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David B. Sonnemann
Manager, Transport Regulations & Fleet Safety

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Praxair, Inc
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April 19, 2003

Associate Administrator for
Hazardous Materials Safety
U. S. Department of Transportation
400 Seventh Street, S.W.
Washington, D. C. 20590

Attention: Office of Exemptions and Approvals (DHM-31)

Re: Application for Exemption

Dear Sir/Madam:

In accordance with the provisions of Section 107.105 of the DOT Hazardous Materials Regulations, Praxair, Inc hereby applies for an exemption to allow the transportation of certain hazardous materials (including tungsten hexafluoride), for export only, in non-DOT specification cylinders constructed of 316L stainless steel to a foreign design. In accordance with the requirements of 49 CFR 107.105, we are providing the following information.

- 1) This application is hereby submitted in duplicate.
- 2) The applicant is:

David B. Sonnemann
Praxair, Inc
39 Old Ridgebury Road (M1)
Danbury, CT 06810-5103

Telephone No. (203) 837-2294;
Fax No. (203) 837-2503
E-mail: dave_sonnemann @ praxair.com
- 3) The applicant is a resident of the United States.
- 4) The regulations affected are 49 CFR Parts 106, 107 and 171-180.

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5) **This application for exemption seeks authorization to offer and transport welded, non-DOT specification cylinders that are designed to a foreign specification containing specific hazardous materials listed in paragraph 5(g) as outlined below:**

a) **The specific regulations from which Praxair, Inc. seeks relief are 49 CFR §173.202, §173.304, §173.304a, §173.323, and §173.338.** None of these sections authorizes the use of welded cylinders manufactured from 316L stainless steel for the products listed herein. In addition, 49 CFR 173.338 authorizes only seamless DOT specification cylinders for the transportation of tungsten hexafluoride.

b) **Modes Of Transportation Authorized:** Motor vehicle and cargo vessel.

c) **Detailed Description of Exemption Proposal:**

The application requests authorization to transport materials specified in paragraph 5(g) in non-DOT specification cylinders constructed of type 316L stainless steel that are designed and manufactured by Graeven Metalltechnik GmbH outside of the United States.

d) **Duration:** The proposed duration of the exemption is continuous.

e) **Basis For Seeking Relief From The Regulations:**

Currently sections §173.202, §173.304 §173.304a, §173.323 do not authorize the use of welded cylinders manufactured from 316L stainless steel for the hazardous materials listed in paragraph 5(g). In addition, §173.338 requires that tungsten hexafluoride be shipped in DOT-3A, 3AA, 3BN, or 3E cylinders that are equipped with a valve protection cap or packed in a strong outside container complying with the provisions of 173.40. Materials listed in paragraph 5(g), including tungsten hexafluoride, are currently authorized in welded stainless steel cylinders under exemptions DOT-E 4884 and DOT-E 12580. Praxair seeks to use cylinders similar to those authorized under DOT-E 4884 and DOT-E 12580 for tungsten hexafluoride in addition to the hazardous materials listed in DOT-E 4884.

f) **Processing Of The Application:**

The applicant does not seek emergency processing, but Praxair requests expedited processing based upon the significant impact this has on international exports from the USA.

g) **Hazardous Materials:**

Proper shipping name/ Hazardous Materials Description	1) Hazard class/Div	2) Identifica tion Number	3) Packing Group
Boron trichloride	2.3	UN1741	4) N/A
Chlorine trifluoride	2.3	UN1749	N/A

Dichlorosilane	2.3	UN2189	N/A
Ethylene oxide	2.3	UN1040	N/A
Liquefied and non-liquefied compressed gases authorized for DOT specification 4BW cylinders	2.1 or 2.2	As appropriate	N/A
Silicon tetrachloride	8	UN1818	II
Trichlorosilane	4.3	UN1295	I
Tungsten hexafluoride	2.3	UN2196	Not applicable

h) Description of Packaging:

Packagings prescribed will be:

- (1) The cylinders are of welded and not seamless construction and will be manufactured from 316L stainless steel components having a nominal thickness of 4mm that are butt-welded together to form a three-piece cylinder having a nominal capacity of either 10 liters or 50 liters.
- (2) The construction details and dimensions are shown in drawing numbers 00-10-07/0 and 98-12-03/2. (see Attachments A & B)
- (3) The cylinders will be manufactured outside of the United States or within the United States to a foreign design shown in drawings 00-10-07/0 and 98-12-03/2 as referenced in item 2.
- (4) The cylinders are similar to DOT specification welded cylinders and comply with the requirements of the HMR.
- (5) Cylinders of boron trichloride, chlorine trifluoride, dichlorosilane, and tungsten hexafluoride, when transported by common carrier or cargo vessel, shall be overpacked in accordance with the requirements of 49 CFR 173.25 and paragraph 5(I) below.

i) Operational Controls.

- (1) Prescribed cylinders shall meet the cylinder re-qualification requirements of the HMR outlined in Subpart C of Part 180.
- (2) Prescribed cylinders shall be charged with hazardous materials specifically identified in paragraph 5(g) of this application and shipped "for export only".
- (3) Prescribed cylinders shall meet the filling density and service pressure requirements of 49 CFR Part 173.
- (4) The shipping papers shall identify the prescribed cylinders with the exemption number "DOT-E _____" and shall carry the following certification: "This (these) cylinder(s) has (have) been retested and refilled in accordance with DOT requirements for export."
- (5) A current copy of the exemption shall be maintained at each facility where the package is offered or re-offered for transportation.

- (6) Each cylinder shall be marked with the DOT exemption number as specified in §172.301(c).
- (7) Prescribed cylinders covered by this exemption shall be plainly and durably marked "For Export Only" near the exemption number marking.
- (8) The following additional requirements apply to the transportation of cylinders containing boron trichloride, chlorine trifluoride, dichlorosilane, and tungsten hexafluoride:
 - i) Boron trichloride, chlorine trifluoride, dichlorosilane and tungsten hexafluoride are limited to transportation by motor vehicle and cargo vessel.
 - ii) For water transportation, the packagings must be stowed "on deck" only, as far away from crew's quarters, other normally manned spaces, and air intakes as reasonably practical.
 - iii) When shipping packages described in this exemption without a secondary overpack, the shipper must load the material, block and brace the material for transportation in accordance with a prepared plan for transportation which precludes stacking (double decking) and must seal the freight container, or van type motor vehicle used. Shipments in freight containers and motor vehicles must be from one origin to one destination only.

Shipments by "private carrier" motor vehicles must segregate in accordance with the HMR and with the load and properly blocked and braced.

- iv) When shipping packagings described in this exemption that are overpacked, the overpack must be as specified in 173.25. The inside package must be isolated from the overpack by a shock-mitigating, non-reactive material. There must be a minimum of two inches (5 cm) of cushioning material around the body of the package, and at least three inches (8 cm) on the top and bottom, between the inner packaging and the overpack.
- j) Justification Of Exemption Proposal.** The alternative packagings for which the exemption is requested provide an equivalent level of safety to DOT authorized packages under DOT-E 4884 and DOT-E 12580 as shown below.
- (1) The packages for which this exemption is requested have been safely used in Europe for decades.
 - (2) The cylinders proposed for use under this exemption have rated service pressure of 20 bar (290 psig) and a test pressure of 30 bar (435 psig) and a minimum burst pressure of 110 bar (1595 psig)
 - (3) A burst test conducted on one cylinder from the batch to be used showed a burst pressure of 280 bar. (see Attachment C)

- (4) Transportation of the cylinders from the filling location in the USA to the port of debarkation minimizes the length of time for any potential risk resulting from container failure occurring during transportation.
- (5) Praxair holds exemption DOT-E 4884 authorizing the shipment of stainless steel cylinders conforming to 4BW specifications and these containers have been successfully used to transport hazardous materials identified in paragraph 5(g).
- (6) Cylinders of boron trichloride, chlorine trifluoride, dichlorosilane, and tungsten hexafluoride, when transported by common carrier or by cargo vessel, will be overpacked in conformance with 173.25 and the operational controls outlined in paragraph 5(i).
- (7) Pressure relief device requirements for cylinders containing the gases listed in paragraph 5(g) shall be equipped with pressure relief devices in accordance with CGA S-1.1
- (8) DOT has previously issued exemption DOT-E 12580 to Matheson-Trigas for the transport of tungsten hexafluoride in cylinders similar to those for which this exemption is sought.

On the basis of this exemption application and previously issued exemptions DOT-E 4884 and DOT-E 12580, Praxair, Inc respectfully requests that this application be given expedited review in order to begin shipping the packages as quickly as possible.

If you have any questions about this application, please contact me. I can be reached at (203) 837-2294.

Respectfully submitted,



David B. Sonnemann, Manager

Cc: Dave Adams
Gilles Ferket
Randy Fletcher
Ron Fuhrhop
Eric Haest
Ron Horn
Jane Seese
Marie Zehler

Nelson, Sherrie

Attached is an application, submitted on behalf of Praxair, Inc., for a new exemption authorizing the use of foreign-manufactured, welded stainless steel cylinders for toxic products. The files below include the application letter and a second file that included three attachments to the application.

Both of these files should be printed and then combined to form the complete application. As this is an important international application for Praxair, we request expedited consideration of this request and hopefully the technical information included on the attachments answers your technical questions.

If you have any questions about this application or the attachments, please contact me at 203-837-2294.

Respectfully submitted,



Dave Sonnemann

Manager, Transport Regulations & Fleet Safety