Transloading of Polymeric Methylene Diphenyl Diisocyanates (PMDI)

The following guidelines have been developed to describe various options for transloading Polymeric Methylene Diphenyl Diisocyanates (PMDI) from rail tank cars to cargo tank trailers. The guidelines are not meant to be all-inclusive and may not cover all legal requirements for transloading at a particular facility or operation. Additionally, material safety data sheets (MSDSs) should be reviewed and considered prior to transloading PMDI.

This document is intended to provide helpful information and guidance to users of PMDI that are sophisticated users of the chemicals and that know the risks associated with the use of the chemicals. Such users should understand the information provided in the PMDI supplier’s MSDS.

Facility Siting
Access roads to and from the transloading facility should be in good condition. These roads should be paved (i.e., concrete or asphalt) and sharp turns should be avoided. Access to certified scales should be provided, either on-site or in close proximity to the facility. Positioning the location of the transfer point so that external neighbors are a safe distance from the operation may help provide additional protection.

Facility Management
Each transloading facility should have a site management structure in place with all areas of responsibility identified. Site management should be responsible for applicable site specific environmental, health and safety (EHS) requirements that should be evaluated with appropriate programs implemented. The facility should have procedures and practices in place to manage the flow of inventory into and out of the facility.

Security
A facility that conducts transloading is required to have a written site security plan and transportation security plan and they must conduct a security vulnerability assessment in accordance with those plans (49 CFR §172.802). Access to the facility should be controlled by a perimeter fence with gated access and perimeter lighting or by using adequate security patrols. The identity of any personnel should be verified prior to letting them enter the facility. Access to the specific transloading location within the facility should be restricted to only those employees who are trained and qualified to participate in the transfer operation or who are escorted by a facility representative.

The application of security seals to all outbound containers is a practice frequently used throughout the industry. The specific instructions on placement of those seals should be supplied by the PMDI supplier.

Safety Requirements
Compliance with all applicable federal, state and local regulations is required. Per Occupational Safety and Health Administration (OSHA) requirements, sites must have developed programs for hazard communication, medical surveillance and emergency response. The OSHA total recordable incidents rates may be reviewed as an indicator of the effectiveness of safety programs at the facility.

A safety shower and eyewash installation provided in handling areas can help in situations where there is a potential for PMDI exposure. Safety shower and eyewash facilities should be installed and maintained in accordance with ANSI Z358.1.

Personal protective equipment (PPE) is specified in the MSDS from the PMDI supplier. It may include chemical safety glasses/goggles and faceshields; chemical resistant suit; chemical resistant gloves; and chemical resistant boots. Per OSHA requirements, facility management is required to make PPE available to all employees involved in the transloading operation. For more guidance, see the supplier’s MSDS and the Center for the Polyurethane Industry’s (CPI) Technical Bulletin “PMDI User Guidelines for Chemical Protective Clothing Selection”.

Derails, wheel chocks and the use of rail warning flags are required during the transloading of product from a rail tank car to a cargo tank trailer (49 CFR §174.67). Safe access to and from the tops of the rail tank cars and cargo tank trailers should be provided. Fall protection for employees working on top of these modes of transport should be considered.
Environmental
Compliance with all applicable federal, state and local regulations is required. All sites should have methods to protect the environment in case of an accidental release. Often the area around the transloading operation is designed with 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 should be covered or valved off during transloading operations.

Appropriate methods should be employed to prevent the 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.

Written facility response plans are required per 29 CFR §1910.120. In the event that a release should occur, a facility should be prepared with spill response supplies. The PMDI supplier can provide a list of recommended supplies.

If a spill of PMDI occurs during transloading, reporting under the Emergency Planning Community Right-to-Know Act (EPCRA) may be necessary and should be decided on a case-by-case basis. Transloading facilities and PMDI suppliers should work closely with the Environmental Protection Agency (EPA) to determine their reporting requirements.

Discarded PMDI is not a hazardous waste under the federal Resource Conservation and Recovery Act (RCRA). However, some states may apply specific disposal requirements to discarded PMDI as a regulated waste stream, which can be determined by checking with the appropriate state regulatory agencies before disposing of waste PMDI.

Training
Upon selection of the transloading facility, the PMDI supplier may provide product specific training materials and may consider assisting with the initial product safe handling training for each facility. Facility management may be responsible for recurrent product training, training required by federal, state and local agencies, and training of employees on procedures and checklists specific to the transloading operations.

Facility Equipment
Piping intended for PMDI transfer should be constructed of carbon steel or stainless steel as approved by the PMDI supplier. Fiberglass, PVC, polyethylene or other plastics are not considered appropriate options for construction of piping for 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.

Typical method for transloading PMDI is pressure transfer, which involves the use of nitrogen or dry air with a -40° F/C dewpoint. This method 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 also have been used successfully in PMDI service. Micron rating for the filter element should be specified by the PMDI supplier. Both plug and ball type valves have been used successfully in PMDI piping systems. Hoses and piping should be purged dry prior to the initial transfer. In addition, hoses and piping should be clearly identified.

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

Fluoroelastomer, such as Viton®, is a material of construction for gaskets that has been used successfully in quick coupler connections in PMDI service.

A source of nitrogen or dry air with a -40° F/C dewpoint should be used for pressure off loading and applying a positive pad pressure to the vapor space after the transfer. Each transloading facility should have the ability to heat both rail tank cars and cargo tank trailers. Low pressure steam, less than 60 psi, is a good source of heating for these operations.

Transloading Operations
Written procedures and checklists can assist with a variety of activities. Each PMDI supplier may assist facility management with developing these documents with the appropriate level of detail, as they pertain to the products for each facility.

- Receipt of loaded tank car, including an acceptance inspection
- Pre and post loading trailer inspections
- Loading trailers
- When and how to change filter (if applicable)
- How to apply heating medium and monitor temperatures, including min./max. for each product
- Inspection, 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 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, as they pertain to the products.

Equipment:
- Tractor
- Tank Trailer
- Hoses
- Fittings
- Gaskets for hoses and fittings
- PPE

Possible Procedures or Checklists
- Pre/Post loading inspections
- Customer specific requirements
- Unloading
- Cleaning, testing and inspecting hoses and fittings
- Preparation for reloading
- Internal trailer cleaning
- Personnel training

Disclaimer

This Transloading Guidance document has been prepared to provide helpful ideas and information for parties interested in transloading Polymeric MDI (PMDI). The guidelines should help a facility review and evaluate its transloading operations for PMDI. However, each facility has an independent obligation to ascertain that their plans, actions and practices meet all relevant laws and represent sound business practices for their particular operations. Facilities may need to vary their approach with respect to particular operations, products or locations based on specific factual circumstances. Therefore, the Center for the Polyurethanes Industry of the American Chemistry Council (ACC) and its members (collectively hereafter CPI) do not make any warranty or representation, either express or implied, with respect to the accuracy or completeness of the information contained in these guidelines. Further, CPI disclaims and does not assume any liability of any kind whatsoever resulting from the use of or reliance upon any information, conclusions or opinions contained herein.

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