compounds, for human or veterinarian use, n.e.s.
Melamine-formaldehyde or Resorcinol-formaldehyde adhesives and glues
Metal patch solvents
Metallic hardeners for cement floors
Metanephrine
Methyl ethyl ketone peroxide 60 percent solution in dimethyl phthalate
Mineral or vegetable waxes, modified
Mixture of isobutyl ethers of propylene glycol and its homologs
Mixture of n-ethyl ortho and paratoluene ethyl sulfonamide
Mixture of ortho and para toluene sulfonamides
Mixtures or solutions containing two or more of any product included in Commodity Interpretation 24
Molecular sieves, loaded
Molecular sieves, not loaded
Monoglycerides
Natural and man-made staple, tow, fibers, filaments, yarn, fabrics, and made-up articles, clothing, and related products, new, used or waste, n.e.s.
Nickel compound catalysts and other catalysts, n.e.s.
Noncyclic-phosphates (plasticizers) n.e.s.
Nonmetallic mineral manufactures, n.e.s.
Oil-field demulsifying agents [1]
Peptones
Petroleum and petroleum products natural or synthetic, n.e.s.
Photographic chemicals and paper, n.e.s.
Photoresist thinners and rinses, synthetic polymer
Phthalate plasticizer incorporating coesterified mixed alkyl alcohols in the range of $C_7C_9C_{11}$
Pickling preparations for metal surfaces
Pigments, inorganic n.e.s.
Pine oil, *except pine-needle oil*
Platinum plating solutions
Polyether triols of alkylene oxides
Polyethylene glycol plus nitro (STAP)
Polyethylene glycol reacted with 2-nitro terephthalic acid (FFAP)
Polyethylene glycol, solidified
Polonium metal, salts and compounds
Polyester of adipic acid and butylene glycol
Polyester of adipic acid and phthalic acids and propylene glycol
Polymeric isocyanate
Polymeric (modified)-adipic acid
Polysaccharides
Polyvinyl acetate emulsion glues and adhesives
Potassium or sodium soaps of rosins in liquid, paste, or powder form
Prepared additives for petroleum lubricants, n.e.s.
Prepared additives for synthetic lubricants
Prepared brighteners and addition agents used in the following electroplating systems: antimony, arsenic, copper and copper alloy, cadmium, chromium, gold, indium, iridium, iron, lead, and lead alloy, nickel, palladium, platinum, rhodium, ruthenium, silver, tin and tin alloy, and zinc.
Prepared culture media
Prepared anti-knock compounds, n.e.s.
Prepared glazings, dressings, mordants, and sizes
Prepared rubber accelerators and compounding agents
Protein substances, including edible and inedible gelatins
Putty powder
Radioisotopes, cyclotron-produced or naturally occurring, having an atomic number 3 through 83, and compounds and preparations thereof; and stable isotopes and their compounds, n.e.s.
Radium and radium salts, alloys, and compounds
Road binding compounds
Rodenticides, inorganic
Rosin and resin acid derivatives, except ester gums
Rubber compounding chemicals, preparations and compounds, n.e.s.
Rubber thread lubricating compounds
Rust-preventive compounds
Screening pastes
Shark deterrents
Shaving cream bases
Silanized diatomaceous earth
Silica-based refractory core coatings
Silk-stocking savers, tablet form
Silver nitrate impregnated silica gel adsorbent
Soda lime
Sodium biphenyl in dimethoxyethane
Solvents, compounds, cutting fluids, or mixtures, containing less than 95 per cent of Trichlorotrifluoroethane (R–113) or Dichlorotetrafloroethane (R–114)
Starches
Sulfite lye, concentrated
Talc paste
Tall oil
Tall oil resins
Terphenyl resin plasticizer, partially hydrogenated
Terpenic solvents, n.e.s.
Tetrapropylene
Toilet, polishing and cleansing preparations
Ultraviolet light absorbers
Urea formaldehyde adhesives and glues
Urine concentrate
Vegetable pitch and products based thereon or on rosin
Water purifiers
Water softeners
Waxes, greases, lubricants, and damping dielectric, or flotation fluids wholly made of polytetrafluoroethylene, coagulated dispersion grades only; polyvinylidenefluoride; the copolymers of tetrafluoreothylene and hexafluoropropylene; or dibromotetrafluoroethane having a purity of 99.8 percent or less and containing at least 25 particles of 200 microns or larger in size per 100 ml.
Weed killers, consisting primarily of boron compounds
Wood creosote
Wood naphtha
Wood rosins
Wood rosin liquid tire chain solution
Wood tar
Wood tar oils
Wood turpentine

Inorganic chemicals elements, acids, oxides, hydroxides, peroxides, and halogen salts, as follows:

Alumina, n.e.s.
Antimony pentoxide
Antimony trioxide
Argon, *except liquified*
Arsenic disulfide
Arsenic, metallic
Arsenic powder
Arsenic trichloride
Arsenic triiodide
Arsenic trioxide
Artificial corundum (fused aluminum oxide), n.e.s.
Barium hydroxide monohydrate
Barium hydroxide octahydrate
Barium hydroxide pentahydrate
Barium oxide
Barium peroxide
Bismuth trioxide
Boric acids, n.e.s.
Boron, n.e.s.
Cadmium oxide
Carbon black, all forms
Carbon disulfide
Cerium oxide
Chlorine
Chlorine dioxide
Chlorosulfonic acid
Chromic acid
Chromic anhydride
Chromium oxides, anhydrides, and hydroxides, n.e.s.
Copper hydroxide
Copper oxide, black
Copper oxide, red
Dihydrazine sulfate
Ferric hydroxide
Fluosilicic acid
Germanium oxides, hydroxides, and peroxides
Hafnium oxides, n.e.s.
Hexafluorophosphoric acid
Hydrazine hydrate
Hydrazine mixtures containing less than 70 percent of hydrazine equivalent
Hydriodic acid
Hydrobromic acid
Hydrochloric acid
Hydrocyanic acid
Hydrofluoric acid
Hydrogen bromide, anhydrous
Hydrogen chloride
Hydrogen sulfide
Hydroxylamine
Hydroxylamine hydrochloride

[2] A validated license is required for export of phosphate rock and processed phosphatic fertilizers of all concentrations to the U.S.S.R.

[1] A validated license is required for export of these commodities to the U.S.S.R., Estonia, Latvia, and Lithuania.

Hypophosphorous acid
Iodic acid and its salts
Iodine U.S.P. (resublimed)
Iron oxides and hydroxides, n.e.s.
Lead oxides, n.e.s.
Lithium, n.e.s.
Magnesium hydroxide
Magnesium oxide
Magnesium peroxide
Manganese oxides, n.e.s.
Manganic hydroxide
Mercuric oxide, red
Mercuric oxide, yellow
Mercury (quicksilver)
Molybdenum oxides
Monocrystalline gallium compounds, n.e.s.
Monocrystalline and polycrystalline forms of molybdenum or tungsten, n.e.s.
Muriatic acid
Neon, *except liquified*
Nickel oxides, hydroxides, and peroxides
Niobium, n.e.s.
Nitric acid, *except fuming nitric acid*
Nitric oxide
Nitrogen, *except liquified*
Nitrogen pentoxide
Nitrous oxide
Oleum
Oxygen, *except liquified*
Perchloric acid
Phosphomolybdic acid
Phosphoric acid [1]
Phosphoric anhydride
Phosphorus, elemental
Phosphorus oxychloride
Phosphorus pentasulfide
Phosphorus sesquisulfide
Phosphorus trichloride
Phosphorus trisulfide
Polyphosphoric acid
Potassium hydroxides
Potassium peroxide
Rhenium oxides, hydroxides, and peroxides
Rubidium hydroxide
Selenium
Selenium dioxide
Selenium oxychloride
Selenium sulfide
Selenous acid
Silanes
Silica aerogel
Silica, colloidal
Silica, gel
Silica, pyrogenic
Silicic acid
Silicon, n.e.s.
Silicon dioxide, hydrated
Silicon monoxide
Silicon tetrachloride
Silicotungstic acid
Sodium hydroxide, solid and liquid
Sodium peroxide
Strontium hydroxide
Strontium oxide
Strontium peroxide
Sulfamic acid
Sulfur, except crude sulfur
Sulfur dioxide
Sulfuric acid
Sulfur trioxide
Tantalum, n.e.s.
Tantalum-niobium, n.e.s.
Thallium monoxide
Thionyl chloride
Tin oxides
Titanium, n.e.s.
Tungsten trioxide
Tungstic acid
Tungstic oxide
Vanadium pentoxide
Vanadium tetraoxide
Vanadium trioxide
Yttrium metal and powders
Zinc oxides and peroxides, n.e.s.
Zirconium oxides, hydroxides, and peroxides, n.e.s.

Other inorganic chemicals n.e.s., as follows:

Alum, crystallized
Aluminum ammonium sulfate
Aluminum chloride, anhydrous
Aluminum chloride hydrate
Aluminum fluoride
Aluminum fluosilicate
Aluminum hydride
Aluminum nitrate
Aluminum phosphate
Aluminum silicate
Aluminum sulfate
Ammonia alum
Ammonium bicarbonate
Ammonium bifluoride
Ammonium borate
Ammonium bromide
Ammonium carbonate
Ammonium chloride
Ammonium chromate
Ammonium dichromate
Ammonium fluosilicate
Ammonium hexafluoroaluminate
Ammonium iodide
Ammonium metavanadate
Ammonium persulfate
Ammonium phosphate, dibasic
Ammonium phosphate, monobasic
Ammonium polyphosphate
Ammonium reineckate
Ammonium sulfate
Ammonium sulfide
Ammonium tungstate
Antimony pentachloride
Antimony pentafluoride
Antimony trichloride
Antimony trifluoride
Antimony trisulfide
Arsenic pentoxide
Arsenic trioxide
Barium chlorate
Barium carbonate
Barium chloride
Barium cyanide
Barium fluoride
Barium nitrate
Barium phosphate, dibasic or secondary
Barium silicate
Barium thiocyanate
Barium titanate
Bismuth chloride
Bismuth iodide
Bismuth nitrate
Bismuth oxychloride
Bismuth subcarbonate
Bismuth subnitrate
Bismuth sulfate
Bismuth tetraoxide
Bismuth trioxide
Borates, refined
Boron compounds and mixtures, n.e.s.
Cadmium bromide
Cadmium carbonate
Cadmium chloride
Cadmium iodide
Cadmium nitrate
Cadmium sulfate
Calcium bromide
Calcium carbide
Calcium carbonate
Calcium carbonate, precipitated
Calcium chloride
Calcium fluoride
Calcium hydride
Calcium hydroxide
Calcium hypochlorite
Calcium hypophosphite
Calcium iodide
Calcium peroxide
Calcium phosphate
Calcium polysulfide
Calcium pyrophosphate
Calcium silicate
Calcium sulfate
Calcium thiosulfate
Calcium tungstate
Carbic cake
Carbic carbide
Carbide powder, *except abrasive powders*
Cesium bromide
Cesium chloride
Cesium iodide
Cesium sulfate
Chalk, precipitated
Chloroplatinic acid
Chromic chloride
Chromic sulfate
Chromium ammonium sulfate
Chromium potassium sulfate
Cobalt compounds, n.e.s.
Copper alloy containing more than 8 percent phosphor
Copper chloride
Copper cyanide
Copper nitrate
Copper oxychloride
Copper sulfate
Copper sulfate, ammoniated
Cupric bromide
Cupric carbonate, basic
Cupric chloride
Cuprous chloride
Cuprous cyanide
Cuprous iodide
Cuprous sulfide
Cyanogen bromide
Cyanogen chloride
Dicalcium phosphate
Dihydroxyaluminum sodium carbonate
Disodium phosphate
Epsom salts
Ferric ammounium sulfate
Ferric bromide
Ferric hypophosphite
Ferric pyrophosphate
Ferrophosphorous containing 15 percent or more by weight of phosphorous
Ferrous ammonium sulfate
Ferrous carbonate
Ferrous chloride
Ferrous sulfate
Fluoroborates, n.e.s.
Gallium compounds, n.e.s.
Germanium compounds
Gold cyanide
Gold sodium thiosulfate
Gold trichloride
Hafnium compounds, n.e.s.

[1] A validated license is required for export of this commodity to the U.S.S.R.

Hydrogen peroxide, concentrations of less than 85 percent
Hydroxylapatite
Iron chloride
Iron phosphate
Iron sulfate
Iron sulfide, artificial
Lead antimonate
Lead arsenite
Lead iodide
Lead nitrate
Lead silicate
Lead silicate, basic
Lead sulfate
Lead sulfate, basic
Lead sulfate, blue basic
Lead sulfate, tribasic
Lead thiocyanate
Lime bisulfate
Lime, chlorinated
Lime phosphate
Lithium compounds, n.e.s.
Magnesium arsenide
Magnesium carbonate
Magnesium chloride
Magnesium fluosilicate
Magnesium hypophosphite
Magnesium perchlorate
Magnesium phosphate
Magnesium silicate
Magnesium silicofluoride
Magnesium sulfate
Magnesium thiosulfate
Magnesium trisilicate
Magnesium tungstate
Manganese acetate
Manganese carbonate
Manganese hypophosphite
Manganous chloride
Manganous nitrate
Manganous sulfate
Manganous sulfide
Mercuric bromide
Mercuric chloride
Mercuric cyanide
Mercuric iodide
Mercuric nitrate
Mercuric oxycyanide
Mercuric potassium iodide
Mercuric sulfate
Mercuric sulfide, black
Mercuric sulfide, red
Mercuric thiocyanate
Mercurous chloride
Mercurous nitrate, hydrated
Mercurous sulfate
Mercury, ammoniated
Mercury fulminate
Molybdenum salts and compounds
Monocalcium phosphate
Monocalcium sulphate
Nickel ammonium sulfate
Nickel carbonate
Nickel chloride
Nickel nitrate
Nickel phosphate
Nickel sulfate
Niobium (columbium) compounds, n.e.s.
Palladium chloride
Palladium salts and compounds
Pea carbide
Potash alum
Potash magnesia carbonate
Potassium alum
Potassium aluminum sulfate
Potassium arsenite
Potassium bicarbonate
Potassium bisulfate
Potassium bromate
Potassium bromide
Potassium carbonate
Potassium chlorate
Potassium chlorochromate
Potassium chromate
Potassium cyanide
Potassium dichromate
Potassium ferricyanide
Potassium ferrocyanide
Potassium fluoride
Potassium fluosilicate
Potassium gold cyanide
Potassium hypophosphite
Potassium iodate
Potassium iodide
Potassium metabisulfite
Potassium nitrate, particle size greater than 100 microns
Potassium perchlorate
Potassium periodate
Potassium permanganate
Potassium persulfate
Potassium phosphate, dibasic
Potassium phosphate, monobasic
Potassium phosphate, tribasic
Potassium pyrophosphate
Potassium silicate
Potassium stannate
Potassium sulfate
Potassium sulfide
Potassium thiocyanate
Potassium tripolyphosphate
Rhenium compounds
Rubidium iodide
Sal soda
Silanes
Silicon carbide, n.e.s.
Silver chloride
Silver cyanide, industrial
Silver iodide
Silver nitrate
Silver oxide
Silver sulfate
Silver sulfide
Soda alum
Sodium aluminate
Sodium ammonium phosphate
Sodium aluminum sulfate
Sodium aluminum phosphate
Sodium antimonate
Sodium arsenate
Sodium azide
Sodium bicarbonate
Sodium bifluoride
Sodium bisulfate
Sodium bisulfite
Sodium bromide
Sodium carbonate
Sodium carbonate peroxide
Sodium chlorate
Sodium chlorite
Sodium chromate
Sodium cyanide
Sodium dichromate
Sodium ferricyanide
Sodium ferrocyanate
Sodium fluorosilicate
Sodium gold cyanide
Sodium hexafluorosilicate
Sodium hexametaphosphate
Sodium hydride and dispersions
Sodium hydrosulfide
Sodium hydrosulfite
Sodium hypochlorite
Sodium hypophosphite
Sodium iodide
Sodium metabisulfite
Sodium metaphosphate
Sodium metasilicate
Sodium metavanadate
Sodium nitrate
Sodium nitrite
Sodium nitroferricyanide
Sodium orthosilicate
Sodium orthovanadate
Sodium paraperiodate
Sodium perborate
Sodium perchlorate
Sodium periodate
Sodium persulfate
Sodium phosphate
Sodium phosphate, dibasic
Sodium phosphate, monobasic
Sodium phosphate, tribasic
Sodium phosphite
Sodium polyphosphate
Sodium polysulfide
Sodium pyrophosphate
Sodium pyrophosphate, acid
Sodium pyrovanadate
Sodium selenite
Sodium sesquicarbonate
Sodium silicate
Sodium silico aluminate
Sodium stannate
Sodium sulfate
Sodium sulfide
Sodium sulfite
Sodium thiocyanate
Sodium thiosulfate
Sodium trimetaphosphate
Sodium tripolyphosphate
Sodium tungstate
Stannic chloride
Stannous chloride
Stannous sulfate
Strontium bromide
Strontium carbonate
Strontium chloride
Strontium iodide
Strontium nitrate
Strontium sulfate
Tantalum compounds, n.e.s.
Tantalum-niobium compounds, n.e.s.
Theophylline
Titanium carbide
Titanium sulfate
Titanium tetrachloride
Titanium trichloride
Tricalcium phosphate
Vanadium carbide
Vanadyl sulfate
Zinc ammonium chloride
Zinc carbonate
Zinc chloride
Zinc chromate
Zinc cyanide
Zinc hydrosulfite
Zinc nitrate
Zinc oxide, U.S.P.
Zinc phosphate
Zinc phosphide
Zinc silicate
Zinc sulfate
Zinc thiocyanate
Zirconium compounds containing one part or more of hafnium to 500 parts of zirconium by weight
Zirconium carbonate, basic

Zirconium phosphate
Zirconium silicate
Zirconium sulfate

Interpretations 25–26

[*Reserved*]

Interpretation 27: Phosphate Materials Subject to Validated Licensing to the U.S.S.R. and Afghanistan

The commodities described below are included in ECCN 6794F and are subject to the policy set forth in §§ 385.2(e) and 385.4(f).

Schedule B[1] No.	Commodity description
416.3000	Phosphoric acid, other than fertilizer grade
480.4500	Phosphates, crude and apatite
480.7015	Phosphoric acid, less than 65 percent available P_2O_5 equivalents
480.7025	Phosphoric Acid, 65 percent or more available P_2O_5 equivalents
480.7030	Normal and enriched superphosphates
480.7050	Concentrated superphosphates
480.7075	Other superphosphates
480.8005	Diammonium phosphates
480.8010	Monoammonium phosphates
480.8018	Other ammonium phosphates
480.8027, 480.8065.	Other mixed chemical fertilizers containing 1 percent or more P_2O_5

[1] Commodity description, not Schedule B Number, determines the commodity subject to validated licensing.

Interpretation 28: Commodities and Transactions Not Classified According to Kind

The commodities below require a validated license for export to **Country Groups S and Z.**

Bacteria and protozoa, as follows:
1. Bacteria, as follows:
(a) Attenuated or inactivated systems.
(b) Orders and Suborders, *the following only:*
Chlamydobacteiales
Hyphomicrobiales
Caryophanales
Beggiatoales
Myxobacterales
Rhodobacteriineae
(c) Families and Subfamilies, *the following only:*
Nitrobacteraceae
Methanomonadaeae
Thiobacteriaceae
Caulobacteraceae
Siderocapsaceae
Azatobacteraceae
Rhizobiaceae
Brevibacteriaceae
Propionibacteriaceae
Streptomycetaceae
Serratia
(d) Genera, *the following only:*
Acetobacter
Alginomonas
Azotomonas
Mycoplana
Photobacterium
Protaminobacter
Zymomonas
Achromobacter
Agarbacterium
Alcaligenes
Aerobacter
Alginobacter
Paracolobactrum
Methanococcus
Micrococcus
Peptococcus
Sarcina
Veillonella
Eubacterium
Lactobacillus
Leuconostoc
Pediococcus
Mycococcus
Saprospira
Spirochaeta
Grahamella
Anaplasma
Ehrlichia
Neorickettsiella
Symbiotes
Wolbachia
2. Protozoa, as follows:
(a) Classes, *the following only:*
Ciliata
Suctoria
(b) Orders, *the following only:*
Chrysomonadida
Cryptomonadida
Phytomonadida
Euglenoidida
Chloromonadida
Hypermastigida
Proteomyxida
Mycetomyxida
Testacida
Foraminiferida
Heliozoida
Radiolarida
Gregarinida
(c) Families, *the following only:*
Prorocentridae
Cystodiniidae
Pronoctilucidae
Pauchetiidae
Noctilucidae
Polykrikidae
Peridiniidae
Dinophysidae
Multiciliidae
Phalansteriidae
Cadosigidae
Bicosoecidae
Amphimonadidae
Trimastigidae
Streblomastigidae
Pyrsonymphidae
Devesconvinidae
Calonymphidae
Naegleriidae
Amoebidae
Paramoebidae
Selenococcidiidae
Aggregatidae
Dabelliidae
Adeleidae
Ceratomyxidae
Trilosporidae
Myxidiidae
Tetractionomyxidae
Sphaeractionomyxidae
Trisctionomyxidae
Heractionomyxidae
Coccosporidae
Mrazekiidae
Telomyxidae

Interpretation 29: General Industrial Equipment

The commodities listed below require a validated license for export to **Country Groups S and Z.**

General industrial equipment and parts therefor, n.e.s. *the following only:*
Abrasive circulators
Abrasive-coating
Accumulators, hydraulic
Aerators
Agricultural machines and applicances, n.e.s.
Air-conditioning machines, n.e.s.
Air or gas compressors, n.e.s.
Air heaters, portable, fuel, fired, n.e.s.
Armature winding
Assembling fixtures, production, *except for production of military equipment*
Basket-making
Battery-making
Binoculars and telescopes, including astronomical telescopes, n.e.s.
Bituminous pavers, finishers, and spreaders
Blenders
Boiler room specialty tools
Bottling, canning, cleaning, dishwashing, filling, packaging, and sealing machines, n.e.s.
Broom-making
Brush-making
Button covering
Button-making
Cable-making, n.e.s.
Cable spinning
Calendering machines and similar rolling machines, n.e.s.
Candle making
Carpet sweepers, hand
Cattle stunners
Centrifuges, filtering, and purifying machines for liquids, air, and gases, n.e.s.
Cigarette and cigar making and other tobacco processing
Clay guns
Cleaners, ultrasonic, n.e.s.
Cleaning equipment, n.e.s., for magnetic tape and other recording media
Cleaning units, sack
Coil winding for electrical components
Coiling, flexible casing or flexible tube
Color mixing and dispensing
Concrete pavers, finishers, and spreaders
Coolers, evaporative type
Cordage making
Cranes, n.e.s., nonmilitary
Creosoting, wood products
Dehumidifiers, non-freezing
Diving bells or suits, mechanically equipped
Drawing, marking out, calculating, drafting, measuring, and checking appliances and machines, mechanical, nonelectric, or non-electronic, n.e.s.
Environmental chambers, n.e.s.
Excavating, leveling, mining, oilwell drilling, well drilling, construction, and maintenance equipment, n.e.s.[1]
Fans and blowers, n.e.s.
Fermentors
Filament winding, n.e.s.
Filters, ferro-magnetic
Flame arrestors

[1] A validated license is required for export of oil well drilling equipment and oil field wire line and down hole equipment to the USSR, Estonia, Latvia, and Lithuania.

Floor finishers, sanders, scrubbers, and surfacers, industrial type
Flourescent disposal units
Food processing machines
Freeze dryers
Fumigation chambers
Fur-blowing
Fur-treating
Garbage grinders, commercial and industrial
Gas operated welding, cutting, brazing, and surface tempering machines and appliances, n.e.s.
Gas or liquid supply meters, n.e.s.
Gas turbine engines, n.e.s.
Glass working machines, n.e.s.
Grinders and crushers, laboratory
Hand tools, n.e.s.
Hat-blocking and hat-making
Homogenizers, laboratory
Humidifiers, air
Ice breakers
Ice-crusher slingers
Ice saw and drill, combination type, engine driven
Impregnators, non-centrifugal
Incinerators, commercial and industrial
Incubator shalkers
Industrial and laboratory nonelectric furnaces and ovens, n.e.s.
Internal combustion engines, reciprocating
Internal pneumatic line-up clamps for welding transmission line pipe
Lifting, loading, and conveying machines and equipment, n.e.s.
Line-travelling coating and wrapping for pipes and tubes
Linoleum-making
Lubricating
Machinery and equipment, n.e.s., for the manufacturing and assembling of electronic components, n.e.s.
Machines, n.e.s., for processing and working wood, cork, bone, ebonite, glass, plastics, cement products, stone, and similar mineral materials.
Machines, n.e.s., for treatment of a material involving a change in temperature.
Mattress filling
Measureograph for measuring cloth
Mechanical appliances for testing physical properties of industrial materials, n.e.s.
Mechanical instruments, n.e.s., for measurement, transmission, or control of temperature, pressure, or other variables of liquids or gases
Mechanical watches and clocks
Metal finishing, chemical
Metallurgical, mill, and foundry equipment, n.e.s.
Metering and mixing, n.e.s.
Microscopes, except electron and proton, n.e.s.
Nutters
Office machines, n.e.s.
Oil field wire line and downhole equipment [1]
Optical elements and appliances, n.e.s.
Paint markers and mixers
Paper making machinery
Photoprinters, n.e.s.
Pin ticketing (tag-to-product applying)
Pipe line cleaning
Plastic working, n.e.s.
Power sweepers
Power transmission equipment, n.e.s.
Presses, n.e.s.
Printed circuit board laminating presses and lead masters
Printing machines, n.e.s.
Proportioning, mixing, and dispensing resins
Pulsating dampeners
Pumps for liquids, n.e.s.
Reels, hose and cable, power operated
Refractory injection guns
Refrigerant charging apparatus, automatic
Refrigeration equipment, n.e.s.
Ribbon coiling
Roller coaters, n.e.s.
Rope-making
Rubber extruding and processing
Rubber products manufacturing, n.e.s.
Searchlights and spotlights
Shaking machines, laboratory
Shock absorbers, mechanical or hydraulic
Shoelace tipping
Smoke generators, *except military*
Snow throwers, self-propelled
Soldering, automotive wave and reflow type
Sonic sewing machines
Special purpose industrial vehicles, n.e.s., non-military, *e.g.*, cement mixers, street and airfield cleaning, asphalt mixers, seismograph thumper mounted trucks, mine shuttle vehicles, trucks with derrick assembly and similar equipment for drilling, mounted integral to truck frame, etc.
Spinning
Spraying machines, n.e.s.
Steam cleaning
Steam generating power boilers, engines, and turbines, n.e.s.
Stone products manufacturing
Surgical dressing making
Surveying, hydrographic, meteorological, hydrological, and geophysical instruments, n.e.s.
Sweepers, road
Tank-cleaning
Tanks with agitators
Taping machines for covering wire and cable
Textile and leather working machines, n.e.s.
Tire building, recapping, and repairing
Toothbrush manufacturing
Track press for repairing tractor crawlers or tracks
Transfer machines, nonmetalworking, *except for assembling, gauging, or packing of munitions*
Tube cleaners
Tube expanders, maintenance type
Typemaking and typesetting machines, n.e.s.
Vacuum cleaners
Valves, plumbing fixtures, cocks, and taps, n.e.s.
Vegetable oil mill
Vibrating paper joggers
Vibrators, hydraulic
Wall-board plaster core
Watch-cleaning
Water bath shakers
Watercraft controls, nonelectric, *except military* (for example, steering equipment excluding rudders and remote controls)
Water turbines, water engines, wind, and hot air engines
Wax molding
Waxing, industrial
Weed cutting, underwater
Weighing machines
Welders, plastic, ultrasonic
Welding machines, n.e.s.
Welding rod brushing and feeders
Wheel tractors, including garden, log skidders, and contractors earthmoving types, n.e.s.
Wind tunnels, subsonic
Winding, n.e.s.
Windshield wipers, nonelectric
Wire braiding, wire rope-making, wire stitching, and measuring, stripping, cutting, and terminal attaching
Zipper manufacturing

[1] A validated license is required for export of oil well drilling equipment and oil field wire line and down hole equipment to the U.S.S.R., Estonia, Latvia and Lithuania.

Interpretation 30: Petroleum and Natural Gas Exploration and Production Equipment

The following is an illustrative list of petroleum and natural gas exploration and production equipment subject to validated license control for export to the USSR, Estonia, Latvia, and Lithuania. This list is illustrative only. It does not include all commodities which are covered by CCL entry Nos. 6191, 6391, and 6598.

(1) All equipment related to off-shore floating or bottom-supported drilling and producing structures, including all gathering equipment.

(2) Production and pipeline equipment designed for use in Arctic regions and the Polar Seas.

(3) Rotary type well drilling rigs and derricks.

(4) Parts, accessories, and equipment for well drilling machines, including, but not limited to, drill bits, box and pin tool joints, drill pipe, drill collars, rotary tables, and blow-out preventors.

(5) Petroleum gas-lift equipment.

(6) Oil well and oil field pumps, including, but not limited to, high performance types of submersible or conventional pumping units.

(7) Pipeline valves for oil and gas pipelines and high pressure steel hoses, pipes, and connections.

(8) Wire line and down-hole equipment and accessories, including, but not limited to, collars, stabilizers, mandrels, packers, multicompletion equipment, gun perforators, and telemetry equipment.

(9) Optical, electrical, or electronic geophysical and mineral prospecting instruments, including magnetic, gravity, seismic, bore-hole logging and high-resolution remote sensing equipment.

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