VACONO *DOME*

VACONO*DOME* – Aluminium geodesic dome roof is used to cover storage tanks of any diameter in the petroleum industry. It is usually used in refineries and tank farms, where both the storage product and the structural tank components must be protected from atmospheric and environmental influences.

VACONO*DOME* combines ecological aspects with economic benefits as it prevents the contamination of the storage product by e.g. rainwater, sand and other foreign matters, and reduces evaporation loss caused by wind or direct exposure to sunlight.

This is what makes the **VACONO***DOME* so interesting:

SELF-SUPPORTING ALUMINIUM DOME ROOF

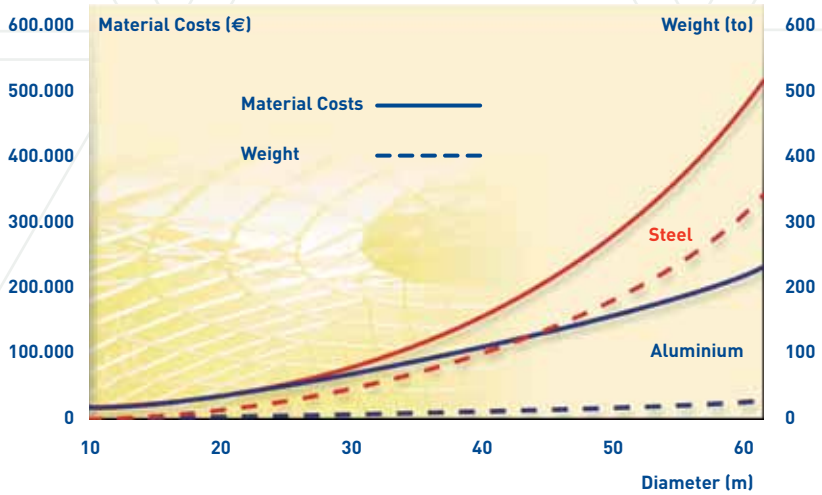
VACONO*DOME* is designed as a self-supporting dome roof whereby only its outer edge is connected to the tank shell around the outer rim. Central struts, which would have to pass through erected floating roofs or decks and which would diminish the efficiency of these systems, are no longer required. This advanced constructional design results in an important reduction of evaporation loss.

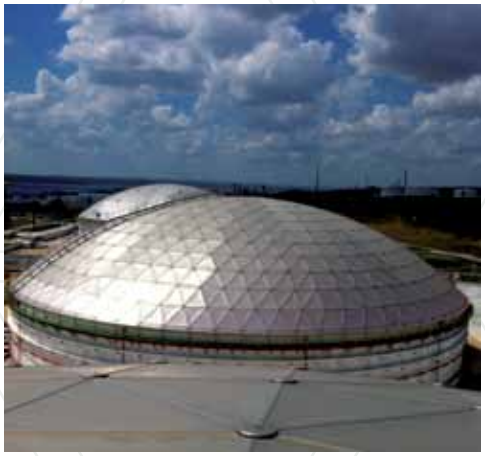
INTELLIGENT LIGHT-WEIGHT CONSTRUCTION

The weight of a **VACONO***DOME* (approx. 60 m diameter) is only 10-15% of a comparable, self-supporting steel roof. The system therefore offers a cost-optimised solution by saving the weight of the tank cover and is also suitable for the retrofitting of existing floating roof tanks, which are designed to function without a steel roof. The storage product is thus completely protected from contamination by rainwater as a malfunctioning of the floating roof drainage system is eliminated. For new tanks, the light weight of the **VACONO***DOME* allows savings in expenditure for the foundations as well as the tank shell.

Use the know-how of our experienced engineers during the planning stage for new or already existing tanks even when in operation.

Cost overview





VACONO *DOME*

CORROSION RESISTANCE AND LOW MAINTENANCE

All structural components of the **VACONO***DOME* are fabricated from highly-tensile aluminium alloys and possess excellent corrosion-resistant features, especially in an aggressive humid or saline atmosphere. An additional protective coating is not required, even after decades of operation, as our aluminium constructions are designed to last as long as the tanks they are built on. This has been confirmed in the course of numerous tests in cooperation with internationally accepted research institutes of the aluminium industry. These features are derived from our track record covering more than 100 years of aluminium production and processing as well as the continuous further development of the single structural components.

THE VACONO DOUBLE I-BEAM: A GLOBAL PIONEER

As early as 1999 **VACONO** developed the Double I-beam and introduced it as a pioneer in the industry. The VACONO Double I-beam has up to 50 times higher torsional stiffness than a conventional H-beam and removes all possibilities of failures through Euler buckling. Today the Double I-beam has become an industry standard. VACONO continues to develop the advanced design even further to optimize the weight to strength ratio and to implement the latest developments in advanced mechanical engineering.

COMPLIANCE WITH INTERNATIONAL STANDARDS

The **VACONO***DOME* is designed and fabricated in compliance with the national and international industrial standards using materials as referenced in the Aluminium Association's 2010 Aluminium Design Manual and then erected on site.

Great significance is paid to the American API 650 App. G standard recommended for the petroleum industry or chemical industry which is accepted in most countries all over the world. Moreover the latest European standards (Eurocode DIN EN 1990, 1991, 1999) as well as other industrial standards such as IBC 2012 or AWWA D108 are of course complied within the scope of the structural calculations.

FABRICATION AND UNIQUE FEATURES

The **VACONO***DOME* structure is entirely CNC fabricated with minimal tolerances. Also, the Double I-beams increase the accuracy during fabrication and installation.
All gaskets are extruded EPDM, which is extremely UV and Ozone resistant and temperature stable.

SLIDING SUPPORTS FOR EXISTING TANKS

The horizontal thrust from the Dome is taken on by the internal aluminium tension ring. As a consequence, virtually no radial forces act on the tank wall. The tank can be left untouched in most cases. The slide shoe design is therefore most suitable for existing tanks where the retrofit operation is time critical. It can often be fitted to the tank using "cold work" only, as all connections to the tank can be bolted.

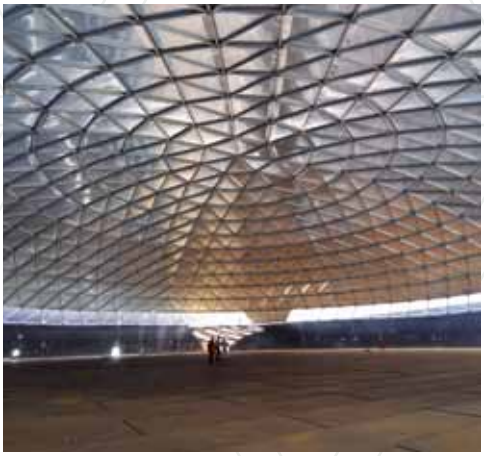
FIXED SUPPORTS: UNBEATABLE FOR NEW TANKS

For new tanks or for large diameter tanks, VACONO has developed a fixed support design utilizing an external steel landing ring able to compensate the tank out-of-roundness above the usually acceptable tolerances. The steel ring fully absorbs the horizontal thrust from the Dome and can be included in the initial tank design in a cost efficient way. The resulting lighter design of the **VACONO***DOME* reduces its material cost by approx. 10 % vs. the slide shoe design.

VACONO QE²

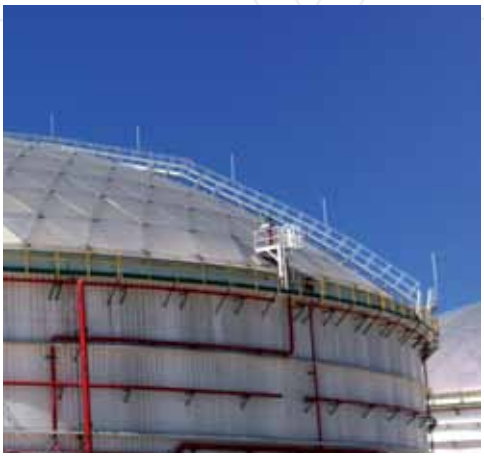
VACONO's new trademark when it is about exceeding international market levels and setting new standards in terms of **Q**uick Assembly, **E**fficiency in the use of materials, **Q**uality of Installation and **E**xcellence in operation.

The **VACONO***DOME* QE² is the state of the art brother of VACONO's established and internationally accepted light weight aluminium geodesic dome.



QUICKNESS & EFFICIENCY

Through research and manufacturing excellence, it has been possible to extend the maximum width of triangular cover sheets from 2,74 m (108") to up to 4 m (157") by means of shop-welding the API required 1,2mm (0,02") coversheets under full workshop quality control
The piece count of triangular sheets, supporting beams and gusset connections can be reduced significantly.
As a consequence, the net installation time in the field can be reduced by as much as 30 %, setting a new standard in the market.



QUALITY & EXCELLENCE

The total seam length (clamping bars) can also be reduced by up to over 10 % and therefore increase the long term water tightness of the **VACONO***DOME* QE² in a way beyond usual market level.
Another positive side effect is the reduction of materials by up to 10 %, thus reducing the Sales price by as much (depends on individual geometry).

Round Counterflashing

Walkway with 2 Handrails

Polycarbonate Skylight

Negotiation Device

Erection on EFR

Erection adjacent to tank

Lifting with grip hoists

Lifting with crane

VACONO *DOME*

ACCESSORIES

The **VACONO***DOME* can be equipped with different and sophisticated accessories to ensure an optimal functioning of the entire tank construction.
For example, VACONO's unique round counterflashing reduces the overhang of the Dome significantly to around 6 inches especially on smaller diameter Domes e.g. if walkways have to be kept clear.
The Walkway from the perimeter to the apex of the Dome can be built in various widths and designs.
Skylights allow for natural light in the tank when performing maintenance work.
Pipe negotiation devices are available in all diameters and different designs.

VARIOUS INSTALLATION OPTIONS

The **VACONO***DOME* is installed from the center outwards, eliminating expensive scaffolding and not requiring flat surfaces. No field fit is necessary for structural elements.
Installation can be done adjacent to the tank and craned in position. Alternatively, in new tanks of large diameter the **VACONO***DOME* is usually built on the tank bottom and lifted up with manual or pneumatic grip hoists.
In existing tanks and due to its low weight, the **VACONO***DOME* can be built on the EFR in low or even in high position, thus eliminating the need for cranes or grip hoists.
Sometimes the Dome is installed on the first course of the tank while the other courses are built underneath and the tank is jacked up. This provides a closed and protected working space free of rain and wind, especially under adverse climatic conditions.

LOW ERECTION COST

As a consequence of the simple but well-developed design, the **VACONO***DOME* aluminium construction can be erected very quickly by local crews, without the demand for specially trained personnel. Our specialists usually supervise the on-site erection worldwide, to ensure VACONO's usual level of quality.

PLEASE CONTACT US AT

www.vacono.com

GERMAN QUALITY WORLDWIDE

VACONO
ahead of technology

ISO 9001