

**Dual-Use Facilities and Equipment related to
the Manufacture of Chemical Weapons and Handling of
Biological Materials Controlled under the Import and Export Ordinance**

2B350 Chemical manufacturing facilities and equipment, as follows :

- (a) Reaction vessels or reactors, with or without agitators, with total internal (geometric) volume greater than 0.1 m³ (100 litres) and less than 20 m³ (20 000 litres), where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coating or glass lining);
 - (4) Nickel or alloys with more than 40% nickel by weight;
 - (5) Tantalum or tantalum alloys;
 - (6) Titanium or titanium alloys; or
 - (7) Zirconium or zirconium alloys;

- (b) Agitators for use in reaction vessels or reactors where all surfaces of the agitator that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Nickel or alloys with more than 40% nickel by weight;
 - (5) Tantalum or tantalum alloys;
 - (6) Titanium or titanium alloys; or
 - (7) Zirconium or zirconium alloys;

- (c) Storage tanks, containers or receivers with a total internal (geometric) volume greater than 0.1 m³ (100 litres) where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Nickel or alloys with more than 40% nickel by weight;
 - (5) Tantalum or tantalum alloys;
 - (6) Titanium or titanium alloys; or
 - (7) Zirconium or zirconium alloys;

- (d) Heat exchangers or condensers with a heat transfer surface area of less than 20 m², where all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Graphite;

- (5) Nickel or alloys with more than 40% nickel by weight;
 - (6) Tantalum or tantalum alloys;
 - (7) Titanium or titanium alloys;
 - (8) Zirconium or zirconium alloys;
 - (9) Silicon carbide; or
 - (10) Titanium carbide;
- (e) Distillation or absorption columns of internal diameter greater than 0.1 m, where all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials :
- (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Graphite;
 - (5) Nickel or alloys with more than 40% nickel by weight;
 - (6) Tantalum or tantalum alloys;
 - (7) Titanium or titanium alloys; or
 - (8) Zirconium or zirconium alloys;
- (f) Remotely operated filling equipment in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials :
- (1) Alloys with more than 25% nickel and 20% chromium by weight; or
 - (2) Nickel or alloys with more than 40% nickel by weight;
- (g) Multiple seal valves incorporating a leak detection port, bellows-seal valves, non-return (check) valves or diaphragm valves, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials :
- (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Nickel or alloys with more than 40% nickel by weight;
 - (5) Tantalum or tantalum alloys;
 - (6) Titanium or titanium alloys; or
 - (7) Zirconium or zirconium alloys;
- (h) Multi-walled piping incorporating a leak detection port, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials :
- (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Fluoropolymers;
 - (3) Glass (including vitrified or enamelled coatings or glass lining);
 - (4) Graphite;
 - (5) Nickel or alloys with more than 40% nickel by weight;
 - (6) Tantalum or tantalum alloys;
 - (7) Titanium or titanium alloys; or
 - (8) Zirconium or zirconium alloys;

- (i) Multiple-seal, canned drive, magnetic drive, bellows or diaphragm pumps, with manufacturer's specified maximum flow-rate greater than 0.6 m³/hour, or vacuum pumps with manufacturer's specified maximum flow-rate greater than 5 m³/hour (under standard temperature (273 K(0°C)) and pressure (101.3 kPa) conditions), in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Ceramics;
 - (3) Ferrosilicon;
 - (4) Fluoropolymers;
 - (5) Glass (including vitrified or enamelled coatings or glass lining);
 - (6) Graphite;
 - (7) Nickel or alloys with more than 40% nickel by weight;
 - (8) Tantalum or tantalum alloys;
 - (9) Titanium or titanium alloys; or
 - (10) Zirconium or zirconium alloys;

- (j) Incinerators designed to destroy chemicals controlled by 1C350, having specially designed waste supply systems, special handling facilities and an average combustion chamber temperature greater than 1 273 K(1 000°C), in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with any of the following materials :
 - (1) Alloys with more than 25% nickel and 20% chromium by weight;
 - (2) Ceramics; or
 - (3) Nickel or alloys with more than 40% nickel by weight;

2B351 Toxic gas monitoring systems, as follows, and dedicated detectors therefor :

- (a) Designed for continuous operation and usable for the detection of chemical warfare agents, chemicals controlled by 1C350 or organic compounds containing phosphorus, sulphur, fluorine or chlorine, at concentrations of less than 0.3 mg/m³; or
- (b) Designed for the detection of cholinesterase-inhibiting activity;

2B352 Equipment capable of use in handling biological materials, as follows :

- (a) Complete biological containment facilities at P3, P4 containment level;

Technical Note :

P3 or P4 (BL3, BL4, L3, L4) containment levels are as specified in the WHO Laboratory Biosafety manual (Geneva, 1983).

- (b) Fermenters capable of cultivation of pathogenic "microorganisms", viruses or capable of toxin production, without the propagation of aerosols, and having a total capacity of 100 litres or more;

Technical Note :

Fermenters include bioreactors, chemostats and continuous-flow systems.

- (c) Centrifugal separators, capable of continuous separation without the propagation of aerosols, having all the following characteristics :
 - (1) Flow rate exceeding 100 litres per hour;
 - (2) Components of polished stainless steel or titanium;
 - (3) Double or multiple sealing joints within the steam containment area; and
 - (4) Capable of in-situ steam sterilisation in a closed state;

Technical Note :

Centrifugal separators include decanters.

- (d) Cross (tangential) flow filtration equipment, capable of continuous separation without the propagation of aerosols, having both of the following characteristics :
 - (1) Equal to or greater than 5 m²; and
 - (2) Capable of in-situ sterilization;
- (e) Steam sterilisable freeze drying equipment with a condenser capacity exceeding 50 kg of ice in 24 hours and less than 1 000 kg of ice in 24 hours;
- (f) Equipment that incorporates or is contained in P3 or P4 containment housing, as follows :
 - (1) Independently ventilated protective full or half suits;
 - (2) Biological safety cabinets or isolators, which allow manual operations to be performed within, whilst providing an environment equivalent to Class III biological protection;

Note : In 2B352(f)(2), isolators include flexible isolators, dry boxes, anaerobic chambers, glove boxes and laminar flow hoods.

- (g) Chambers designed for aerosol challenge testing with "microorganisms" or "toxins" and having a capacity of 1 m³ or greater;

Note : The products list is for reference only and may be subject to change from time to time. Traders are advised to refer to the schedules promulgated in the Import and Export (Strategic Commodities) Regulations (Cap. 60) for up-to-date information in relation to scope of products subject to licensing requirements.