

SILOS IN MODULAR CONSTRUCTION
Lower costs – maximum flexibility



Silo Technology

INTELLIGENT DESIGN

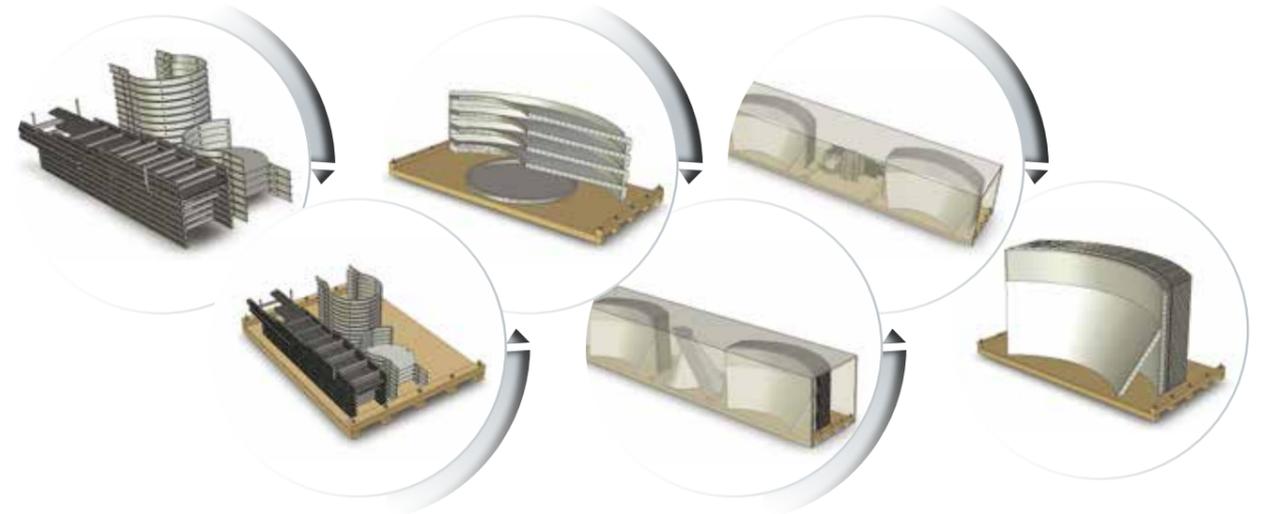
Zeppelin Bolt-Tec silos

Our intelligent design ensures your technological lead: from now on, silo sections no longer need welding – they can be bolted on site. This innovative concept has been developed in cooperation with several research institutes. The concept: the different silo segments are transported in containers and then bolted to each other on site. No specialized assembly staff is required as the work can be carried out quickly and at low cost by your own staff.

Zeppelin Bolt-Tec silos innovative & quick

Thanks to the innovative technology for joining and assembling silo sections, long-haul freight transport - which represent a substantial share of the total costs - can be reduced significantly. The use of standard containers rather than wide load trucks allows an exact calculation of the transport freight charges and the assembly costs whatever the location of your plant. This ensures you planning reliability right from the project stage. Various methods of payment and financing are available (operating or capital lease, etc.).

With the new Bolt-Tec silos, high freight charges, expensive assembly operations and damage to silos during transport are things of the past. The silos can „grow“ to meet your changing requirements: should you ever require larger storage capacities in the future your silo can be quickly retrofitted without difficulty. Furthermore, Bolt-Tec silos can be easily dismantled and reinstalled at another location.



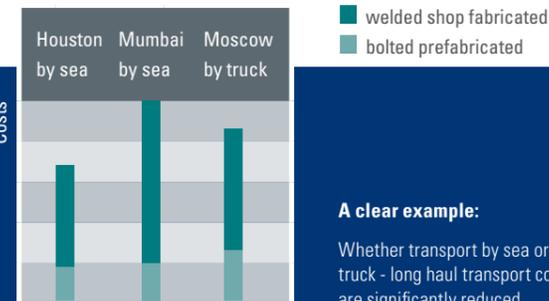
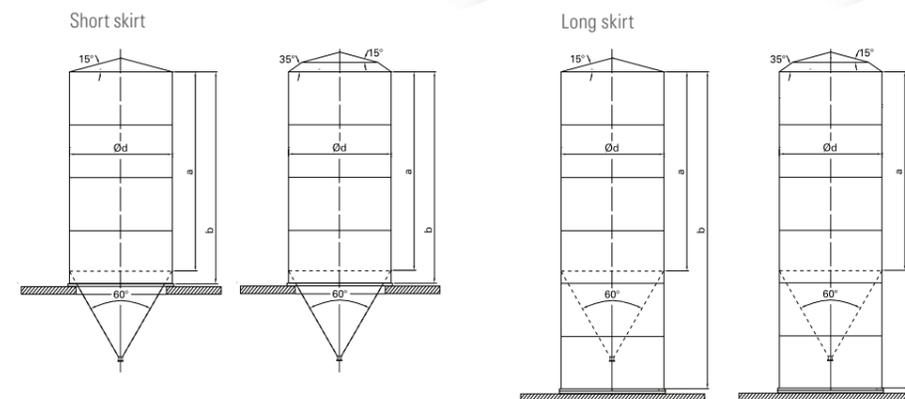
Let's add it all up:

Practical modular construction

- Low freight charges
- Easy and quick assembly
- Low assembly costs
- Assembly also possible in the production hall
- Subsequent increase of the silo capacity
- Planning reliability
- Flexible location
- Internal special seals ensure very high leak tightness
- Weathering resistant
- ➔ **Maximum profitability with highest Zeppelin quality**

Smart technology

The different silo segments are transported to site in containers. Thanks to clever loading planning, no transport space is wasted.



Subject to change

Diameter d = 4050 mm				Diameter d = 5400 mm*				Diameter d = 6750 mm*		
V [m³]	Cylindrical height with			V [m³]	Cylindrical height with			V [m³]	Cylindrical height with	
	a [mm]	b [mm]	b [mm]		a [mm]	b [mm]	b [mm]		a [mm]	b [mm]
64	3650	4150	8300	151	4650	5190	10380	502	11540	12460
90	5730	6230	10380	199	6730	7260	12460	576	13610	14530
117	7800	8300	12460	246	8800	9340	14530	649	15690	16610
143	9880	10380	14530	293	10880	11420	16610	723	17760	18680
170	11960	12460	16610	340	12950	13490	18680	797	19840	20760
196	14030	14530	18680	387	15030	15570	20760	871	21950	22870
223	16110	16610	20760	435	17110	17640	22840	946	24060	24980
249	18190	18680	22840	482	19180	19720	24910	1021	26170	27090
276	20260	20760	24910	529	21260	21800	26990	1096	28280	29200

*with stepped cone roof 35°/15°



COST ADVANTAGE AND TIME SAVING

The Zeppelin Panel-Tec silos

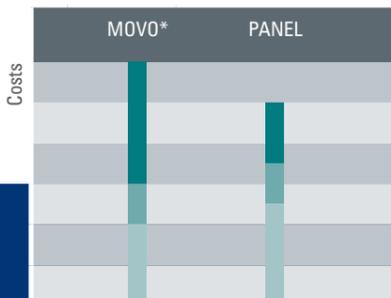
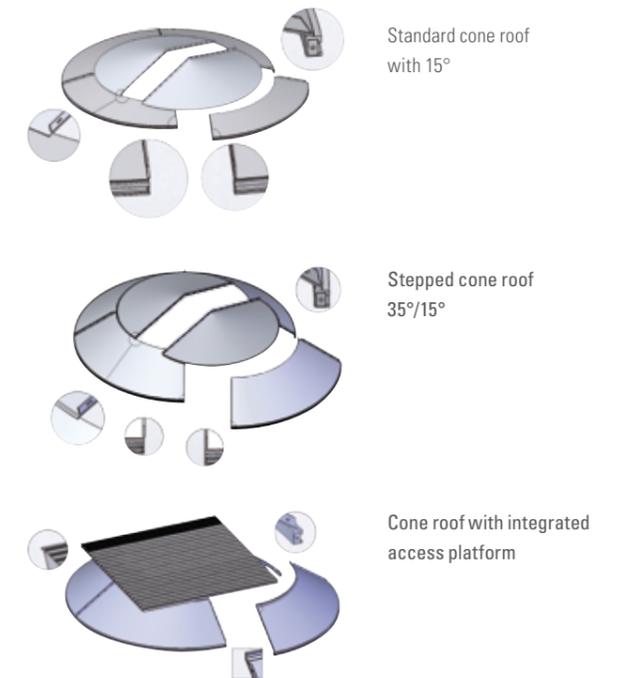
Zeppelin, the world market leader, also excels in the economic manufacturing of silos larger than 500 m³. The new Panel-Tec design ensures distinct advantages – lower assembly times with the same verifiable Zeppelin quality thanks to the innovative flange design and assembly technologies. The concept: single silo sections are prefabricated in our plant to the maximum possible extent and provided with flanges. These segments are then transported to the assembly site in containers and assembled on site either hanging from the crane or in a horizontal position. Then the silo segments are automatically welded from the inside. This assembly method is much faster than any conventional procedure and works independent of climatic conditions.

Verified welding quality ensures cost advantages

Thanks to our innovative flange connection design, the welds can be inspected and approved at the flanges. Your advantage: with the documented results of non-destructive welding tests (e.g. ultrasonics), the joint efficiency factor can be increased to allow a better use of the silo wall thicknesses. Furthermore, the flange connections used as assembly aids improve the silo stability - to prevent buckling - and allow optimization of the wall thicknesses.

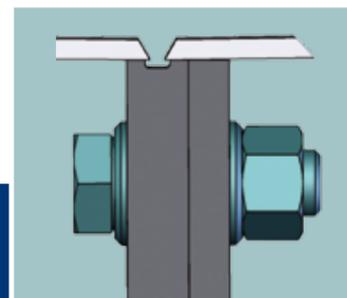
From roof to cone full of smart ideas

The experts at Zeppelin have thought about everything regarding the new Panel-Tec design. The new cone design allows a fast and precise orientation and alignment of the cone segments – naturally without any edges or protrusions on the silo inside surface. No need to grind the welding seams to ensure the optimum bulk-material flow. As for the silo roof, you can choose between 3 options available. All process engineering equipment, such as the market leading Zeppelin blending or gas inlet and distribution devices, can be integrated into the Panel-Tec design.

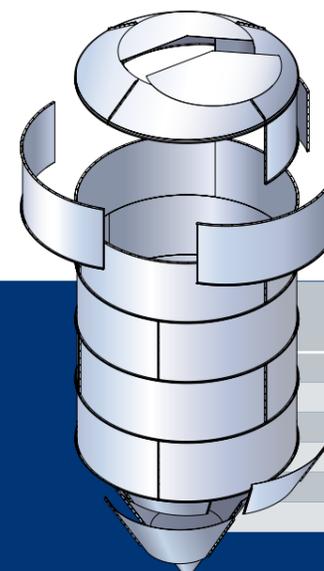


* conventional site assembly

Assembly
Transport
Prefabrication

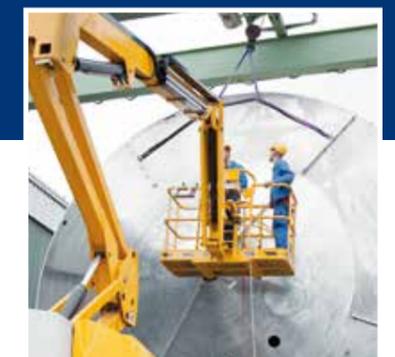


Longitudinal flange connection: the protrusion and recess design ensures proper welding and enable non destructive examination after.



Silo diameter d [mm]	Roof design	Cylindrical height h [mm]	Skirt height [mm]	Total height [m]	Volume [m ³]	Aspect ratio [d/h]
6000	15°	17500	500	18000	501	1:3.0
6000	35°/15° or 35°/flat	17500	500	18000	512	1:3.0
7000	35°/15° or 35°/flat	18500	500	19000	752	1:2.7
8000	35°/15° or 35°/flat	18500	500	19000	1000	1:2.4
9000	35°/15° or 35°/flat	21500	500	22000	1500	1:2.4
10000	35°/15° or 35°/flat	23500	500	24000	2000	1:2.4

Subject to change



QUALITY HAS MANY DIFFERENT FACETS

In order to be able to produce long-term quality, many factors have to be right. Zeppelin applies the highest standards in all areas to achieve this goal. State-of-the-art production processes ensure top-class quality.

One weld joint is not like the other

Only the most skilled employees do welding work here. That is why only TÜV-certified welders are employed at Zeppelin. Made in Germany always pays off. Of course, we have all the important and relevant certifications for welding and processing technology.

Innovation edge

Zeppelin owns many patents from which our customers benefit. Special machines for circular form bending of cones, simultaneous two-sided welding, the new modular system: this is how quality is achieved in a cost-efficient way.

Know-how

Zeppelin brings together plenty of know-how. We have one of the largest bulk material libraries in the world. At our globally-leading technology center, tests on a scale of 1:1 can be performed.

Service – service – service

As a system supplier, we deliver turn-key plants for the plastics processing and plastics producing industry. You obtain everything from a single source, from consulting, engineering and production to commissioning. And it doesn't stop there. Modification, repair work, change of location, spare parts service, etc. You can always count on us.



Trust is good – certifications are better! Zeppelin disposes of all certificates, licenses and accreditations.



High degree of automation: Special production plants for silos in compact design ensure maximum, consistent quality and short delivery times.





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