

Guidelines for Transloading Polymeric Methylene Diphenyl Diisocyanate (pMDI)

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Table of Contents

Introduction	1
Facility Considerations	2
Facility Management Considerations	2
Security Considerations	2
U.S. EPA Classification of pMDI in Transportation	3
Safety Considerations	3
Environmental Considerations	4
Training Considerations	5
Facility Equipment	5
Transloading Operations	6
Carrier Operations	6
Responding to Emergencies	7
Disclaimer	7

Introduction

This document provides guidelines for facility owners and/or operators interested in transloading Polymeric Methylene Diphenyl Diisocyanate (pMDI) from rail tank cars to cargo tank trailers. This document is not meant to be exhaustive and may not cover all requirements for transloading at a particular facility or operation. This document is intended for facilities that transload pMDI, and describes the general requirements for transloading this type of material. Before transloading pMDI, read and understand the information provided in the pMDI supplier's Safety Data Sheet (SDS) and other technical guidance that may be available at www.polyurethane.org.

Pursuant to 49 CFR 171.8, "transloading" means "the transfer of a hazardous material by any person from one bulk packaging to another bulk packaging, from a bulk packaging to a non-bulk packaging, or from a non-bulk packaging to a bulk packaging for the purpose of continuing the movement of the hazardous material in commerce.

Facility Considerations

Prior to selecting the transfer point location, consider the following:

- Proximity of transfer point to neighboring properties
- Proximity of transfer point to waterways and drains
- Available safety and emergency equipment
- Site security
- Condition of access roads to and from the transloading facility (i.e., suitably sized roads in good condition)
- It would be beneficial to have available certified scale(s) either on site or in close proximity to the facility to validate the amount of product loaded and help prevent overweight vehicles from entering public roadways (see 23 CFR 658.17)

Facility Management Considerations

Best practices dictate that each transloading facility or operation have a site management structure in place with all areas of responsibility identified and have applicable site-specific procedures that address quality, environmental, health, safety and operation requirements.

Security Considerations

PMDI is not subject to the U.S. Department of Transportation (DOT) transportation security plan requirements. However a facility or operation that conducts transloading may be required to have such a plan based on other materials handled. Facility operator would be required to conduct a security vulnerability assessment in accordance with those plans (49 CFR 172.800 et seq). Transportation security plan may require:

- Controlling access to a facility (i.e., perimeter fence with gated access and lighting or by using adequate security patrols)
- Security clearances and background checks for all personnel working at the facility
- Provide an appropriate facility escort for any visitors that have not received security clearances and background checks
- Secure shipment (i.e., application of security seals to all outbound containers is a practice frequently used throughout the industry. Consult the pMDI supplier with respect to the specific instructions for seal utilization.)

U.S. EPA Classification of pMDI in Transportation

The United States Environmental Protection Agency (EPA) lists pure MDI as a hazardous substance, and DOT regulates the shipment of pure MDI when contained in single packages equal to or greater than the reportable quantity (RQ) of 5,000 pounds (49 CFR 172.101 Appendix A). Mixtures of MDI are regulated if the amount of pure MDI in the mixture equals or exceeds the RQ amount. Polymeric MDI (pMDI) contains about 50% MDI; therefore, a single package of 10,000 pounds is subject to DOT regulation. Review all federal, state, and local regulations prior to the storage and handling of MDI.

When pMDI is contained in single packages where the amount of MDI is equal to or greater than the RQ, the transportation of MDI in the U.S. is regulated by DOT. In addition, export shipments may be regulated by various international organizations that establish specific transport requirements that are observed by all parties. For additional details on how MDI is regulated, contact your supplier.

Safety Considerations

According to DOT 49 CFR 174.67 the transloading facility operator must maintain written safety procedures (such as those it may already be required to maintain pursuant to the Department of Labor's Occupational Safety and Health Administration (OSHA) requirements in 29 CFR 1910.119 and 1910.120) in a location where they are immediately available to hazmat employees responsible for the transloading operation. OSHA requires sites to have developed programs for hazard communication, emergency response, and other applicable standards.

A safety shower and eyewash installation may be provided in areas where pMDI is transferred to help in situations where there is a potential for accidental exposure to pMDI. OSHA requires that eyewash and safety showers be provided in areas where the eyes or body may be exposed to "injurious corrosive materials." Consult the SDS for all materials to be transloaded at the facility in advance to help you understand whether such materials will be present, and if so, how to comply with applicable OSHA requirements. Safety shower and eyewash facilities must be installed and maintained in accordance with American National Standard Institute (ANSI) American National Standard for Emergency Eyewash and Shower Equipment (ANSI Z358.1).

In accordance with federal regulatory requirements under 29 CFR 1910.132(a), all personnel involved in the pMDI transloading process must wear the proper personal protective equipment (PPE). This may include chemical resistant suit, gloves, and boots. For more guidance on PPE, see the pMDI supplier's SDS and the Center for the Polyurethane Industry's (CPI) guidance document, "*Guidance for the Selection of Protective Clothing for MDI Users*" (AX-178) available at www.polyurethane.org.

Unloading operations must be performed by hazmat employees properly instructed in unloading hazardous materials in accordance with 49 CFR 174.67. Restrict access to the

specific transloading location within the facility to employees who are trained and qualified to participate in the transfer operation.

Responsibilities for hazmat employees may include, but are not limited to, the following:

- Apply the hand brake and chock at least one wheel to prevent movement of tank car.
- Secure access to the track to prevent entry by other rail equipment, including motorized service vehicles. This requirement may be satisfied by use of derails, locked switches portable bumper blocks or other equipment that provides an equivalent level of safety.
- Display caution signs on the track or on the tank cars to warn persons approaching the cars from the open end of the track. Caution flags must be left up until after all closures are secured and the cars are in proper condition for transportation.
- Provide safe access to and from the tops of the rail tank cars and cargo tank trailers. Consider fall protection for employees working on top of these modes of transportation.

Environmental Considerations

Protect the environment in case of an accidental release. Consideration may include:

- Secondary containment constructed of impervious materials.
- Spill pans and track pans may be used to contain minor spills.
- Drainage systems in the immediate transfer area may be adequately protected during transloading operations by using drain covers or isolation valves on the drainage system. See 40 CFR 112 for additional guidance on drainage systems.
- Methods to prevent potential release of pMDI vapors to the atmosphere during transloading operations. (Depending on the method of transfer employed, vapor discharged from the trailer during transloading operations may be returned to the rail car or vented to an activated carbon drum designed for this purpose.)

Written facility emergency action plans are required in accordance with 29 CFR 1910.38. In the event that a release occurs, a facility should be prepared to respond in accordance with 29 CFR 1910.120. The pMDI supplier can provide a list of recommended spill response supplies and emergency response resources.

Local, state and federal agencies as well as your supplier may have reporting requirements for spills. Understand these requirements before any transloading activities occur. If you are unsure of the requirements, consult your pMDI supplier or manufacturer. Thoroughly understand federal, state and local regulations that govern pMDI waste disposal. See CPI's *Guidelines for Responsible Disposal of Waste and Containers from Polyurethane Processing* (AX-151) available at www.polyurethane.org.

Training Considerations

Implement a training program that fulfills the requirements of 49 CFR and 29 CFR. The pMDI supplier may assist the transloading facility in providing product-specific training.

Facility Equipment

The pMDI supplier may provide guidance on the piping materials intended for pMDI transfer. Piping materials are typically carbon steel or stainless steel. Fiberglass, PVC, polyethylene or other plastics are not considered appropriate options for the pipe in contact with pMDI because of the potential for permeability and embrittlement. Depending on the product involved and the specific geographic location, temperature control (including tracing and insulation) may be appropriate for transfer piping.

The typical method for transloading pMDI is pressure transfer, which involves the use of nitrogen or dry air with a -40° F/C dew point. When working with nitrogen, take precautions to prevent nitrogen escape and build-up in enclosed areas, and be aware of its asphyxiating nature. Containers padded with nitrogen that can be entered must be properly labeled according to OSHA's Hazard Communication standard (29 CFR).

Transfer methods can include the use of compatible hoses, meters, filters, pressure gauges, manual valves, and possibly a high level probe interlocked to an actuated valve. Bag filters are an option that have been used successfully in pMDI service. Micron ratings for the filter element can be specified by the pMDI supplier. Both plug and ball type valves have been used successfully in pMDI piping systems. Purge dry hoses and piping prior to the initial transfer. It is important to clearly label and identify hoses and piping in pMDI service.

An alternative method for transloading pMDI involves use of a pump. This method can use much of the same equipment described above.

Regardless of the transfer method employed, a source of nitrogen or dry air with a -40° F/C dew point will be necessary to prevent moisture in the air from reacting with pMDI. Both rail tank cars and cargo tank trailers need to be maintained under a positive nitrogen or dry air pad pressure.

To facilitate the transfer and meet customer delivery temperature requirements, transloading facilities need a mechanism and procedure to heat rail tank cars and cargo tank trailers in a controlled and safe manner. A supply of low pressure steam is an appropriate source of heating for these operations. Contact your supplier for additional guidance regarding heating rail tank cars.

Transloading Operations

Written procedures and checklists can assist with a variety of transloading activities. Each pMDI supplier may assist facility management with developing these documents with the appropriate level of detail, specific to the products at each facility. Typical areas to address may include:

- Receipt of loaded tank car, including an acceptance inspection
- Pre- and post-loading trailer inspections (See CPI's *Guidelines for Receiving and Unloading MDI* on www.polyurethane.org for additional information.)
- Loading trailers
- When and how to change filter (if applicable)
- How to apply heating medium and monitor temperatures, including minimum/maximum for each product
- Inspecting, cleaning, and pressure testing hoses
- Preparation and return of empty rail cars

Carrier Operations

Specific equipment, written procedures, and checklists can assist the carrier making deliveries to or from the transloading facility. The pMDI supplier may assist the carrier with equipment specification and the development of documents with the appropriate level of detail for the products. Some areas for consideration may be:

Possible Procedures or Checklists:

- Pre- and post-loading inspections
- Customer specific requirements
- Unloading (See CPI's *Guidelines for Receiving and Unloading MDI* on www.polyurethane.org for additional information.)
- Cleaning, testing and inspecting hoses and fittings
- Preparation for reloading
- Internal trailer cleaning
- Personnel training

Equipment:

- Tractor
- Cargo tank trailer
- Desiccant dryer
- Hoses
- Fittings
- Gaskets for hoses and fittings
- PPE

Responding to Emergencies

Fires, spills, and other emergencies involving pMDI require an immediate response by trained and knowledgeable personnel. If you have not been trained to respond to an emergency, leave the area immediately and notify the appropriate emergency response personnel. If you need additional guidance, CHEMTREC®, the Chemical Transportation Emergency Center, is available to provide assistance by telephone 24-hours a day in the event of an emergency involving a fire, leak, spill or personnel exposure. CHEMTREC's emergency number is 1-800-424-9300.

Additional information on safe use and handling of pMDI may be found on CPI's website www.polyurethane.org.

Disclaimer

This guidance document was prepared by the American Chemistry Council's Center for the Polyurethanes Industry. It is intended to provide general information on transloading polymeric MDI. It is not intended to serve as a substitute for in-depth training or specific protective clothing requirements, nor is it designed or intended to define or create legal rights or obligations. It is not intended to be a "how-to" manual, nor is it a prescriptive guide. All persons involved in safe handling and use of polymeric MDI have an independent obligation to ascertain that their actions are in compliance with current federal, state and local laws and regulations and should consult with legal counsel concerning such matters. The guidance is necessarily general in nature and individual companies may vary their approach with respect to particular practices based on specific factual circumstance, the practicality and effectiveness of particular actions and economic and technological feasibility. Neither the American Chemistry Council, nor the individual member companies of the Center for the Polyurethanes Industry of the American Chemistry Council, nor any of their respective directors, officers, employees, subcontractors, consultants, or other assigns, makes any warranty or representation, either express or implied, with respect to the accuracy or completeness of the information contained in this guidance document; nor do the American Chemistry Council or any member companies assume any liability or responsibility for any use or misuse, or the results of such use or misuse, of any information, procedure, conclusion, opinion, product, or process disclosed in this guidance document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

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Center for the
Polyurethanes Industry

700 2nd Street, NE
Washington, DC 20002
(202) 249-7000
www.americanchemistry.com