Maine EPR for Packaging Stakeholder Meetings – Producer Exemptions

December 7, 2022

Worthington Industries is responding to the following question from Maine DEP:
Which products, if any, should be exempt under paragraph 13(D) (38 M.R.S. § 2146(13)(D)? If you propose a subset of products should be exempt, please provide information justifying why those products should be exempt, including information on the way federal regulations limit the producer's ability to increase the recyclability and/or decrease the amount of packaging used.

Background
Worthington is a leading US-based manufacturer of pressurized cylinders, including both refillable and non-refillable cylinders. We propose that pressurized cylinders should be exempt under paragraph 13(D) (38 M.R.S. § 2146(13)(D) due to the federal regulations governing these products. We have a number of concerns related to the current inclusion of both refillable and non-refillable pressurized cylinders in a broad EPR packaging bill, including:

- Federal regulations that affect a producer's ability to improve the recyclability and/or reduce the quantity of pressurized cylinder packaging material in relation to the volume of product, and
- Significant differences between collection and management system considerations for pressurized cylinders and those for other household packaging.

Federal Regulations
Pressurized cylinders are federally regulated by the Department of Transportation. Title 49 of the Code of Federal Regulations defines hazardous materials, outlines transportation requirements by hazardous material type, and dictates the design of the packaging (e.g., pressurized cylinder) containing the hazardous material, including the cylinder material, wall thickness and strength. Excerpts from the regulation are provided at the Appendix for the hazardous material designation of pressurized cylinders, the material specifications, and the minimum wall thickness requirements.

Given these rules, there is little to no opportunity to reduce the quantity of the packaging material (e.g., the steel thickness) in relation to the volume of product. Further, while the steel is recyclable, the cylinder is pressurized and may contain residual gas. Because the DOT regulates both reverse logistics and the transportation of empty packagings that have contained a hazardous material, these products require special arrangements for collection and processing prior to recycling compared to other household packaging.

Differences in Considerations related to Collection and Management of Pressurized Cylinders:
Pressurized cylinders (refillable and non-refillable) require much different collection and processing systems than other types of household packaging (e.g., beverage containers, steel food cans, plastic film). These different considerations are included in Table 1.

Table 1 – Considerations related to collection, transportation and processing of pressurized cylinders

	Considerations
Collection	• Cylinders are typically physically segregated from other recyclables at depots or in special publicly accessible containers • Municipal collection systems usually do not allow residents to place cylinders in curbside collection systems (recycling or garbage)
Transportation	• Health and safety risks exist if cylinders are compacted in a curbside collection vehicle
Processing	• Pressurized cylinders pose health and safety risks to workers at material recovery facilities (MRF) particularly in the baling process • MRFs do not have equipment to properly process cylinders (e.g., remove the gas safely and prepare for recycling)
Overarching Impacts	• Unique permitting requirements or specifications are required for the collection, storage, transportation, and processing of pressurized cylinders (e.g., Fire Marshall, National Fire Protection Association (NFPA), and Department of Transportation requirements) • Communications with the public become more complex and more likely to create confusion if the pressurized cylinders are included in the same program since they require different handling than packaging placed into comingled collection systems.

Because of these considerations, pressurized cylinders are typically included in regulations focusing on packaging for hazardous or special products rather than in regulations for packaging of non-hazardous products. By way of example, in Canada no residential packaging regulation includes pressurized cylinders. Instead, jurisdictions like Ontario[1], Quebec[2], Manitoba[3], Alberta[4], and British Columbia[5] regulate pressurized cylinders in a regulation for hazardous packaging. This approach allows for governments to establish requirements that reflect the special circumstances described above for collection, transportation and management of pressurized cylinders and other types of packaging for hazardous products (e.g., management of residual contents).

Given the special considerations in handling pressurized cylinders, dedicated collection, transportation, and management systems are required. These systems are not compatible with systems for packaging of non-hazardous products. Including producers of cylinders with dedicated collection, transportation, and management systems in the same PRO as producers of packaging for non-hazardous products that can be safely collected through commingled curbside collection will reduce the effectiveness and efficiency of both collection systems.

Producers of pressurized cylinders also will want to take advantage of specialized collection, transportation, and processing infrastructure already established for pressurized cylinder exchange networks (e.g., 20 lb propane cylinders) or municipal household hazardous depots and will want to

[1] Ontario Government. O. Reg 449/21 - Hazardous and Special Products, 2021. Available at https://www.ontario.ca/laws/regulation/r21449.
[2] Quebec Government. O.C.C 933-2022 – Recovery and reclamation of products by enterprises – Amendment. Available at http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=1&file=105769.pdf.
[3] Manitoba Government. Household Hazardous Material and Prescribed Material Stewardship Regulation, 2010. Available at https://web2.gov.mb.ca/laws/regs/annual/2010/016.pdf.
[4] Alberta Government. Extended Producer Responsibility (EPR) for Packaging, Paper Products, Single-Use Plastics, as well as Hazardous and Special Products, 2021. Available at https://www.alberta.ca/circular-plastics-economy-engagement.aspx.
[5] British Columbia Government. Advancing Recycling in B.C.: Extended Producer Responsibility Five-Year Action Plan 2021-2026. Available at https://www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/extended_producer_five_year_action_plan.pdf

collaborate with producers of other types of hazardous materials (e.g., paint containers) on messaging, collection and transportation.

Proposed Path Forward

Both refillable and non-refillable pressurized cylinders are federally regulated, limiting producers' ability to either increase their recyclability in collection systems designed for household products or to reduce the quantity of the cylinder packaging material. As a result, we recommend that Maine exempt pressurized cylinders from packaging legislation and instead regulate pressurized cylinders based on the model legislation developed in Connecticut.

The model legislation:

- Creates a free, statewide collection of residential pressurized cylinders at state parks, campgrounds, municipal collection and transfer sites and hazardous waste events;
- Creates a marketing awareness campaign to educate consumers on how to manage pressurized cylinders at end-of-life;
- Establishes a tracking and monitoring provision to ensure cylinders are properly collected and recycled;
- Establishes targets that would be reviewed after the first year of operation, once operational data is available; and
- Requires annual reporting of progress against targets.

Worthington would be pleased to work closely with Maine legislators, as we did in Connecticut, to develop this legislation.

Appendix: 49 CFR Excerpts for Example Refillable and Non-refillable Pressurized Cylinders

- **49 CFR 172.101: Hazardous Materials Table**
  The Hazardous Materials Table (Table) in this section designates the materials listed therein as hazardous materials for the purpose of transportation of those materials. For each listed material, the Table identifies the hazard class or specifies that the material is forbidden in transportation, and gives the proper shipping name or directs the user to the preferred proper shipping name. In addition, the Table specifies or references requirements in this subchapter pertaining to labeling, packaging, quantity limits aboard aircraft and stowage of hazardous materials aboard vessels.

  There are many types of pressurized cylinders, including those containing liquefied petroleum gas, helium, and carbon dioxide. The Hazardous Materials Table directs the user to design and transportation requirements according to the designated hazard classification. Note that the table defines liquefied petroleum gases (e.g., propane, isobutane and butane) as hazard class 2.1 for *Flammable gas*. Both helium and carbon dioxide, when compressed in pressurized cylinders, are defined as hazard class 2.2 for *Non-flammable compressed gas*.

- **49 CFR 177: Carriage by Public Highway**
  This part prescribes requirements, in addition to those contained in parts 171, 172, 173, 178 and 180 of this subchapter, that are applicable to the acceptance and transportation of hazardous materials by private, common, or contract carriers by motor vehicle.

  Requirements for transportation of hazardous materials cover specialized driver training, shipping papers, Hazmat placarding, etc.

- **49 CFR 178.35 – 178.75 Subpart C: Specifications for Cylinders**
  This part prescribes the manufacturing and testing specifications for packaging and containers used for the transportation of hazardous materials in commerce.

  Subpart C defines the materials allowed and minimum wall thickness depending on the cylinder specification.

  Example requirements for steel type and minimum wall thickness are shown below for the DOT-4BA specification, which is commonly followed for refillable propane tanks.

Appendix A to Part 178 - Specifications for Steel

Table 1

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[Open-hearth, basic oxygen, or electric steel of uniform quality. The following chemical composition limits are based on ladle analysis:]

Designation	Chemical composition, percent-ladle analysis		
	Grade 1[1]	Grade 2[1 2]	Grade 3[2 4 5]
Carbon	0.10/0.20	0.24 maximum	0.22 maximum.
Manganese	1.10/1.60	0.50/1.00	1.25 maximum.
Phosphorus, maximum	0.04	0.04	0.045.[6]
Sulfur, maximum	0.05	0.05	0.05.
Silicon	0.15/0.30	0.30 maximum	
Copper, maximum	0.40		
Columbium		0.01/0.04	
Heat treatment authorized	([3])	([3])	([3]).
Maximum stress (p.s.i.)	35,000	35,000	35,000.

[1] Addition of other elements to obtain alloying effect is not authorized.

[2] Ferritic grain size 6 or finer according to ASTM E 112-96 (IBR, see § 171.7 of this subchapter).

[3] Any suitable heat treatment in excess of 1,100 °F., except that liquid quenching is not permitted.

[4] Other alloying elements may be added and shall be reported.

[5] For compositions with a maximum carbon content of 0.15 percent of ladle analysis, the maximum limit for manganese on ladle analysis may be 1.40 percent.

[6] Rephosphorized Grade 3 steels containing no more than 0.15 percent phosphorus are permitted if carbon content does not exceed 0.15 percent and manganese does not exceed 1 percent.

(f) ***Wall thickness.*** The minimum wall thickness of the cylinder must meet the following conditions:

(1) For any cylinder with an outside diameter of greater than 6 inches, the minimum wall thickness is 0.078 inch. In any case, the minimum wall thickness must be such that the calculated wall stress at the minimum test pressure may not exceed the lesser value of any of the following:

(i) The value shown in table 1 of appendix A to this part, for the material under consideration;

(ii) One-half of the minimum tensile strength of the material determined as required in paragraph (j) of this section;

(iii) 35,000 psig; or

(iv) Further provided that wall stress for cylinders having copper brazed longitudinal seams may not exceed 95 percent of any of the above values. Measured wall thickness may not include galvanizing or other protective coating.

An excerpt is shown below for the steel type and minimum wall thickness requirements for the DOT-39 specification, which is commonly followed for non-refillable propane tanks.

(1) ***Steel.***

(i) The steel analysis must conform to the following:

Expand Table

	Ladle analysis	Check analysis
Carbon, maximum percent	0.12	0.15
Phosphorus, maximum percent	.04	.05
Sulfur, maximum percent	.05	.06

(d) ***Wall thickness.*** The minimum wall thickness must be such that the wall stress at test pressure does not exceed the yield strength of the material of the finished cylinder wall. Calculations must be made by the following formulas:

(1) Calculation of the stress for cylinders must be made by the following formula:

$$S = [P(1.3D^2 + 0.4d^2)] / (D^2 - d^2)$$

Where:
S = Wall stress, in psi;
P = Test pressure in psig;
D = Outside diameter, in inches;
d = Inside diameter, in inches.

(2) Calculation of the stress for spheres must be made by the following formula:

$$S = PD / 4t$$

Where:
S = Wall stress, in psi;
P = Test pressure i psig;
D = Outside diameter, in inches;
t = Minimum wall thickness, in inches.