



Chemical Transportation Sealing Solutions

MINIMIZING DOWNTIME FOR CARRIERS



Minimizing Downtime for Carriers

Two sealing materials from Trelleborg Sealing Solutions offer superior compatibility in chemical transportation valve applications, enabling the same sealing solution to be used with virtually all media transported in the demanding environmental conditions to which freight may be exposed.

Isolast® J9503 and Isolast® J9567 perfluoroelastomers (FFKM) materials have been extensively tested and proven to achieve long life even in the harshest of chemicals or media. That means fewer valve changeouts, which significantly reduces the total cost of ownership for an equipment owner or shipper. It also avoids the labor costs and lost uptime involved in bringing equipment into a maintenance shop, the maintenance itself and waiting for an inspector to sign off on completed work.

SHORT LEAD TIMES

Often, availability of replacement seals is as important as selecting the right seal for the media. At Trelleborg Sealing Solutions, we offer rapid supply of seals with short lead times to ensure transportation equipment is back in operation as quickly as possible. Standard products are typically stocked and shipped within one to two business days, while custom parts are available in a market-leading two to four weeks.



**Low total
cost of
ownership**

**Best and
broadest
resistance**
to chemical
transportation
media

**Optimum
seal reliability**
in both extreme
hot and cold
environments

**Extended
service
life**

MATERIAL CHARACTERISTICS

- Both materials offer universal chemical compatibility at acceptable levels within chemicals commonly transported
- Isolast® J9503 provides the best volume change results in the most challenging media, including Ethylenediamine and Glacial Acetic Acid.
- Excellent long-term compression set properties
- Exceptional hysteresis properties
- Superior extrusion resistance
- High resilience and dynamic recovery
- Operating temperatures:

Isolast® J9503: -25 °C to +225 °C/-13 °F to +437 °F

Isolast® J9567: -10 °C to +225 °C/+14 °F to +437 °F

COMMONLY TRANSPORTED CHEMICALS

- Acetone
- Ammonium Hydroxide
- Butyraldehyde
- Diethyl Ether
- Ethanol
- Ethyl Acetate
- Ethylenediamine*
- Ethylene Glycol
- Glacial Acetic Acid*
- Mobil Jet 11
- MTBE*
- Nitric Acid
- Sodium Hydroxide
- Sulfuric Acid
- Toluene
- Urea

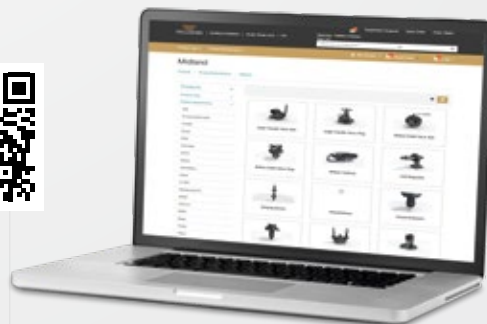
*These chemicals tend to be the most destructive to sealing materials.

REDUCED SEAL INVENTORY

Isolast® J9503 and Isolast® J9567 offer superior compatibility with a broad range of chemicals to satisfy virtually all chemical transportation requirements. That means it is not necessary to stock seals in multiple materials specific to individual chemicals. Equipment owners and maintenance shops can therefore reduce their seal inventory by selecting Isolast® J9503 and Isolast® J9567, which perform well across a wide range of chemicals.

ONLINE ORDERING

For convenient 24/7 online ordering, scan the QR code or visit the Chemical Transportation Seals-Shop at Chemtransportsealsshop.com.

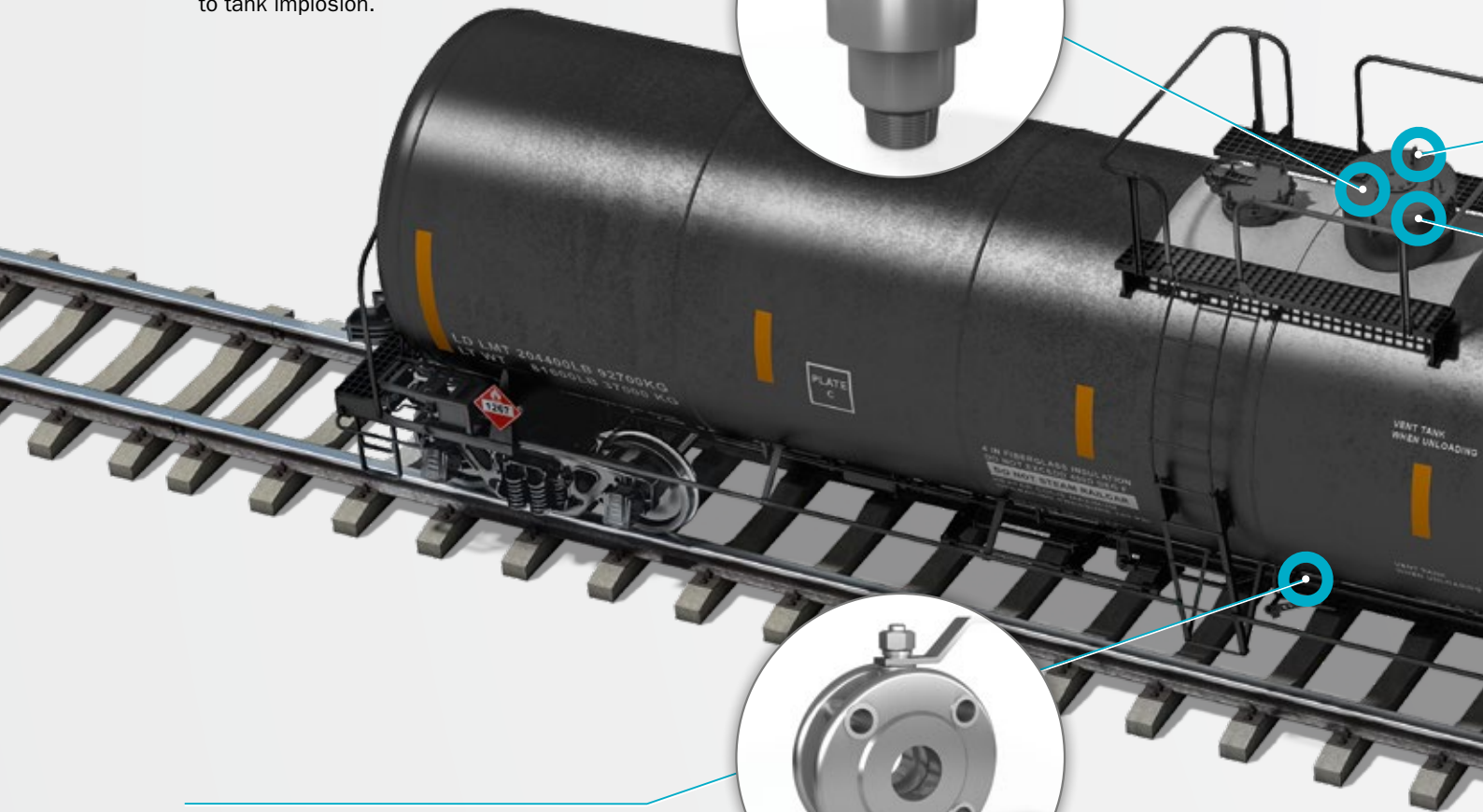
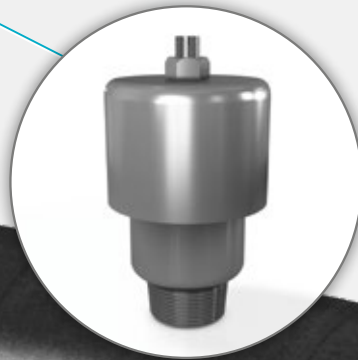


Chemical Transportation Sealing Applications

Transporters of chemicals worldwide rely on Trelleborg Sealing Solutions for reliable, high-quality seals, service and technical support to prevent non-accidental releases and ensure the safe and efficient operation of their railcar, tank truck, ISO container and IBC equipment.

VACUUM RELIEF VALVE

Situated on top of general-purpose tank cars, the Vacuum Relief Valve prevents the formation of a vacuum inside the tank, which could lead to tank implosion.



BOTTOM OUTLET VALVES

Located at the bottom of general-purpose tank cars, the Bottom Outlet Valve enables a tank car's contents to be unloaded.



SEAL TYPES USED



O-RINGS

An efficient, easy to use and economical sealing element for a wide range of primarily static applications, makes O-Rings the most used seal.



X-RINGS

A double-acting four lip seal, the X-Ring or Quad-Ring®, provides higher seal efficiency and lower friction than conventional O-Rings.



SQUARE RINGS

Elastomer square rings keep their shape and provide high sealing efficiency in static applications, mostly in flanges to SAE standards.



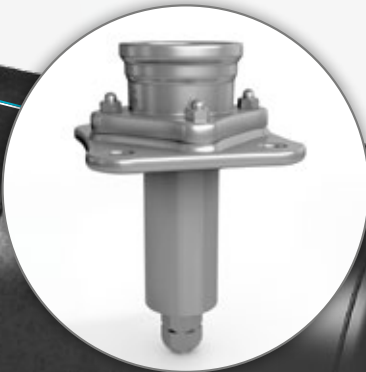
CUSTOM COMPONENTS

Technically challenging applications are solved with custom components manufactured using different processes.



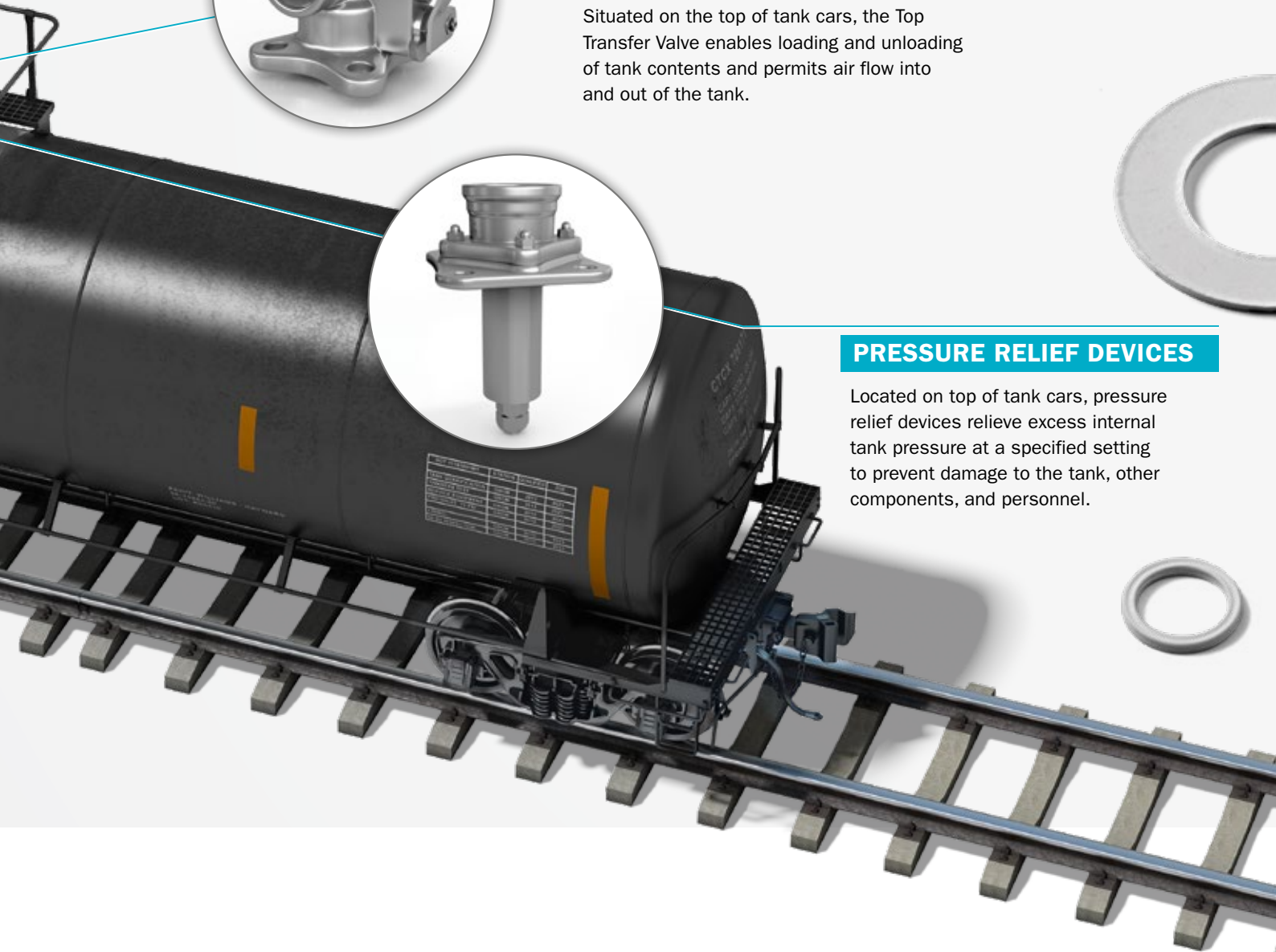
TOP TRANSFER VALVES

Situated on the top of tank cars, the Top Transfer Valve enables loading and unloading of tank contents and permits air flow into and out of the tank.



PRESSURE RELIEF DEVICES

Located on top of tank cars, pressure relief devices relieve excess internal tank pressure at a specified setting to prevent damage to the tank, other components, and personnel.



SUCCESSFUL TEST RESULTS FOR ISOLAST® MATERIALS

To prove the sealing effectiveness of Isolast® J9503 and Isolast® J9567 in 16 of the most common chemical transportation applications, Trelleborg Sealing Solutions conducted extensive testing to ISO 1817 standards, monitoring the Isolast® materials, as well as three competitive materials, for an extended period of 2,000 hours. This testing regimen far exceeded the standard testing requirement, which monitors physical changes in the material over a limited seven-day period.

VOLUME TEST

In the volume change tests, both Isolast® J9503 and Isolast® J9567 exhibited a change of less than 10% in all media, except Ethylenediamine. A change of less than 10% is deemed to have, at most, only a moderate effect on sealing performance. In 12 of the media, the Isolast® materials' volume changes were less than 5%, indicating little to minor effect on sealing performance. In comparison, two of the competitive materials displayed a volume change exceeding 20% in one media, preventing those materials from being recommended for use in those media.

ISOLAST® VOLUME CHANGE SIGNIFICANTLY BETTER IN DESTRUCTIVE MEDIA

Both Isolast® J9503 and Isolast® J9567 performed exceptionally well in the media that is most destructive to seals: Ethylenediamine and Glacial Acetic Acid. In fact, Isolast® J9503 exhibited the best volume change performance of all materials tested in both chemicals. Two of the competitive materials failed in either Ethylenediamine or Glacial Acetic Acid, rendering both materials incapable of delivering fully universal compatibility with all chemicals potentially transported.

VOLUME CHANGE COMPARED TO COMPETITORS' MATERIALS

Chemical Name	Test	Isolast® J9503	Isolast® J9567	A	B	C
Acetone	+23 °C for 2016 hours	1.6%	3.0%	2.8%	1.9%	3.2%
Ammonium Hydroxide	+40 °C for 2016 hours	2.1%	1.8%	3.1%	1.2%	3.6%
Butyraldehyde	+23 °C for 2016 hours	1.9%	1.7%	3.0%	2.9%	2.7%
Diethyl Ether	+23 °C for 1512 hours	5.0%	4.8%	4.6%	4.7%	5.2%
Ethanol	+23 °C for 2016 hours	0.8%	0.4%	0.6%	0.9%	0.7%
Ethyl Acetate	+23 °C for 2016 hours	2.6%	3.3%	2.9%	2.9%	3.2%
Ethylenediamine	+23 °C for 2016 hours	10.7%	12.2%	11.5%	11.0%	26.5%
Ethylene Glycol	+40 °C for 2016 hours	0.3%	0.2%	0.3%	0.5%	0.3%
Glacial Acetic Acid	+100 °C for 2016 hours	3.2%	7.5%	23.3%	7.5%	3.7%
Mobil Jet 11	+40 °C for 2016 hours	0.2%	-0.4%	-0.13%	0.2%	0.1%
MTBE	+40 °C for 2016 hours	7.5%	6.8%	7.2%	7.0%	8.2%
Nitric Acid	+40 °C for 2016 hours	5.5%	7.7%	17.7%	11.3%	2.3%
Sodium Hydroxide	+40 °C for 2016 hours	0.2%	-0.1%	0.2%	0.2%	-0.5%
Sulfuric Acid	+40 °C for 2016 hours	1.1%	4.5%	1.9%	1.3%	0.7%
Toluene	+23 °C for 2016 hours	2.6%	2.4%	1.7%	2.7%	1.5%
Urea	+40 °C for 2016 hours	0.2%	0.4%	0.1%	0.3%	0.1%

□ 0 to <5% ■ 5 to <10% ■ 10 to <20% ■ >=20%

HARDNESS TEST

In all 16 media, the Isolast® materials performed well in hardness tests, with Isolast® J9503, and one competitive material, exhibiting a change of 5 Shore A or less in all but two media and Isolast® J9567 in all but three. Of the other two competitive materials, one recorded a hardness change of more than 5 Shore A in seven media and the other in nine. The hardness characteristics of Isolast® J9567 and Isolast® J9503 are therefore far superior to those of competitive materials.

MTBE

The transportation of MTBE, a denaturant additive for diesel fuel and ethanol, is on the rise. And while MTBE is extremely destructive to sealing materials, Isolast® J9567 has the lowest volume and hardness change in this chemical, making it the best choice for equipment transporting MTBE.

HARDNESS CHANGE COMPARED TO COMPETITORS' MATERIALS

Chemical Name	Test	Isolast® J9503	Isolast® J9567	A	B	C
Acetone	+23 °C for 2016 hours	5.0	5.0	7.0	2.5	5.5
Ammonium Hydroxide	+40 °C for 2016 hours	2.5	5.0	8.0	4.5	2.5
Butyraldehyde	+23 °C for 2016 hours	4.0	4.0	8.0	4.5	4.5
Diethyl Ether	+23 °C for 1512 hours	6.5	5.0	8.0	5.0	7.5
Ethanol	+23 °C for 2016 hours	3.0	1.5	2.0	1.0	2.0
Ethyl Acetate	+23 °C for 2016 hours	5.0	6.0	5.5	2.5	6.0
Ethylenediamine	+23 °C for 2016 hours	3.0	5.0	8.5	3.0	9.5
Ethylene Glycol	+40 °C for 2016 hours	2.5	1.0	4.5	2.0	3.0
Glacial Acetic Acid	+100 °C for 2016 hours	5.0	7.0	9.0	3.5	6.0
Mobil Jet 11	+40 °C for 2016 hours	2.0	0.0	4.0	1.5	2.0
MTBE	+40 °C for 2016 hours	7.0	5.0	10.5	6.0	8.5
Nitric Acid	+40 °C for 2016 hours	5.0	13.0	18.0	5.5	9.0
Sodium Hydroxide	+40 °C for 2016 hours	2.0	1.0	2.5	1.0	2.5
Sulfuric Acid	+40 °C for 2016 hours	1.0	5.0	5.0	1.0	1.5
Toluene	+23 °C for 2016 hours	3.5	4.0	5.0	3.0	3.5
Urea	+40 °C for 2016 hours	1.0	2.0	2.0	1.5	0.5

□ 0 to <5 ■ 5 to <10 ■ 10 to <20 ■ >=20

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Sealing Solutions is a leading developer, manufacturer and supplier of precision seals, bearings and custom-molded polymer components. It focuses on meeting the most demanding needs of aerospace, automotive and general industrial customers with innovative solutions.

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