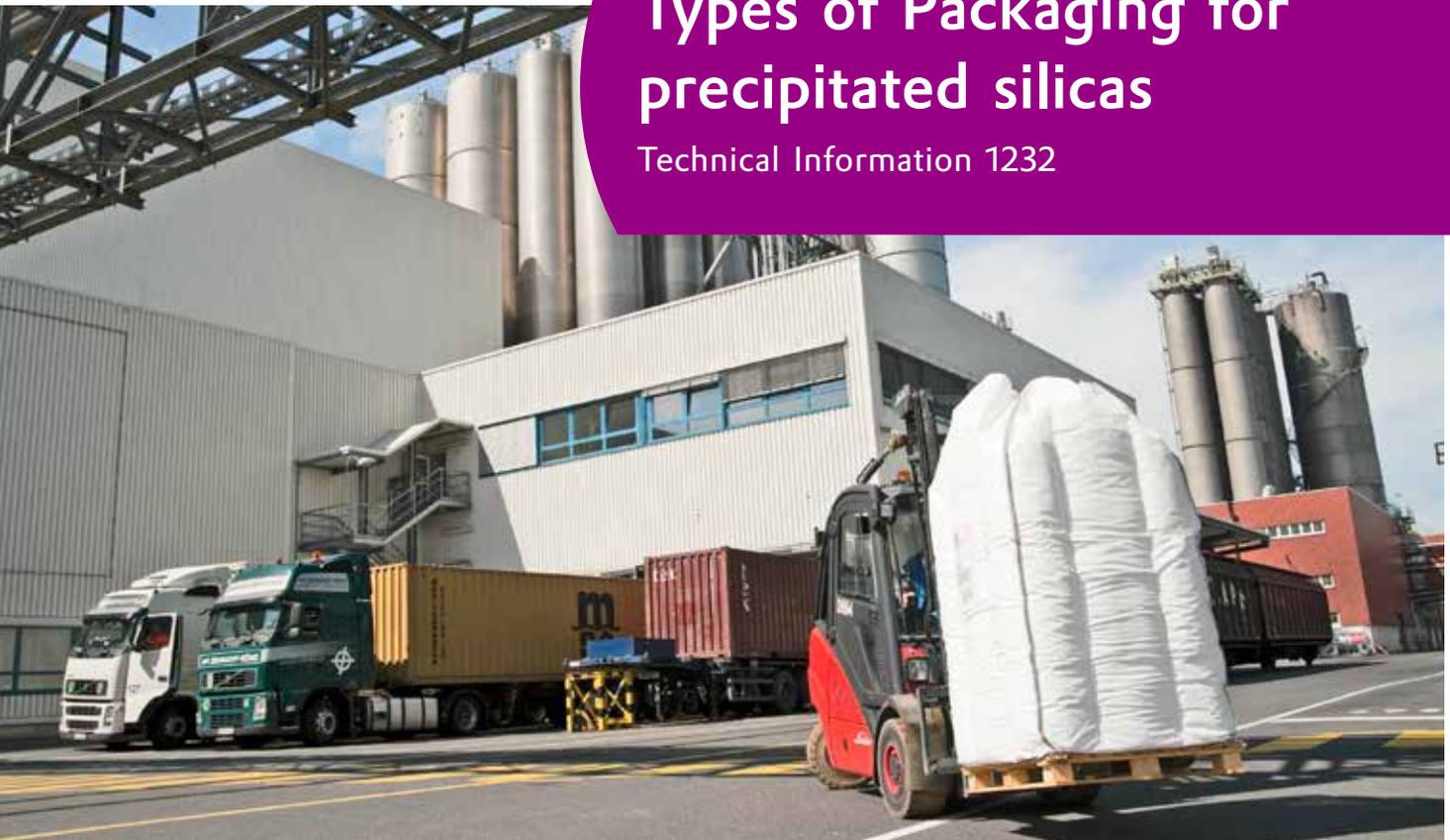


# Types of Packaging for precipitated silicas

Technical Information 1232





## 1 Introduction

This technical bulletin provides an overview of the forms of packaging available for precipitated silicas produced by Evonik Industries AG and marketed worldwide under the brand names ACEMATT®, SIPERNAT® and ULTRASIL®.

As quality standards for the products of different industries rise, special emphasis must be placed on appropriate packaging for the raw materials used. It is also important to consider economic and environmental factors.

## 2 Packaging types and shipping methods

The precipitated silica produced by Evonik is used in a wide variety of applications and industries around the world. To preserve the characteristics of the product and ensure safe transportation, the packaging needs to fit these requirements.

Through continuous testing and enhancement the multilayer paper sack became the standard form of packaging. It is suitable for all means of transport: truck, rail, air, and ship. What is more, Evonik's speciality silicas can also be packed and dispatched in different ways, which makes them easy for our customers to handle and, above all, dust free.

The type of packaging, palletizing, and foil shrinking may vary depending on the production facility. All forms of packaging specified in this document are valid for the Wesseling plant.

Your contact at Evonik can provide you with more detailed information if required.

**Evonik offers the following forms of packaging and dispatch:**

- Dispatch in sacks stacked on pallets
- FIBC on pallets
- Bulk shipments with silo trucks or in silos transported by rail and truck

These days, the vast majority of precipitated silica is shipped in bulk in silo trucks. Larger containers are increasingly being used for the bagged silica. Most of our key accounts now firmly believe that silo transport is the most environmentally friendly and, in most cases, also the most economic form of packaging and transport.

And so the forwarding of synthetic silica in large containers will continue to grow in importance. For large quantities, silos will be the containers of choice.

## 2.1 Dispatch of sacks on pallets

Multilayer paper sacks are the standard form of packaging. To meet the demands placed on the product during transportation and storage and also to satisfy the application technology requirements, the product is packed in multilayer paper sacks. Layers of paper with inner PE film to provide protection against moisture in particular may be used.

The regulations governing the disposal of the empty paper sacks may differ depending on the legislation of the country in question. In Germany, the REPASACK system ([www.repasack.de](http://www.repasack.de)) is used. If you have any questions on this topic, please contact Sales or Customer Service.

In our production facility in Wesseling, the products are bagged, put on pallets, and stored in the automatic high warehouse rack until delivery in a fully automatic process.

Nowadays, the filled sacks are exclusively dispatched on wooden pallets. The sacks are loaded onto the pallets in three interconnecting rows (see **Figure 1**), which gives the entire pallet a certain stability of its own.

The pallets are tailored to the dimensions of the sacks and the means of transport. Shrink-wrapping of the pallet increases safety during transport but also protects the contents against the elements.



**Figure 1**  
SIPERNAT® 22 S entire bag pallet

The volume of the sacks and, consequently, the dimensions of the sacks differ depending on the type of silica and its tapped density and range from 10 kg to 25 kg (see Table 1).

Detailed information on the dust-free discharge of the bagged goods can be found in the Evonik Technical Bulletin Fine Particles No. 28 entitled "Handling of Synthetic Silica and Silicates."

**Table 1**

Product name	Filling weight	Approximate dimensions (cm) of individual filled bags	Number of	Product weight per pallet
Wesseling production and delivery plant	kg	Filled sacks Length x width x height in cm	Sacks/pallet	kg
SIPERNAT® 120	20	101 x 51 x 17	39	780
SIPERNAT® 160	10	102 x 56 x 16	45	450
SIPERNAT® 310	15	104 x 58 x 20	30	450
SIPERNAT® 320	25	105 x 55 x 18	36	900
SIPERNAT® 320 DS	10	102 x 53 x 20	30	300
SIPERNAT® 325 C	20	101 x 51 x 17	39	780
SIPERNAT® 350	15	102 x 58 x 16	33	495
SIPERNAT® 360	20	100 x 57 x 20	39	780
SIPERNAT® 383 DS	10	102 x 53 x 20	30	300
SIPERNAT® 22	25	100 x 51 x 20	30	750
SIPERNAT® 22 S	15	105 x 56 x 19	39	585
SIPERNAT® 2200	25	100 x 51 x 20	30	750
SIPERNAT® 50	20	101 x 54 x 17	30	600
SIPERNAT® 50 S	12.5	100 x 49 x 16	42	525
SIPERNAT® D 10	15	105 x 55 x 22	30	450
SIPERNAT® D 17	15	100 x 50 x 18	33	495
SIPERNAT® 820 A	25	103 x 55 x 18	42	1050
SIPERNAT® 880	25	100 x 52 x 20	30	750
ULTRASIL® VN 2	20	101 x 51 x 17	39	780
ULTRASIL® VN 3	25	105 x 55 x 18	36	900
ULTRASIL® VN 3 GR	25	101 x 50 x 16	39	975
ULTRASIL® 360	20	101 x 57 x 22	39	780
ULTRASIL® AS 7	25	101 x 50 x 17	36	900
ACEMATT® HK 125	15	105 x 50 x 18	30	450
ACEMATT® HK 400	15	105 x 55 x 25	30	450
ACEMATT® OK 412	15	105 x 55 x 25	30	450
ACEMATT® OK 412 LC	15	105 x 55 x 25	30	450
ACEMATT® OK 500	15	105 x 55 x 25	30	450
ACEMATT® OK 607	15	105 x 55 x 27	30	450
ACEMATT® OK 607 LC	15	105 x 55 x 27	30	450
ACEMATT® OK 520	10	105 x 55 x 25	30	300
ACEMATT® 3600	12.5	105 x 55 x 22	30	375
ACEMATT® 3300	10	114 x 55 x 25	18	180
ACEMATT® TS 100	10	114 x 55 x 25	18	180
ACEMATT® OP 278	25	60 x 45 x 20	20	500
ACEMATT® HK 440	10	90 x 45 x 19	30	300
ACEMATT® HK 450	10	90 x 45 x 19	30	300
ACEMATT® HK 460	10	90 x 45 x 21	30	300
ACEMATT® HK 810	15	99 x 55 x 22	30	450

## 2.2 Semi-Bulk Transport

The capacity of this packaging type ranges from that of bagged goods to that of silo vehicles. For this reason, the term “semi-bulk” is used.

Semi-bulk packaging for precipitated silicas is known as the **Flexible Intermediate Bulk Container**, or **FIBC**. Brand names include Big Bag® and Super Sack®. FIBCs are typically made of coated woven polypropylene and supplied on wooden pallets. A few products are shipped in uncoated FIBCs featuring a separate inner layer to achieve a dust free packaging. Every FIBC has four lifting loops in its upper corners used to raise it and empty its contents at an FIBC unloading station. Contents are removed via a discharge spout at the bottom of an FIBC. This spout is sealed during transport by a B-Lock and a polypropylene fastener.

FIBCs can be fitted with baffles for enhanced stability as necessitated by a given product and its tamped density. These are designated as dimensionally stable FIBCs. FIBCs are offered only as disposable containers for reasons of quality. In Germany, empty containers can be disposed of by using the RIGK system.

**Table 2**

Product	Filling weight kg	Measurements L x W x H cm
SIPERNAT® 2200	500	110 x 110 x 215
SIPERNAT® 22	500	110 x 110 x 220
SIPERNAT® 22 S	270	110 x 110 x 220
SIPERNAT® 320	450	110 x 110 x 220
SIPERNAT® 320 DS	250	110 x 110 x 220
SIPERNAT® 383 DS	250	110 x 110 x 220
SIPERNAT® 350	270	110 x 110 x 220
SIPERNAT® 325 C	450	110 x 110 x 220
SIPERNAT® D 17	270	110 x 110 x 210
SIPERNAT® 120	450	110 x 110 x 210
ULTRASIL® VN 3	450	110 x 110 x 215
ULTRASIL® VN 3 GR	625	115 x 115 x 215
ULTRASIL® 7000 GR	625	110 x 110 x 215
ULTRASIL® 7005	500	110 x 110 x 215
ULTRASIL® 5500	625	110 x 110 x 220
ULTRASIL® 6000	625	110 x 110 x 220
ULTRASIL® VN 2	450	110 x 110 x 220

### FIBC for PESy Discharge

SIPERNAT® 22 S	400	105 x 105 x 215
SIPERNAT® 50 S	430	105 x 105 x 215
SIPERNAT® 320 DS	370	105 x 105 x 215
SIPERNAT® 383 DS	370	105 x 105 x 215
SIPERNAT® D 10	400	105 x 105 x 215
SIPERNAT® D 17	500	105 x 105 x 215
ACEMATT OK 412	300	120 x 120 x 200
ACEMATT OK 500	300	120 x 120 x 200
ACEMATT OK 520	100	120 x 120 x 130



**Figure 2**  
ULTRASIL® VN 3 GR in a FIBC

There is a list of collection points at [www.rigk.de](http://www.rigk.de). If you have any questions, please contact our Sales or Customer Service department.

Table 2 lists precipitated silicas and their filling weights. The products in the upper section of the table are offered in coated FIBCs that can be emptied at commercially available unloading stations. Products in the lower part of the table are supplied in FIBCs featuring a separate inner layer. Please note that these FIBCs necessitate a specialized discharge solution (**PESy – Powder Emptying System**), which Evonik provides to customers using for these containers. It is very difficult—if not impossible—to empty these FIBCs at customary unloading stations. For more information, please request the Technical Information TI 1321 “Semi-bulk packaging for fine-particle SIPERNAT® products”. Specified dimensions are recommended standard values as per full containers on pallets. You can request a sketch specifying exact FIBC dimensions inclusive of lifting loops and discharge spout. Concerning dimensions please contact our Sales department.

Information on the dust-free emptying of FIBCs can be found in the Evonik Technical Bulletin Fine Particles No. 28 entitled "The Handling of Synthetic Silica and Silicates."

### 2.3 Bulk shipping

Depending on the distance the goods are being transported, bulk shipping is often the cheapest form of shipping.

#### Silo deliveries have obvious advantages:

- Large quantities handled with minimum manpower
- Lower packaging costs, thus reducing the price of the raw material
- Higher product quality protection
- Storage capacity can be used for other purposes
- No manual provision and handling of the raw material in production
- Compliance with dust and emissions limits
- No disposal of packaging and pallets

The silo trucks normally used have a capacity of 60 m<sup>3</sup> up to 90 m<sup>3</sup> maximum and can carry between 4 mt and 20 mt depending on the product type (see **Figure 3**). It must be noted that the capacity may vary by approximately 10% through the formation of material cones. For technical reasons, it is not possible to load precise weights of certain volumes.

To store the silo material, the customer must have a stationary silo that has been adapted to the quantities being consumed.

During the unloading process, the silo trailer must be tilted. A clear height of at least 10 m must be allowed for the tilted silo truck.

It takes 45 to 60 minutes to empty the silo truck, depending on the product type. The product pipe is connected using a connector socket in accordance with DIN 14323 or DIN 14309. The approximate fill quantities for the precipitated silica and silicates are shown in **Table 3**.



**Figure 3**  
Transportation of silica in a silo truck

**Table 3**

Product	Silo truck	Approx. loading quantity in metric tons (mt)*
	in approx. volume (m <sup>3</sup> )	
ULTRASIL® 7000 GR	60	13
	90	19.5
ULTRASIL® 6000 GR	90	20
ULTRASIL® VN2	60	11.5
ULTRASIL® VN3	60	10
ULTRASIL® VN3 GR	60	13
	90	19
SIPERNAT® 2200	60	11.5
	90	15.5
SIPERNAT® 22	66	13
SIPERNAT® 22 S	60	5.5
SIPERNAT® 50 S	60	6
SIPERNAT® 325 C	60	11.5
SIPERNAT® 383 DS	60	6
SIPERNAT® D 17	60	6
SIPERNAT® 320 DS	60	5.5
SIPERNAT® 820 A	60	12

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\* Deviation of +/-10% from the loading quantity possible.  
The data represents typical values

More information on the emptying of silo trucks and the building of silos for storing the precipitated silica can be found in the Evonik Technical Bulletin Fine Particles No. 28 entitled "Handling of Synthetic Silica and Silicates."



**Figure 4**  
Bulk storage and dispatch area in Wesseling

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