



U.S. Department  
of Transportation

**Research and  
Special Programs  
Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

FEB 23 1998

Mr. Aris Antoniou  
Vice President  
The Columbiana Boiler Company  
200 West Railroad Street  
Columbiana, OH 44408

Dear Mr. Antoniou:

This is in reference to your inquiry asking whether a packaging can be dual marked as a DOT-E 11580 exemption cylinder and a UN1A1 standard drum under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180).

The answer is yes, provided that the packaging meets the requirements of the DOT-E 11580 exemption and the UN 1A1 packaging standard in the HMR, in all aspects.

I hope this information is helpful. If we can be of further assistance, please contact us.

Sincerely,

A handwritten signature in cursive script that reads "Hattie L. Mitchell".

Hattie L. Mitchell, Chief  
Regulatory Review and Reinvention  
Office of Hazardous Materials Standards



# THE COLUMBIANA BOILER COMPANY

CUSTOM FABRICATIONS • GALVANIZING AND TINNING KETTLES • ASME PRESSURE VESSELS • CHEMICAL SHIPPING CONTAINERS TO DOT SPECIFICATIONS

200 WEST RAILROAD STREET  
COLUMBIANA, OHIO, 44408 U.S.A.

FAX (216) 482-3390

7.10.172.300  
50.334,230

TELEPHONE (216) 482-3373

April 24, 1996

Mr. Edward T. Mazzullo (DHM-10)  
Director, Office of Hazardous Materials Standards  
Research and Special Programs Administration  
U.S. Department of Transportation  
400 Seventh Street, SW  
Washington, DC 20590

**SUBJECT:** dual marking of a packaging

Dear Sir:

We are a manufacturer of stainless steel cylinders (similar to DOT 4BW cylinders) under DOT-E 11580. These cylinders are frequently used to transport liquid hazardous materials. Because DOT cylinder specifications (or related exemptions) are not necessarily recognized by foreign regulatory agencies (or their inspectors), we would like our cylinders also approved as a UN performance-based non-bulk packaging. We see no reason why this packaging cannot be dual marked as an E 11580 cylinder and a UN1A1 drum provided all the requirements for DOT Spec. 4BW (as amended by the exemption) are met and provided all the requirements for a UN1A1 drum are also met. Our packaging (typically as shown on the attached drawing) meets the standards for steel drums Subpart L of Part 178 of Title 49 of the Code of Federal Regulations and will also be tested in accordance with Subpart M. Also, there does not appear to be any non-bulk packaging authorization for a liquid in Subpart E of Part 173 where a UN1A1 drum is authorized but a specification cylinder is not. In other words, wherever a specification cylinder is authorized, a UN1A1 drum is also authorized.

Please indicate if we are correct in our opinion that our packaging can be dual marked as DOT Specification E-11580 cylinder and a UN1A1 drum if the respective requirements for each packaging are met.

Yours Very Truly,

Aris Antoniou,  
Vice President

encl: dwg. no. 18024F

cc: Ms. J. Suzanne Hedgepeth (DHM-30)  
Mr. J. Jones (DHM-32)



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DOT/RS&PA/OTHERS  
EXEMPTIONS APPROVALS  
96 APR 29 AM 9:40

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Yours Very Truly,

Aris Antoniou,  
Vice President

(972) 548-9021 TEXAS

encl: dwg. no. 18024F

cc: Ms. J. Suzanne Hedgepeth (DHM-30)  
Mr. J. Jones (DHM-32)

File 178.03  
Hwy  
Title 17  
SC

DOT-E 11580  
(FIRST REVISION)

EXPIRATION DATE: September 30, 1999

(FOR RENEWAL, SEE 49 CFR SECTION 107.109)

1. GRANTEE: The Columbiana Boiler Company (CBC)  
Columbiana, Ohio
2. PURPOSE AND LIMITATION: This exemption authorizes the manufacture, marking and sale of non-DOT specification stainless steel cylinders comparable to DOT Specification 4BW to be used for the transportation in commerce of those hazardous materials described in paragraph 6 below. This exemption provides no relief from any regulation other than as specifically stated herein.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR Sections 173.40(a), 173.158(b), (g), and (h), 173.192(a), 173.201(c), 173.202(c), 173.203(c), 173.226(a), 173.227(a), and 173.336 only in that the prescribed cylinders are not listed as authorized packagings; and 173.40(c), 178.35 and 178.61 as specified herein.
5. BASIS. This exemption is based on CBC's application dated December 16, 1996, submitted in accordance with 49 CFR 107.121 and the public process thereon and a subsequent letter dated October 28, 1997, submitted in accordance with 49 CFR 107.109.
6. HAZARDOUS MATERIALS (49 CFR 172.101):

| Hazardous materials description/proper shipping name | Hazard Class/ Division | Identification number | Packing Group         |
|--|------------------------|-----------------------|-----------------------|
| Dimethylhydrazine, unsymmetrical                     | 6.1                    | UN1163                | I<br>Hazard<br>Zone B |
| Methylhydrazine                                      | 6.1                    | UN1244                | I<br>Hazard<br>Zone A |

| Hazardous materials description/proper shipping name  | Hazard Class/ Division | Identification number | Packing Group         |
|---|------------------------|-----------------------|-----------------------|
| 50% anhydrous hydrazine and 50% unsymmetrical dimethylhydrazine/<br>Toxic liquids,<br>flammable, organic,<br>n.o.s. | 6.1                    | UN2929                | I<br>Hazard<br>Zone B |
| Hydrazine, anhydrous  | 8                      | UN2029                | I                     |
| Those materials authorized to be transported in DOT Specification 4BW cylinders                                     | Various                | Various               | Various               |
| Dinitrogen tetroxide, liquefied<br>Hazard Zone A  | 2.3                    | UN1067                | N/A                   |
| Nitric acid <i>other than red fuming, with more than 70 percent nitric acid</i>                                     | 8                      | UN2031                | I                     |
| Nitric acid <i>other than red fuming, with not more than 70 percent nitric acid</i>                                 | 8                      | UN2031                | II                    |

The provisions of 49 CFR 172.101, Column 9B apply to shipments made under the terms of this exemption.

7. PACKAGING AND SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a non-DOT specification steel cylinder conforming with the general requirements for specification cylinders (§178.35) and DOT Specification 4BW (§178.61), except as follows:

§178.35(b) Inspection by whom and where.

(1) Inspections and verifications must be performed by a third party. The third party inspector shall either be a National Board Authorized Inspector or an inspector approved in writing by the Associate Administrator for Hazardous Materials Safety, in accordance with §173.300a of the Hazardous Materials Regulations.

(2) \* \* \*

§178.35(f) Marking.

(1) Marking on each cylinder stamped as follows:

(i) "DOT-E 11580" followed by the service pressure.

\* \* \*

§178.61(b) Authorized steel.

Material of construction shall be SA240 type 304L or type 316L stainless steel.

§178.61(d) Manufacture.

(1) \* \* \*

(2) Circumferential seam welds shall be full penetration butt welds with full 100% radiograph inspection.

§178.61(g) Heat treatment.

Cylinders need not be heat treated.

§178.61(i) Hydrostatic test.

(1), (2), (3), and (4) \* \* \*

(5) The first finished cylinder out of each lot of 500 or less successively produced shall be hydrostatically tested to 4 times service pressure without bursting.

§178.61(j) Physical tests.

(1) Specimens must be taken from the first cylinder from each lot of 500 or less as follows:

\* \* \*

The following additional requirements apply for the transportation of dinitrogen tetroxide, liquefied and nitric acid:

o Cylinders must be in conformance with NASA Kennedy Space Center Procurement Specification 81K05262;

o Cylinders must be in conformance with §173.40 except as follows:

Continuation of DOT-E 11580 (1st. rev.)

Page 4

- §173.40(c)(1) Connections shall be straight threads with controlled root radius straight threads (thread form symbol UNJ) in accordance with Military Specification MIL-S-8879. Female ports shall be UNJ straight threads and shall meet Military Standard MS33649. The sealing gasket shall be polytetrafluoroethylene preformed packing per Military Standard MS9956. Preformed packing shall be deformed in assembly only once; reassembly shall require a new preformed packing; and

- §173.40(c)(2) Valves shall be quarter turn ball valves with secondary stem containment stem seals of a NASA approved design. Prior to filling, or at a minimum frequency of one year, a bubble leak check shall be performed on all mechanical joints at a minimum of 200 psig. Prior to cylinder refill, or at a five-year frequency, whichever is greater, valves shall have all softgood materials (such as seats, packing, and o-rings) replaced, valves shall be cleaned, and valves shall be leak-tested at rated pressure at all joints and across the seat.

o Cylinders may not be equipped with safety relief devices. Cylinders shall be equipped with a detachable protective housing for the loading and unloading valves.

b. TESTING -

(1) For the transportation of dinitrogen tetroxide, liquefied and nitric acid, cylinders must be inspected and tested as required in NASA Kennedy Space Center Procurement Specification 81K05262.

(2) Cylinders must be retested in accordance with the requirements of 49 CFR 173.34 applicable to DOT 4BW cylinders.

c. OPERATIONAL CONTROLS - The transport pressure shall be limited to 50 psig.

8. SPECIAL PROVISIONS.

a. Offerors for transportation of the hazardous materials specified in this exemption may use the packaging described in this exemption for the transportation of such hazardous materials provided no modifications or changes are made to

the packages, all terms of this exemption are complied with, and a copy of the current exemption is maintained at each facility from which such offering occurs.

b. Each packaging manufactured under the authority of this exemption must be either (1) marked with the name of the manufacturer and location (city and state) of the facility at which it is manufactured or (2) marked with a registration symbol designated by the Office of Hazardous Materials Exemptions and Approvals Program for a specific manufacturing facility.

c. A copy of this exemption, in its current status, must be maintained at each manufacturing facility at which this packaging is manufactured and must be made available to a DOT representative upon request.

d. Shippers using the packaging covered by this exemption must comply with all provisions of this exemption, and all other applicable requirements contained in 49 CFR Parts 171-180.

e. This exemption is to serve as an authorization of the Competent Authority for the United States CA-9602012 under Section 10.3 of the General Introduction to the International Maritime Dangerous Goods Code and Section 2.5 Chapter 2 of Part 3 of the International Civil Aviation Organization's Technical Instructions authorizing the use of the packaging, described in paragraph 7, for the substances authorized for transport in cylinders (receptacles).

9. MODES OF TRANSPORTATION AUTHORIZED. Motor vehicle, rail freight, cargo vessel, and cargo aircraft only.
10. MODAL REQUIREMENTS: A copy of this exemption must be carried aboard each cargo vessel, aircraft or motor vehicle used to transport packages covered by this exemption. The shipper shall furnish a copy of this exemption to the air carrier before or at the time the shipment is tendered.
11. COMPLIANCE. Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by Federal hazardous materials transportation law, 49 U.S.C. Section 5101 et seq.,
- o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
  - o Registration required by 49 CFR 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in 49 CFR 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by 49 CFR 172.700 through 172.704.

No person may use or apply this exemption, including display of its number, when the exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS. The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (49 CFR 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must inform the AAHMS, in writing, of any incidents involving the package and shipments made under the terms of this exemption.

Issued at Washington, D.C.:

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Alan I. Roberts  
Associate Administrator  
for Hazardous Materials Safety

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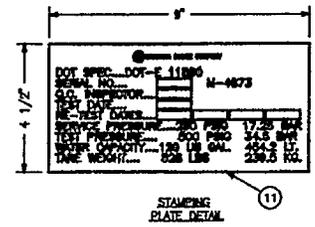
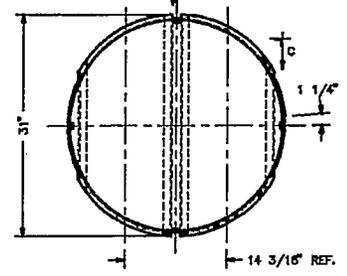
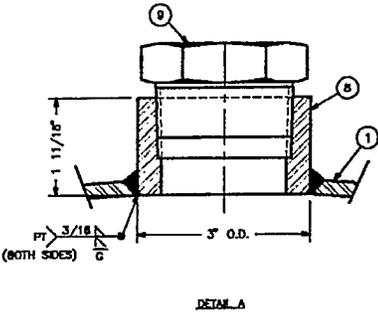
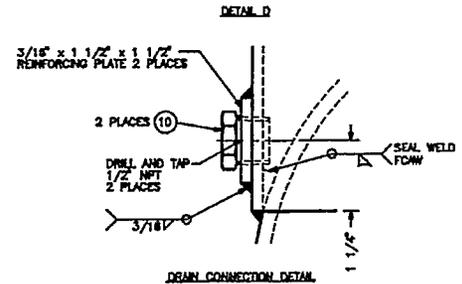
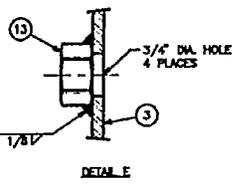
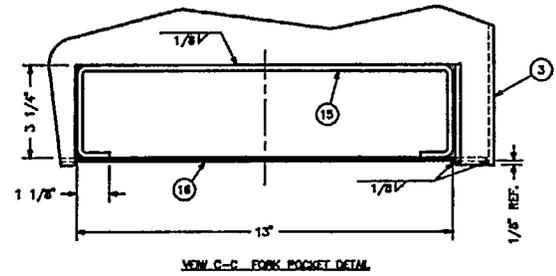
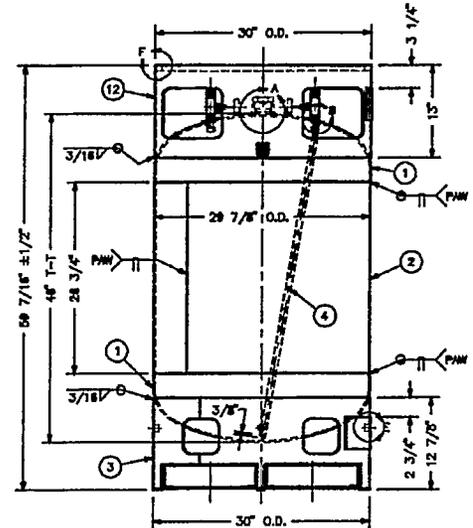
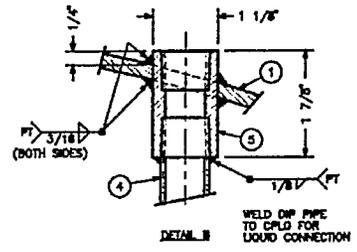
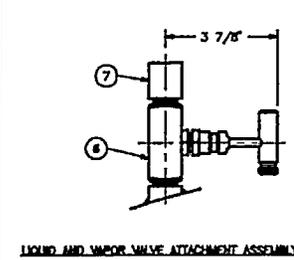
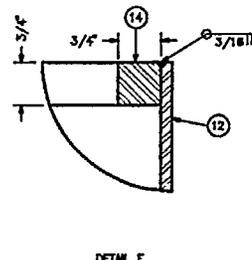
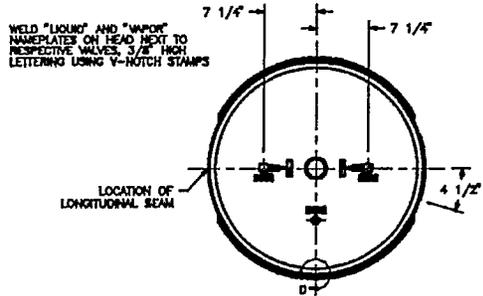
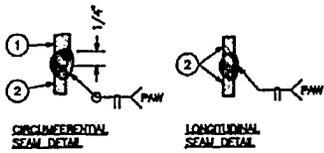
(DATE)

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590.  
Attention: DHM-31.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

Dist: FHWA; FRA; FAA; USCG  
PO: am





DESIGN & FABRICATION DATA

Working Pressure: 250 PSIG 17.25 BAR

Design Temperature: -20F -25C TO 100F 38C

Design Code: UNDOT 178.81 SPEC 4BW EXEMPTION E11880

Product File No: (DOT48250) 34,014 PS

Subgroup: 178.81-(B)(2) FULL E-1.0

Drawn: NONE

Checked: NONE

Author of Design: R.A.

Design Notes: ONE FINISHED CYLINDER OUT OF EACH LOT OF 300 OR LESS TO BE TESTED TO 1000 PSIG W/D BURST. HYDRO TEST EACH CYLINDER TO 500 PSIG. ONE FINISHED CYLINDER OUT OF EACH LOT OF 300 OR LESS SHALL BE TESTED FOR 178.81-17. CYLINDER WILL BE FURNISHED COMMERCIAL CLEAN BY CRD. ALL SPECIAL CLEANING INCLUDING PASSIVATION OR ELECTROPLATING IS ADDITIONAL.

Material: BEAD BLAST

Paint: NONE

Paint System: NONE

Estimated Total Weight: 120 GAL (454.2 L) NOM. ±1 OAL (1.78 L)

Estimated Net Weight: 538 LBS (239.5 KG) AVE. TARE WT. INCLUDING VALVES AND PLUGS

MATERIALS

SA340-304L FOR SHELL AND HEADS

CHEMICAL ANALYSIS REQUIREMENTS 304L (ASTM A340)

C-208 IN-2.8 MAX P-8.0 MAX S-0.03 MAX N-0.75 MAX

CP-18.0-30.0 ME-0.0-12.0 MO-0.0 MAX

ALL COMPONENTS CONTAIN LESS THAN 0.03% BI EXCEPT AS NOTED

Designation: ASTM SA-182-F304L FORGED STEEL

THREADS SHALL BE SPARINGLY LUBRICATED PRIOR TO ASSEMBLY WITH "KRYFOK"

Hardware: STAINLESS STEEL 11 OALC ARM A-249 TYP 304

MATERIALS

LOCATION DESCRIPTION

- 2 1/2" HDG. GALV. x .048 IN. ELLIPTICAL-21 FWD 304 SS
- 1 SHIM 3/8" DIA. x 3/8" x 3/8" 16 MIL. PLATE 304 SS
- 1 BOTTOM SHIRT (SEE DETAIL 18024-2) 304L SS
- 1 REACTION PIPE 1/2" SCH 10 x 6' 304L SS
- 3 1/2" NPT COUPLING 3000# 304L SS
- 2 WHITEY PLUG VALVE - 1/2" NPT x 1/2" SS-SPTM-75-316L-PIPE SEAT
- 2 1/2" NPT CAP 3000# 304 OR 316 SS
- 1 1/2" NPT NIP COUPLING 3000# 304 SS
- 1 HEX HEAD FLUID 1/2" NPT 3000# 304 OR 316 SS
- 2 HEX HEAD FLUID 1/2" NPT 3000# 304 OR 316 SS
- 12 STAINLESS PLATE 4 1/2" x 8" x 12 GA. 304 SS
- 1 TOP SHIRT (SEE DETAIL 18024-1) 304L SS
- 4 NUT, HDG. HD. 8/8"-11 STAINLESS STEEL
- 1 TOP SHIRT REBAR 3/4" x 3/4" x 66 3/4" 304L SS
- 2 FORK POCKET (SEE DETAIL 18024-3) 304L SS
- 1 FORK POCKET CONE 11 GA. x 3/8" 1/2" DIA. 304L SS
- 1 "LIQUID" NAMEPLATE 11 GA. x 3/8" x 2 1/2" 304L SS
- 1 "VAPOR" NAMEPLATE 11 GA. x 3/8" x 2 1/2" 304L SS
- 1 "FLUID" NAMEPLATE 11 GA. x 3/8" x 2 1/2" 304L SS
- 1 PRESSURE RELIEF VALVE

REFERENCE DRAWINGS

18024-1, 18024-2, 18024-3

THE COLUMBIANA BOILER CO.

COLUMBIANA, OHIO

GENERAL ARRANGEMENT

120 GAL/250 PSIG DOT 4BW E-11880

STAINLESS STEEL CYLINDER

Stamping Plate No: 18024F

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