STATUTORY INSTRUMENTS

1981 No. 1641

CUSTOMS AND EXCISE

The Export of Goods (Control) Order 1981

Made - - - - 17th November 1981

Coming into Operation 23rd December 1981

The Secretary of State, in exercise of powers conferred by section 1 of the Import, Export and Customs Powers (Defence) Act 1939(a) and now vested in him (b), and of all other powers enabling him in that behalf, hereby makes the following Order:

Citation, commencement and interpretation

1.—(1) This Order may be cited as the Export of Goods (Control) Order 1981 and shall come into operation on 23rd December 1981.

(2) In this Order, unless the context otherwise requires—

"Commissioners" means the Commissioners of Customs and Excise;

"country" includes territory;

"goods", unless otherwise specified, means both used and unused goods;

"hovercraft" has the same meaning as in section 4(1) of the Hovercraft Act 1968(c);

"international import certificate" means a certificate issued by the Secretary of State for the purposes of this Order or any Order revoked by this Order certifying that an importer has undertaken with the Secretary of State to import into the United Kingdom the goods specified in the certificate or to deal with them in such other manner as is authorised by a licence granted under this Order;

"importation" and "exportation" in relation to a ship or aircraft includes the taking into or out of the United Kingdom of the ship or aircraft notwithstanding that the ship or aircraft is conveying goods or passengers, and whether or not it is moving under its own power; and cognate expressions shall be construed accordingly;

"member State" means a member State of the European Communities;

"scheduled goods" means goods of a description specified in Schedule 1 hereto and any reference to such goods being indicated by a letter shall be taken as a reference to the goods being so indicated in Schedule 1 hereto;

"scheduled journey" means one of a series of journeys which are undertaken between the same two places and which together amount to a systematic service operated in such a manner that the benefits thereof are available to members of the public from time to time seeking to take advantage of it;

(a) 1939 c. 69.
(b) *See* S.I. 1970/1537.
(c) 1968 c. 59.

"ship" includes the hull or part of the hull of a ship;

a prohibition on exportation means a prohibition on exportation from the United Kingdom and shall include a prohibition on shipment as ships' stores;

numerical references in Schedule 1 hereto to British Standards are references to the standards so numbered published by the British Standards Institution in the year indicated after such references with such amendments (if any) thereto as may have been made before the making of this Order;

reference in Schedule 1 hereto to percentages of the contents of any goods are references to percentages by weight;

any description of goods in Group A of Part I of Schedule 1 hereto in relation to a Tariff heading number, other than one covering a whole heading, shall be taken to comprise all goods which would be classified under an entry in the same terms constituting a subheading in the relevant heading in the common customs tariff of the European Economic Community **(a)**.

Prohibition and restrictions on exportation

2. Subject to the provisions of this Order—

(i) scheduled goods indicated by the letter "A" are prohibited to be exported to any destination;

(ii) scheduled goods indicated by the letter "T" are prohibited to be exported to any destination except that when in relation to such goods the provisions of Regulation (EEC) 223/77**(b)**, as amended by Regulation (EEC) 1601/77**(c)**, relating to the use of Community transit documents requiring anything to be done at or before the time of exportation have been complied with, the goods may be exported to a destination in another member state;

(iii) scheduled goods indicated by the letter "E" are prohibited to be exported to any destination except a destination in another member State;

(iv) scheduled goods indicated by the letter "C" are prohibited to be exported to any destination except a destination in any country named, or included in a country named, in Schedule 2 hereto;

(v) scheduled goods consisting of classes of ships indicated by the letter "S" are prohibited to be exported to any destination after delivery, or for the purpose of delivery, directly or indirectly, to a person in Albania, Bulgaria, China, Czechoslovakia, the German Democratic Republic, Hungary, Democratic Kampuchea, the Lao People's Democratic Republic, Mongolia, North Korea, Poland, Romania, the Union of Soviet Socialist Republics and the Socialist Republic of Vietnam;

(vi) all goods in relation to the export of which from any country an international import certificate has been issued and which have been imported into the United Kingdom are prohibited to be exported to any destination; and

(vii) specialised parts and components of any of the apparatus, appliances or equipment falling within a description in Group 1 of Part II of Schedule 1, whether or not such parts and components are specified in the description, are prohibited to be exported to any destination in South Africa or Namibia.

(a) *See* Council Regulation (EEC) No. 3000/79 O.J. No. L342, 13.12.79 amending Regulation (EEC) No. 950/68.

(b) O.J. No. L38, 9.2.77, p. 1. **(c)** O.J. No. L182, 22.7.77, p. 1.

Exceptions

3. Nothing in Article 2 of this Order shall be taken to prohibit the exportation of—

Licensed exports and permitted ships stores

(*a*) any goods under the authority of a licence granted by the Secretary of State, or the shipment of any goods as ships' stores with the permission of the proper officer of Customs and Excise at the port of departure for use on board the ship, provided that all conditions attaching to the said licence or the said permission are complied with;

Channel Islands

(*b*) any goods other than goods of a description included in Group B of Part I of Schedule 1 hereto or in Group 1 of Part II of the said Schedule, to any destination in the Channel Islands;

Samples

(*c*) trade samples of any goods, except goods of a description included in Group 1 of Part II of Schedule 1 hereto, if the samples have no saleable value;

Aircraft

(*d*)(i) any aircraft which is being exported after temporary importation into the United Kingdom, provided that there has been no change of ownership or registration since such importation;

(ii) any aircraft engaged on a scheduled journey;

Cocoa

(*e*) cocoa beans, whole or broken, raw or roasted, and the following cocoa products namely cocoa paste (in bulk or block) whether or not defatted, cocoa butter (fat or oil) and unsweetened cocoa powder to any destination if there is produced to the proper officer of Customs and Excise at the place of export the appropriate certificate prescribed for this purpose by the economic and control rules and transitional arrangements of the International Cocoa Agreement 1980(**a**) which were adopted by the International Cocoa Council on 7th August 1981 and were set out in the annex to Regulation (EEC) 2818/81(**b**);

Firearms and Ammunition

(*f*) firearms and ammunition to any destination other than a destination in South Africa or in Namibia, not being goods of a description included in Group B of Part I of Schedule 1 hereto, authorised to be held by a valid firearm certificate or shot gun certificate granted or having effect as if granted under the Firearms Act 1968(**c**) or by a valid firearm certificate granted in Northern Ireland under the Firearms Act (Northern Ireland) 1969(**d**) or granted in the Isle of Man under the Firearms Act 1947 (an Act of Tynwald)(**e**) and forming part of the personal effects of the holder, if the certificate is produced by the holder, or his duly authorised agent, with the firearms and ammunition to the proper officer of Customs and Excise at the place of export;

(**a**) Cmnd. 8226.
(**b**) O.J. No. L279, 1.10.81.
(**c**) 1968 c. 27.
(**d**) 1969 c. 12 (N.I.).
(**e**) Acts of Tynwald 1947 p. 586.

Hovercraft

(*g*) hovercraft engaged on a schedule journey;

Live Animals of the Bovine Species, Swine and Sheep

(*h*)(i) any live animal if the place of export is Great Britain;

(ii) live animals of the bovine species, live swine and live sheep from Northern Ireland to the Republic of Ireland;

Ships

(*i*) (i) any ship registered or constructed outside the United Kingdom which is being exported after temporary importation into the United Kingdom;

(ii) any ship which is departing from the United Kingdom on trials.

Customs powers to demand evidence of destination which goods reach

4. Any exporter or any shipper of goods which have been exported from the United Kingdom shall, if so required by the Commissioners, furnish within such time as they may allow proof to their satisfaction that the goods have reached either—

(i) a destination to which they were authorised to be exported by a licence granted for the purposes of this Order, or

(ii) a destination to which their exportation was not prohibited by this Order;

and, if he fails to do so, he shall be liable to a customs penalty not exceeding one thousand pounds unless he proves that he did not consent to or connive at the goods reaching any destination other than such a destination as aforesaid.

Offences in connection with applications for licences, etc.

5. If for the purpose of obtaining any international import certificate or of obtaining any licence or permission under this Order for the exportation or shipment as ships' stores of any goods any person makes any statement or furnishes any document or information which to his knowledge is false in a material particular or recklessly makes any statement or furnishes any document or information which is false in a material particular he shall be guilty of an offence and liable on summary conviction to a fine not exceeding one thousand pounds and on conviction on indictment to a fine or imprisonment for a term not exceeding 2 years, or to both; and any licence or permission which may have been granted for the exportation or shipment as ships' stores of any goods, in connection with the application for which the false statement was made or the false document or information furnished, shall be void as from the time it was granted.

Declaration as to goods: powers of search

6.—(1) Any person who, on any occasion, is about to leave the United Kingdom shall, if on that occasion he is required to do so by an officer of Customs and Excise—

(*a*) declare whether or not he has with him any goods the export of which from the United Kingdom is subject to any prohibition or restriction under this Order; and

(*b*) produce any such goods as aforesaid which he has with him;

and such officer, and any person acting under his direc'ions, may search that person for the purpose of ascertaining whether he has with him any such goods as aforesaid:

Provided that no person shall be searched in pursuance of this paragraph except by a person of the same sex.

(2) Any person who without reasonable excuse refuses to make a declaration, fails to produce any goods or refuses to allow himself to be searched in accordance with the foregoing provisions of this Article shall be guilty of an offence and liable to a customs penalty not exceeding five hundred pounds.

(3) Any person who under the provisions of this Article makes a declaration which to his knowledge is false in a material particular or recklessly makes any declaration which is false in a material particular shall be guilty of an offence and liable on summary conviction to a customs penalty not exceeding one thousand pounds and on conviction on indictment to a customs penalty of any amount or imprisonment for a term not exceeding two years, or to both.

Overlapping descriptions

7. Where any goods fall within more than one description specified in Schedule 1 hereto and at least one description is specified in Group B of Part I or in Part II and the goods are indicated in that Schedule by more than one of the letters specified in Article 2 those goods shall be deemed to fall only within the prohibition in the paragraph first-mentioned in Article 2 relating to the goods.

Modification and revocation of licences, etc.

8.—(1) Any international import certificate or licence granted by the Secretary of State in pursuance of Article 2(vi) or 3(*a*) or having effect as if so granted may be modified or revoked by him at any time.

(2) Any permission granted by the proper officer of Customs and Excise for the shipment of any goods as ships' stores may be modified or revoked by such officer at any time.

Revocations etc.

9. The Arms Export Prohibition Orders 1931-37(**a**) are hereby suspended and the Orders specified in Schedule 3 hereto are hereby revoked:

17th November 1981.

P. M. S. Corley,
An Under Secretary,
Department of Trade.

(**a**) S.R. & O. 1931/413, 1937/525.

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SCHEDULE 1 Article 1(2)

PART I

GROUP A

GOODS SPECIFIED BY REFERENCE TO HEADINGS IN THE COMMON CUSTOMS TARIFF OF THE EUROPEAN ECONOMIC COMMUNITY

Note. Goods of any description falling within Chapter 73 of the said tariff and expressed in this Group to be subject to rule (1) or rule (2) are excluded from the scope of the description in question if they have all three of the characteristics respectively specified below in relation to those rules:

Rule (1)

(i) They are in a straightened state.

(ii) They are free from attachments (including bolts and rivets).

(iii) They have one dimension not less than 1·50 m.

Rule (2)

The characteristics specified in rule (1) above, but with the substitution of "2·50 m" for "1·50 m" in characteristic (iii).

Tariff Heading No.	*Description of Goods*	
01.02	Live animals of the bovine species	A
01.03	Live swine	A
ex 01.04	Live sheep	A
18.01	Cocoa beans, whole or broken, raw or roasted	E
18.03	Cocoa paste (in bulk or block), whether or not defatted	E
18.04	Cocoa butter (fat or oil)	E
18.05	Cocoa powder, unsweetened, otherwise than in retail packs each of less than 3·5 kg	E
ex 26.03	Ash and residues, containing copper	T
ex 72.01	Coins of silver alloy of the United Kingdom minted before 1947, but not more than 100 years old at the date of exportation, exported in a quantity exceeding 10 in number	A
73.03	Waste and scrap metal of iron or steel (ECSC)	T
ex 73.09	Used universal plates, of iron or steel (ECSC), subject to rule (1) above	T
ex 73.10	Unused bars and rods (including wire rod), of iron or steel, less than 0·9 m in length	E
ex 73.10	Used bars and rods (including wire rod), of iron or steel; and used hollow mining drill steel; subject to rule (1) above	T
ex 73.11	Unused angles, shapes, sections and sheet piling, of iron or steel, less than 0·9 m in length	E
ex 73.11	Used angles, shapes, sections and sheet piling, of iron or steel, subject to rule (1) above	T
ex 73.12	Unused hoop and strip (except in coiled form), of iron or steel, of which any dimension of the surface area is less than 0·45 m	E
ex 73.12	Used hoop and strip, of iron or steel, subject to rule (1) above	T
ex 73.13	Unused sheets and plates, of iron or steel, of which any dimension of the surface area is less than 0·45 m	E
ex 73.13	Used sheet and plates, of iron or steel, subject to rule (1) above	T
ex 73.14	Used wire, whether or not coated, but not insulated, of iron or steel, subject to rule (1) above	T

Tariff Heading No.	*Description of Goods*	
ex 73.15	Unused alloy steel and high carbon steel products in the forms mentioned in headings Nos. 73.10 and 73.11, less than 0·9 m in length	E
ex 73.15	Unused alloy steel and high carbon steel products in the forms mentioned in headings Nos. 73.12 (except in coiled form) and 73.13, of which any dimension of the surface area is less than 0·45 m	E
ex 73.15	Alloy steel waste or scrap in ingot form	T
ex 73.15	Used alloy steel and high carbon steel products in the forms mentioned in headings Nos. 73.09 to 73.14 (inclusive), subject to rule (1) above	T
ex 73.16	Used railway and tramway track construction material, of iron or steel, the following:—	
	Switch blades, crossings (or frogs), crossing pieces, point rods, rack rails, sleepers, fish-plates, chairs, chair wedges, sole plates (base plates), rail clips, bedplates, ties and other material specialised for joining or fixing rails, subject to rule (1) above	T
ex 73.16	Used steel rails and check-rails, subject to rule (2) above	T
ex 73.18	Used tubes and pipes, of iron or steel, and blanks therefor (except of cast iron), excluding high-pressure hydro-electric conduits, subject to rule (1) above	T
ex 73.19	Used high-pressure hydro-electric conduits, of steel, whether or not reinforced, subject to rule (1) above	T
ex 74.01	Copper waste and scrap	T
ex 76.01	Aluminium waste and scrap	T
ex 78.01	Lead waste and scrap	T

GROUP B

PHOTOGRAPHIC MATERIAL, ANTIQUES, COLLECTORS' ITEMS, ETC.

Any photographic positive or negative produced more than 60 years before the date of exportation, the value of which, as required by the Commissioners to be declared, is £200 or more, except any photographic positive or negative exported by, and being the personal property of, the manufacturer or producer thereof, or the spouse, widow or widower of that person ..... A

Any goods manufactured or produced more than 50 years before the date of exportation ..... A

except

(1) photographic positives and negatives;

(2) postage stamps and other articles of philatelic interest;

(3) birth, marriage or death certificates or other documents relating to the personal affairs of the exporter or the spouse of the exporter;

(4) letters or other writings written by or to the exporter or the spouse of the exporter; and

(5) any goods exported by, and being the personal property of, the manufacturer or producer thereof, or the spouse, widow or widower of that person.

PART II

GROUP 1

Note. Goods specified in the heads of this Group may also be specified in Groups 3F and 3G of this Part of this Schedule.

Aircraft, Arms and related materiel, Ammunition, Military Stores and Appliances, and Para-military Police Equipment

Acoustic devices represented by the manufacturers or suppliers thereof as suitable for riot control purposes, and specialised parts and components therefor .... A

Aircraft, assembled or dismantled, aircraft engines and parts and components for aircraft and aircraft engines, the following:—

(1) Aircraft and helicopters, of the piloted or pilotless type, specially designed or adapted for military purposes ..... A

(2) Other helicopters over 4,530 kg empty weight ..... A

(3) Aircraft and helicopters, not specified in heads (1) and (2) above, and having a maximum all-up weight of 680 kg or more, incorporating or equipped with equipment specified in this Group or in the entries in Group 3 relating to communication, navigation, direction-finding and radar equipment, or to compasses and gyroscopic apparatus ..... A

(4) Aircraft engines and helicopter engines, specially designed for military purposes ..... A

(5) Aircraft engines and helicopter engines, not specified in head (4) above . A

(6) Specialised parts and components for aircraft, helicopters, or aircraft engines and helicopter engines, specified in heads (1) to (5) above (inclusive) ..... A

Anti-riot shields and parts and components therefor ..... A

Apparatus and appliances specially designed for use in aircraft, the following:—

(1) Anti-**g** suits ..... A

(2) Anti-**g** valves ..... A

(3) Crash helmets ..... A

(4) Ejection seats and catapults and cartridges therefor ..... A

(5) Liquid oxygen converters ..... A

(6) Partial pressure suits ..... A

(7) Pressurised breathing apparatus ..... A

Appliances for use with arms and apparatus specially designed and intended for land, sea or aerial warfare ..... A

Appliances, mechanical, designed to produce smoke for military purposes .... A

Armour, the following:—

(1) Armour plate made wholly or mainly of metal ..... A

(2) Panels, whether or not of metal, specially designed to be bullet resistant A

Arms and ammunition and parts and components therefor, the following:—

(1) Small arms, machine guns and smooth bore guns, the following:

(*a*) carbines, pistols (including machine pistols), revolvers, rifles and smooth bore guns, except air weapons (other than those declared by the Firearms (Dangerous Air Weapons) Rules 1969 to be specially dangerous) ..... A

(*b*) machine guns, interrupter gears and mountings for machine guns A

(2) Artillery and projectors, the following:

(*a*) cannon, guns, howitzers, military flame throwers, mortars, recoilless

rifles, projectile launchers, rocket launchers, rocket projectors, tank destroyers ..... A

(*b*) carriages and mountings and accessories for mountings for items mentioned in sub-head (*a*) above ..... A

(*c*) military smoke, gas and pyrotechnic projectors ..... A

(3) Ammunition, including projectiles, for any of the weapons mentioned in heads (1) or (2) of this entry ..... A

(4) Parts and components for any of the foregoing specified in heads (1) to (3) above (inclusive) ..... A

Bayonets and parts and components therefor ..... A

Bombs, mines, missiles, guided or unguided, rockets, torpedoes, demolition charges, pyrotechnic flare signals, apparatus designed for use therewith, and parts and components therefor, the following:—

(1) Bombs, torpedoes, grenades (including smoke grenades), smoke canisters, rockets, mines, missiles (guided or unguided), depth charges, fire bombs, incendiary bombs; military demolition charges and kits; and pyrotechnic flare signals for military use, cartridges therefor and simulators thereof ..... A

(2) Apparatus and devices specially designed for the handling, control, activation, launching, laying, sweeping, clearing, discharging, detonation or detection of items mentioned in head (1) of this entry ..... A

(3) Parts and components for any of the foregoing ..... A

Bullet-proof clothing ..... A

Centrifugal equipment specially designed for the testing of any item included in this Group ..... A

Charcoal impregnated bonded fibre clothing specially designed to protect personnel against radioactive, biological or chemical agents in the atmosphere .... A

Construction equipment built to military specifications, specially designed for airborne transport ..... A

Decontamination kits for use following contamination of personnel or objects by any of the noxious chemicals specified in this Group ..... A

Devices designed for the detection of the noxious chemicals specified in this Group A

Devices for firing booby traps ..... A

Diving and under-water swimming apparatus, self-contained, of the closed circuit or semi-closed (re-breathing) types, and articles specially designed for use therewith ..... A

Electrically triggered shutters of the carbon injection or photochromic function type having a shutter speed of less than 100 microseconds, except shutters specially designed for high speed cameras ..... A

Electronic, chemical and other timer-delay devices designed for the detonation of explosive charges and munitions ..... A

Electronic equipment specially designed for military use and parts and components therefor ..... A

Equipment specially designed for ground functional testing of the hydraulic systems of military aircraft ..... A

Explosives, propellants and related substances, the following:—

(1) (*a*) ammonium perchlorate ..... A

(*b*) cellulose nitrate (in dry or wetted form) with a nitrogen content of more than 12·2% ..... A

(*c*) dinitrophenol (in dry or wetted form) ..... A

(*d*) guanidinium nitrate ..... A
(*e*) hydrazine and its derivatives, the following:
(i) *asym*Dimethylhydrazine ..... A
(ii) *sym*Dimethylhydrazine ..... A
(iii) hydrazine in concentrations of 70% or more ..... A
(iv) hydrazinium nitrate ..... A
(v) hydrazinium perchlorates ..... A
(vi) methylhydrazine ..... A
(*f*) hydrogen peroxide in concentrations of 85% or more ..... A
(*g*) nitric acid, red fuming, containing dissolved nitrogen dioxide .... A
(*h*) perflouroguanidines ..... A
(*i*) picrates (in dry or wetted form) ..... A
(*j*) stabilisers for explosives, the following:
(i) *sym*Diethyldiphenylurea (centralite 1) ..... A
(ii) *sym*Dimethyldiphenylurea (centralite 2) ..... A
(iii) *asym*Diphenylurea ..... A
(iv) ethyldiphenylcarbamate ..... A
(v) ethyl*asym*diphenylurea ..... A
(vi) ethyl di-*o*-tolylcarbamate ..... A
(vii) ethyl N-ethylphenylcarbamate ..... A
(viii) methyl*asym*diphenylurea ..... A
(ix) 2-nitrodiphenylamine ..... A
(x) N-methyl-*p*-nitroaniline ..... A

(2) Chemical base high energy solid or liquid fuels, including aircraft fuels, specially formulated for military purposes ..... A

(3) Explosives, not elsewhere specified, as defined in Section 3 of the Explosives Act 1875, except those specially designed for toys, novelty goods and display fireworks ..... A

Fire-control, range-finding and sighting apparatus, the following:—

(1) Fire-control, gun-laying, night-sighting, missile-tracking and guidance apparatus ..... A

(2) Range, position and height-finders, and spotting instruments specially designed for military purposes ..... A

(3) Aiming devices, electronic, gyroscopic, acoustic and optical, specially designed for military purposes ..... A

(4) Bomb sights, bombing computers, gun sights and periscopes specially designed for military purposes ..... A

(5) Television sighting units specially designed for military purposes ..... A

(6) Parts and components for any of the foregoing ..... A

(7) Telemetering and telecontrol apparatus suitable for use with aircraft (piloted or pilotless), missiles (guided or unguided) or space vehicles (guided or unguided) and specialised test equipment therefor ..... A

Fuses and parts and components therefor ..... A

Gas masks, respirators and similar protective devices, and face-pieces and filter canisters therefor ..... A

Gilding metal clad steel ..... A

Gun forgings, rough ..... A

Gun turrets, including barbettes, and parts and components therefor ..... A

Hovercraft, the following:—

(1) Hovercraft, assembled or dismantled ..... A

(2) Engines for hovercraft ..... A

(3) Specialised parts and components for any of the foregoing ..... A

Kine-theodolites ..... A

Metal-cutting and working tools for machine operations, the following:—

(1) Gun barrel rifling broaches ..... A

(2) Small arms deep hole drills or bars ..... A

Military steel helmets ..... A

Military infra-red equipment and image-intensifier equipment, and specialised parts and components therefor ..... A

Naval equipment, the following:—

(1) Accumulators (electric storage batteries) of a kind used in the propulsion of submarines, and parts thereof, the following:

(*a*) accumulators, lead acid ..... A

(*b*) containers ..... A

(*c*) covers ..... A

(*d*) plates and grids ..... A

(*e*) separators ..... A

(2) Cables, buoyant or near buoyant ..... A

(3) Catapults and other similar aircraft launching gear ..... A

(4) Compasses and ship's course indicators, specially designed for submarines A

(5) Diesel engines of 1,500 brake horse power and over with rotary speed of 700 rev/min or over, specially designed for submarines ..... A

(6) Electric motors over 1,000 brake horse power, quick reversing type, liquid cooled and totally enclosed, specially designed for submarines ... A

(7) Gunmountings and parts and components therefor ..... A

(8) Marine boilers having either of the following characteristics:

(*a*) a heat release rate (at maximum rating) equal to or in excess of 2,000 kW per hour per cubic metre of furnace volume ..... A

or

(*b*) a ratio of steam generated in kg/h (at maximum rating) to the dry weight of the boiler in kg equal to or in excess of 0·83 ..... A

(9) Nets, anti-submarine and anti-torpedo ..... A

(10) Non-magnetic diesel engines capable of developing 50 brake horse power and over, specially designed for military purposes and having:

(*a*) non-magnetic parts other than crank-case, block, head, pistons, covers, end plates, valve facings, gaskets, and fuel, lubrication and other supply lines ..... A

or

(*b*) a non-magnetic content exceeding 75% of their total weight ..... A

(11) Periscopes, submarine ..... A

(12) Torpedo aiming, control or loading apparatus, torpedo tubes and other apparatus for discharging torpedoes ..... A

(13) Underwater detecting devices specially designed for military purposes, magnetic, pressure or acoustic, and controls and parts and components therefor ..... A

Noxious chemicals, the following:—

(1) Bromobenzyl cyanide ..... A
(2) *o*Chlorobenzylidenemalononitrile (*o*Chlorobenzalmalononitrile) ..... A
(3) *mono*Chloromethyl chloroformate ..... A
(4) 2-Chlorotriethylamine ..... A
(5) Dibenzoxazepine ..... A
(6) Dibromodimethyl ether ..... A
(7) Dichlorodimethyl ether ..... A
(8) 2:2'-Dichlorotriethylamine ..... A
(9) Diphenylaminechloroarsine ..... A
(10) Diphenylchloroarsine ..... A
(11) Diphenylcyanoarsine ..... A
(12) Ethyl NN-dimethylphosporamidocyanidate ..... A
(13) Ethyldibromoarsine ..... A
(14) Ethyldichloroarsine ..... A
(15) Lewisite (chlorovinyldichloroarsine and dichlorodivinylchloroarsine) A
(16) Methyldichloroarsine ..... A
(17) Mustard gas (dichlorodiethyl sulphide) ..... A
(18) Phenylcarbylamine chloride (phenylaminocarbonyl chloride) ..... A
(19) Phenylacyl chloride (*w*-Chloroacetophenone) ..... A
(20) Phenyldibromoarsine ..... A
(21) Phenyldichloroarsine ..... A
(22) Pinacolyl methylphosphonofluoridate ..... A
(23) *iso*Propyl methylphosphonofluoridate ..... A
(24) 2:2':2" Trichlorotriethylamine ..... A

Parachutes ..... A

Photographic instruments and appliances, the following:—

(1) Cameras, the following:
(*a*) of the kind specially designed for aerial survey or reconnaisance . A
(*b*) gun cameras, aircraft ..... A
(*c*) other cameras and devices for recording on film which are specially designed for military use ..... A
(*d*) specialised parts and components for any of the cameras specified in sub-heads (*a*) to (*c*) above (inclusive) ..... A
(2) Machines of the kinds specially designed for the continuous processing of photographic film or paper of a width of 50 mm or more ..... A

Portable anti-riot devices for administering an electric shock or an incapacitating substance, and specialised parts and components therefor ..... A

Refuelling apparatus and appliances, for military aircraft, the following:—

(1) Aircraft pressure-refuellers and aircraft refuellers, open circuit ..... A
(2) Pressure-refuelling hose-end couplings or units and pressure-control or flow-control valves of the kind specially designed for aircraft pressure-refuelling ..... A
(3) Ring-main dispensers, aircraft servicers or other appliances incorporating any of the articles mentioned in head (2) of this entry ..... A

Refuelling apparatus and appliances for missiles, guided or unguided ..... A

Rocket-assisted take-off apparatus and parts and components therefor ..... A

Rocket motors and parts and components therefor ..... A

Searchlight control units ..... A

Searchlights, power-controlled, of which the reflectors have a diameter of 50 cm or more ..... A

Ships of war, designed for offensive or defensive action (surface or under-water) whether or not converted to non-military use ..... A

Silencers and telescopic sights, for firearms ..... A

Specialised machinery, equipment and gear specially designed for the examination, manufacture, testing and checking of the arms, ammunition, appliances and machines referred to in this Group, including but not limited to the following:—

(1) Armour plate drilling machines, other than radial drilling machines .. A
(2) Armour plate planing machines ..... A
(3) Armour plate quenching presses ..... A
(4) Artillery casting machines ..... A
(5) Bomb copy boring lathes ..... A
(6) Bomb nose and tail boring machines ..... A
(7) Bomb nose and tail forging machines ..... A
(8) Bomb spinning lathes ..... A
(9) Bullet assembling (multipunch) machines ..... A
(10) Bullet canneluring machines ..... A
(11) Bullet core filling machines ..... A
(12) Bullet cutting and cupping machines ..... A
(13) Bullet drawing machines ..... A
(14) Bullet gauging machines ..... A
(15) Bullet lead forming machines ..... A
(16) Bullet pointing, forming and sizing machines ..... A
(17) Bullet trimming machines ..... A
(18) Bullet weighing machines ..... A
(19) Cartridge automatic loading machines ..... A
(20) Cartridge cap cutting and cupping machines ..... A
(21) Cartridge cap varnishing machines ..... A
(22) Cartridge case presses ..... A
(23) Cartridge case flash-hole drilling machines ..... A
(24) Cartridge case flash-hole piercing machines ..... A
(25) Cartridge case head turning lathes ..... A
(26) Cartridge case mouth boring lathes ..... A
(27) Cartridge cordite reeling machines ..... A
(28) Cartridge cup priming and pressing machines ..... A
(29) Cartridge finishing and assembly machines ..... A
(30) Cartridge gauging and weighing machines ..... A
(31) Cartridge neck varnishing machines ..... A
(32) Cartridge sizing or rectifying machines ..... A
(33) Cartridge wadding machines ..... A
(34) Centrifugal casting machines capable of casting tubes 1·8 m or more in length, with a wall thickness of 5 cm and over ..... A
(35) Gun barrel rifling and broaching machines ..... A
(36) Gun barrel rifling machines ..... A

(37) Gun barrel trepanning machines	A
(38) Gun boring and turning machines	A
(39) Gun honing machines of 1·8 m stroke or more	A
(40) Gun jump screw lathes	A
(41) Gun rifling machines	A
(42) Gun straightening presses	A
(43) Induction hardening machines for tank turret rings and sprockets	A
(44) Jigs and fixtures and other metal working implements or accessories of the kinds specially designed for use in the manufacture of ammunition, firearms, ordnance and other stores and appliances for land, sea or aerial warfare	A
(45) Shell and shell case extrusion and draw presses	A
(46) Shell banding presses	A
(47) Shell cavity boring lathes	A
(48) Shell copper band turning lathes	A
(49) Shell forging presses	A
(50) Shell groove, wave and undercutting lathes	A
(51) Shell heading or nosing presses	A
(52) Shell lathes	A
(53) Shell loading or filling machines	A
(54) Shell making rough turning lathes of the "inverted bed" type	A
(55) Shell making special purpose capstan lathes	A
(56) Shell shot automatic blasting machines	A
(57) Shell tappers	A
(58) Small arms chambering machines	A
(59) Small arms deep hole drilling machines	A
(60) Small arms machines for rifling groove or bore	A
(61) Small arms rifling machines	A
(62) Small arms spill boring machines	A
(63) Tank turret bearing grinding machines	A
Supply dropping apparatus, aircraft	A
Tanks, self-propelled guns and other vehicles, the following:—	
(1) Tanks, and self-propelled guns	A
(2) Military type armed or armoured vehicles and vehicles fitted with mountings for arms	A
(3) Armoured railway trains	A
(4) Military half tracks	A
(5) Military type recovery vehicles	A
(6) Gun carriers and tractors specially designed for towing artillery	A
(7) Trailers and semi-trailers, specially designed or modified for military use	A
(8) Amphibious and deep water fording military vehicles	A
(9) Military mobile repair shops specially designed to service military equipment	A
(10) Engines specially designed, or essentially modified for military use, for the propulsion of the above-mentioned vehicles; and parts thereof	A
(11) Other vehicles specially designed for military use	A
(12) Specially designed parts and components for any of the vehicles specified in heads (1) to (11) above (inclusive)	A

Training devices specially designed for military purposes, the following:—

(1) Flight and navigational synthetic training equipment and parts and components therefor ..... A

(2) Other training devices ..... A

Tyres and tubes, the following:—

Bullet-proof and run-flat tyres and double-chambered and self-sealing inner tubes ..... A

Water cannon and parts and components therefor ..... A

GROUP 2

ATOMIC ENERGY MINERALS AND MATERIALS, AND NUCLEAR FACILITIES, EQUIPMENT AND APPLIANCES

Note 1: Goods specified in the heads of this Group may also be specified in Groups 3B and 3H of this Part of this Schedule.

Note 2: The definitions applying to crude or semi-fabricated forms are those given under Group 3H.

GROUP 2A

Atomic Energy Minerals and Materials

Beryllium, the following:—

(1) Beryllium and alloys containing more than 50% of beryllium, in crude or semi-fabricated forms ..... A

(2) Beryllium compounds ..... A

(3) Manufactures of any of the foregoing except metal windows for medical X-ray machines ..... A

Calcium containing both less than 100 parts per million by weight of impurities other than magnesium and less than 10 parts per million by weight of boron A

Chlorine trifluoride ..... A

Deuterium and compounds, mixtures and solutions containing deuterium, including heavy water and heavy paraffins, in which the ratio of deuterium atoms to hydrogen atoms exceeds 1:5,000 by number ..... A

Fluorine ..... A

Graphite nuclear grade i.e. having a purity level less than 5 parts per million boron equivalent and with a density greater than 1·5 g/cm^3 ..... A

Hafnium, the following:—

(1) Hafnium and alloys containing more than 60% of hafnium, in crude or semi-fabricated forms ..... A

(2) Hafnium compounds containing more than 60% of hafnium ..... A

(3) Manufactures of any of the foregoing ..... A

Lithium, the following:—

(1) Lithium and alloys containing 50% or more of lithium, in crude or semi-fabricated forms ..... A

(2) Lithium and alloys, mixtures, concentrates and compounds, containing lithium enriched in the lithium-6 isotope ..... A

(3) Alloys containing a higher percentage of magnesium than of any other element and 10% or more of lithium ..... A

(4) Hydrides in which lithium, whether normal, depleted or enriched in the lithium-6 isotope, is compounded with hydrogen or its isotopes or complexed with other metals or aluminium hydride ..... A

(5) Substances not specified above containing lithium enriched in the lithium-6 isotope ..... A

Nickel powder having a nickel content of 99% or more and a particle size of less than 100 microns, whether compacted or not ..... A

Nuclear materials, the following:—

(1) Special and other fissionable materials, the following:

(*a*) plutonium all isotopes, alloys, compounds and any material containing any of the foregoing ..... A

(*b*) uranium 233, uranium enriched in the isotopes 235 or 233, alloys, compounds and any material containing any of the foregoing ..... A

Note: "Uranium enriched in the isotopes 235 or 233" is defined as uranium containing the isotopes 235 or 233, or both, in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is greater than the ratio of the isotope 235 to the isotope 238 occurring in nature.

(2) Source material: any of the following source materials in any form or incorporated in any substance in which the concentration of source material exceeds 0·05%, except compounds of natural uranium or thorium for medical purposes:

(*a*) uranium containing the mixture of isotopes occurring in nature .. A

(*b*) uranium depleted in the isotope 235 ..... A

(*c*) thorium, except alloys containing less than 5% thorium ..... A

(*d*) any of the foregoing in the form of metal, alloy, chemical compound or concentrate ..... A

Tritium, compounds and mixtures containing tritium, in which the ratio of tritium to hydrogen by atoms exceeds 1 part in 1,000, and products containing one or more of the foregoing ..... A

except

(1) labelled compounds not exceeding 100 curies per shipment (In this entry "labelled compounds" means compounds in which one of the atoms is a different isotope from that found normally);

(2) luminous paint, self luminous products, gas and aerosol detectors, electron tubes, lightning or static electricity gradient meters, devices designed for the ionisation of air including static elimination devices, ion generating tubes, detector cells of gas chromatography devices, calibration standards, or apparatus and instruments not elsewhere specified in this Schedule incorporating such products or devices, provided that each product or device contains not more than 40 curies of tritium in any chemical or physical form; and

(3) compounds and mixtures of tritium, where the separation of the constituents cannot result in the evolution of an isotopic mixture of hydrogen in which the ratio of tritium to hydrogen by atoms exceeds 1 part in 1,000.

Zirconium in which the ratio of hafnium content to zirconium content is less than one part to five hundred parts by weight, the following:—

(1) Zirconium and alloys containing more than 50% zirconium, in crude or semi-fabricated forms ..... A

(2) Zirconium compounds, except zirconium oxide thermally stabilized with calcium oxide or magnesium oxide or both ..... A

(3) Manufactures wholly of any of the foregoing ..... A

GROUP 2B

Nuclear Facilities, Equipment and Appliances

Electrolytic cells for the production of fluorine, with a production capacity greater than 250g of fluorine per hour ..... A

Equipment specially designed for the manufacture or assembly of gas centrifuges capable of the enrichment or separation of isotopes and specially designed parts, components and equipment therefor ..... A

(For gas centrifuge plants, see entry for plants for the separation of isotopes in this Group).

Equipment specially designed for the production or separation of tritium ..... A

Equipment specially designed for the separation of isotopes of lithium ..... A

(For plants for the separation of isotopes other than lithium, see entry for such plants in this Group).

Mass spectrometers and mass spectrometer sources designed for measuring the isotopic composition of uranium hexafluoride (UF_6) gas, uranium and uranyl compounds ..... A

Neutron generator systems, including tubes, designed for operation without an external vacuum system and utilising electrostatic acceleration to induce a tritium-deuterium nuclear reaction ..... A

Nuclear reactors, i.e. reactors capable of operation so as to maintain a controlled, self-sustaining fission chain reaction, and equipment and components specially designed or prepared for use in connection with a nuclear reactor, including:— A

(1) Pressure vessels, ie metal or other vessels as complete units or as major shop-fabricated parts therefor ..... A

(2) Fuel element handling equipment, including reactor fuel charging and discharging equipment ..... A

(3) Control rods, including the neutron absorbing part and the support or suspension structures therefor, and control rod guide tubes ..... A

(4) Electronic controls for controlling the power levels in nuclear reactors, including reactor control rod drive mechanisms and radiation detection and measuring instruments to determine neutron flux levels ..... A

(5) Pressure tubes ..... A

(6) Coolant pumps ..... A

(7) Internals specially designed or prepared for the operation of a nuclear reactor, including core support structures, thermal shields, baffles, core gridplates, diffuser plates ..... A

(8) Heat exchanges ..... A

Plants and equipment specially designed for the fabrication of nuclear reactor fuel elements ..... A

Plants for the production or concentration of heavy water, deuterium, or deuterium compounds, and specially designed or prepared equipment and components therefor ..... A

Plants for the production of uranium hexafluoride (UF_6) and specially designed or prepared equipment (including UF_6 purification equipment) and components therefor ..... A

Plants for the reprocessing of irradiated nuclear fuel and equipment and components specially designed or prepared therefor, or capable of being adapted for use therein, including:— ..... A

(1) Fuel element chopping machines ..... A

(2) Criticality safe tanks (e.g. small diameter, annular or slab tanks) ..... A

(3) Countercurrent solvent extractors ..... A

(4) Process control equipment or instrumentation specially designed or prepared for monitoring or controlling the reprocessing of irradiated source and special and other fissionable materials ..... A

(For process control equipment for lithium, see relevant entry in this Group).

Plants for the separation of isotopes of source material and special and other fissionable materials, and specially designed or prepared equipment and components therefor, including:— ..... A

(1) Valves wholly made of or lined with aluminium, nickel or alloy containing 60% or more nickel, 0·5 cm or greater in diameter, with bellows seal, except valves not so defined ..... A

(2) Units capable of separating isotopes of source material and special and other fissionable materials, such as:

(*a*) Gas centrifuges ..... A

(*b*) Jet nozzle separation units ..... A

(*c*) Vortex separation units ..... A

(*d*) Laser isotopic separation units ..... A

(3) Blowers and compressors (turbo, centrifugal and axial flow types) wholly made of or lined with aluminium, nickel or alloy containing 60% or more nickel and having a capacity of 1,700 litres (1·7 m^3) per minute or greater, including compressor seals, except blowers and compressors not so defined A

(4) Heat exchangers made of aluminium, copper, nickel, or of alloys containing more than 60% of nickel, separately or together, and heat exchangers incorporating tubing clad with aluminium, copper, nickel, or with alloys containing more than 60% of nickel, separately or together, and in which the other parts are made wholly of the foregoing metals, separately or together, designed to operate at sub-atmospheric pressure with a leak rate of less than 0·1 millibar (10^{-4} atmospheres) per hour under a pressure differential of 1 bar (1 atmosphere), except heat exchangers not so defined ..... A

(5) Gaseous diffusion barriers ..... A

(6) Gaseous diffuser housings ..... A

Power generating or propulsion equipment specially designed or adapted for use with nuclear reactors ..... A

Pressure gauges capable of measuring pressures to 100 Torr (13332·2 newtons per square metre) or less having sensing elements of nickel, nickel alloy, phosphor bronze, stainless steel or aluminium, corrosion resistant to UF_6 or hydrogen fluoride (HF) ..... A

Process control equipment or instrumentation specially designed or prepared for monitoring or controlling the reprocessing of irradiated lithium ..... A

GROUP 3

STRATEGIC GOODS NOT SPECIFIED IN GROUPS 1 AND 2

GROUP 3A

Metal Working Machinery and Associated Equipment

Machines, apparatus and tools of the kinds used for the production of aircraft, aircraft engines and gas turbine engines derived from aircraft engines, the following:—

(1) Machines, apparatus and tools for the manufacture, inspection and testing of gas turbines (including the compressor section of such engines), the following:

(*a*) compressor and turbine disc turning machines C

(*b*) compressor or turbine disc broaching machines ..... A

(*c*) compressor or turbine disc computerised inspection machines .... A

(*d*) machines and apparatus specially designed for making, measuring or processing compressor or gas turbine blades ..... A

(*e*) rotor grinding machines ..... A

(2) Machines for milling aircraft skin C

(3) Machines for the working or forming of aircraft sheet, aircraft plate or aircraft extrusions C

Machines, gear making or gear finishing, the following:—

(1) Bevel gear making machines, the following:

(*a*) gear grinding machines (non-generating type) ..... A

(*b*) other machines capable of the production of bevel gears having a diametral pitch finer than 48 (a module finer than 0·5 mm) and meeting a quality standard better than Admiralty Class I ..... A

(2) Machines capable of the production of gears meeting a quality standard better than British Standard 436:190 Grade 2 ..... A

Machines, internal grinding (except hand-held drills) of the kind incorporating or specially designed for the utilisation of grinding heads designed or rated for operation at speeds in excess of 120,000 revolutions per minute C

Machines, spin-forming and flow-forming with double support or three rollers, the following:—

(1) Horizontal spindle type designed to have or having a drive motor of 80 horse power (59kW) or more ..... A

(2) Vertical spindle type designed to have or having a drive motor of 50 horse power (37kW) or more ..... A

Machine tools and numerical control systems, the following:—

(1) Machine tools and dimensional inspection machines equipped or capable of being equipped with numerical control systems (as specified in head (2) below) C

except

(*a*) boring mills, milling machines and machining centres, having all of the following characteristics—

(i) maximum slide travel in any axis equal to or less than 3,000 mm;

(ii) positioning accuracy of any axis equal to or greater than ± 0·01 mm per 300 mm and 0·005 mm for each additional 300 mm;

(iii) spindle power equal to or less than 20 kW;

(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 $D \times 2 \times 10^{-5}$ mm TIR (peak to peak) where D is the spindle diameter in millimetres; and

(vi) not more than 3 axes capable of simultaneously co-ordinated contouring motion regardless of the numerical control unit connected to the machine; and

(*b*) machine tools (excluding any specified in sub-head (*a*) 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 and 0·005 mm for each additional 300 mm;

(ii) 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

(iii) not more than 3 axes capable of simultaneously co-ordinated contouring motion regardless of the numerical control unit connected to the machine.

(2) Numerical control systems the following:

(*a*) units for numerically controlling simultaneously co-ordinated (contouring and continuous path) movements of machine tools and dimensional inspection machines in two or more axes C

except units having all of the following characteristics—

(i) hardwired [not softwired or Computerised Numerical Control (CNC)];

(ii) no more than two contouring interpolating axes can be simultaneously co-ordinated;

(iii) minimum programmable increment equal to or greater (coarser) than 0·001 mm; and

(iv) without interface to allow direct computer input.

(*b*) Direct Numerical Control (DNC) systems consisting of a dedicated-stored programme computer acting as a host computer and controlling, on-line and off-line, one or more numerically-controlled machine tools or inspecting machines (as specified in head (1) of this entry), related software, and interface and communication equipment for data transfer between the host computer memory, the interpolation functions and the numerically-controlled machine tools C

(3) 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 the following: C

(*a*) 0·0008 mm TIR (peak-to-peak) for lathes and turning machines; or

(*b*) $D \times 2 \times 10^{-5}$ mm TIR (peak-to-peak) where D is the spindle diameter in millimetres, for milling machines, boring mills, jig grinders and machining centres.

(4) Lead screws, including ball nut screws, except those having all of the following characteristics: C

(*a*) accuracy equal to or greater (coarser) than 0·004 mm/300 mm;

(*b*) overall accuracy equal to or greater (coarser) than $(0{\cdot}0025 + 5 \times 10^{-6} \times L)$ mm where L is the effective length in millimetres of the screw; and

(*c*) concentricity of the centre line of the journal bearing surface and the centre line of the major diameter of the screw equal to or greater (coarser) than 0·005 mm TIR (peak-to-peak) at a distance of 3 times the diameter of the screw or less from the journal bearing surface.

(5) Linear and rotary position feedback units including inductive type devices, graduated scales and laser systems C

except

(*a*) linear type units having an accuracy equal to or greater (coarser) than $(0{\cdot}0004 + 13 \times 10^{-6} \times L)$ mm for L equal to or less than 100 mm and $(0{\cdot}0015 + 2 \times 10^{-6} \times L)$ mm, for L greater than 100 mm, where L is the effective length in millimetres of the linear measurement; and

(*b*) rotary types having an accuracy equal to or greater (coarser) than 2 seconds of arc.

(6) Linear induction motors, used as drives for slides, having all of the following characteristics: ..... A

(*a*) stroke greater than 200 mm;

(*b*) nominal force rating greater than 45N; and

(*c*) minimum controlled incremental movement less than 0·001 mm.

(7) Specially designed sub-assemblies for the equipment specified in heads (1) and (2) above C

Machines, turning, for generating optical quality surfaces using a single point cutting tool, and components and accessories therefor, the following:—

(1) Turning machines having all of the following characteristics: ..... A

(*a*) slide positioning accuracy finer than 0·0005 mm per 300 mm of travel, TIR (peak-to-peak);

(*b*) slide positioning repeatability finer than 0·00025 mm per 300 mm of travel, TIR (peak-to-peak);

(*c*) spindle runout (radial and axial) less than 0·0004 mm TIR (peak-to-peak);

(*d*) angular direction of the slide movement (yaw, pitch and roll) finer than 2 seconds of arc (peak-to-peak) over full travel; and

(*e*) slide perpendicularity less than 0·001 mm per 300 mm of travel, TIR (peak-to-peak).

In this entry evaluation of performance shall be made under conditions yielding the most accurate values, including but not limited to the incorporation of control systems which permit mechanical, electronic or software compensation.

(2) Components, the following:

(*a*) spindle assemblies, consisting of spindles and bearings as a minimum assembly, except those assemblies with axial and radial axis motion measured along the spindle axis in one revolution of the spindle equal to or coarser than 0·008 mm TIR (peak-to-peak) ..... A

(*b*) linear induction motors used as drives for slides having all of the following characteristics— ..... A

(i) stroke greater than 200 mm;

(ii) nominal force rating greater than 45N; and

(iii) minimum controlled incremental movement less than 0·001 mm.

(3) Accessories, the following:

single point diamond cutting tool inserts having all of the following characteristics— ..... A

(*a*) flawless and chip-free cutting edge when magnified 400 times in any direction;

(*b*) cutting radius between 0·1 mm and 5 mm; and

(*c*) cutting radius out-of-roundness less than 0·002 mm TIR (peak-to-peak).

Precision linear and angular measuring systems, the following:—

(1) Contact-type systems and linear voltage differential transformers (LVDT) therefor, the following:

(*a*) systems having all the following characteristics— ..... A

(i) a range equal to or less than 5 mm;

(ii) a linearity equal to or less than 0·1%; and

(iii) a drift equal to or less than 0·1% per day, at standard ambient test room temperatures ±1°C.

(*b*) linear voltage differential transformers with no compensation networks and having either of the following characteristics— ..... A

(i) a range equal to or less than 5 mm; or

(ii) a linearity equal to or less than 0·2%.

(2) Linear measuring machines, except optical comparators, with two or more axes having both the following characteristics: ..... A

(*a*) a range in any axis greater than 200 mm; and

(*b*) an accuracy (including any compensation) less (finer) than 0·0008 mm per any 300 mm segment of travel.

(3) Angular measuring systems having an accuracy equal to or less than 1 second of arc, except optical instruments using collimated light to detect angular displacements of a mirror ..... A

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

(*a*) an effective probe measurement diameter less than 0·5 mm and a drift less than 0·5% per day, at standard ambient test room temperatures ±1°C; or

(*b*) a linearity of less than 0·3% and a drift of less than 0·5% per day, at standard ambient test room temperatures ±1°C.

(5) Specialised parts and components for equipment specified in heads (1) to (4) above (inclusive) ..... A

GROUP 3B

Note. Goods specified in the heads of this Group may also be specified in Group 2 of this Part of this Schedule.

Chemical and Petroleum Equipment

Chemical plant and equipment, the following:—

(1) Containers, jacketed only, specially designed for the storage and/or transportation of liquid fluorine ..... A

(2) Gas liquefying equipment, the following:

(*a*) equipment for the production of liquid hydrogen, except plants with a capacity of less than 1½ tonnes per 24 hour day and not designed for, or capable of, the production of hydrogen slush ..... A

(*b*) equipment for the production of liquid fluorine ..... A

(3) Plant for the production of military explosives and solid propellants, and parts and components specially designed therefor, including nitrators, continuous types ..... A

Cryogenic equipment, the following:—

(1) Equipment designed for maintaining an ambient temperature below −170°C, the following:

(*a*) designed for use in marine, airborne or space applications ..... A

(*b*) ruggedised for mobile ground use ..... A

(2) Electrical, magnetic and electronic equipment, electrical conductors, and materials, specially designed for operation continuously or discontinuously at ambient temperatures below −170°C, the following:

(*a*) superconductive metals, alloys, compounds, composites and intercalate materials ..... A

except

(i) superconductive wire having a filament cross-sectional area of $4{\cdot}42 \times 10^{-3}$ sq mm (or 75 microns diameter) or greater; and

(ii) superconductive niobium-titanium wire having a filament cross-sectional area of $1{\cdot}26 \times 10^{-3}$ sq mm (or 40 microns diameter) or greater in a copper matrix.

(*b*) components, the following—

(i) Josephson effect devices ..... A

(ii) dayem bridges ..... A

(iii) proximity effect bridges ..... A

(iv) super-normal-super (SNS) proximity devices ..... A

(v) memory and logic devices ..... A

(vi) phase slip devices ..... A

(*c*) superconducting electromagnets (including superconducting solenoids) rated for producing peak magnetic inductions of 30 kilogauss or greater at overall current densities of 10,000 A/sq cm or greater ..... A

except

(i) those which can be fully charged/discharged in 1 minute or more provided they are not specially designed for gyroton applications; and

(ii) those which are specially designed to be fully charged/discharged in less than 1 minute and have all the following characteristics—

(*a*) wound with wire, cable or tape consisting of niobium-titanium superconductive filament in a copper matrix;

(*b*) inner diameter of less than 6 cm; and

(*c*) maximum energy delivered per pulse divided by the duration of that pulse not exceeding 500 kJ per minute.

(*d*) superconducting electrical equipment (rotating machines and transformers) ..... A

except

(i) superconducting electrical equipment for civil electrical power transmission and distribution; and

(ii) direct current hybrid homopolar generators having a single pole normal metal armature operating at ambient temperatures and rotating in a magnetic field produced by superconducting windings, provided those windings are the only superconducting component in the generator.

(3) Specially designed accessories, sub-assemblies, parts and components for the equipment specified in heads (1) and (2) above ..... A

In this entry—

"dayem bridges" means superconducting thin film devices with a reduced area section having a much lower critical current than the adjoining areas and acting as a conductive weak link;

"overall current density" means the total number of ampere-turns in the coil (that is, the sum of the number of turns multiplied by the maximum current carried by each turn) divided by the total cross section of the coil (comprising the superconductive filaments, the metallic matrix in which the superconductive filament is embedded, the encapsulating material, and any cooling channels);

"proximity effect bridges" means superconducting weak link devices whose low critical current is due to an overlay of normal metal rather than a small area; and

"dayem bridges" and "proximity effect bridges" can act as superconducting switches and may be employed in superconducting quantum interference devices.

Pipe valves, cocks and pressure regulators, having all flow contact surfaces made of materials containing 90% or more, separately or combined, of tantalum, titanium or zirconium, except materials containing more than 97%, but less than 99·7%, titanium ..... A

Pumps, the following:—

(1) Vacuum pumps, the following:

(*a*) turbo-molecular pumps having a capacity higher than 2,000 litres of nitrogen per second C

(*b*) diffusion pumps rated for unbaffled pumping speeds of more than 50,000 litres of nitrogen per second at pressures of 10^{-4} mm of mercury or less C

(*c*) cryopump systems in which the circulation of liquefied gas is used to achieve a vacuum by lowering the temperature of the environment, designed to operate at temperatures of less than −220°C measured at atmospheric pressure C

(*d*) parts, components, controls and accessories, specially designed for the equipment specified in sub-heads (*a*) to (*c*) above (inclusive) .. C

(2) Other pumps having either of the following characteristics:

(*a*) designed to move molten metals by electromagnetic forces; or ... A

(*b*) all flow contact surfaces made of materials containing 90% or more, separately or combined, of tantalum, titanium or zirconium, except materials containing more than 97%, but less than 99·7%, titanium A

Tubing, the following:—

(1) Un-reinforced, heat-shrinkable tubing having an inner diameter of less than 28·57 mm, before shrinkage, and made of, lined with or covered with any of the substances included in sub-head (*c*) below ..... A

(2) Re-inforced tubing designed for operating pressures of 210·92 kg/cm² or greater, whether or not specially processed to make flow surfaces electrically conductive and made of, lined with or covered with any of the substances included in sub-heads (*a*), (*b*) or (*c*) below; and connectors and fittings therefor: ..... A

(*a*) coagulated dispersion grades of polytetrafluoroethylene;

(*b*) copolymers of tetrafluoroethylene and hexafluoropropylene;

(*c*) copolymers and terpolymers composed of any combination of the monomers tetrafluoroethylene, chlorotrifluoroethylene, vinylidene fluoride, hexafluoropropylene and bromotrifluoroethylene, except the copolymers of tetrafluoroethylene and hexafluoropropylene.

GROUP 3c

Electrical and Power-Generating Equipment

Electro-chemical, semi-conductor and radio-active devices for the direct conversion of chemical, solar or nuclear energy to electrical energy, the following:—

(1) Electro-chemical devices of the following types:

(*a*) fuel cells operating at temperatures of 200°C or less, including regenerative cells which generate electric power from consumable components all of which are supplied from outside the cell C

(*b*) primary cells and batteries having any of the following characteristics—

(i) possessing a means of activation and having an open circuit storage life in the unactivated condition, at a temperature of 21°C, of ten years or more C

(ii) capable of operating at temperatures from below −25°C to above +55°C, including cells and cell assemblies (except dry cells) possessing self-contained heaters; or C

(iii) utilising a lithium anode with lithium salt solute in organic solvent (non-aqueous) electrolyte and having an energy density at the 24 hour discharge rate of greater than 100 W-hrs/lb. at +24°C and greater than 35 W-hrs/lb. at −29°C C

(*c*) mechanically-rechargeable leak-proof batteries having cells with removable zinc plates with porous air electrodes and immersed in electrolyte of potassium hydroxide C

(*d*) molten salt electrolyte cells and batteries which normally operate at temperatures of +150°C or below C

(2) Photo-voltaic cells, the following:

(*a*) types with a power output of 14 mW or more per sq cm under 100 mW per sq cm tungsten (2,800 °K) illumination C

(*b*) gallium arsenide type cells, except those having a power output of less than 4 mW per sq cm under 100 mW per sq cm tungsten (2,800 °K) illumination C

(*c*) types with a power output of 450 mW or more per sq cm under 10 W per sq cm silicon carbide (1,750 °K) illumination C

(3) Power sources based on radioactive materials systems C

except

(*a*) those having an output power of less than 0·5 W and a total weight of more than 90·7 kg; and

(*b*) those specially designed and developed for medical use within the human body.

(4) Specialised parts, components and sub-assemblies for the equipment specified in heads (1) to (3) above (inclusive) C

In this entry—

"energy density" is the product of the average power in watts and the duration of the discharge in hours to 90% of the initial load voltage divided by the total weight of the cell or battery in pounds; and

the limit of 200°C relates to the fuel cell alone and not to any other equipment whether integrated with or ancillary to such cells.

Frequency changers capable of a multi-phase electrical output of between 600-2,000 Hz and parts, components and sub-assemblies therefor ..... A

Furnaces, electric vacuum, including those capable of operating with protective atmospheres, the following:—

(1) Consumable electrode vacuum arc furnaces with a capacity in excess of 20 tonnes C

(2) Skull type vacuum arc furnaces C

(3) Specialised parts, components and controls for the equipment specified in heads (1) and (2) above C

Plasma arc equipment, the following:—

(1) Electric arc devices generating a flow of ionised gas in which the arc column is constricted C

except

(*a*) devices wherein the flow of gas is for isolation purposes only; and

(*b*) devices of less than 100 kW for cutting, welding, melting, plating or spraying.

(2) Accessories, parts, components and control or test equipment, specially designed for arc devices as specified in head (1) above C

(3) Equipment incorporating arc devices as specified in head (1) above .. C

GROUP 3D

General Industrial Equipment

Anti-friction bearings and parts and components therefor, the following:—

(1) Ball and roller bearings having an inner bore diameter of 10 mm or less and hollow bearings having an inner bore exceeding 10 mm and having

tolerances specified in Table 2 (EP5) of British Standard 292: 1969 or better and either of the following characteristics:

(*a*) made of any material ..... A
except

(i) low carbon steel containing not more than 0·4% of carbon and no other elements other than those present as impurities or in such low quantities as not to modify the basic characteristics of the steel;

(ii) high carbon chromium steel types Steel-534A99 and 535A99 as specified in British Standard 970: Part 2: 1970, or equivalent types normally used in the manufacture of ball or roller bearings;

(iii) nickel-molybdenum steel type Steel-665M17 as specified in British Standard 970: Part 3: 1971, or equivalent types normally used in the manufacture of ball or roller bearings; and

(iv) stainless steel type AISI-440C (SAE-51440C) or equivalent types normally used in the manufacture of ball or roller bearings; or

(*b*) processed by heat treatment for the purpose of stabilising such bearings for use at normal temperatures over 150°C ..... A

(2) Ball and roller bearings (except separable ball bearings and thrust ball bearings) having an inner bore diameter exceeding 10 mm and having tolerances specified in Table 3 (EP7) of British Standard 292: 1969 or better, and either of the characteristics in sub-heads (1)(*a*) or (1)(*b*) of this entry ..... A

(3) Ball and roller bearings having tolerances better than those specified in Table 3 (EP7) of British Standard 292: 1969 ..... A

(4) Parts and components of ball and roller bearings, usable only for bearings specified in heads (1) to (3) above (inclusive), the following:

Outer rings, inner rings, retainers, balls, rollers and sub-assemblies A

This entry also covers bearings having tolerances specified in imperial measures which are equivalent to the metric tolerances specified in British Standard 292: 1969.

Environmental chambers capable of pressures below 10^{-4} Torr, except equipment fitted with industrial machinery not specified in this Schedule; and specially designed parts, components and ancillary equipment therefor ..... A

Machines and equipment specially designed for the manufacture of devices and assemblies included in heads (2) to (5) (inclusive) of the entry in Group 3G relating to materials composed of crystals having spinel, hexagonal, orthorhombic or garnet crystal structures, single aperture forms of ferrites having a maximum dimension less than 0·76 mm and for the manufacture of magnetic recording media (other than for magnetic tape specified in head (5) of the entry in Group 3G relating to recording or reproducing equipment), the following:—

(1) Equipment for the manufacture of single and multi-aperture forms specified in heads (2) to (4) (inclusive) of the entry in Group 3G relating to materials composed of crystals, and single aperture forms of ferrites having a maximum dimension less than 0·76 mm, the following:

(*a*) automatic presses for the production of the specified forms C

(*b*) press dies for the production of the specified forms C

(*c*) automatic equipmemt for the monitoring, grading, sorting, exercising or testing of the specified forms C

(2) Equipment for the manufacture of thin film devices, the following:

(*a*) equipment for the manufacture of thin film memory storage or switching devices having square hysteresis loops C

(*b*) automatic equipment for the monitoring, grading, sorting, exercising or testing of thin film (including plated wire and plated rods) memory storage or switching devices C

(3) Automatic equipment for monitoring, exercising or testing assemblies of any devices specified in heads (2) to (4) (inclusive) of the entry in Group 3G relating to materials composed of crystals C

(4) Equipment for the application of magnetic coatings to recording media specified in head (5) of the entry in Group 3G relating to recording or reproducing equipment and to single aperture forms of ferrites having a maximum dimension less than 0·76 mm C

(5) Automatic and semi-automatic equipment for monitoring, grading, exercising or testing recording media specified in head (5) of the entry in Group 3G relating to recording or reproducing equipment C

(6) Specially designed test equipment, parts, components and controls for the equipment specified in heads (1) to (5) above (inclusive) C

Note. For magnetic tape equipment see the entry in this group relating to machinery and apparatus for the working of synthetic film.

Machinery, equipment and software for the manufacture or testing of electronic equipment, components or materials, and parts, components, specialised controls and accessories for such machinery and equipment, the following:—

(1) Equipment specially designed for the manufacture of the vacuum or gas-filled tubes specified in Group 3F, or of parts, components or sub-assemblies for such tubes ..... A

(2) Equipment for the manufacture of semi-conductor material for the manufacture of the semi-conductor, acoustic wave or film memory devices, or of electronic equipment or components specified in heads (2) and (3) of the entry in Group 3F relating to electronic components, assemblies, sub-assemblies, printed circuit boards and microcircuits, the following:

(*a*) equipment for the deposition of electronic grade polycrystalline silicon in the form of rods (ingots, boules), pellets, sheets or small particles, from silane (SiH_4), silicon tetrachloride ($SiHCl_3$), dichlorosilane (SiH_2Cl_2) or monochlorosilane (SiH_3Cl) ..... A

(*b*) equipment specially designed for purifying or processing III-V or II-VI semi-conductor materials specified in the entry in Group 3I relating to monocrystalline and polycrystalline compounds ..... A

(*c*) crystal pullers, furnaces and gas systems, the following—

(i) types with digitally-controlled temperature, power input or gas flow ..... A

(ii) diffusion, oxidation or annealing furnaces for operation at pressures above 1 atmosphere ..... A

(iii) plasma-enhanced or photo-enhanced chemical reactor equipment ..... A

(iv) equipment for automatic control of crystal taper and diameter A

except taper and diameter control mechanisms using any of the following techniques—

(*a*) radiation pyrometers;

(*b*) thermocouples;

(*c*) RF power sensors; or

(*d*) mass weighing, without digital or anomaly control permitting the growth of semi-conductors.

(v) crystal pullers having any of the following characteristics— .. A

(*a*) rechargeable without replacing the crucible containers;

(*b*) capable of operation at pressures above 10^5 pascals (1 atmosphere absolute); or

(*c*) capable of pulling crystals of a diameter greater than 76·2 mm.

(vi) vacuum induction-heated zone-refining equipment for operation at a pressure of 0·01 pascal or less;

(*d*) equipment for the epitaxial growth of semi-conductor materials having either of the following characteristics— ..... A

(i) operation at pressures below 10^5 pascals (1 atmosphere absolute); or

(ii) digitally-controlled.

(*e*) molecular beam epitaxial growth equipment ..... A

(*f*) magnetically enhanced sputtering equipment ..... A

(*g*) equipment designed for ion implantation or ion-enhanced or photo-enhanced diffusion ..... A

(*h*) equipment for selective or non-selective removal by dry methods of passivation layers, dialectrics, semi-conductor materials, resists or metals, except vacuum sputtering equipment designed to operate on the sputter-etch mode ..... A

(*i*) equipment for semi-conductor device fabrication operating below 10^5 pascals (1 atmosphere absolute) for the chemical vapour deposition of oxides, nitrides, metals and polysilicon, except reactive-sputtering equipment ..... A

(*j*) electron beam systems (including scanning electron microscopes) capable of mask making or semi-conductor device processing and having any of the following characteristics— ..... A

(i) electrostatic beam deflection;

(ii) shaped, non-Gaussian beam profile;

(iii) beam blanking capability;

(iv) digital-to-analogue conversion accuracy greater than 12 bits;

(v) digital-to-analogue conversion rate greater than 3 MHz; or

(vi) target-to-beam position feed-back control precision of 1 micrometre or finer; except

(*a*) electron beam deposition systems; and

(*b*) scanning electron microscopes having characteristic (iii) which are equipped for Auger analysis.

(*k*) automatic sawing equipment, specialy designed for the processing of semi-conductor wafers and capable of slicing ingots of 76·2 mm or greater in diameter ..... A

(*l*) surface-finishing equipment, specially designed for the processing of semi-conductor wafers and having any of the following characteristics— A

(i) waxless or non-adhesive mounting;

(ii) double-sided simultaneous polishing; or

(iii) capable of polishing wafers greater than 50·8 mm in diameter.

(3) Masks, mask substrates, mask-making equipment and image transfer equipment for the manufacture of devices, equipment or components referred to in head (2) above, the following:

(*a*) finished masks and mask artwork ..... A

(*b*) hard surface (e.g. chromium, silicon, iron oxide) coated substrates (e.g. glass, quartz, sapphire) for the preparation of masks having dimensions greater than 76·2 mm by 76·2 mm ..... A

(*c*) computer-aided design (CAD) equipment, for transforming schematic or logic diagrams into artwork for producing semi-conductor devices or microcircuits, having any of the following functions— ... A

(i) storage of pattern cells for sub-division of integrated circuits;

(ii) scaling, positioning or rotation of pattern cells;

(iii) interactive graphic capabilities;

(iv) design rule and circuit checking; or

(v) circuit layout modification of the arrangement of the elements.

(*d*) computer programmes which—

(i) perform any of the functions specified in sub-head (3)(*c*) above A

(ii) can be used for integrated circuit transient analysis ..... A

(iii) can be used for integrated circuit logic analysis or logic checking A

(iv) can be used for automatic routing or cell placement for integrated circuits ..... A

(*e*) mask fabrication machines using photo-optical methods, the following—

(i) step and repeat cameras capable of producing arrays larger than 63·5 mm by 63·5 mm, or capable of producing a single exposure larger than 3·75 mm by 3·75 mm in the focal plane, or capable of producing useful line widths of 3·5 micrometres or less ..... A

(ii) pattern generators specially designed for the generation or manufacture of masks or the creation of patterns in photosensitive layers and with placement precision finer than 10 micrometres A

(iii) mask fabrication equipment containing automatic adjustment of focus or adjustment of the mask material into the focal plane A

(iv) equipment for altering masks to remove defects ..... A

(*f*) mask inspection equipment, the following—

(i) for comparison with a precision of 0·75 micrometre or finer over an area of 63·5 mm by 63·5 mm or greater ..... A

(ii) digitally-controlled equipment with a resolution of 0·25 micrometre or finer and with a precision of 0·75 micrometre or finer over a distance in one or two co-ordinates of 63·5 mm or greater A

(iii) digitally-controlled defect inspection equipment, except conventional scanning electron microscopes not specially designed or instrumented for automatic pattern inspection ..... A

(*g*) align and expose equipment using photo-optical methods, including projection image transfer equipment, capable of performing any of the following functions— ..... A

(i) production of a useful pattern size of less than 5 micrometre;

(ii) alignment with a precision finer than 1 micrometres;

(iii) field coverage greater than 76·2 mm by 76·2 mm;

(iv) wafer backside alignment;

(v) automatic alignment by the sensing of patterns or index marks on the substrate; or

(vi) projection image transfer for the processing slices (wafers) of 50·8 mm or greater in diameter (in the case of equipment except non contacting (proximity) image transfer equipment).

(*h*) electron beam, ion beam, or X-ray equipment for projection image transfer ..... A

(*i*) photo-optical or non-photo-optical step and repeat or partial field equipment for the transfer of the image on to the wafer ..... A

(*j*) mask contact image transfer equipment for imaging a field greater than 76·2 mm by 76·2 mm ..... A

(4) Digitally-controlled inspection equipment for the detection of defects in processed wafers or chips using optical pattern comparison or other machine scanning techniques, except conventional scanning electron microscopes not especially designed or instrumented for automatic pattern inspection A

(5) Equipment for the assembly of microcircuits specified in head (2) above, the following:

(*a*) digitally-controlled die (chip) mounters ..... A

(*b*) digitally-controlled wire bonders and welders for performing consecutive bonding operations ..... A

(*c*) equipment for producing multiple bonds in a single operation, including but not limited to beam lead bonders, chip carrier bonders and tape bonders ..... A

(6) Digitally-controlled wafer probing equipment having any of the following characteristics: ..... A

(*a*) positioning accuracy finer than 50 micrometres, or incremental steps finer than 6·4 micrometres;

(*b*) individual die location read-out (X-Y position information) during testing;

(*c*) capability of testing devices having more than a total of 24 terminals; or

(*d*) automatic slice (wafer) alignment.

(7) Test equipment, the following:

(*a*) computer-controlled equipment specially designed for testing discrete semi-conductor devices and unencapsulated dice, capable of performing any of the following functions— ..... A

(i) measurement of time intervals of less than 10 nanoseconds;

(ii) measurement of parameters (such as f_T, S− parameters, noise figure) at frequencies greater than 250 MHz;

(iii) resolution of currents of less than 100 picoamperes; or

(iv) measurement of spectral response at wavelengths outside the range from 450 to 950 nanometres.

(*b*) digitally-controlled equipment specially designed for testing microcircuits and assemblies thereof, capable of performing any of the following functions— ..... A

(i) functional (truth table) testing at a pattern rate greater than 2 MHz;

(ii) resolution of currents of less than 1 nanoampere; or

(iii) testing of integrated circuits (not mounted on circuit boards) in packages having more than a total of 24 terminals, except equipment specially designed for and dedicated to the testing of circuits other than those specified in the entry in Group 3F relating to electronic components.

In this entry—

"masks" includes those used in electron beam lithography, X-ray lithography, and for ultraviolet lithography as well as the usual ultraviolet and visible photo-lithography;

"microcircuit" means a device in which a number of passive and active circuit elements are considered as indivisibly associated on or within a continuous structure to perform the function of a circuit;

"assembly" means a number of components (ie circuit elements, discrete components, microcircuits) connected together to perform a specific function or functions, replaceable as an entity (and normally capable of being disassembled);

"digitally-controlled" refers to automated equipment the functions of which are partially or entirely controlled by stored, digitally-coded, electrical signals;

"electronic grade polycrystalline silicon" is defined as having a maximum concentration of P-type impurity (eg boron) of 0·3 parts in 10^9 or a maximum concentration of N-type impurity (eg phosphorous) of 1·5 parts in 10^9. Purity shall be verified according to ASTM specification F 574-78

or equivalent followed by resistivity measurement according to ASTM specification F 43-78 or equivalent;

"magnetically enhanced" refers to equipment incorporating a cathode assembly having an integral structure for enhancing plasma intensity; and

"discrete semi-conductor devices" include diodes, transistors, thyristors, photocells and solar cells.

Machinery and apparatus for the working of synthetic film used as magnetic recording tape, the following:—

Equipment specially designed for the continuous coating of polyester base magnetic tape of the kind specified in the entry in Group 3G relating to recording and reproducing equipment and specially designed parts and components therefor ..... A

Machinery and apparatus specially designed for the manufacture of cable and wire described in heads (2) and (3) of the entry in Group 3F relating to cable and wire C

Machines and apparatus specially designed for the extrusion of any of the materials specified in sub-head (1)(*b*) of the entry in Group 3I relating to fluorocarbon compounds ..... A

Machines for filament winding, tape-laying and interlacing using any of the materials described in the entry in Group 3I relating to fibrous and filamentary materials, the following:—

(1) Machines of which the motions for positioning, wrapping and winding of fibres are co-ordinated and programmed in three or more axes, specially designed to fabricate composite structures or laminates from fibrous and filamentary materials, and the mechanical parts of the machines, co-ordinating and programming controls, and specialised parts, components and accessories therefor ..... A

(2) Machines of which the motions for positioning and laying of tape and sheets are co-ordinated and programmed in two or more axes, specially designed for the manufacture of composite airframe and missile structures A

(3) Machines for weaving, interlacing or braiding fibres to fabricate composite structures, and specialised parts, components, adapters and modification kits therefor, except textile machinery not modified for such purposes A

Presses, associated equipment and controls therefor, the following:—

(1) Presses designed or re-designed for the working or forming of metals, alloys or other materials with a melting point exceeding 1,900°C ..... A

(2) Presses, hydraulic, the following:

(*a*) vertical presses of an effective operating pressure of over 10,000 tonnes ..... A

(*b*) horizontal presses of an effective operating pressure of over 5,000 tonnes ..... A

(3) Presses, isostatic, having either of the following characteristics:

(*a*) capable of achieving a maximum working pressure of 1,406 kg per sq cm or more and possessing a chamber cavity with an inside diameter of more than 40·6 cm; or ..... A

(*b*) capable of achieving a maximum working pressure of 351 kg per sq cm or more and having a controlled thermal environment within the closed cavity, except those possessing a chamber cavity with an inside diameter of less than 12·7 cm which are also capable of achieving and maintaining a controlled environment only between +80°C and −35°C A

(4) Control equipment and parts and components especially designed for the presses in heads (1) to (3) above (inclusive) ..... A

Rolling mills of the kind used for the reduction of metal by rolling, specially designed or re-designed for the rolling of metals or alloys with a melting point

exceeding 1,900°C, and specially designed controls, parts and components (except rolls and ancillary equipment) therefor C

Vibration test equipment and ancillary equipment therefor, the following:—

(1) Vibration test equipment using digital-control techniques and specially designed ancillary equipment and software therefor ..... A

except

(*a*) mechanical and pneumatic exciters (thrusters);

(*b*) other individual exciters (thrusters) with a maximum thrust of less than 100 kN;

(*c*) vibrometers;

(*d*) analogue equipment; and

(*e*) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.

(2) High intensity acoustic test equipment having either of the following characteristics:

(*a*) capable of producing an overall sound pressure level of 140 dB or greater (referenced to $2 \times 10^{-5} \frac{N}{m^2}$) ..... A

or

(*b*) having a rated output of 4kW or greater ..... A

and especially designed ancillary equipment and software therefor ... A

except

(i) analogue equipment; and

(ii) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.

(3) Ground vibration (including modal survey) test equipment which uses digital-control techniques, and specially designed ancillary equipment and software therefor ..... A

except

(*a*) analogue equipment; and

(*b*) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.

Wind tunnels and devices (including but not limited to hot shot tunnels, plasma arc tunnels, shock tunnels, shock tubes, gas tunnels and light gas guns) capable of simulating environments at velocities of Mach 1·4 and above, and specially designed parts, components and accessories therefor, except wind tunnels specially designed for educational purposes and having a maximum internal cross section measurement of less than 25 cm C

GROUP 3E

Compasses, Gyroscopic Apparatus, Marine Equipment and Ships (other than Warships and Naval Equipment)

Compasses and gyroscopic apparatus and systems incorporating such apparatus, the following:—

(1) Accelerometers with a threshold of 0·005**g** or less, or a linearity error within 0·25% of full scale output, or both, which are designed for use in inertial navigation systems or in guidance systems, of all types ..... A

(2) Automatic pilots, except types for surface vessels and aircraft control C

(3) Gyro compasses with provision for determining and transmitting ship's level reference data (roll, pitch) in addition to own ship's course data .. C

(4) Gyro-astro compasses and other devices which derive position or orientation by means of automatically tracking celestial bodies C

(5) Gyro-stabilisers other than the kinds used for stabilising an entire surface vessel C

(6) Gyros with a rated free directional drift rate of less than 0·5° (1 Sigma or root mean square) per hour in a 1g environment C

(7) Inertial or other equipment using accelerometers specified in head (1) above or gyros specified in head (6) above or both, and systems incorporating such equipment C

(8) Integrated flight instrument systems for aircraft which include gyro-stabilisers or automatic pilots or both C

(9) Specially designed parts and components, testing, calibration and alignment equipment for the equipment specified in heads (1) to (8) above (inclusive) C

Deep submergence vehicles, and equipment, parts, components and materials therefor, the following:—

(1) Deep submergence vehicles, whether or not for operation manned or unmanned, tethered or untethered, capable of operating at depths exceeding 1,000 metres ..... A

(2) Specially designed equipment, parts, components and materials for the vehicles specified in head (1), including but not limited to pressure housings or pressure hulls specially designed for normal operating pressures of 101 bars or greater ..... A

Gas turbine engines for marine propulsion of 3,500 rated shaft horsepower and above, whether originally designed for marine use or adapted for such use from aero engines ..... A

Ships, the following:—

(1) Hydrofoil vessels with automatically controlled foil systems and capable of a speed of more than 40 knots in rough water (sea state five) ..... S

(2) Ships, sea going, including sea going fishing vessels and coasters, designed for speeds of over 26 knots when fully loaded ..... S

(3) Ships with hulls and propulsion machinery made wholly or primarily of non-magnetic materials ..... S

(4) Ships with decks and platforms specially strengthened to receive weapons S

(5) Ships fitted with any of the following:

(*a*) apparatus and equipment specified in Group 1 ..... S

(*b*) apparatus and equipment specified in the entries in Group 3 relating to—

(i) apparatus of a kind used for detecting or locating objects under water;

(ii) communication, detection and tracking equipment;

(iii) communication, navigation, direction finding and radar equipment; or

(iv) compasses and gyroscopic apparatus; or ..... S

(*c*) degaussing equipment ..... S

Syntactic foam for underwater use, the following:—

(1) Syntactic foam formulated for applications at depths greater than 1,000 metres ..... A

(2) Syntactic foam having a density of 0·561 g/cm^3 (35 lbs/cu.ft.) or less . A

In this entry—

"syntactic foam" consists of hollow plastic or glass spheres less than 100 micrometres in diameter uniformly embedded in a resin matrix.

GROUP 3F

Note. Goods specified in the heads of this Group may also be specified in Group 1 of this part of this Schedule.

Electronic Equipment including Communications and Radar

Amplifiers (except microwave amplifiers included in the entry relating to microwave equipment), the following:—

(1) Tuned amplifiers having a bandwidth which exceeds 50 MHz or 10% of the mean frequency, whichever is less, except those specially designed for use with civil television receivers (aerial amplifiers), for use in community television distribution systems or for use in radio communications equipment for frequencies not exceeding 32 MHz ..... A

(2) Untuned amplifiers having a bandwidth which exceeds 10 MHz, except types having any of the following characteristics: ..... A

(*a*) a bandwidth not exceeding 50 MHz, provided that the power output does not exceed 20 W; or

(*b*) a bandwidth between 50 MHz and 100 MHz, provided that the power output does not exceed 1 W; or

(*c*) operating in the range of 380 to 512 MHz and designed for civil communications equipment provided that the power output does not exceed 20 W; or

(*d*) a design specialised for use with civil television receivers (aerial amplifiers), for use in community television distribution systems or for use in radio communications equipment for frequencies not exceeding 32 MHz.

In this entry—

"bandwidth" means the band of frequencies over which the power amplification does not drop to less than one-half of its maximum value; and

"mean frequency" means the arithmetic mean between the frequencies at which the power amplification is one-half of its maximum value.

Apparatus designed to jam or otherwise interfere with radio reception and specialised parts and components of such apparatus ..... A

In this entry is included jamming and counter-jamming apparatus such as electronic counter-measure (ECM) and electronic counter-counter-measure (ECCM) apparatus (i.e. apparatus designed to introduce extraneous or erroneous signals into radar or radio communications equipments or to otherwise hinder the transmission, reception, operation or effectiveness of radar or radio communications equipments including their counter-measure equipment); and specialised parts and components therefor.

Apparatus of a kind specially designed for detecting or locating objects or physical features under water or below the surface of the earth by acoustic or ultrasonic methods, and specialised parts and components therefor ..... A

except

(1) Marine apparatus, the following:—

(*a*) active transmitting, or transmitting and receiving, apparatus, the following:

(i) depth-sounders of a kind used solely for measuring the depth of water or the distance of submerged or buried objects, fish or whales vertically below the apparatus;

(ii) horizontally-operated systems of a kind used for detecting or locating submerged or buried objects, fish or whales, and having all the following characteristics—

(*a*) a transmitting frequency of 15 kHz or greater;

(*b*) a sound pressure level less than 250dB (reference 1 micro-

pascal at 1 metre) for apparatus with an operating frequency of between 15 and 30 kHz and with no decibel limitation for apparatus operating at frequencies of 30 kHz or greater;

(*c*) a transmission capability limited to ± 10% of the design centre frequency;

(*d*) a design incapable of withstanding pressure during normal operation at depths greater than 1,000 metres; and

(*e*) a display range of 5,000 metres or less;

(iii) electronic noise sources designed for vertically directional use only;

(iv) mechanical noise sources;

(v) chemical noise sources;

(*b*) passive receiving apparatus, whether or not related in normal application to separate apparatus, the following:

(i) acoustic hydrophones and transducers, having all the following characteristics—

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

(*b*) a design incapable of operating at depths greater than 100 metres; and

(*c*) independently mounted or configured and incapable of assembly by the user into a towed hydrophone array.

(2) Terrestrial apparatus incapable of conversion by the user to underwater or marine uses defined in this entry.

In this entry "passive hydrophone sensitivities" 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. A hydrophone of −160 dB (reference 1 volt per micropascal) would yield an output voltage of 10^{-8} volts in such a field: one of −180 dB sensitivity would yield 10^{-9} bolts output.

Burst transmitters and associated receiving equipment (except simple on-line morse or other data signal convertors or standard items of ADP equipment) and specialised assemblies, sub-assemblies, parts and components therefor ..... A

In the entry a burst transmitter is any electronic equipment or device for use with radio or other communications systems, whether part of a transmitter or modulation device or ancillary to it, which has a capability to accept and store data (telegraphic, speech or other) and to transmit these at transmission speeds/bit rates which are multiples of the input keying speed/bit rates, the purpose or effect of which is to reduce total message duration time and thus to evade detection by other than the intended recipient.

Cable and wire, the following:—

(1) Cable (including coaxial cable, but excluding oil well logging cable) and wire, coated with or insulated with any of the materials specified in sub-head (1)(*b*) of the entry in Group 31 relating to fluorocarbon compounds .... A

(2) Non-communications coaxial cable with the outer conductor electroplated directly on spirally grooved cable dielectric ..... A

(3) Communications cable, the following:

(*a*) submarine cable, the following—

(i) reversed-twist, double-armoured cable specially designed for towing or suspending, and communicating with, submerged devices ..... A

(ii) unarmoured or single-armoured ocean cable having an attenua-

tion of 1·8 dB per nautical mile (0·97 dB/km) or less, measured at a frequency of 600 kHz ..... A

(*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 ..... A

(*c*) graded index or single-mode step index optical fibre communications cable and optical fibres therefor, having either of the following characteristics— ..... A

(i) an attenuation at any operating wavelength of 5 dB/km or less; or

(ii) a tensile strength greater than 7×10^9 N/m^2.

(*d*) secure communications cable, coaxial or multi-conductor, protected by mechanical or electrical means from physical damage or intrusion in such manner that communications security is maintained between terminals without the need for additional encoding and scrambling equipment, except cable which is only armoured by a tough outer sheath or screened electromagnetically ..... A

Capacitors designed to maintain or capable of maintaining their rated electrical or mechanical characteristics during their specified operating lifetime, the following:—

(1) Monolithic ceramic capacitors rated for operation over the whole range of ambient temperatures from below −55°C to above +125°C ..... A

(2) Tantalum electrolytic capacitors rated for operation at ambient temperatures exceeding +125°C except sintered electrolytic capacitors having a casing made of epoxy resin and capacitors sealed or coated with epoxy resin ..... A

(3) Other capacitors rated for operation at ambient temperatures below −55°C or above +200°C ..... A

Communication, detection and tracking equipment of a kind using ultra-violet radiation, infra-red radiation or ultrasonic waves, and specially designed parts and components therefor ..... A

(1) Industrial equipment of a kind using cells not specified in the entries relating to photo-electric cells and thermal detecting cells elsewhere in this Group;

(2) Equipment used for industrial and civilian intrusion alarms, traffic and industrial movement control and counting systems, medical applications, industrial inspection, sorting or analysis of the properties of materials, or for simple educational or entertainment purposes;

(3) Flame detectors for industrial furnaces;

(4) Equipment of a kind using a single detector cell with no scanning of the detector and used for laboratory or industrial non-contact temperature measurement;

(5) Instruments capable of measuring radiated power or energy and having a response time constant greater than 10 milliseconds; and

(6) Equipment of a kind using ultrasonic waves, the following—

(*a*) which operates in contact with a controlled material to be inspected or which is used for industrial cleaning, sorting or materials handling, emulsification or homogenisation;

(*b*) used for under-water communications, designed for operation with amplitude modulation and having a communications range of 500 m or less, a carrier frequency of 40 to 60 kHz, and a carrier power supplied to the transducer of 1 W or less.

Communications transmission equipment (single and multi-channel), including terminal, intermediate amplifier or repeater equipment and multiplex busses, and multiplex equipment used for communications within or between communi-

cations or other equipment and systems, by line, cable, optical fibre or radio means, and associated modems and multiplex equipment (except: equipment employing exclusively the direct current transmission technique; electronic measuring equipment suitable for use with the PCM transmission equipment defined in CCITT recommendation series G 700 (ITU Geneva); facsimile equipment not covered by the entry in this Group relating to cryptographic equipment; and telemetering, telecommand and telesignalling equipment designed for industrial purposes but not including transmission equipment intended for the transmission of written or printed text), the following:—

(1) Equipment employing analogue transmission techniques with analogue input and output, including but not limited to frequency division multiplex (FDM), designed to deliver, carry or receive baseband frequencies higher than those in sub-heads (*a*) and (*b*) below into, or in, a communications system:

(*a*) in the case of equipment suitable for use with submarine cable, frequencies higher than 300 kHz ..... A

(*b*) in all other cases, frequencies higher than 19 MHz ..... A

(2) Equipment employing digital transmission techniques which is designed for operation at a data signalling rate exceeding 2·1 Megabits per second and having analogue input and output including, but not limited to, pulse code modulation (PCM) designed for use on communications circuits .. A

(3) Data communications equipment employing digital transmission with digital input and output, including telegraphic and data transmission, the following:

(*a*) equipment designed for operation at a data signalling rate in bits per second, excluding servicing and administrative channels, numerically exceeding either 4,800 bits per second or 160% of the channel or sub-channel bandwidth in Hz C

(*b*) equipment employing an automatic error detection and correction system in which retransmission is not required for correction and the data signalling rate exceeds 300 bits per second C

(4) Parts, components, accessories and sub-assemblies specially designed for equipment specified in heads (1) to (3) above (inclusive), except connectors for use with optical fibres or cable with a repeatable coupling loss of 0·5 dB or more ..... A

(5) Test equipment specially designed for the equipment specified in head (2) of this entry ..... A

In this entry—

"data signalling rate" takes into account that, for non-binary modulation systems, "bauds" and "bits per second" are not equal since bits for coding, checking and synchronisation should be included with the "bits per second"; and

"bandwidth", for data communications equipment designed to operate in one voice channel, is 3,100 Hz and for voice frequency telegraph systems designed to International Telegraph and Telephone Consultative Committee (CCITT) and International Radio Consultative Committee (CCIR) standards "bandwidth" is the number of channels times the channel spacing.

Cryptographic equipment and ancillary equipment (such as teleprinters, perforators, vocoders, visual display units) designed to ensure secrecy of stored information or information transmitted via communications media such as telegraphy, telephony, facsimile, video, data; their specialised parts and components; and software controlling or performing the function of such cryptographic equipment; except simple coding devices or equipment only ensuring the privacy of communication ..... A

This entry includes but is not limited to the following:

(*a*) video systems which use a digital transmission or digital techniques to modify an analogue transmission for video or facsimile secrecy;

(*b*) receivers and transmitters for spread spectrum and frequency agile systems which are more precisely defined in the entries in this Group relating to radio receivers and radio transmitters.

Densitometers, flatbed, and parts, components and assemblies therefor, the following:—

(1) Flatbed microdensitometers, except cathode-ray types having any of the following characteristics: ..... A

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

(*b*) a figure of merit less than 0·1; or

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

(2) Specially designed parts, components and assemblies for the instruments specified in head (1) above ..... A

In this entry: "figure of merit" is the product of the density resolution expressed in density units and the spatial resolution expressed in micrometers. Density resolution is measured over the optical density range of the instrument.

Electrical or electronic equipment, whether or not separately specified in an entry in this Schedule, the following:—

(1) Electric typewriters;

(2) Teleprinters;

(3) Visual display units; and

(4) Word processors;

in respect of which a certificate has been issued to the knowledge of the exporter by or on behalf of the Secretary of State to the effect that the equipment to which the certificate relates meets or has been modified or designed to meet government standards concerned with the limitation of compromising electromagnetic radiation ..... A

Electronic cathode-ray tubes, vacuum tubes or valves (except tubes included in the entry in this Group relating to X-ray systems, flash discharge types), the following:—

(1) Cathode-ray tubes having any of the following characteristics: ..... A

(*a*) a resolving power of 32 lines or more per mm using the shrinking raster method of measurement;

(*b*) with travelling wave, or distributed deflection structure, using delay lines or incorporating other techniques to minimise mismatch of fast phenomena signals to the deflection structure; or

(*c*) incorporating microchannel plate electron multipliers.

(2) Cold cathode tubes, whether gas-filled or not, operating in a manner similar to a spark gap, containing three or more electrodes and having all of the following characteristics: C

(*a*) rated for an anode peak voltage of 2,500 V or more;

(*b*) rated for peak currents of 100 A or more;

(*c*) an anode delay time of 10 microseconds or less; and

(*d*) an envelope diameter of less than 25·4 mm

(3) Electron tubes except commercial standard television camera tubes not having fibre optic faceplates and commercial standard X-ray amplifier tubes, and specialised components and parts therefor, the following:

(*a*) image intensifiers, image convertors, incorporating fibre-optic face-

plates or microchannel plate electron multipliers and camera tubes incorporating or coupled with image intensifiers or image convertors A

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

(*c*) camera tubes with fibre optic faceplates or microchannel plate electron multipliers or both ..... A

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

(4) Hydrogen thyratrons of ceramic/metal construction rated for a peak pulse power of 12·5 MW or more ..... A

(5) Vacuum tubes specially designed for use as pulse modulators for radar or similar applications, having a peak anode voltage rating of 100kV or more or rated for a peak pulse power of 2·4 MW or more, and specially designed parts and components therefor C

(6) Valves, the following:

(*a*) valves in which space charge control is utilised as the primary functional parameter, the following—

(i) valves rated for continuous wave operation above 4 GHz at the maximum rated anode dissipation ..... A

(ii) valves rated for continuous wave operation within the frequency range 0·3 GHz to 4 GHz and for which (under any condition of cooling) the product of the maximum rated anode dissipation (expressed in W) and the square of the maximum frequency (expressed in GHz) at the maximum rate anode dissipation is greater than 10^4 ..... A

except

valves specially designed for television transmitters operating in the frequency range 0·47 GHz to 0·96 GHz and rated for operation without a grid current, for which the product of the rated anode dissipation (expressed in W) and the square of the maximum frequency (expressed in GHz) is not greater than 2×10^4;

(iii) valves rated only for pulse operation above 1 GHz at the peak pulse output power ..... A

(iv) valves rated only for pulse operation between 0·3 and 1 GHz and for which (under any condition of cooling), the product of the peak pulse output power (expressed in W) and the square of the maximum frequency (expressed in GHz) is greater than $4{\cdot}5 \times 10^4$ A

(v) valves specially designed for use as pulse modulators for radar and similar applications, the following—

(*a*) having a peak anode voltage rating of 100 kV or more . A

(*b*) rated for a peak pulse power of 6 MW or more ..... A

(see also the entry in this Group relating to pulse modulators);

(*b*) valves which utilise interaction between a beam of electrons and microwave elements and in which the electrons travel in a direction perpendicular to the magnetic field, including but not limited to magnetrons, crossed-field amplifier valves and crossed-field oscillator valves, ... A

except

(i) fixed frequency and tunable pulsed magnetrons and crossed-field amplifier valves, the following—

(*a*) those designed to operate at frequencies below 3 GHz with a maximum rated peak output power of 1·5 MW or less;

(*b*) those designed to operate at frequencies of between 3 GHz and 12 GHz if the product of the maximum rated peak output

power (expressed in kW) and the frequency (expressed in GHz) is less than 4,200; and

(*c*) crossed-field amplifier valves designed to operate at frequencies below 4 GHz with a maximum rated peak output power of 1·2 MW or less and a gain of less than 15 dB;

(ii) fixed frequency continuous wave magnetrons designed for medical, 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 4kW, or at a frequency lower than 1 GHz with a maximum rated power not exceeding 25 kW;

(*c*) valves which utilise interaction between a beam of electrons and microwave elements or cavities and in which the electrons travel in a direction perpendicular to the applied magnetic field, including but not limited to klystrons and travelling wave tubes, ... A

except

(i) continuous wave valves designed for octave or lesser bandwidth (where the highest operating frequency is equal to or less than twice the lowest operating frequency) and having both the following characteristics—

(*a*) designed to operate below 20 GHz; and

(*b*) the product of the rated output power (expressed in W) and the frequency (expressed in GHz) is less than 800;

(ii) pulsed valves designed for octave or lesser bandwidth and having either of the following characteristics—

(*a*) peak saturated ouput power not exceeding 1 kW and average power not exceeding 40 W at or below 10 GHz; or

(*b*) peak saturated output power not exceeding 100 W and average power not exceeding 20 W at between 10 and 20 GHz;

(iii) pulsed valves designed for fixed frequency operation at frequencies less than 3·5 GHz, having a peak output power of 1·6 MW or less and an operating bandwidth less than one per cent; and

(iv) low power oscillator valves designed to operate at frequencies below 20 GHz with a maximum output power of less than 3 W;

(*d*) valves which utilise interaction between an electron beam and microwave elements or cavities but do not require a magnetic field to control or focus the electron beam, except low power reflex oscillator klystrons designed to operate at frequencies below 20 GHz and at a maximum output power of less than 3 W ..... A

(*e*) valves which utilise interaction between a beam of electrons and microwave elements in which the electrons drift in a direction parallel to the applied magnetic field but also require for their operation a large component of velocity transverse to the direction of the applied magnetic field, including but not limited to gyrotrons and ubitrons ..... A

(*f*) valves designed to withstand on any axis an acceleration of short duration (shock) greater than 1,000**g** ..... A

(*g*) valves designed for operation in ambient temperatures exceeding 200°C ..... A

(*h*) valves specified in sub-heads (*c*), (*d*) or (*e*) above which are designed to operate with no cathode heating element ..... A

(*i*) electronic valves which use a modulated beam of electrons striking one or more semi-conductor diodes to provide power gain (see also the entry in this Group relating to semi-conductor diodes) ..... A

(*j*) specially designed parts or components for the valves specified in this entry ..... A

Electronic components, assemblies, sub-assemblies, printed circuit boards and microcircuits, the following:—

(1) Printed circuit boards (single-sided, double-sided or multilayer) designed physically to mount and provide electrical interconnection between electronic components but which are not manufactured from any of the following insulating materials ..... A

(*a*) paper base phenolics;

(*b*) glass cloth melamine;

(*c*) glass epoxy resin;

(*d*) polyethylene terephthalate; or

(*e*) any other insulating materials with a continuous operating temperature not exceeding 150°C.

(2) Assemblies, modules and printed circuit boards with physically mounted components, the following:

(*a*) those incorporating printed circuit boards specified in head (1) above A

(*b*) those incorporating microprocessor, microcomputer or memory microcircuits or components specified elsewhere in this Group, ... A

except

(i) assemblies incorporating components specified in this Group but which components are capacitors; and

(ii) power supply assemblies.

(3) Microcircuits (monolithic integrated circuits, microprocessor, microcomputer, multichip, hybrid, film or integrated optical types), .. A

except

(*a*) encapsulated passive networks;

(*b*) encapsulated microcircuits (other than those designed or rated as radiation hardened and other than those rated for operation below −40°C or above +85°C) packaged in TO-5 outline cases (7·747 to 9·398 mm diameter) or in non-hermatically sealed cases, the following:

(i) bipolar 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 Schmitt-triggers, designed for operation as digital logic circuit elements and having all 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 30 pJ (that is speed-power product-gate not less than 30 pJ);

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

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

(ii) CMOS circuits designed for operation as digital logic circuit elements, the following—

gates, inverters, buffers, flip-flops, latches, multivibrators, bilateral switches, display drivers, fixed counters, fixed frequency dividers, storage registers, decoders, voltage translators, encoders or Schmitt-triggers having both of the following characteristics—

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

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

(iii) silicon single-chip microcomputer microcircuits, other than bit-slice microcomputers, that have been mask programmed for a civil application and have all of the following characteristics—

(*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*) 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 programme memory; and

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

(iv) silicon microprocessor microcircuits, other than bit-slice microprocessors, having all of the following characteristics—

(*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 programme memory of less than or equal to 32,768 bytes; and

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

In sub-heads (*b*)(iii) and (*b*)(iv) "speed" in each case means the time (in microseconds) to add characteristic "(*c*)" to characteristic "(*d*)", where "(*c*)" and "(*d*)" are both in memory, and put the result back in "(*c*)".

(v) memory microcircuits, the following—

(*a*) MOS dynamic RAMs having both the following characteristics—

(i) a maximum of 1,024 bits per package and an access time of not less than 20 nanoseconds; and

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

(*b*) mask programmed RAMs not rated for operation below −20°C or above +75°C, the following—

(i) with a maximum of 2,048 bits per package and an access time of not less than 450 nanoseconds;

(ii) PMOS or NMOS types with a maximum of 4,096 bits per package and an access time not less than 700 nanoseconds;

(*c*) MOS static RAMs having both the following characteristics—

(i) a maximum of 256 bits per package; and

(ii) an access time of not less than 450 nanoseconds;

(*d*) bipolar RAMs, the following—

(i) with a maximum of 64 bits per package and an access time of not less than 30 nanoseconds;

(ii) with a maximum of 256 bits per package and an access time of not less than 40 nanoseconds; or

(iii) with a maximum of 1,024 bits per package and an access time of not less than 45 nanoseconds;

(vi) microcircuits, the following—

(*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, and are capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in not 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 the following characteristics—

(i) capable of executing a sequence of not more than 256 programme steps introduced into a programme memory on the chip by a sequence of keystrokes; and

(ii) capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in not 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 of 1,024 bits per package;

(vii) microcircuits, the following—

(*a*) untuned AC amplifier circuits having a bandwidth of less than 3 MHz and a maximum rated power dissipation of 5 W or less at a case temperature of 25°C;

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

(viii) operational amplifier microcircuits 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 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 V/microsecond;

(ix) analogue multiplier or divider microcircuits having both the following characteristics—

(*a*) a best case related non-linearity of not better than 0·5% of full scale; and

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

(x) isolation amplifier microcircuits;

(xi) instrumentation amplifier microcircuits having all of the following characteristics—

(*a*) a best case rated non-linearity of not better than 0·2% at a gain of 100;

(*b*) a maximum gain-bandwidth product not greater than 5 MHz; and

(*c*) a typical slew rate at unity gain not exceeding 1 V/microsecond;

(xii) voltage regulator microcircuits, whether or not rated for operation above +85°C, the following—

(*a*) linear types having both the following characteristics—

(i) a rated nominal output voltage of 40 V or less; and

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

(*b*) switching types having both the following characteristics—

(i) a rated nominal output voltage of 40 V or less; and

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

(xiii) voltage comparator microcircuits having both the following characteristics—

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

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

(xiv) bipolar microcircuits designed for operation in civil applications as electronically controlled inductive, magnetic or optical switches or as threshold value switches with switching times of 0·5 microsecond or greater;

(xv) non-coherent light-emitting alphanumeric displays not incorporating an integral circuit;

(xvi) 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;

(xvii) simple encapsulated photo-coupler (transopter) assemblies with electrical input and which incorporate non-coherent light-emitting diodes;

(xviii) interface microcircuits, the following—

(*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 the following characteristics—

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

(ii) a typical input threshold voltage of not less than 10mV;

(*c*) memory and clock drivers having all of the following characteristics—

(i) a maximum rated output current of 500 mA or less;

(ii) a maximum rated output voltage of 30 V or less; and

(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 mA or less;

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

(iii) a maximum rated output voltage of 80 V or less;

(xix) voltage-to-frequency converter microcircuits not employing delta or delta/sigma modulation techniques, having both the following characteristics—

(*a*) a rated non-linearity of not better than 0·01% of full scale; and

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

(xx) Rms-to-dc voltage converter microcircuits having both the following characteristics—

(*a*) a rated conversion accuracy, with or without external adjustment, of not better than 0·2% of full scale; and

(*b*) a ±1% amplitude error bandwidth of not greater than 100 kHz;

(xxi) analogue-to-digital and digital-to-analogue converter microcircuits (other than coder, decoder or coder/decoder (codec) microcircuits specially designed for voice), the following—

(*a*) analogue-to-digital converter microcircuits having both the following characteristics—

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

(ii) a rated non-linearity of not better than 0·05% of full scale over the specified operating temperature range;

(*b*) digital-to-analogue converter microcircuits having both 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; and

(ii) a rated non-linearity of not better than 0·05% of full scale over the specified operating temperature range;

(xxii) non-programmable 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, whether or not such circuits are rated for operation below −40°C or above +85°C;

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

(*c*) personal communicaions up to 150 MHz, including amateur radio communications and intercom;

(*d*) for cameras and cinecameras (other than for imaging microcircuits, or those used in cameras and cinecameras specified in entries in Groups 1 or 3G) whether or not such circuits are rated for operation below −40°C or above +85°C;

(*e*) cardiac pacemakers;

(xxiii) timing microcircuits having both the following characteristics—

(*a*) a typical timing error of not less than 0·5%; and

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

(*c*) unencapsulated monolithic integrated circuits which are not designed or rated as radiation hardened and which are—

(i) bipolar types (other than complex custom bipolar digital devices), 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, multi-vibrators, code convertors, registers, encoders, decoders, demultiplexers, diode matrices, multipliers and Schmitt-triggers, having both 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); and

(*b*) a typical propogation delay time not less than 5 nanoseconds;

(ii) 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; and

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

(iii) audio amplifiers having a maximum rated power output of 10 W or less at a case temperature of 25°C;

(iv) non-reprogammable types which are specially designed for, and by virtue 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 using charge-coupled device (CCD) technology;

(*d*) not intended for beam lead bonding; and

(*e*) not intended for video and/or luminance amplifiers with maximum rated supply voltages exceeding 30 V or with typical bandwidths greater than 7·5 MHz;

In this entry—

"assembly" means a number of components (i.e. circuit elements, discrete components, microcircuits) connected together to perform a specific function or functions, replaceable as an entity (and normally capable of being disassembled);

"circuit element" means a single active or passive functional item in an electronic circuit, such as one diode, one transistor, one resistor or one capacitor;

"discrete component" means a separately packaged circuit element with its own external connections;

"film type microcircuit" means an array of circuit elements and metallic interconnections formed by deposition of a thick or thin film on an insulating substrate;

"integrated optical microcircuit" means a microcircuit containing one or more elements designed to function as a photosensor and/or photoemitter;

"hybrid microcircuit" means a microcircuit consisting of a combination of film type microcircuits and monolithic integrated circuit elements or combinations of either with discrete components or circuit elements;

"microcircuit" means a device in which a number of passive and active circuit elements are considered as indivisibly associated on or within a continuous structure to perform the function of a circuit;

"monolithic integrated circuit" means a microcircuit fabricated as a single component consisting of elements formed in or on a single semiconducting substrate by diffusion, implantation or deposition;

"module" means an assembly, replaceable as an entity, not normally capable of being disassembled;

"microprocessor microcircuit" means a single package (normally single-chip) electronic logic unit capable of executing from external memory a series of general purpose instructions contained in the external memory;

"microcomputer microcircuit" means an electronic logic unit capable of executing instructions from internal memory on data contained in the internal memory; and

"multichip microcircuit" means a microcircuit containing two or more monolithic integrated circuit chips bonded to a common substrate.

Electronic measuring, calibrating, counting, testing and time interval measuring equipment (whether or not incorporating frequency standards), the following:—

(1) Equipment designed as reference frequency standards for laboratory use, with a stabilitiy over 24 hours or more of 1 part in 10^{10} or better ..... A

(2) Equipment designed for fixed ground use and containing a frequency standard, or standards, with a stability over 24 hours of 1 part in 10^{9} or better A

(3) Equipment designed for portable or mobile use and containing a frequency standard, or standards, with a stability over 24 hours of 1 part in 10^{8} or better ..... A

(4) Instruments designed for use at frequencies exceeding 18 GHz ..... A

(5) Instruments designed and rated for use at frequencies exceeding 12·5 GHz, the following:

(*a*) comb frequency generators ..... A

(*b*) transfer oscillators ..... A

(*c*) frequency converters ..... A

(6) Instruments designed for use at frequencies exceeding 1 GHz, the following:

(*a*) network analysers, for the automatic measurement of equivalent circuit parameters over a range of frequencies ..... A

(*b*) specially calibrated microwave instrumentation receivers capable of measuring amplitude and phase simultaneously ..... A

(*c*) instruments for the direct measurement of impedance ..... A

(*d*) instruments the functions of which can be controlled by the injection of digitally-coded electrical signals from an external source ..... A

(7) Spectrum analysers employing time compression of the input signal or FFT (Fast Fourier Transform) techniques ..... A

(8) Instruments incorporating computing facilities with user accessible reprogramming capability and an alterable memory or more than 8,192 bits A

(9) Digital instruments incorporating computing facilities, the following:

(*a*) digital test instruments with user accessible reprogramming capability (including digital circuit testers, logic (state or timing) analysers, bus analysers, serial data analysers and digital word generators), specially designed for examining or comparing the absolute or relative information content or the timing of one of more digital bit streams,

except

(i) logic probes, logic pulsers, digital current tracers (or "sniffers"), signature analysers and other digital circuit testers capable of observing single events and/or providing stimulus at single test points;

(ii) logic clips and logic comparators;

(iii) logic (state or timing) analysers with not more than eight data channels (not including qualifier channels) and a maximum clock rate capability of 2 MHz or less; and

(iv) digital word generators capable of operating at a maximum clock rate of 2 MHz or less with word lengths of 8 bits or less;

(*b*) microprocessor and microcomputer development instruments and systems, specially designed for use in debugging, diagnosing, emulating, simulating, designing, evaluating, programming or reprogramming firmware or software of signal processor-based, computer-based, or memory-based, devices, systems or microsystems, except instruments and systems which are designed for use only with microprocessors and microcomputers not specified in the entry relating to electronic components in this Group ..... A

(10) Digital counters, the following:

(*a*) counters capable of counting successive input signals with less than 5 nanoseconds time difference without prescaling (digital division) of the input signal; (for counter/timers having a time interval measurement mode, see also head (11) below) ..... A

(*b*) counters employing prescaling of the input signal in which the prescaler is capable of resolving successive input signals in less than 1 nanosecond time difference ..... A

(*c*) counters capable of measuring burst frequencies exceeding 100 MHz for a burst duration of less than 5 milliseconds ..... A

(11) Time interval measuring equipment employing digital techniques, capable of measuring time intervals of less than 5 nanoseconds on a single shot basis ..... A

(12) Testing equipment rated to maintain specified operating data over a range of ambient temperatures from below −25°C to above +55°C .... A

(13) Digital voltage measuring apparatus (with or without electrical outputs) irrespective of the physical units in which calibrated, with a reading speed (from zero to the measured value) faster than 25 accesses per second, except visual quantization apparatus capable of providing an average value—displayed or not—of the results of the measurement and multichannel analysers of all types used in nuclear instrumentation, having any of the following characteristics:

(*a*) a digital resolution over the whole scale greater than 0·0005% ... A

(*b*) an accuracy greater than 0·002% of reading over an ambient temperature range of ± 5°C or more, or a stability better than 10^{-6} of reading over a period of 24 hours or more ..... A

or

(*c*) a capability of more than 500 independent measurements per second A

(14) Transient recorders, utilising analogue-to-digital conversion techniques, capable of storing transients by sequentially sampling single input signals at successive intervals of less than 50 nanoseconds ..... A

In this entry—

"user accessible reprogramming capability" means that the instrument contains a computing facility, such as a microprocessor, and the user has the ability to alter the computing programme through external controls such as switches, keyboards or digital busses; and

"reading speed" does not include changes in range or polarity.

Frequency synthesizers (any kind of frequency source or signal generator, regardless of the techniques used, provided 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) and equipment containing frequency synthesizers, the following:—

(1) Frequency synthesizers, the following:

(*a*) those containing frequency standards specified in head (1) of the entry relating to electronic measuring calibrating, counting, testing and time interval measuring equipment in this Group ..... A

(*b*) those containing temperature-compensated crystal oscillators (TCXO) having either of the following characteristics— ..... A

(i) a stability with respect to temperature of better than ±0·00015% over their operating temperature range; or

(ii) an operating temperature range wider than 120°C

(2) Instrument frequency synthesizers and synthesized signal generators, 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:

(*a*) a maximum output frequency in excess of 550 MHz ..... A

(*b*) having a phase noise to signal ratio better than −60 dB or an AM noise to signal ratio better than −70 dB referred to the 30 kHz band centred on the carrier, excluding the 1 Hz band centred on the carrier A

(*c*) 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 speed of switching from one selected output frequency to another selected output frequency less than 10 milliseconds ..... A

(*d*) having a level of spurious components in the output better than −80 dB non-harmonic or −60 dB harmonic component measured relative to the selected output frequency ..... A

(*e*) having more than 3 different selected synthesized output frequencies available simultaneously from one or more outputs ..... A

(*f*) having facilities for pulse modulation of the output frequency .... A

(3) Airborne communications equipment using frequency synthesizers, the following:

(*a*) equipment designed to receive or transmit frequencies greater than 156 MHz ..... A

(*b*) equipment incorporating facilities for the rapid selection of more than 200 channels per equipment, except equipments operating in the frequency range of 108 to 136 MHz incorporating facilities for the rapid selection of 720 channels or fewer at not less than 25 kHz channel spacing which have been in normal civil use for at least one year .. A

(*c*) equipment with a speed of switching from one selected output frequency to another selected output frequency less than 10 milliseconds A

(*d*) frequency synthesizers designed for any of the equipment specified in sub-heads (*a*) to (*c*) above (inclusive), whether supplied separately or with such equipment and exceeding the parameters defined for equipment specified in head (2) of this entry ..... A

(4) Digitally-controlled radio receivers, whether or not computer-controlled, which search or scan automatically a part of the electro-magnetic spectrum, using frequency synthesizers, the following:

(*a*) digitally-controlled receivers in which the switching operation takes less than 10 milliseconds, except non-ruggedised digitally-controlled pre-set type radio receivers designed for use in civil communications, which have 200 selective channels or fewer; ..... A

(*b*) frequency synthesizers designed for the equipment specified in sub-head (*a*) above, whether supplied separately or with such equipment, and exceding the parameters defined for equipment specified in head (2) of this entry, except those specially designed for the non-ruggedised receivers specified in sub-head (*a*) above ..... A

(5) Radio transmitters incorporating transmitter drive units, exciters and master oscillators using frequency synthesis, the following:

(*a*) transmitters having an output frequency of up to 32 MHz with a frequency resolution of better than 10 Hz and with a speed of switching

from one selected output frequency to another selected output frequency less than 10 milliseconds ..... A

(*b*) transmitters having an output frequency from 32 MHz to 235 MHz with a frequency resolution of better than 250 Hz and with a speed of switching from one selected output frequency to another selected output frequency less than 10 milliseconds ..... A

(*c*) transmitters having an output frequency greater than 235 MHz, . A

except

(i) television broadcasting transmitters having an output frequency from 470 MHz to 960 MHz with a frequency resolution of not better than 1 kHz and where the manually-operated frequency synthesizer incorporated in or driving the transmitter has an output frequency not greater than 120 MHz; and

(ii) FM and AM ground communications equipment for use in the land mobile service and operating in the 420 to 470 MHz band with a power output of 50 W for mobile units and 300 W for fixed units with a frequency resolution of not better than 6·25 kHz and with a speed of switching from one selected output frequency to another selected output frequency greater than 50 milliseconds;

(*d*) transmitters having more than three different selected synthesized output frequencies available simultaneously from one or more outputs A

(*e*) transmitters with facilities for pulse modulation of the output frequency of the transmitters or of the incorporated frequency synthesizer A

(*f*) frequency synthesizers designed for any of the equipments specified in sub-head (*a*) to (*e*) above (inclusive), whether supplied separately or with such equipment, and exceeding the parameters specified in head (2) of this entry ..... A

(6) Specially designed parts, components, accessories and sub-assemblies for equipment specified in heads (2) to (5) above (inclusive) ..... A

Lasers and laser systems and specially designed parts and components therefor (including amplification stages) and any equipment containing lasers or designed to contain lasers, the following:—

(1) Lasers and specially designed components and parts therefor, ... A

except

(*a*) argon, krypton and dye lasers, when not contained in equipment, with both the following characteristics:

(i) an output wavelength shorter than 0·8 micrometre; and

(ii) a pulsed output not exceeding 0·5 joule per pulse and an average or continuous wave maximum rated single- or multi-mode output power not exceeding 20 W;

(*b*) helium-cadmium, nitrogen, and multi-gas lasers not specified elsewhere in this entry and not contained in equipment, having both the following characteristics:

(i) an output wavelength shorter than 0·8 micrometre; and

(ii) a pulsed output not exceeding 0·5 joule per pulse and an average or continuous wave maximum rated single- or multi-mode output power not exceeding 120 W;

(*c*) helium-neon lasers, when not contained in equipment, with an output wavelength shorter than 0·8 micrometre;

(*d*) ruby-lasers, when not contained in equipment, with both the following characteristics:

(i) an output wavelength shorter than 0·8 micrometre; and

(ii) an energy output not exceeding 20 joules per pulse;

(*e*) CO_2, CO or CO/CO_2 lasers, when not contained in equipment, with either of the following characteristics:

(i) an output wavelength in the range of 9 to 11 micrometres and a pulsed output not exceeding 2 joules per pulse and a maximum rated average single- or multi-mode output power not exceeding 1·2 kW or a continuous wave maximum rated single- or multi-mode output power not exceeding 2·5 kW; or

(ii) an output wavelength in the range of 5 to 7 micrometres and having a continuous wave maximum rated single- or multi-mode output power not exceeding 50 W;

(*f*) Nd:YAG lasers, when not contained in equipment, having an output wavelength of 1·06 micrometres and either of the following characteristics:

(i) a pulsed output not exceeding 0·5 joules per pulse and a maximum rated average single- or multi-mode output power not exceeding 10 W or a continuous wave maximum rated single- or multi-mode output power not exceeding 50 W; or

(ii) a pulsed output not exceeding 10 joules per pulse with a pulse width not less than 50 microseconds and a maximum rated average single- or multi-mode output power not exceeding 50 W;

(*g*) Nd:Glass lasers, when not contained in equipment, having both the following characteristics:

(i) an output wavelength of 1·06 micrometres; and

(ii) a pulsed output not exceeding 0·5 joules per pulse;

(*h*) tunable CW dye lasers, when not contained in equipment, having both the following characteristics:

(i) an output wavelength shorter than 0·8 micrometre; and

(ii) an output not exceeding an average or continuous wave maximum rated single- or multi-mode output power of 1 W;

(*i*) tunable pulsed lasers, including dye and N2 lasers, when not contained in equipment, having all of the following characteristics:

(i) an output wavelength shorter than 0·8 micrometre;

(ii) a pulse duration not exceeding 100 nanoseconds; and

(iii) a peak power output not exceeding 1 MW;

(*j*) single-element semi-conductor lasers, not contained in equipment, having a wavelength shorter than 1 micrometre and designed for use in the video and audio recorders and reproducers and point of sale price scanners referred to at sub-heads (2)(*m*) and (*n*) below.

(2) Equipment containing lasers and laser systems, ... A

except the following equipment containing lasers of the types excluded from head (1) above:

(*a*) equipment specially designed for industrial and civilian intrusion detection and alarm systems;

(*b*) equipment specially designed for medical applications;

(*c*) equipment for educational and laboratory purposes;

(*d*) equipment specially designed for traffic and industrial movement control and counting systems;

(*e*) equipment specially designed for the detection of environmental pollution;

(*f*) optical spectrometers and densitometers;

(*g*) equipment containing continuous wave helium-neon gas lasers, other than lasers described in heads (3) and (4) below;

(*h*) equipment for cutting or bonding textiles;

(*i*) equipment for cutting paper;

(*j*) equipment containing lasers for drilling diamond dies for the wire drawing industry;

(*k*) electronic daylight scanning equipment with auxiliary electronic screening unit specially designed for printing processes;

(*l*) laser-radar (lidar) equipment specially designed for surveying or meteorological observation;

(*m*) consumer disc-type video and audio recorders and reproducers;

(*n*) point of sale price scanners; and

(*o*) equipment designed for surveying purposes if it is not capable of measuring range.

(3) Laser measuring systems that maintain over the full scale a resolution equal to or finer than 0·1 micrometre and an accuracy equal to or finer than 1 ppm for a 48 hour period over a temperature range of ±10°C around a standard temperature and a standard pressure as indicated in IEC publication No 160 ..... A

(4) Laser feedback systems and laser interferometers for use in equipment described in heads (3) to (6) (inclusive) of the entry in Group 3A relating to machine tools and numerical control systems ..... A

In this entry "tunable" means the ability of a laser to produce an output at any wavelength within its tunable range. A line-selectable laser which can operate only on discrete wavelengths is not considered tunable.

Materials specially designed and manufactured for use as absorbers of electromagnetic waves having frequencies greater than 2×10^8 Hz, and less than 3×10^{12} Hz ..... A

except materials having both the following characteristics:

(*a*) a tensile strength of less than 7×10^7 N/m² and a compressive strength of less than $17{\cdot}5 \times 10^7$ N/m²; and

(*b*) not capable of withstanding temperatures in excess of 176°C.

Microwave equipment, including parametric amplifiers, capable of operating at frequencies over 1 GHz (other than microwave equipment included in the entries relating to communications, navigation, direction finding and radar equipment; radio transmitters and components; radio relay communications equipment; coaxial cable with the outer conductor electroplated directly on spirally-grooved cable dielectric; and electronic measuring, calibrating, counting, testing and time interval measuring equipment), the following:—

(1) Rigid and flexible waveguides and components therefor designed for use at frequencies in excess of 18 GHz C

(2) Waveguides having a bandwidth ratio greater than 1·7:1 C

(3) Waveguide components, the following:

(*a*) directional couplers having a bandwidth ratio greater than 1·7:1 and a directivity over the band of 20 dB or more C

(*b*) rotary joints capable of transmitting more than one isolated channel or having a bandwidth greater than 5% of the centre mean frequency, except rotary joints used in air traffic control equipment carrying combinations of frequencies suitable for secondary surveillance radar antennae co-mounted on a primary radar antenna and which do not have a bandwidth exceeding 5% of the centre mean frequency C

(*c*) magnetic, including gyro-magnetic, waveguide components C

(4) TEM mode devices using magnetic, including gyro-magnetic, properties C

(5) TR and anti-TR tubes and components therefor, ... C

except

(*a*) those designed for use in waveguides and operating at a peak power not exceeding 3 MW and at a frequency of 1·5 GHz or less;

(*b*) those designed for use in waveguides and operating at a peak power not exceeding 1·2 MW and at a frequency over the range 1·5 GHz to 6 GHz; and

(*c*) those designed for use in waveguides and operating at a peak power not exceeding 300 kW and at a frequency over the range 6 GHz to 10·5 GHz.

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

(7) Phased array antennae and sub-assemblies, permitting electronic control of beam shaping and pointing, and specially designed parts and components therefor C

(8) Microwave assemblies or sub-assemblies having circuits fabricated by the same processes as used in integrated circuit technology, that include active circuit elements (see also the entries relating to acoustic wave devices in Group 3G; and electronic components, assemblies, sub-assemblies, and printed circuit boards and microcircuits in this group) C

(9) Microwave assemblies or sub-assemblies which contain band pass or band stop filters and which are capable of operating at 3 GHz or greater C

(10) Amplifiers (see also the entry relating to amplifiers in this Group) .. C

(11) PIN Modulators (see also the entry relating to semi-conductor diodes in this Group) C

In this entry "ITU Standards" means the standards for civil television systems designed to International Telecommunication Union recommendations.

Navigation, direction finding, radar and airborne communication equipment, the following:—

(1) Airborne communication equipment and specialised parts and components therefor, having any of the following characteristics:

(*a*) designed to operate at frequencies greater than 156 MHz ..... A

(*b*) incorporating facilities for—

(i) the rapid selection of more than 200 channels per equipment, or . A

(ii) equipment using frequency synthesis techniques ..... A

except conventional equipment operating in the frequency range of 108 to 136 MHz with 720 channels or fewer at not less than 25 kHz spacing;

(*c*) pressurised throughout ..... A

(*d*) rated for continuous operation over a range of ambient temperatures extending from below −55°C to above +55°C ..... A

or

(*e*) designed for modulating methods employing any form of digital modulation using time and frequency redundancy such as "Quantized Frequency Modulation" (QFM) ..... A

(2) Airborne navigation equipment and direction finding equipment, the following:—

(*a*) equipment designed to make use of the Doppler frequency phenomena ..... A

(*b*) equipment utilising either of or both the following characteristics: A

(i) the constant velocity; and/or

(ii) the rectilinear propagation of electromagnetic waves having frequency less than 4×10^{14} Hz (0·75 microns);

(*c*) radio altimeters, the following—

(i) pulse modulated ..... A

(ii) frequency modulated having a displayed electrical output accuracy better than ±·914 m over the whole range between 0 and 30·4 m or ±3% above 30·4 m ..... A

(iii) frequency modulated using other than conventional techniques A

(*d*) direction finding equipment, operating at frequencies greater than 5 MHz, except direction finding equipment specially designed for search and rescue purposes and operating under crystal control at a frequency of 121·5 MHz or on alternating frequencies of 121·5 MHz and 243 MHz ..... A

(*e*) equipment pressurised throughout C

(*f*) equipment rated for continuous operation over a range of ambient temperatures extending from below −55°C to above +55°C C

(3) Airborne radar equipment C

(4) Ground and marine radar equipment, the following:

(*a*) equipment operating at a frequency of less than 1·5 GHz and having a peak output power from a transmitter greater than 2·5 MW ..... A

(*b*) equipment operating at a frequency within the range 1·5 to 3·5 GHz and having a peak output power from the transmitter greater than 1·5 MW ..... A

(*c*) equipment operating at a frequency within the range from 3·5 to 6·0 GHz and having a peak output power from the transmitter greater than 1MW ..... A

(*d*) equipment operating at a frequency within the range from 6·0 GHz to 10·5 GHz and having a peak output power from the transmitter greater than 500 kW ..... A

(*e*) equipment operating at a frequency of less than 3·5 GHz and having an 80% or better probability of detection for a 10 sq m target at a free space range of 250 nautical miles ..... A

(*f*) equipment operating at a frequency within the range from 3·5 to 10·5 GHz and having an 80% or better probability of detection for a 10 sq m target at a free space range of 100 nautical miles ..... A

(*g*) equipment utilising other than pulse modulation with either a constant or a 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 phase, except civil airport radar equipment using a carrier frequency that may change from pulse to pulse between two fixed frequencies separated in time and in frequency by constant magnitudes ..... A

(*h*) equipment using a Doppler technique ..... A

except

(i) moving target indicator systems using a conventional double or triple pulse delay line cancellation technique; and

(ii) equipment designed for aerial navigation surveillance or radar control at civil airports;

(i) equipment including any digital signal processing techniques used for automatic target tracking ..... A

(*j*) equipment including any digital signal processing techniques with a facility for electronic tracking ..... A

(*k*) equipment including other than conventional signal processing techniques ..... A

(*l*) equipment not specified above operating at a frequency of more than 10·5 GHz or at a frequency not in normal civil use ..... A

In this head cumulative probability of detection must be determined according to the following parameters:—

(*a*) radial closing velocity of the target 610 m per second;

(*b*) probability of false alarm 10^{-8};

(*c*) operating factor 3 dB;

(*d*) fluctuation of the target in accordance with Rayleigh distribution.

(5) Ground and marine equipment for use with airborne navigation equipment utilising either of or both the following characteristics: C

(*a*) the constant velocity; and/or

(*b*) the rectilinear propagation of electromagnetic waves having a frequency less than 4×10^4 Hz (0·75 micron).

(6) Ground and marine direction finding equipment operating at frequencies greater than 30 MHz C

(7) Specially designed parts, accessories, testing or calibrating equipment and training or simulating equipment for the apparatus in heads (2) to (6) above (inclusive) C

Optical elements and elements for optical tubes, the following:—

(1) Non-flexible fused fibre optic plates or bundles, having a fibre pitch (centre to centre spacing) of less than 15 microns; a light-absorbing medium surrounding each fibre or interstitially placed between fibres; and a diameter greater than 13 mm C

(2) Microchannel plates for electron image amplification, having 15,000 or more hollow tubes per plate; and a hole pitch (centre to centre spacing) of less than 30 microns C

Photosensitive components and dice and wafers therefor (including photodiodes, phototransistors, photothyristors, photo-conductive cells and similar photsensitive components), the following:—

(1) Photosensitive components with a peak sensitivity at a wavelength longer than 1,200 nanometres or shorter than 190 nanometres ..... A

(2) Semi-conductive 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 ..... A

(3) Specialised parts and components, including wafer and dice, for the equipment specified in heads (1) and (2) of this entry ..... A

Photomultiplier tubes, the following:—

(1) Those for which the maximum sensitivity occurs at wavelengths longer than 0·75 micrometre or shorter than 0·3 micrometre ..... A

(2) Those having an anode pulse rise time of less than 1 nanosecond .... A

(3) Those containing microchannel plate electron multipliers ..... A

Pulse modulators of a kind used for 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 and pulse-forming equipment and delay lines, being parts specially designed for such pulse modulators C

Radio receivers, the following:

(1) Panoramic radio receivers, being receivers which search or scan automatically a part of the electromagnetic spectrum and indicate or identify the received signals, except ancillary equipment for receivers with which the frequency spectrum searched does not exceed either ±20% of the intermediate frequency of the receiver or ±2 MHz ..... A

(2) Digitally controlled radio receivers, whether or not computer controlled, which search or scan automatically a part of the electromagnetic spectrum and in which the switching operation takes less than 10 milliseconds and which indicate or identify the received signals ..... A

except

(*a*) receivers capable of digital control of frequency selection, with a maximum operating frequency over the range from 100 kHz to 32 MHz and where the speed of switching from one selected operating frequency to another selected operating frequency does not take less than 10 milliseconds;

(*b*) non-ruggedised digitally controlled pre-set type radio receivers designed for use in civil communications which have 200 selective channels or fewer.

(3) Receivers for spread spectrum and frequency agile systems operating within a total transmitted bandwidth which is:

(*a*) 100 or more times greater than the bandwidth of any one information channel; and

(*b*) in excess of 50 kHz ..... A

(4) Specially designed parts, components and accessories for the radio receivers specified in heads (1) to (3) above (inclusive) ..... A

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

Radio spectrum analysers (being apparatus capable of indicating the single-frequency components of multi-frequency signals), having any of the following characteristics:—

(1) Non-programmable and capable of operating at frequencies over 12·5 GHz ..... A

(2) Programmable and capable of operating at frequencies over 1·0 GHz A

(3) Having a display bandwidth in excess of 125 MHz ..... A

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

(5) Having either of the following characteristics for analysing frequencies greater than 1 GHz:

(*a*) including a scanning preselector, or ..... A

(*b*) incorporating a tracking signal generator, or ..... A

(6) Having an overall display dynamic range of better than 80 dB ..... A

and specially designed parts, components and accessories for the equipment specified in heads (1) to (6) above (inclusive) ..... A

Radio transmitters and components (except transmitters incorporating transmitter drive units, exciters and master oscillators using frequency synthesis, which are specified in the entry in this Group relating to frequency synthesizers, or radio relay communications equipment specified in the entry in this Group relating thereto, the following:—

(1) Transmitters or transmittter amplifiers designed to operate at output frequencies greater than 960 MHz ..... A

(2) Transmitters or transmitter amplifiers designed to provide any of the following features:

(*a*) any system of pulse modulation other than amplitude-, frequency-, or phase-modulated television or telegraphic transmitters ..... A

(*b*) rated for operation over a range of ambient temperatures extending from below −40°C to above +60°C ..... A

(3) Transmitters for spread spectrum and frequency agile systems having a total transmitted bandwidth which is:

(*a*) 100 or more times greater than the bandwidth of any one information channel, and

(*b*) in excess of 50 kHz ..... A

(4) Specially designed parts, components, accessories and sub-assemblies for the equipment specified in heads (1) to (3) above (inclusive) ..... A

Semi-conductor diodes and dice and wafers therefor (except those specified elsewhere in this Schedule, or 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:—

(1) Mixer and detector diodes designed or rated for use at input or output frequencies greater than 1 GHz ..... A

except

(*a*) point contact diodes designed or rated for use at input or output frequencies of 12·5 GHz or less;

(b) Schottky diodes designed or rated for mixer use at input or output frequencies of;

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

(ii) greater than 3 GHz and less than 12·5 GHz and having a noise figure of more than 6·5 dB;

(*c*) 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 not better than −45dBm under unbiased conditions or not better than −50dBm under biased conditions;

(2) Oscillator and amplifier devices such as Gunn, Impatt, Teapatt, TED and LSA, including those used for the direct conversion of DC to RF power, designed or rated for use at:

(*a*) output frequencies above 1 GHz, but not exceeding 4 GHz, with a peak power greater than 2 W or a maximum CW power greater than 200 mW, or ..... A

(*b*) output frequencies above 4 GHz, but not exceeding 12·5 GHz, with a peak power greater than 1 W or a maximum CW power greater than 100 mW ..... A

(3) Voltage variable capacitance diodes designed or rated for use at input or output frequencies greater than 1 GHz ..... A

(4) Fast recovery diodes having either of the following characteristics:

(*a*) a rated maximum reverse recovery time of less than 1 nanosecond or rated for a stored charge of less than 25 pico-colombs, or ..... A

(*b*) both a rated forward rectified current over 1A and a rated maximum reverse recovery time of less than 30 nanoseconds or a rated storage charge of less than 25 pico-colombs ..... A

(5) PIN diodes designed or rated for use at input or output frequencies above 1 GHz ..... A

(6) Non-coherent light-emitting diodes with a peak radiant intensity at a wavelength of greater than 1,000 nanometres ..... A

(7) Dice and wafers for the semi-conductor diodes specified in heads (1) to (6) above (inclusive) ..... A

Thyristors and dice and wafers therefor, the following:—

(1) Thyristors designed for use in pulse modulators having a rated turn-on time of less than 1 microsecond where the rated peak current exceeds 150A A

(2) Thyristors having a rated turn-off time of less than 1 microsecond ... A

(3) Thyristors having a rated turn-off time of 1 microsecond or more but less than 2·3 microseconds, except those having a rated peak current of 50A or less and encapsulated in non-hermetically sealed packages ..... A

(4)Thyristors having a rated turn-off time of from 2·3 microseconds to 10 microseconds (inclusive) and a figure of merit greater than 25 ..... A

(5) Dice and wafers for the thyristors specified in heads (1) to (4) above (inclusive) ..... A

In this entry "the figure of merit" is defined as the product of the repetitive peak off-state voltage (V DRM) in kV and the repetitive peak on-state current (I TRM) in A as shown on the thyristor data sheets.

Transistors and dice and wafers therefor (except photo-transistors which are specified in the entry in this Group relating to photosensitive components), the following:—

(1) Transistors using a bulk semi-conductor material other than germanium or silicon ..... A

(2) Transistors using silicon as the bulk semi-conductor material, the following:

(*a*) types having an operating frequency greater than 1 GHz ..... A

(*b*) types having an operating frequency of 1·5 MHz or less, and a maximum collector dissipation exceeding 300W ..... A

(*c*) types having an operating frequency greater than 1·5 MHz and a maximum collector dissipation exceeding 250W ..... A

(*d*) types having an operating frequency greater than 200 MHz and a product of the operating frequency (in GHz) and the maximum collector dissipation (in W) exceeding 5 ..... A

(*e*) 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 ..... A

This entry covers all devices incorporating a semi-conducting crystal of any material with three or more electrical connections or with only two such connections where four or more active junctions exist within a single block of semi-conductor material, which are used as amplifiers, oscillators, trigger devices or other similar devices, or in combinations thereof in electronic circuits.

In this entry "maximum collector dissipation" means the continuous dissipation measured under the optimum cooling conditions specified by the manufacturer;

"maximum operating frequency in Hertz" means $f\max = \frac{gm}{2\pi Ci}$ where gm is the maximum transconductance in Siemens (mho) and Ci is the input capacitance in farads; and

"operating (specification) frequency" means the frequency used in measuring output power or power gain (G_pE, G_pB or G_pC). When these parameters are not specified, "operating frequency" means the frequency used in measuring gain bandwidth product "(f_T)" 0 or noise figure.

Triggered spark gaps having an anode delay time of 15 microseconds or less and rated for a peak current of 3,000 A or more and parts specially designed therefor A

X-Ray systems, flash discharge type, including tubes having all of the following characteristics:— C

(1) Peak power greater than 500 MW;

(2) Output voltage greater than 500 kV; and

(3) Pulse width less than 0·2 microsecond.

GROUP 3G

Note. Goods specified in the heads of this Group may also be specified in Group 1 of this Part of this Schedule.

Scientific Instruments and Apparatus, Servo-Mechanisms and Photographic Equipment.

Acoustic wave devices and specialised parts and components therefor, the following:—

(1) Surface acoustic wave and surface skimming acoustic wave devices, 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: ..... A

(*a*) a carrier frequency of greater than 400 MHz;

(*b*) a carrier frequency of 400 MHz or less (except such devices specially designed for domestic and entertainment purposes) having either of the following characteristics—

(i) a side-lobe rejection of greater than 45 dB; or

(ii) a product of the maximum delay time in microseconds and the bandwidth in MHz greater than 100;

(*c*) a dispersive delay of greater than 10 microseconds; or

(*d*) an insertion loss of less than 10 dB.

(2) Bulk (volume) acoustic wave devices which permit the direct processing of signals at frequencies greater than 1 GHz, including but not limited to fixed delay lines, non-linear and pulse compression devices ..... A

(3) Specialised parts and components for the equipment specified in heads (1) and (2) above ..... A

In this entry "acoustic wave devices" means signal processing devices employing elastic waves in materials including but not limited to lithium niobate, lithium tantalate, bismuth germanium oxide, silicon, quartz, yttrium garnet, aluminium oxide and magnesium aluminium oxide.

Amplifiers, electronic or magnetic, specially designed for use with resolvers, the following:—

(1) Isolation types having a variation of gain constant (linearity of gain) of 0·2% or better ..... A

(2) Summing types having a variation of gain constant (linearity of gain) or an accuracy of summation of 0·2% or better ..... A

(3) Types employing solid state Hall effect ..... A

(4) Types designed to operate below −55°C or above +125°C ..... A

(5) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive) ..... A

Cathode-ray oscilloscopes and specialised parts and components therefor including associated plug-in units, external amplifiers, pre-amplifiers and sampling devices, having any of the following characteristics:—

(1) An amplifier bandwidth greater than 100 MHz ..... A

(2) Incorporating or designed for use with any of the cathode-ray tubes specified in sub-heads 1(*a*) or 1(*b*) of the entry in Group 3F relating to electronic cathode-ray tubes ..... A

(3) Ruggedised to meet a military specification ..... A

(4) Rated for operation over an ambient temperature range of from below −25°C to above +55°C ..... A

(5) Digital oscilloscopes with sequential sampling of the input signal at an interval of less than 50 nanoseconds ..... A

(6) Using sampling techniques for the analysis of recurring phenomena which increase the effective bandwidth of an oscillator or time domain reflectometer to a frequency greater than 1,000 MHz ..... A

In this entry "bandwidth" means the band of frequencies over which the deflection on the cathode-ray tube does not fall below 70·7% of that at the maximum point measured with a constant input voltage to the amplifier.

Computers, electronic, and equipment and systems incorporating such computers, and specialised parts, components, peripherals, displays, sub-assemblies, accessories and spare parts for such computers, the following:—

(1) Computers designed or modified for use in aircraft, missiles or space vehicles to a specification for continuous operation at temperatures from below −45°C to above +55°C ..... A

(2) Digital computers and differential analysers, the following:

(*a*) those designed or modified to limit electromagnetic radiation to levels below those acceptable for normal civil use ..... A

(*b*) those ruggedised for military use or modified so as to be ruggedised for military use ..... A

(*c*) those designed or modified for data (message) switching or incorporating equipment or devices or using techniques [including software, microprogramme control (firmware) and specialised logic control (hardware)] for accepting, storing, processing and retransmitting data groups ..... A

(3) Equipment and systems incorporating computers specified in heads (1) and (2) above ..... A

(4) Specialised parts, components, peripherals, displays, sub-assemblies, accessories and spare parts for computers specified in heads (1) and (2) above ..... A

(5) Other computers C

(6) Equipment and systems incorporating computers not specified in heads (1) and (2) above C

(7) Specialised parts, components, peripherals, displays, sub-assemblies, accessories and spare parts for computers not specified in heads (1) and (2) above, ... C

except (save as otherwise provided below) the following peripherals and displays:

(*a*) digital computer peripherals, the following—

(i) punched card readers not capable of operating at a speed exceeding 2,000 cards per minute;

(ii) punched card punches;

(iii) paper tape readers not capable of operating at a speed exceeding 2,000 characters per second;

(iv) paper tape punches;

(v) manually operated keyboards, including teletype input devices;

(vi) non-impact printers not capable of operating at a speed exceeding 2,500 characters per minute;

(vii) impact line printers; and

(viii) impact character printers; and

(*b*) digital computer displays, the following—

(i) non-graphic cathode-ray tube displays for which circuitry and character generation devices external to the tube limit displays to alpha-numeric characters in fixed formats or to graphs composed only of the same basic elements as are used for alpha-numeric composition;

(ii) graphic cathode-ray tube displays having the characteristic specified at sub-head (i) above in relation to non-graphic displays, and also the characteristic that the sequence of symbols is fixed by the format and character generators in the display and cannot be generated arbitrarily by the computer;

(iii) those with light guns or other graphic input devices of a kind ordinarily used as parts of the cathode-ray tube displays specified at sub-heads (i) and (ii) above;

(iv) cathode-ray tube displays of a kind ordinarily used as parts of industrial or medical equipment and not specially designed for computer use;

(v) non-coherent visible-spectrum light emitting diode displays;

(vi) nixie-type tube displays; and

(vii) other non-graphic displays having the characteristic specified at sub-head (i) above in relation to cathode-ray tube non-graphic displays, and other graphic displays having the characteristics specified at sub-head (ii) above in relation to cathode-ray tube graphic displays, but not those having circuitry or non-mechanical character-generation devices integral with the display, nor those having any of the following characteristics—

(*a*) an area of 1,200 sq cm or less and a minimum character height of less than 8 mm;

(*b*) an area greater than 1,200 sq cm and a minimum character height of less than 20 mm; or

(*c*) a capability of displaying at more than the three levels off, intermediate and full on;

but not excluding interface or control units for such peripherals and displays.

Converters, analogue-to-digital and digital-to-analogue, other than digital voltage measuring apparatus specified in Group 3F, the following:—

(1) Electrical-input type analogue-to-digital converters having any of the following characteristics:

(*a*) a peak conversion rate capability in excess of 200,000 complete conversions per second; ..... A

(*b*) an accuracy in excess of 1 part in more than 10,000 of full scale; or . A

(*c*) a figure of merit of 10^8 or more (derived from the number of complete conversions per second divided by the accuracy) ..... A

(2) Electrical-input type digital-to-analogue converters having any of the following characteristics:

(*a*) a setting time of less than 5 microseconds for voltage input devices or of less than 500 nanoseconds for current input devices; ..... A

(*b*) an accuracy in excess of 1 part in more than 10,000 of full scale; or . A

(*c*) a figure of merit of 10^9 or more (derived from the number of complete conversions per second divided by the accuracy) ..... A

In this head "setting time" means the time required for the output to come within one half bit of the final value when switching between any two levels of the converters.

(3) Solid state synchro-to-digital and digital-to-synchro converters and resolver-to-digital or digital-to-resolver converters (including multi-pole resolvers), having a resolution of better than ± 1 part in 5,000 per full synchro revolution for single speed synchro systems or better than ± 1 part in 40,000 for dual speed systems ..... A

(4) Mechanical input types, including shaft-position encoders and linear displacement encoders, but excluding complex servo-follower systems, the following:

(*a*) rotary types having an accuracy or maximum incremental accuracy better than ± 1 part in 40,000 of full scale ..... A

(*b*) linear displacement types having an accuracy better than ± 5 micrometres ..... A

(5) Types designed to operate below −55°C or above +125°C ..... A

(6) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (5) (inclusive) ..... A

Electrical optical devices designed to monitor relative rotation of remote surfaces; and specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for such equipment ..... A

Gravity meters (gravimeters) designed or modified for airborne or marine use and specialised parts and components therefor C

Induction potentiometers (including function generators and linear synchros), linear and non-linear, possessing any of the following characteristics:—

(1) A rated conformity of 0·25% or less, or of 13 minutes of arc or less . A

(2) Types employing solid state Hall effect ..... A

(3) Types designed for gimbal mounting; or ..... A

(4) Types designed to operate below −55°C or above +125°C ..... A

and specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive) ..... A

Induction rate (tachometer) generators, synchronous and asynchronous, the following:—

(1) Types employing solid state Hall effect ..... A

(2) Types with a housing diameter of 50·8 mm and smaller and a length (without shaft ends) of 101·6 mm and smaller, or with a diameter-to-length ratio greater than 2:1, having either or both of the following characteristics:—

(*a*) with a rated linearity of 0·1% or less, and/or ..... A

(*b*) being temperature compensated or temperature corrected types . A

(3) Types designed to operate below −55°C or above +125°C ..... A

(4) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (3) above (inclusive) ..... A

Magnetometers capable of a sensitivity better than ±1·0 gamma ($\pm 10^{-5}$ oersteds) and specialised parts therefor C

In this entry "sensitivity" is defined as the visually recognised minimum sinusoidal signal in the frequency range of 0·025 Hz to 1·5 Hz when signal-to-noise ratio is higher than 1.

Materials composed of crystals having spinel, hexagonal, orthorhombic or garnet crystal structures, and thin film devices, the following:—

(1) Monocrystals of ferrites and garnets (synthetic only) ..... A

(2) Single aperture forms possessing either of the following characteristics:

(*a*) switching speed of 0·3 microsecond or faster at the minimum field strength required for switching at 40°C; or ..... A

(*b*) a maximum dimension less than 0·45 mm ..... A

(3) Multi-aperture forms with fewer than 10 apertures possessing either of the following characteristics:

(*a*) switching speed of 1 microsecond or faster at the minimum field strength required for switching at 40°C; or ..... A

(*b*) a maximum dimension less than 2·54 mm ..... A

(4) Multi-aperture forms having 10 or more apertures ..... A

(5) Memory storage or switching devices, the following:

(*a*) thin film (including plated wire and plated rods) devices ..... A

(*b*) single crystal or amorphous film magnetic bubble devices ..... A

(*c*) moving domain devices ..... A

(*d*) crosstie devices ..... A

(6) Materials suitable for application in electromagnetic devices making use of the gyro-magnetic resonance phenomenon ..... A

(7) Rod forms possessing either of the following characteristics:

(*a*) a switching speed of 0·3 microsecond or faster at the minimum field strength required for switching at 40°C; or C

(*b*) a minimum dimension less than 0·254 mm C

(8) Assemblies of, and devices incorporating, any of the items specified in heads (1) to (7) above (inclusive) C

Photographic apparatus and film, the following:—

(1) High speed cinema recording cameras and equipment, the following:

(*a*) cameras in which the film is continuously advanced throughout the recording period, and which are capable of recording at framing rates exceeding 13,150 frames per second, using any camera and film combination from the standard 8 mm to the 90 mm size (inclusive) ..... A

(*b*) special optical or electronic devices which supplement, replace, or are interchangeable with, standard camera components for the purpose of increasing the number of frames per second ..... A

(2) High speed cameras in which the film does not move, and which are capable of recording at rates exceeding 1,000,000 frames per second for the full framing height of standard 35 mm wide photographic film, or proportionately higher rates for lesser frame heights, or proportionately lower rates for greater frame heights ..... A

(3) Cameras incorporating electron tubes specified in sub-head (3)(*a*) of the entry in Group 3F relating to electronic cathode-ray tubes, vacuum tubes or valves ..... A

(4) Streak cameras having writing speeds of 10 mm per microsecond and above ..... A

(5) Camera shutters with speeds of, or greater than, 50 nanoseconds per operation and specially designed parts, components and accessories therefor ..... A

(6) Film, the following:

(*a*) high speed film having—

(i) an intensity dynamic ratio of 1,000,000 to 1 or more; or .... A

(ii) a speed of ASA 10,000 (or its equivalent) or better ..... A

(*b*) colour film having a spectral sensitivity extending beyond 7,200 Å or below 2,000 Å ..... A

(7) High speed plates having an intensity dynamic range of 1,000,000 to 1 or more ..... A

Potentiometers, having a rated conformity better than 0·25% for a linear potentiometer or 1% for a non-linear potentiometer, the following:—

(1) Linear potentiometers having a constant resolution and a rated linearity of better than 0·05% absolute ..... A

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

(*a*) 1% 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 .. A

(*b*) 0·5% 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 ..... A

(3) Types designed for gimbal mounting ..... A

(4) Types designed to operate below −55°C or above +125°C ..... A

(5) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive) ..... A

Quartz crystals having piezo-electric qualities, in worked, semi-finished or mounted form including assemblies, the following:—

(1) Filter elements having either of the following characteristics:

(*a*) types designed for operation over a temperature range wider than 125°C; or ..... A

(*b*) types making use of the trapped energy phenomenon (i.e having more than one series or parallel resonance on a single quartz element) A

(2) Oscillator elements specially designed for temperature-controlled crystal ovens and/or for temperature-conpensated crystal oscillators described in head (3) of this entry and having an average ageing rate of $\pm 10^{-8}$ per day or better ..... A

(3) Temperature-compensated crystal oscillators having either of the following characteristics:

(*a*) a temperature stability of better than ± 0·00015% over their operating temperature range; or ..... A

(*b*) an operating temperature range wider than 120°C ..... A

In this entry "ageing rate" shall be measured over a longer period at a constant temperature (within ± 2°C) of +60°C or more.

Recording or reproducing equipment, the following:—

(1) Equipment using magnetic techniques ..... A

except

(*a*) equipment specially designed for voice or music and not employing digital techniques; and

(*b*) equipment specially designed to use magnetic card, tag, label or bank cheque recording media with a magnetic surface not exceeding 85 sq cm.

(2) Equipment using electron beams operating in a vacuum or using laser-produced light beams or both, that produce pattern or images directly on the recording surface ..... A

except

(*a*) equipment specially designed for television recording or reproducing on discs; and

(*b*) facsimile equipment incorporating lasers such as that used for commercial weather imagery and commercial wire photos and text.

(3) Equipment specially designed for image development ..... A

except

(*a*) equipment specially designed for television recording or reproducing on discs; and

(*b*) facsimile equipment incorporating lasers such as that used for commercial weather imagery and commercial wire photos and text.

(4) Graphic instruments capable of continuous direct recording of sinusoidal waves at frequencies exceeding 20 kHz ..... A

(5) Specially designed recording media (tapes, drums, discs and matrices), except magnetic cards, checks and similar discrete non-rigid magnetic media (other than tape) for use with the equipment specified in heads (1) to (3) above (inclusive) ..... A

(6) Specially designed parts and components for the equipment specified in heads (1) to (4) above (inclusive) ..... A

Semi-conductor Hall field probes, specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) therefor, the following:—

(1) Types made of indium arsenide-phosphide C

(2) Types coated with ceramic or ferritic materials (including tangential field probes, multipliers, modulators and recorder probes) C

(3) Types with an open circuit sensitivity greater than $\frac{0{\cdot}12\ \text{V}}{\text{A} \times \text{kG}}$ C

In this entry "open circuit sensitivity" is calculated by dividing the open circuit Hall voltage by the product of the control current in A and the nominal value of the control field.

Servo-motors (gear-head or plain) the following:—

(1) Types designed to operate from power sources of more than 300Hz, except those designed to operate from power sources of over 300 Hz up to but not exceeding 400 Hz with a temperature range of from −55°C to +125°C ..... A

(2) Types designed to have a torque-to-inertia ratio of 50,000 radians per second or greater ..... A

(3) Types incorporating special features to secure internal damping ..... A

(4) Types employing solid state Hall effect ..... A

(5) Types designed to operate below −55°C or above +125°C ..... A

(6) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (5) above (inclusive) ..... A

Synchros, resolvers, microsyns, synchro-tels and inductosyns, possessing any of the following characteristics:—

(1) A rated electrical error of 7 minutes of arc or less or of 0·2% or less of maximum output voltage ..... A

(2) A rated dynamic accuracy for receiver types of 1° or less, except that for units of size 30 (76·2 mm in diameter) or larger, a rated dynamic accuracy of less than 1° ..... A

(3) Multi-speed from single shaft types ..... A

(4) Types designed for gimbal mounting; or ..... A

(5) Types designed to operate below −55°C or above +125°C; ..... A

and specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (5) above (inclusive) ..... A

Synchronous motors, the following:—

(1) Types not exceeding size 20 (50·8 mm in diameter) having synchronous speeds in excess of 3,600 r.p.m. ..... A

(2) Types designed to operate from power sources of more than 400 Hz . A

(3) Types designed to operate below −55°C or above +125°C ..... A

(4) Specially designed parts, components, sub-assemblies and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (3) above (inclusive) ..... A

Thermoelectric materials and devices, the following:—

(1) Thermoelectric materials with a maximum product of the figure of merit (Z) and the temperature (T in °Kelvin) in excess of 0·75 C

(2) Junctions and combinations of junctions using any of the materials specified in head (1) above C

(3) Heat absorbing or electric power generating devices incorporating any of the junctions specified in head (2) above C

(4) Other power generating devices which generate in excess of 10 watts per pound or of 500 watts per cubic foot of the devices' basic thermoelectric components C

(5) Specialised parts, components and sub-assemblies for the equipment specified in heads (1) to (4) above (inclusive) C

In this entry—

"the figure of merit (Z)" equals Seebeck coefficient squared divided by the product of electrical resistivity and thermal conductivity; and

the weight and cubic measurement in head (4) are not intended to encompass the complete device but to include only the thermoelectric elements and assembly and the components for pumping calories. Other components, such as heating or cooling sources or containers, device frames or stands and control equipment are not to be included in the calculations.

Torquers, direct current and alternating current (torque motors specially designed for gyros and stabilised platforms); and specialised parts, components, sub-assemblies and test equipment (including adaptors and couplers) for such equipment ..... A

GROUP 3H

Note. Goods specified in the heads of this Group may also be specified in Group 2 of this Part of this Schedule.

Metals, Minerals and their Manufactures

In this Group, the following definitions apply:—

Crude forms:

Anodes, balls, bars (including notched bars and wire bars), billets, blocks, blooms, briquettes, cakes, cathodes, crystals, cubes, dice, grains, granules, ingots, lumps, pellets, pigs, powder, rondelles, shot, slabs, slugs, sponge, sticks;

Semi-fabricated forms (whether or not coated, plated, drilled or punched):

(1) Wrought or worked material fabricated by rolling, drawing, extruding, forging, impact extruding, pressing, graining, atomising and grinding, i.e. angles, channels, circles, discs, dust, flakes, foil and leaf, forgings, plates, powder, pressings and stampings, ribbons, rings, rods (including bare welding rods, wire rods and rolled wire), sections, shapes, sheets, strip, pipe and tube (including tube rounds, squares and hollows), drawn or extruded wire;

(2) Cast material produced by casting in sand, die, metal, plaster or other types of moulds, including high pressure castings, sintered forms, and forms made by powder metallurgy.

Aluminium alloy of high strength containing a higher percentage of aluminium than of any other element and containing nominally 6·5% of zinc, 2·5% of magnesium and 1·6% of copper, with or without additions of silver to 0·5% maximum, in crude, semi-fabricated or fabricated form ..... A

Cobalt-based alloys containing a higher percentage of cobalt than of any other element and one or more of the following constituents in the proportions stated:—

(1) 5% or more of tantalum; or C

(2) 1% or more of thorium, aluminium, yttrium, zirconium or cerium oxides; or C

(3) 0·05% or more of rare earth metals C

in crude or semi-fabricated forms.

Graphite, artificial, whther or not coated or mixed with other elements or compounds, having an apparent relative density of not less than 1·90 when compared with water at 15·5°C, except artificial graphite which has been coated or mixed with inorganic materials to improve only its electrical conductivity, its mechanical resistance or its mechanical friction properties C

Magnetic materials, the following:—

(1) Magnetic materials in all forms (including specialised forms such as core assemblies, laminations, stampings, tapes and wound cores) having any of the following characteristics:

(*a*) initial permeability of 120,000 (using C.G.S. units) or 0·15 (using Henry-metre units) or more ..... A

(*b*) remanence 98·5% or over of maximum flux for materials having magnetic permeability; or ..... A

(*c*) a composition capable of an energy product—

(i) greater than 10 times 10^6 gauss-oersteds (that is, 80,000 joules per cubic metre); or ..... A

(ii) of 4·85 times 10^6 gauss-oersteds (that is, 38,600 joules per cubic metre) or more, and having a coercive force of 1,800 oersteds (that is, 143,200 A per metre) or greater ..... A

(2) Grain oriented sheet or strip (and core assemblies, laminations, stampings, tapes and wound cores composed of such sheet or strip) having a thickness of 0·1 mm or less ..... A

Maraging steel alloy capable of ultimate tensile strength of 150 tons per square inch or greater, whether or not finally heat treated, in crude, semi-fabricated or fabricated form ..... A

Molybdenum alloys containing not less than 97·5% or more than 99·9% of molybdenum, in crude or semi-fabricated forms, except wire C

Nickel alloys containing a higher percentage of nickel than of any other element and containing:—

(1) 11% or more of aluminium and titanium combined; or C

(2) 1% or more of oxides of thorium, aluminium, yttrim, zirconium, cerium, or lanthanum; or C

(3) 0·05% or more of scandium, yttrium, didymium, cerium, lanthanum, neodymium or praseodymium C

in crude or semi-fabricated forms.

Niobium based alloys containing 60% or more but not more than 99·3% of niobium, or having a combined content of 60% or more but not more than 99·3% of niobium-tantalum, in crude, semi-fabricated or scrap forms C

Steels in crude or semi-fabricated forms containing a higher percentage of iron than of any element and not being products obtained by casting with a carbon content of more than 1·5%, the following:—

(1) Steels containing 10% or more of molybdenum C

(2) Steels containing 5% or more of molybdenum together with 14% or more of chromium C

Tantalum, the following:—

(1) Tantalum powder containing less than 200 parts per million of total metallic impurities C

(2) Sintered anodes fabricated from tantalum powder containing less than 200 parts per million of total metallic impurities C

(3) Tantalum based alloys containing 60% or more of tantalum (except ferro-tantalum or ferro-tantalum-niobium), in crude or semi-fabricated forms or scrap C

Titanium based alloys in crude or semi-fabricated form or scrap, having the following nominal compositions:—

(1) 6% aluminium, 2% tin, 4% zirconium, 6% molybdenum and the balance titanium ..... A

(2) Other alloys of titanium containing 12% or more aluminium ..... A

(3) Other compositions containing three or more of any alloying additives, except oxygen, nitrogen, hydrogen or carbon, the total of which is more than 11% but less than 30%, in crude or semi-fabricated forms or scrap C

In this entry the alloying compositions are nominal and may be subject to slight variations.

GROUP 31

Chemicals, Metalloids and Petroleum Products.

Boron, boron compounds, mixtures and alloys, except pharmaceutical preparations packaged for retail sale, the following:—

(1) Boron element in any form ..... A

(2) Boron compounds and mixtures in which the boron-10 isotope comprises more than 20% of the total boron content ..... A

(3) Boron compounds, mixtures and composites containing 5% or more of boron, the following:

(*a*) boron carbide (except powders) with a boron content of 70% or more and composites thereof ..... A

(*b*) boron nitride (hexagonal close-packed structure, white form) and composites thereof, and other boron-nitrogen compounds ..... A

(*c*) boron hydrides, except sodium boron hydride, potassium boron hydride, monoborane, diborane and triborane ..... A

(*d*) organoboron compounds (i.e. those containing boron atoms directly linked to carbon atoms) ..... A

(*e*) borides with purities above 98·5% and having melting points of 2,000°C or higher and composites thereof ..... A

Composite structures and laminates, including metal matrix composite materials, made from the materials defined in the entry in this Group relating to fibrous and filamentary materials by any of the following methods:—

(1) By using machines of which the motions for positioning, wrapping and winding of fibres are co-ordinated and programmed in three or more axes, specially designed to make such composite structures or laminates C

(2) By metal casting; or C

(3) By strengthening eutectic alloys in situ by directional solidifiction C

Compounds and Materials, the following:—

(1) Monocrystalline silicon having any of the following characteristics: ... A

(*a*) containing bismuth, indium, gallium, selenium or thallium at an average carrier concentration of greater than 10^{16} per cubic centimetre;

(*b*) containing arsenic at an average carrier concentration of greater than 10^{16} per cubic centimetre and less than 10^{18} per cubic centimetre;

(*c*) having P-type conductivity and a resistivity of 5,000 ohm cm or greater; or

(*d*) in the form of wafers (slices) or ingots (boules), having—

(i) for all N-type a resistivity of 50 ohm cm or less;

(ii) for P-type 1-1-1 a resistivity of 50 ohm cm or less;

(iii) for P-type 1-0-0 a resistivity of 100 ohm cm or less;

(2) Monocrystalline gallium compounds ..... A

except

(*a*) gallium phosphide; and

(*b*) gallium arsenide, gallium arsenide phosphide and gallium nitride, having all of the following characteristics—

(i) diffusion processed wafers;

(ii) selenium, tellurium, silicon, sulphur, tin or zinc doped;

(iii) dislocation density (EPD) greater than 10,000 per square centimetre;

(iv) carrier concentration greater than 10^{16} per cubic centimetre: and

(v) carrier mobility less than 2,000 square centimetres per volt second;

(3) Monocrystalline indium compounds in any form C

(4) Composites (hetero-epitaxial materials) consisting of a monocrystalline insulating substrate epitaxially layered with silicon, compounds of gallium or compounds of indium C

(5) Mercury cadmium telluride compounds in any form ..... A

(6) Elecronic grade polycrystalline silicon having a maximum concentration of P-type impurity (e.g. boron) of 0·3 parts in 10^9 or a maximum concentration of N-type impurity (e.g. phosphorus) of 1·5 parts in 10^9, or both. Purity shall be verified according to ASTM specification F 574-78 or equivalent followed by resistivity measurement according to ASTM specification F 43-78 or equivalent ..... A

Compounds of tantalum and niobium (colombium), the following:—

(1) Tantalates and niobates having a purity of 98% or more C

(2) Other compounds containing 20% or more of tantalum in which the niobium content with respect to tantalum is less than 1 part per thousand C

Fibrous and filamentary materials suitable for use in composite structures or laminates and manufactures thereof, the following:—

(1) having both the following characteristics: ..... A

(*a*) specific modulus greater than $1{\cdot}25 \times 10^8$; and

(*b*) specific tensile strength greater than 3×10^6; or

(2) having both the following characteristics: ..... A

(*a*) specific modulus greater than 10^8; and

(*b*) melting or sublimation point higher than 1,649°C in an inert environment;

except carbon fibres having a specific modulus of less than 2×10^8 and a specific tensile strength of less than 10^6.

In this entry—

"specific modulus" is Young's modulus in g/cm² (measured at a temperature of 23°C ± 2°C and a relative humidity of 50% ± 5%) divided by density in g/cm³; and

"specific tensile strength" is ultimate tensile strength in g/cm² (measured at a temperature of 23°C ± 2°C and a relative humidity of 50% ± 5%) divided by density in g/cm³.

Fluorocarbon compounds and manufactures, the following:—

(1) Monomeric and polymeric materials, the following:

(*a*) Polychlorotrifluorethylene, oily and waxy modifications only C

(*b*) Copolymers and terpolymens composed of any combination of the monomers tetrafluoroethylene, chlorotrifluoroethylene, vinylidenefluoride, hexafluoropropylene and bromotrifluoroethylene, except copolymers of tetrafluorotheylene and hexafluoropropylene C

(*c*) Polybromotrifluoroethylene C

(*d*) Dibromotetrafluorethane, except dibromotetrafluoroethane having a purity of 99·8% or less and containing at least 25 particles each 200 microns or larger per 100 ml C

(*e*) Perfluoroalkylamines C

(2) Greases, lubricants and dielectric, damping and flotation fluids made wholly of any of the materials listed in head (1) above C

Hydraulic fluids consisting wholly or mainly of petroleum (mineral) oils or synthetic hydrocarbon oils which have a pour point of −34°C or lower, a viscosity index of 75 or greater and are thermally stable at 343°C C

Lubricating oils and greases, synthetic, which are or contain as their principal ingredient, the following:—

(1) monomeric and polymeric forms of perfluorotriazines, perfluoroaromatic ethers and esters, and perfluoroaliphatic ethers and esters ..... A

(2) polyphenyl ethers and thio ethers containing more than three groups of any of the following: ..... A

(*a*) phenyl;

(*b*) alkyl phenyl;

(*c*) phenyl and alkyl phenyl;

Polymeric materials and manufactures thereof, the following:—

(1) Polyimides, except the following forms: C

Fully cured polyimide or polyimide-based film, sheet, tape or ribbon having a maximum thickness of 0·25 mm, whether or not coated or laminated with heat-sensitive or pressure-sensitive resinous substance 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.

(2) Polybenzimidazoles C

(3) Polyimidazopyrrolones C

(4) Aromatic polyamides, except staples, fibres, filaments, yarns and threads, having a fibre modulus of 0·161 newtons per tex (250 grammes-force per denier) or less and a tenacity of 0·00709 newtons per tex (11 grammes-force per denier) or less, and textile or mat products thereof C

(5) Polyparaxylylenes C

(6) Polyphenylene sulphides C

(7) Polyquinoxalines C

(8) Polybenzothiazoles C

(9) Polyoxadiazoles C

(10) Polytriazoles C

(11) Polythiazoles C

(12) Polyphosphonitriles C

(13) Polybenzimidazolphenanthrolines C

(14) Polypyrazines C

(15) Polyspiranes C

(16) Polysilazanes C
(17) Polyperfluorotriazines C
(18) Polysilsequioxane ladders C
(19) Polyparabenzoquinone ladders C
(20) Polynapthaleneimidazoanthraquinone ladders C
(21) Laminated or reinforced forms of any of the materials specified in heads (1) to (20) above (inclusive) C
(22) Manufactures of one or more of the materials specified in heads (1) to (20) above (inclusive) not included in head (21) above, where the value of the polymeric component together with that of any other components specified elsewhere in this Schedule is 50% or more of the total value of the materials used C

In this entry—

"tenacity" is the maximum specific tensile strength when tested to the point of rupture;

"fibre modulus" is the ratio of change in stress to change in strain between two points on the stress-strain curve, viz the point of zero stress and the point of breaking stress;

"denier" means the number of grammes in 9,000 metres of material, usually fibre, filament, staple, thread, etc.; and

"tex" means the number of grammes in 1,000 metres of material, usually yarn.

Preforms of glass, or of any other material, specially designed for the fabrication of optical transmission fibres for the manufacture of fibre communications cable specified in sub-head (3)(*c*) of the entry in Group 3F relating to cable and wire . A

In this entry "preforms" are defined as bars, ingots or rods, of glass, plastic or other materials, which have been specially processed for use in the fabrication of optical fibres. The characteristics of the preform determine the basic parameters of the resultant drawn optical fibres.

Silicone fluids and greases, the following:—

(1) Fluorinated silicone fluids C
(2) Silicone lubricating greases capable of operating at 180°C or higher and having a drop point of 220°C or higher C

GROUP 3J

Synthetic Rubber

Synthetic rubber, the following:—

(1) Alkyl polysulphide liquid polymers, except water dispersions C
(2) Fluorinated silicone rubber and other fluorinated elastomeric material and such organic intermediates for their production as contain 10% or more or combined fluorine C
(3) Polymeric products of butadiene, the following:
  (*a*) carboxyl terminated polybutadiene, hydroxyl terminated polybutadiene, thiol terminated polybutadiene and cyclised 1, 2-polybutadiene C
  (*b*) mouldable copolymers of butadiene and acrylic acid C
  (*c*) mouldable terpolymers of butadiene, acrylonitrile and acrylic acid or any of the homologues of acrylic acid C
(4) Carboxyl terminated polyisoprene and polyisobutylene C

SCHEDULE 2

LIST OF COUNTRIES MENTIONED IN ARTICLE 2(iv)

Antigua
Ashmore and Cartier Islands
Australia
Australian Antarctic Territory

Bahamas
Bangladesh
Barbados
Belize
Bermuda
Botswana
British Antarctic Territory
British Indian Ocean Territory
British Virgin Islands
Brunei

Canada
Cayman Islands
Christmas Island
Cocos (Keeling) Islands
Cook Islands
Coral Sea Islands Territory
Cyprus

Dominica

Falklands Islands and Dependencies (S Georgia and S Sandwich Group)
Fiji

The Gambia
Ghana
Gibraltar
Grenada
Guyana

Heard Island and McDonald Islands
Hong Kong

India
Ireland, Republic of

Jamaica

Kenya
Kiribati

Lesotho

Malawi
Malaysia
Malta
Mauritius
Montserrat

Namibia
Nauru
New Zealand
Nigeria
Norfolk Island
Niue

Pakistan
Papua New Guinea
Pitcairn Islands Group

Ross Dependency

St Helena (with Ascension and Tristan Da Cunha)
Seychelles
Sierra Leone
Singapore
Solomon Islands
South Africa
Sri Lanka
St. Kitts-Nevis-Anguilla
St. Lucia
St. Vincent
Swaziland

Tanzania
Tokelau
Tonga
Trinidad and Tobago
Turks and Caicos Islands
Tuvalu

Uganda
United States

Vanuatu

Western Samoa

Zambia
Zimbabwe

SCHEDULE 3 Article 9

The Export of Goods (Control) Order 1978 (S.I. 1978/796).

The Export of Goods (Control) Order 1978 (Amendment No. 2) Order 1978 (S.I. 1978/1219).

The Export of Goods (Control) Order 1978 (Amendment No. 3) Order 1978 (S.I. 1978/1496).

The Export of Goods (Control) Order 1978 (Amendment No. 4) Order 1978 (S.I. 1978/1812).

The Export of Goods (Control) (Amendment) Order 1979 (S.I. 1979/136).

The Export of Goods (Control) (Amendment No. 2) Order 1979 (S.I. 1979/164).

The Export of Goods (Control) (Amendment No. 3) Order 1979 (S.I. 1979/276).

The Export of Goods (Control) (Amendment No. 4) Order 1979 (S.I. 1979/1437).

The Export of Goods (Control) (Amendment No. 5) Order 1979 (S.I. 1979/1671).

The Export of Goods (Control) (Amendment) Order 1980 (S.I. 1980/1370).

The Export of Goods (Control) (Amendment) Order 1981 (S.I. 1981/668).

The Export of Goods (Control) (Amendment No. 2) Order 1981 (S.I. 1981/925).

The Export of Goods (Control) (Amendment No. 3) Order 1981 (S.I. 1981/1206).

EXPLANATORY NOTE

(This Note is not part of the Order.)

This Order revokes and replaces the Export of Goods (Control) Order 1978 and the subsequent amendments thereto. The changes (apart from minor and drafting changes) it effects are as follows:

1. Export control is:—

   (*a*) *removed* on copper coin, gas discharge voltage regulator tubes, helium gas liquefying equipment, ion microscopes, magnesium based alloys and synthetic film;

   (*b*) *reduced* on amplifiers, cable and wire making machinery, electronic components, electronic vacuum furnaces, explosives, extrusion machinery, hydrofoil vessels, hydrogen thyratrons, liquid gas containers, pipe valves, pulse modulators, pumps (except vacuum pumps), thorium and thyristors;

   (*c*) *extended in scope* on beryllium, cable and wire, deep submergence vehicles, detection and location apparatus, electronic measuring equipment, hafnium, certain high accuracy turning machines and accessories, linear induction drive motors for machine tools, machines for filament winding, tape-laying and interlacing (braiding), nuclear grade

graphite, photographic equipment, photographic instruments for military use, photomultiplier tubes, syntactic foam and zirconium;

(*d*) *introduced* on cocoa, dice and wafers for thyristors that remain under control, equipment specially designed for the production or separation of tritium, certain flatbed microdensitometers and glass preforms; and

(*e*) *amended in scope* on acoustic wave devices, anti-friction bearings, boron transistors, capacitors, certain cathode-ray tubes, communication transmission equipment, cryogenic equipment, diodes, electromagnetic absorber materials, electronic valves, fluorocarbon tubing, frequency synthesisers, gearmaking machines, jamming apparatus, lasers, machines and apparatus for the manufacture or testing of electronic devices, components and materials, machinery for the production of aircraft engines, machinery and apparatus for the working of synthetic film, microwave equipment parts, navigation equipment, oscilloscopes, potentiometers and converters, quartz crystals, radio relay communications equipment, radio spectrum analysers, radio transmitters, recording and reproducing equipment, titanium and vibration equipment.

2. The descriptions of goods subject to export control have been amended in respect of electron beam equipment, electron tubes, electronic valves, machinery for making or measuring gas turbine blades, machines for the manufacture of crystal devices, machinery for the production of aircraft engines, machinery and apparatus for the working of synthetic film used as magnetic recording tape, presses and spin-forming and flow-forming machines.

3. The definition of the goods to which export control applies has been amended in respect of photo-electric components and trailers, semi-trailers and other military vehicles.

4. Group 2 of Part II of Schedule 1 (Atomic Energy Minerals, Materials and Equipment) has been divided into two sub-Groups, as follows:

Group 2A—Atomic Energy Minerals and Materials; and
Group 2B—Nuclear Facilities, Equipment and Appliances.

5. Anti-friction bearings have been transferred from Group 3H to Group 3D and presses have been transferred from Group 3A to Group 3D.

6. Notwithstanding other changes in control specified in this Note, many goods which were not previously subject to control to a destination in any country named, or included in a country named, in Schedule 2 to the Order are now subject to control to all destinations.

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