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POSSIBLE AMENDMENTS OF THE NOMENCLATURE (PROPOSAL BY THE RESEARCH GROUP FOR BIOLOGICAL ARMS CONTROL)

(Item III.C.1 on Agenda)

I. BACKGROUND

1. The Secretariat has been approached by the Research Group for Biological Arms Control - Carl Friedrich von Weizsäcker Centre for Science and Peace Research, of the University of Hamburg (Germany) (hereinafter "the Research Group")for assistance with a view to exploring possibilities of how the Harmonized System could be used to help with the implementation of United Nations Security Council Resolution Nr. 1540 of 28 April 2004, in the monitoring and control of international trade in "biological dual-use items".

2. On 11 September 2007 the Secretariat received a request from the Research Group to place on the agenda of the Sub-Committee's 36th Session a possible amendment of the Nomenclature to provide separately for certain biological dual-use items. The submission from the Research Group for Biological Arms Control follows. The list of proposed "biological dual-use items" to be individually identified in the Harmonized System is set out in the Annex to this document.

II. NOTE BY THE RESEARCH GROUP FOR BIOLOGICAL ARMS CONTROL

"**Proposal for an amendment of the Harmonized System nomenclature to more clearly identify biological dual-use items**

3. Currently, biological dual-use items are poorly described and identified in the Harmonized System nomenclature. In particular, their identification is of limited specificity because large numbers of different items are often covered under one code number. This complicates the work of exporters, importers and customs authorities and negatively affects the worldwide implementation of export controls and UN Security Council Resolution 1540 against the proliferation of weapons of mass destruction.

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4. Here we propose changes to the Harmonized System nomenclature to better identify biological dual-use items. The proposed changes aim to divide biological dual-use items into more specific and therefore smaller groups of items than is currently done and attach individual HS codes to these. This would be useful for several reasons.

5. It would facilitate the work of all actors in the procedural chain from the suppliers and exporters via the customs authorities to the importers and end-users in terms of identifying the correct HS code for the item in question and validating declarations on the transfer of biological dual-use items.

6. A more specific identification of biological dual-use items would facilitate the implementation of national exports controls. It would increase the detectability of illicit transfers and therewith the effectiveness of control and licensing systems. A more specific identification of biological dual-use items would also promote the implementation of UN Security Council Resolution 1540 (2004). The proposed amendments to the HS codes would help states to meet the call upon greater national efforts to limit the proliferation of weapons of mass destruction. Enhanced and globally compatible capabilities to identify biological dual-use items would be a substantial advancement in national anti-proliferation measures.

7. Once the proposed amendments to the HS nomenclature have been put into force, more specific datasets would become available to online databases such as UN COMTRADE or EUROSTATS. These more specific datasets would :

- Allow a coordinated view on global trade flows of biological dual-use items;
- Provide indications of countries' capabilities in the biological field;
- Allow improved market analysis in the biological area;
- Make trade with biological dual-use items more transparent; and
- Allow monitoring trade for signs of suspicious activities related to the development of bioweapons.

8. A list of items to be specifically identified under an amended HS nomenclature is provided in the Annex. The items list was compiled in collaboration with Dr. Jan van Aken, a biologist and former weapons inspector at the UN Monitoring, Verification and Inspection Commission for Iraq (UNMOVIC). For the development of the items list three existing lists of biological dual-use items were consulted. These are :

- Control list of the UNMOVIC export-import monitoring system;
- Relevant parts of the control list of the Australia Group.
- The list of equipment developed for use with the verification protocol to the Biological and Toxin Weapons Convention that was rejected in 2001.

9. A range of biological dual-use items was, is or had been planned to be internationally controlled under these three regimes. Each of these three control systems has or had different objectives and a different scope and, accordingly, these systems differ in what is controlled.

10. In the first column of the table in the Annex, all items that occur in one of the sources are listed. The three following columns indicate where the item in question is listed and cites the exact specification in the appropriate list. The fifth column finally indicates whether and how the item should be identified with an individual subheading within the HS. It is also indicated where additional sub-divisions concerning the size or other specifications of the item in question should be made."

III. SECRETARIAT COMMENTS

11. The proposal of the Hamburg Research Group concerns an area in which the Harmonized System could play an important role in the monitoring and control of "bioweapons" in international trade.

12. Weapons of mass destruction have been on the international agenda since a long time, in particular in relation with security. It was in this context that the United Nations Security Council, on 28 April 2004, passed Resolution Nr. 1540 (see : http://www.un.org/documents/scres.htm) on the non-proliferation of weapons of mass destruction. The resolution calls upon all Member States to enact national legislation criminalizing the development, acquisition, manufacturing, possession, transport or transfer of nuclear, chemical and biological weapons and their means of delivery by a non-state actor. All Member States of the United Nations are obliged under this resolution to report to the Security Council subcommittee on 1540 ("the 1540 Committee") on their progress implementing this resolution.

13. The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (BTWC) was simultaneously opened for signature in Moscow, Washington DC and London on 10 April 1972 and entered into force on 26 March 1975 (after the deposit of instruments of ratification by twenty-two Governments, including the Governments designated as Depositaries of the Convention).

14. The Biological and Toxin Weapons Convention prohibits the development, production, stockpiling, or transfer of biological weapons agents (microbial pathogens and toxins) for other than peaceful purposes and any devices used to deliver these agents. The scope of the BWC's prohibition is defined in Article 1 (the so-called *general purpose criterion*).

15. As stated in Article 1 of the BTWC :

> "Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain :
>
> (1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;
>
> (2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict."

16. As of June 2005 there are 171 Signatories to the BTWC, the number of Ratifications and Accessions is 155 (16 Signatories have yet to ratify the Convention). There are 23 Non-Signatories. (Source : http://www.opbw.org).

17. There is no formal verification regime to monitor compliance. Member States are encouraged to abide by numerous Confidence-Building Measures (CBMs) prescribed by State Parties at various review conferences. These include : domestic implementation measures, if considered necessary; consultation and co-operation among parties; lodging of complaints with the UN Security Council; and incentives, such as assistance to victims.

18. Since 1991, there have been efforts to negotiate a verification protocol to strengthen the BTWC's lack of provisions for an international mechanism to monitor compliance. Difficulties in creating a verification regime for the BTWC include : any nation with a developed pharmaceutical industry has the potential to make biological weapons and the emergence of non-state actors makes it difficult to develop effective verification measures. (Source : *Center for Nonproliferation Studies)*.

19. That having been said, the Secretariat would like to run through certain aspects in respect of the proposal by the Research Group.

Research Group for Biological Arms Control

20. The Research Group is an academic research group at the University of Hamburg. The group does not represent Signatories to the BTWC. In this respect it is to be noted that there is no international agency – such as the Organization for the Prohibition of Chemical Weapons – for the Biological Weapons Convention.

Items to be identified separately in the HS Nomenclature

21. With regard to the status of the proposed list of items to be separately identified as commodities that would fall under Resolution Nr. 1540 (2004) of the UN Security Council, the Secretariat would like to note that there is no internationally agreed product coverage annex to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (BTWC). Although the Research Group stated that they had received strong encouragement from the German authorities, the proposed list of items in the Annex is entirely their own and therefore has no formal status.

Dual-use items

22. With regard to the items listed in the fifth column of the Annex, i.e., the items to be identified separately in the Harmonized System Nomenclature, the Secretariat would like to note that many of these items concern so-called dual-use items, i.e., goods and technology developed for civilian uses, but which can be used, according to that list, for purposes such as the production of biological weapons or their means of delivery. As a consequence of this, several descriptions of the items listed in the fifth column refer to "end-use" provisions, e.g., "…designed for use with biological material"; "…for development of micro-organisms designed for production purposes".

23. It stands to reason that the uniform interpretation and application of the HS Nomenclature can only be ensured when the descriptions of the commodities make it possible to identify the goods at issue. In this connection, it should be noted that goods are to be classified in the Nomenclature on the basis of their objective characteristics. The actual use of the goods after being presented for classification is a criterion which cannot be verified at the time of presenting the goods, unless the use is described in terms related to certain characteristics of the goods to be classified.

Legal amendments to the HS / HS Recommendation

24. As, on the one hand, the legal amendments to the Harmonized System take a long time to be implemented and, on the other hand, the period to finalize the proposed amendments to the Harmonized System 2012 draw to a close, the Secretariat has informed the Research Group about the possibility of a WCO Council Recommendation concerning national statistical subdivisions, for example as an interim measure.

25. Regarding the possibility of aiming at a WCO Council Recommendation instead of a formal amendment of the Harmonized System, the Research Group has expressed the view that a WCO Council Recommendation would not generate all the positive effects that a formal HS-amendment would produce. In particular, the amount of public information on trade with biological dual use items would be very limited, because there would not be an input of the relevant trade data into publicly accessible databases like UN COMTRADE. According to the Research Group, the non-proliferation goals of the proposal would only be achievable, if the generated detailed trade data on biological dual use items would be available publicly. The Research Group would, however, consider the possibility of a WCO Council Recommendation, should an HS amendment not be achievable in the next few years.

26. If felt appropriate, the Secretariat will prepare, for the Sub-Committee's next session, a list of draft amendments to the Nomenclature reflecting the intention of the Research Group and taking into account any comments the Sub-Committee may have, in the usual lay-out and format.

IV. CONCLUSION

27. The Sub-Committee is invited to rule on whether to proceed with draft amendments, as suggested by the Research Group for Biological Arms Control, and to examine the list in the Annex to this document with the proposed items to be identified separately in the Harmonized System.

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ANNEX

LIST OF BIOLOGICAL DUAL USE ITEMS TO BE INDIVIDUALLY IDENTIFIED UNDER AN AMENDED HARMONIZED SYSTEM NOMENCLATURE

In the following table, the first column contains information on the item to be more specifically identified and its typical use. The second column provides the description of the relevant item in the control list of the export-import monitoring system of the United Nations Monitoring, Verification and Inspection Commission for Iraq (UNMOVIC)[1]. The third column provides the description of the relevant item in the control list of the Australia Group[2]. The fourth column provides the description of the relevant item in the list of key equipment developed during negotiations on a verification system to the Biological Weapons Convention[3]. The fifth column lists the items to be individually identified under an amended HS Nomenclature.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
Production				
Fermenters Equipment in which fermentation (growth) of micro-organisms takes place. The equipment needs to provide a standardised environment of pH value, oxygen content, nutrient level, etc. The term "fermenter" includes bioreactors, chemostats, and continuous flow fermentation	Fermenters, bioreactors, chemostats, and continuous flow fermentation systems with a vessel capacity of 20 (or for continuous operation, 2 ltr/h) liters or more, and the following specially designed components :	Fermenters capable of cultivation of pathogenic micro-organisms, viruses, or for toxin production, without the propagation of aerosols, and having a capacity of 20 liters or greater. Fermenters include bioreactors, chemostats and	Fermenters, bioreactors and chemical reactors with a total/internal volume exceeding (50) liters. Equipment for continuous or perfusion growth of micro-organisms with a volume over (2) liters per	Fermenters with a vessel capacity : • Up to 5 liters; • Greater than 5 up to 20 liters; • Greater than 20 up to 100 liters; • Greater than 100 up to 1,000 liters; • Greater than 1000 liters. Continuous flow fermentation

[1] S/2001/560, Revised Appendix to Annex III of the Plan for ongoing monitoring and verification, 15 October 2001.
[2] AG Common Control Lists, Control List of Dual-Use Biological Equipment and Related Technology, April 2005.
[3] BWC/ Ad Hoc Group/CRP.8, Protocol to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction, 3 April 2001.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
systems. It includes stainless steel vessels equipped with a jacket, a stirring system and ports for process parameter probes and capable of in-situ sterilization. This also includes single-use fermentation systems. Widely used in brewing and biotechnology, medical and pharmaceutical industries.	• Top plates; • Vessels; • pH probes; and • pO_2 probes.	continuous flow systems. Recommended to be included in awareness raising guidelines to industry fermenters of less than 20 liter capacity with special emphasis on aggregate orders or designs for use in combined systems.	hour.	systems with a volume: • Up to 2 liters per hour; • Greater than 2 liters per hour.
Orbital or reciprocal shakers To cultivate small quantities of micro-organisms, for R & D or seed cultures for larger scale fermentation. The cabinet holds a number of glass conical flasks that are shaken. The flasks contain growth media and micro-organisms. The cabinet is contained in a temperature controlled enclosure.	Orbital or reciprocal shakers with a total flask capacity greater than 250 liters, designed for use with biological material.	Not Listed	Not Listed	Orbital or reciprocal shakers and shaking incubators, designed for use with biological material, regardless of size.
Shaking incubators To cultivate small quantities of micro-organisms, for R & D or seed cultures for larger scale fermentation. The temperature controlled cabinet holds a number	Shaking incubators with a total flask capacity greater than 250 liters, designed for use with biological material.	Not Listed	Not Listed	

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
of glass conical flasks that are shaken. The flasks contain growth media and micro-organisms.				
Tissue culture vessels Used in the production of cells in tissue culture and in virus production.	Specially designed tissue culture cultivation vessels in which each vessel has an effective growth surface area of 450 cm^2 or greater. *Note: The size criteria will exclude small scale R & D activities; production / pilot scale activities should be identifiable.*	Not Listed	Not Listed	Do not include, because too specific.
Complex media Food containing all necessary nutrients for the growth of micro-organisms. *Note: Countries may increasingly produce growth media indigenously, hence this indicator shows also the level of indigenous biotechnological capabilities.*	Formulated powdered complex growth media prepackaged in a container size of 5 kg or greater. Formulated concentrated liquid complex growth media prepackaged in a container size of 5 liters or greater.	Not Listed	Not Listed	Prepared culture media for development of micro-organisms designed for production purposes. Prepared culture media for development of micro-organisms designed for diagnostic purposes.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
	Microbiological grade yeast extract prepackaged in a container size of 5 kg or greater.			
Downstream Processing				
Continuous and batch centrifuges and separators, including rotors For the separation of solids from liquid. Used to harvest micro-organisms from liquor or concentrate soluble materials in fermentation liquor. An example is the removal of pulp from liquids such as clarifying orange juice.	Centrifugal separators (or decanters) designed for use with biological material capable of continuous operation at a flow rate of 50 liters per hour or greater and specially designed rotors therefore. Batch centrifuges with a rotor capacity of 25 liters or greater, designed for use with biological material.	Centrifugal separators, capable of continuous separation without the propagation of aerosols, and having all of the following characteristics: a) one or more sealing joints within the steam containment area; b) flow rate greater than 100 liters per hour; c) components of polished stainless steel or titanium; d) capable of in-situ steam sterilization in a closed state. Technical Note: Centrifugal separators include decanters.	Continuous or semi-continuous centrifuge(s) that are self-sterilisable, with throughput capacity greater than 100 liter per hour.	Centrifuges and specially designed rotors therefore, regardless of size, having all of the following characteristics: • Designed for use with biological material; • Capable of in-situ steam sterilization in a closed state. Batch centrifuges and separators, including rotors, with a rotor capacity of: • Less than 25 liters; • 25 liters or greater. Continuous centrifugal separators or decanters regardless of size.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
		Note: Batch centrifuges not listed.		
Cross-flow and tangential filtration equipment For the large scale separation of solids from liquid, used to harvest micro-organisms from liquids or concentrate soluble materials in fermentation liquor. Used extensively in the food processing industry, e.g. to remove pulp from liquor such as clarifying orange juice.	Cross-flow and tangential filtration equipment designed for use with biological material with a filter area equal to or greater than 2 m^2 and component filter cartridges therefore.	Cross (tangential) flow filtration equipment capable of separation of pathogenic micro-organisms, viruses, toxins or cell cultures, without the propagation of aerosols, having all of the following characteristics: • A total filtration area equal to or greater than 1 square meter; • Capable of being sterilized or disinfected in-situ. Note : this control excludes reverse osmosis equipment, as specified by manufacturer. Plus components with a filtration area equal to or greater than 0.2 square meters for each component and designed for use in cross (tangential) flow filtration	Cross-flow/tangential filtration equipment with a filter area of over 5 square meters.	Cross-flow and tangential filtration equipment designed for use with biological material with a filter area • Under 0,2 m^2 • Equal to or greater than 0.2 m^2 and component filter cartridges therefore.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
		equipment as specified above.		
Spray drying equipment To dry material in order to prevent breakdown or degradation of product. Used extensively for large scale processing of bio-material, e.g. foodstuffs and micro-organisms. Spray and freeze-drying are the two major ways in bioweapons programmes to dry agents for weapons purposes.	Spray drying equipment designed for use with biological material and the following specially designed components: • Spray/atomizer units; • Cyclones; • Classifiers; and • Electronic control units.	Not Listed	Spray dryer(s).	Spray drying equipment • Designed for use with biological material; • Not designed for use with biological material.
Freeze-drying (lyophilisation)	Freeze-drying	Steam sterilisable freeze	Freeze dryer(s) with	Freeze-drying equipment with a

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
equipment To dry material in order to prevent breakdown or degradation of product. Used extensively for large scale processing of bio-material, e.g. vaccines.	(lyophilisation) equipment with a condenser capacity greater than 5 kg of ice in 24 hours, and specially designed vacuum chambers therefore.	drying equipment with a condenser capacity of 10 kg of ice in 24 hours and less than 1,000 kg of ice in 24 hours.	condenser capacity of over 5 kg of ice in 24 hours.	condenser capacity: • Less than 5 kg of ice in 24 hours; • 5 kg of ice in 24 hours or greater; and specially designed vacuum chambers therefore.
Drum drying equipment Solid-liquid separation device. Used to harvest micro-organisms. However, not best suited to do this. Is, in combination with appropriate milling equipment, an alternative for spray and freeze-drying of bioweapon agents.	Not Listed	Not Listed	Drum dryer(s).	Drum dryers: • Aseptic (i.e. fully contained and sterilisable); • Not designed for use with biological material.
Milling equipment Primarily used in the pharmaceutical industry for the production of fine powder that is tableted.	Size reduction equipment (including milling and grinding equipment) capable of producing powders with a mean particle size of 15 microns or less, and the following specially designed components: • Grinding heads; • Milling beads and bodies; • Grinders; and	Not Listed	Milling equipment designed or utilized to produce a grain mass median diameter of less than 10 micrometers. Equipment designed or utilized to produce dry powders.	Size reduction equipment (including milling and grinding equipment) capable of producing powders with a mean particle size of 15 microns or less.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
	• Classifiers.			
Biosafety and Sterilization				
HEPA Filters These are consumable items for biological or medical laboratories that have biological safety cabinets. Also used in large numbers by clean room air handling facilities. Now used in household air conditioning systems and vacuum cleaners.	HEPA filters of a frame area of 0.0625m^2 or larger and which have a DOP rating of 99.997% (at 0.3 micron) or higher."	Not Listed	Not Listed	Filters: • HEPA (High Efficiency-Particulate Air); • ULPA (Ultra Low Penetration Air); • SULPA (Super-ULPA) with a DOP rating of 99.997% (at 0.3 micron) or higher.
Biohazard containment facilities Used in clean rooms in hospitals, R&D facilities, universities, pharmaceutical facilities and electronics facilities.	Facilities, rooms or other enclosures that meet the physical containment criteria for P3 or P4 (BL3, BL4, L3, L4) biological containment as specified in the WHO Laboratory Biosafety Manual (Geneva, 1993).	Complete containment facilities that meet the criteria for P3 or P4 (BL3, BL4, L3, L4) containment as specified in the WHO Laboratory Biosafety manual (Geneva, 1993). Recommended to be included in awareness raising guidelines to industry: Conventional or turbulent air-flow clean-air rooms and self-contained fan-HEPA filter units that may be used for P3 or P4	Not Listed	*Do not include.*

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
		(BL3, BL4, L3, L4) containment facilities.		
Biological safety cabinets Or isolators with similar performance standards, e.g. flexible isolators, dry boxes, anaerobic chambers, glove boxes, or laminar flow hoods, and other equipment that can be modified by the addition of HEPA filter units to provide the equivalent level of containment.	Biological safety cabinets, which allow manual operations to be performed within, whilst providing an equivalent to Class I, Class II or Class III biological protection, as specified in the WHO Laboratory Biosafety Manual (Geneva, 1993). Kits to upgrade Class I cabinets to Class II or Class III. Specially designed long sleeved gloves for Class III biosafety cabinet.	Class III biological safety cabinets or isolators with similar performance standards (e.g. flexible isolators, dry boxes, anaerobic chambers, glove boxes, or laminar flow hoods (closed with vertical flow)).	Biological safety cabinets Class III or Class I with accessories for conversion to Class III. Flexible film isolators or other cabinets with air handling characteristics equivalent to Class III and anaerobic boxes. Biological safety cabinets Class II.	Class II and Class III biological safety cabinets or isolators. Rubber gloves specially designed for use with Class III or Class IV biological safety cabinets.
Autoclaves All microbiological laboratories and hospital departments dealing with clinical waste will have at least one autoclave with an internal volume of 1 cubic meter or more. Also for sterilising instruments, media, etc.	Autoclaves designed to sterilize infectious material, with an internal volume equal to 1 cubic meter or greater.	Not Listed	Not Listed	Double ended autoclaves.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
Pass through sterilization systems For sterilization of waste water.	Not Listed	Not Listed	Not Listed	Pass through sterilization systems.
Positive pressure air-fed suits Widely used for the protection of personnel exposed to hazards, i.e. smoke, fire, chemical spill, etc.	Positive pressure air-fed suits, half suits, helmets and respirators designed for biological use.	Protective full or half suits, or hoods dependent upon a tethered external air supply and operating under positive pressure. *Technical Note: This does not control suits designed to be worn with self-contained breathing apparatus.*	Self-contained breathing apparatus for other than fire fighting purposes.	Positive pressure air-fed suits, incorporating respirators which would provide protection from exposure to pathogens. Half suits, helmets and respirators which would provide protection from exposure to pathogens capable to be incorporated into positive pressure air-fed suits.
Research and Genetic Engineering				
Micro-encapsulation equipment Micro-encapsulation is used to stabilise and protect products against a harmful environment. It is a very common activity, e.g. oxidizable vitamins in face creams are micro-encapsulated into liposomes.	Not Listed	Recommended to be included in awareness raising guidelines to industry: Equipment for the micro-encapsulation of living micro-organisms and toxins in the range of 1-10 micrometer particle size, specifically: a) Interfacial polycondensors;	Micro-encapsulation equipment.	Do not include, not readily identifiable and no prerequisite for bioweapons programme.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
		b) Phase separators.		
Nucleic acid synthesizers	Nucleic acid synthesizers.	Not Listed	Automatic DNA synthesiser.	Do not include, no prerequisite for bioweapons programme and not very specific for work with micro-organisms.
Automatic peptide synthesisers Are useful in toxin production and indicator for technical capability	Not Listed	Not Listed	Automatic peptide synthesiser.	Automatic peptide synthesisers.
Dissemination				
Nose-only aerosolization equipment Used in R & D to study the effect of inhalation of pharmacologically active molecules.	Nose-only aerosolization equipment, but excluding devices for personal prophylaxis or therapy for medical conditions.	Not Listed	Not Listed	Nose-only aerosolization equipment, but excluding devices for personal prophylaxis or therapy for medical conditions.
Aerosol chambers Enclosure that is used to study aerosol behaviour and characterisation. Used in R & D of sprayers, etc.	Aerosolization drums, cabinets, chambers, rooms or other enclosures usable in the study of aerosols.	Chambers designed for aerosol challenge testing with micro-organisms, viruses or toxins and having a capacity of 1 cubic metre or greater.	Aerosol chambers (either static, dynamic or explosive).	Do not include, since the market size seems to be too small.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
Aircraft sprayers An aircraft crop sprayer takes a pressurised liquid feed and forces it out through fine nozzles. This has the consequence of producing a fine mist capable of covering all parts of the foliage. Aircraft sprayers can cover a large area quickly. Major use in crop spraying of pesticides. Militarily the most effective way for dispersal of bioweapons agents.	Aircraft sprayers capable of dispersing aerosols with an ultimate mean size of 15 microns or less at a flow rate exceeding 1 liter of liquid suspension per minute or 10 g of dry material per minute, and following specially designed components: • Spray tanks; • Certified pumps; and • Spray nozzles.	a. Complete spraying or fogging systems, specially designed or modified for fitting to aircraft, lighter than air vehicles or UAVs, capable of delivering, from a liquid suspension, an initial droplet Volume Media Diameter of less than 50 microns at a flow rate of greater than two liters per minute. b. Spray booms or arrays of aerosol generating units, specially designed or modified for fitting to aircraft, lighter than air vehicles or UAVs, capable of delivering, from a liquid suspension, an initial droplet Volume Media Diameter of less than 50 microns at a flow rate of greater than two liters per minute. c. Aerosol generating units specially designed	Not Listed.	Aerosol disseminators but capable of dispersing aerosols with an initial mean droplet size of 50 microns or less at a flow rate exceeding 1 liter of liquid suspension per minute or 10 g of dry material per minute, and specially designed components (nozzles, tanks, pumps), for fitting to aircraft or Unmanned Aerial Vehicles (UAVs). Products with the same specification, but specially designed for fitting to aircraft lighter than air vehicles or UAVs.
Foggers Large scale equipment that is capable of producing a fine mist (aerosol) of powder or liquid in to the environment. Used extensively in agriculture for dispersal of insecticides into large enclosed areas, e.g. greenhouses, or more open areas e.g. orchards. Militarily useful for the dissemination of BW agents over a relatively large area, approximately several hundred	Foggers including pulse jet disseminators capable of dispersing aerosols with an ultimate mean particle size of 15 microns or less at a flow rate exceeding 1 liter of liquid suspension per minute or 10 g of dry material per minute, and the following specially designed components: • Head unit; and • Nozzle assembly.		Not Listed.	Foggers/nebulisers including pulse jet disseminators capable of dispersing aerosols with an ultimate mean particle size of 15 microns or less at a flow rate exceeding 1 liter of liquid suspension per minute or 10 g of dry material per minute, and the following specially designed components: • Head unit; and • Nozzle assembly.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
square meters.		for fitting to systems that fulfil all the criteria specified in paragraphs 8a and 8b. *Technical Note: Aerosol generating units are devices specially designed or modified for fitting to aircraft such as nozzles, rotary drum atomisers and similar devices.*		
Aerosol disseminators other than aircraft sprayers or foggers	Aerosol disseminators, other than aircraft sprayers and foggers, capable of dispersing aerosols with an ultimate mean particle size of 15 microns or less at a flow rate exceeding 1 liter of liquid suspension per minute or 10 g of dry material per minute. *Note: This entry excludes dry powder fire extinguishers.*		Equipment designed or utilized to generate aerosols of micro-organisms or toxins and simulants.	Aerosol disseminators other than aircraft sprayers or foggers.
Aerodynamic particle-sizing equipment	Aerodynamic particle-sizing equipment.	Not Listed	Aerosol analytical equipment to determine	Aerodynamic particle-sizing equipment.

Description of item and its typical use	Item as identified in the control list of the UNMOVIC export-import monitoring system	Item as identified in the control list of the Australia Group	Item as identified in the list of key equipment for the BWC verification system	Item to be identified individually under an amended HS nomenclature
Used to study and characterise aerosols, e.g. size distribution. Essential tool in R & D use in pharmaceutical industry and aerobiology research.			the size of particles.	
OTHER				
Insect rearing cabinets/chambers	Not Listed	Not Listed	Cabinets/chambers designed or used for rearing insects.	*Do not include because less important.*
Plant inoculation cabinets/chambers	Not Listed	Not Listed	Plant inoculation cabinets/chambers providing quarantine.	Plant inoculation cabinets/chambers providing quarantine.
Detection assays for micro-organisms and toxins (including immunological and gene probe assays).	A number Immunological and gene probe assays for organisms listed in an explanatory note are part of the UNMOVIC list.	Not listed.	Not Listed.	Detection assays for micro-organism and toxins, including immunological and gene probe assays.