

Transport Containers

To meet the various requirements of transporting metal alkyls a special transport container system has been developed. These containers are used in sizes from 1,6 liters to 22,390 liters filling volume by always representing 90% of their total capacity. Altogether 10 different types are available. They are: 2, 3, 4, 5, 5.1, 6, 6.1, 7, 8 and 9.

For type 2 to 8 the following pressures apply:

- Maximum allowable operating pressure: 6 bar
- Test pressure: 10 bar

Container 2

Container 2 is made of stainless steel. The design of the base provides a high degree of stability. The concave bottom allows complete product withdrawal. The opening for removal of product is designed so that a pipette can also be used for this purpose. The gasket contained in the screw plug has a high elasticity and can be used repeatedly.

Container 2 must be transported and stored in an upright position and is dispatched in metal drums which can be re-used (e.g. for returning the container). Vermiculite is used as a filling material. For further details on dispatch, see section "Transport Regulations."

Container 2 can be used in many different ways, both for transporting and storing metal alkyls as well as a sample container for transferring the sample to an analytical laboratory (see also section "Sampling").

Container 2 will be sold with each single delivery.

Container 3, 4 and 5

Containers 3, 4 and 5 are all made of steel. All have two welded, threaded openings for valves. One valve is for the inert gas supply, the other (which is specially marked with a red ring on the threaded opening) is connected to a dip pipe for product withdrawal. The valve connections are provided with plugs (note: left hand thread). Both valves are secured with a protective cover which is sealed before leaving our factory.

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Container 5 has two outlets fitted with flanged ball valves. The first outlet with a 20 mm ball valve is for the nitrogen supply. The second outlet with a 15 mm ball valve is fitted to a dip pipe which is used for product withdrawal. The flanges of the ball valves conform to DIN EN 1092-1, with a male face flange form F, and are secured by a blind flange. The dip pipe valve for product withdrawal is specially marked with a red, wedge shaped, color marking. The valves are located in a robust well, protected against outside influences by a steel cover. The closures of the dip pipe valves (screw cap or blind flange) must not be removed if the container is under nitrogen pressure. Containers 3, 4 and 5 must be transported and stored in an upright position.

Containers 3, 4 and 5 conform to the specifications according to GGVSE, ADR and RID. Furthermore they are classified according to UN regulations for dangerous goods packaging and can be used as UN cylinders or pressure receptacles for transport by sea according to GGVSee/IMDG. For internal transport of Container 5 a fork-lift truck or a lift truck may be used. Container 3 and 4 will be sold with each single delivery.

Container 5.1 to 8

Containers 5.1 to 8 are made of steel and have two outlets fitted with flanged ball valves for discharging.

The 20 mm ball valve (DIN EN 1092-1) is for the nitrogen supply. The flanges have male facings conforming to DIN EN 1092-1, Form F.

The second ball valve fitted to the dip pipe outlet is 15 mm for containers 5.1, 6 and 6.1, 25 mm for containers 7 and 8, and is used for product withdrawal.

The flanges of the ball valves are constructed according to DIN EN 1092-1 with male facings according to Form F, and are fitted with a blind flange. The dip pipe for product withdrawal is specially marked with a red, wedge shaped, color marking. **The red blind flange must not be removed if the container is under nitrogen pressure.** The valves are situated in a well or a dome with cover to protect them against outside influences.

Containers 5.1 to 8 conform to the following specifications: GGVSE, ADR, RID and GGVSee/IMDG-Code. A special series of Container 6.1 has been particularly designed for the USA market and is approved by DOT.

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Container movement within the site area can be carried out with the following equipment:

- For Container 5.1: fork-lift truck and crane or lift truck.
- For Containers 6 and 6.1: lifting gear, lift truck and fork-lift truck.
- For Containers 7 and 8: lifting gear and special trailer.

On request we will send you detailed technical information on the individual transport possibilities. A video on this subject is also available.

The dip pipe valves and protective well covers on Containers 5.1 to 8 are sealed before leaving our works.

Container 9

For transporting larger quantities of metal alkyls or metal alkyl solutions we use specially developed tank frame containers built to ISO specifications. These containers have standard ISO dimensions of 20' x 8' x 8' or 20' x 8' x 8'6", and are approved for both, land and sea transport.

Container 9 is made of steel and has two outlets fitted with flanged ball valves (50 mm) for discharging. One ball valve is for the nitrogen supply, the second is fitted to the dip pipe outlet and is used for product withdrawal. This ball valve is specially marked and fitted with a pneumatic actuator.

The control air pressure required for operation must be at least 6 bar. The red blind flange must not be removed if the container is under nitrogen pressure.

When the control air is shut off, the ball valve closes automatically by spring tension. This facility gives additional security when discharging pyrophoric metal alkyls, since if there is a leakage with simultaneous fire at the point where the outlet from the transport container connects to the transfer piping, the product flow is automatically cut off.

All valves are situated in a dome and are protected against outside influences with a blind flange. The dip pipe valve and well cover are sealed before leaving our works.

All containers from 5.1 to 9 are rental containers. For our customers they are available free of charge for a certain period of time. After this time is elapsed we will impose a demurrage fee based on a day's rate.

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