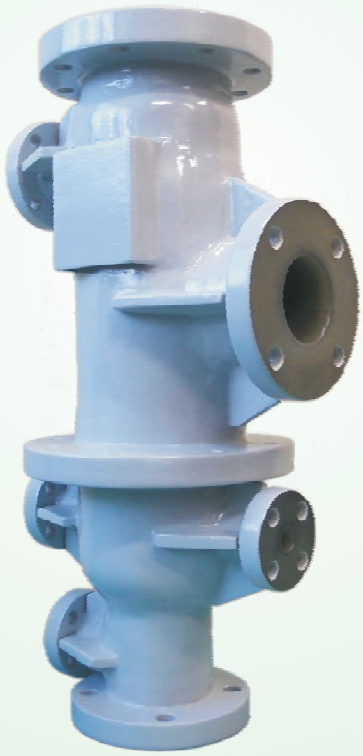
MARE d.o.o. Ltd.
advanced composites

FRP
pressure vessels
waterworks
parts



ASME RP

ASME certified manufacturer

Composite products

We manufacture high performance chemically resistant Fiber Reinforced Plastics (FRP) pressure vessels and other products for demanding applications.

Our vessels often have complex geometries that make them impractical to produce using filament winding. Superior structural integrity is instead achieved using innovative manufacturing approaches with advanced design techniques. These allow us to build integral vessels that have no structural joints, and offer superior resistance to static and dynamic loading.

Premium materials are accurately selected to enhance the chemical resistance of the vessel, which is exceptional due to its internal liner of integral construction (no liner joints). With a strong emphasis on R&D and testing, we produce vessels that exceed the most rigorous standards.

Our FRP products:
- pressure vessels
- containers, waterworks
- flanges, covers, pistons, bushings

Vessels built according to standards:
- ASME Section X (certified)
- EN 13121
- ASME RTP-1
- AD 2000 Merkblatt N1

Manufacturing know-how:
- in-house developed integral lamination techniques
- integral high quality chemically resistant inner liners
- high accuracy, repeatability, and tight tolerances
- environmentally friendlier manufacturing with minimal waste
- tight control of lamina thickness, fiber orientation, layup sequence, and fiber fractions

Advanced engineering techniques:
- laminate theory calculations
- stress, strain, and strength analysis
- analytical, discontinuity, and numerical modeling

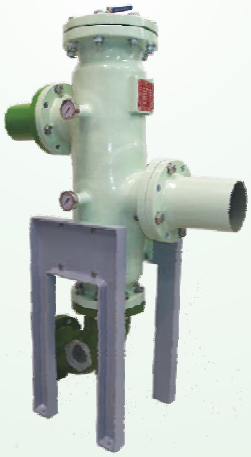
Pressure vessel ASME 3”/6” for a self-cleaning filter.

Pressure vessel ANSI 6”/10” for a self-cleaning filter.

Pressure vessel ASME 24”/40” with a support ring for a self-cleaning filter.

Pressure vessel ASME 24”/40” with elaborated composite saddles.

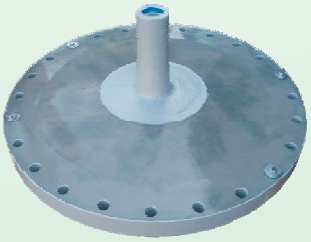
Pressure vessel DN600/1000mm with elaborated composite saddles.



Basket filter DN150/250mm (flush basket).

Basket filter DN150/250mm (classic basket).

In-line basket filter ANSI 12”/24” (classic basket).

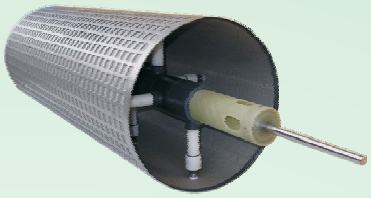


Pressure vessel flat cover DN800mm with a composite piston rod guide.

Pressure vessel concave cover DN800mm with a composite piston rod guide.

Quality control and testing:

- dimensional, thickness, and weight control
- pressure and vacuum testing
- laminate fiber fraction content
- Barcol hardness
- resin viscosity, gel-time, peak exotherm
- materials tensile testing
- hydrostatic pressure cycling



Scanner filter internal assembly with plastic nozzles and composite elements.

Lateral composite support ring for a scanner filter with a duplex rod guide.

Services

We offer FRP product design services using advanced structural calculations, computer aided engineering, and mold making.

Customers typically come to us with a metallic vessel, which we then redesign in FRP, and proceed with mold making, prototyping, and testing. Depending on cost efficiency, number of runs and required accuracy, we make molds from wood, thermoplastics, thermo-set polymers, aluminum, or steel.

In structural calculations we use Classical Laminate Theory to determine the directional properties of composite laminates, and other advance theories to predict the material failure envelope. Optimization of the structure also involves careful consideration of fibers' drapability.

For the most demanding applications, our stuff (partially employed at a local university) performs virtual prototyping using Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD).

Composite piston with flow stabilization ribs for a self-cleaning filter.

PVDF bath for chemical etching externally reinfroced with FRP.

Composite elbow with flanged nozzles for flow monitoring devices.

Pipe reducer DN200/100mm.

DN150mm pipe elbow 45°.

Flange ASME 2".

Composite product services:

- design, analysis, testing
- structural calculations per vessel standards
- mold making, vapor flushing
- consulting

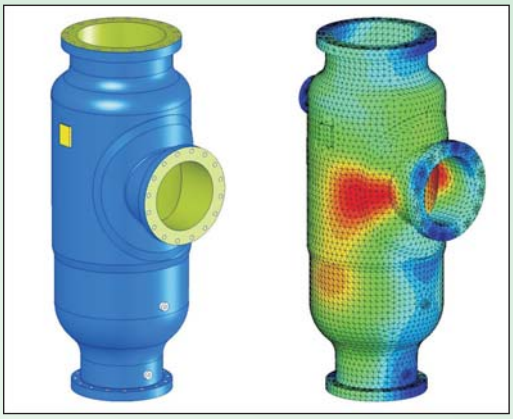
Strong R&D partnership with university:

- our staff is partially employed at the Faculty of Mechanical Engineering, University of Ljubljana
- joint time-dependent materials testing and modeling
- shear & volumetric testing under temperature and pressure variation
- joint research in various composites areas, including laminate theories

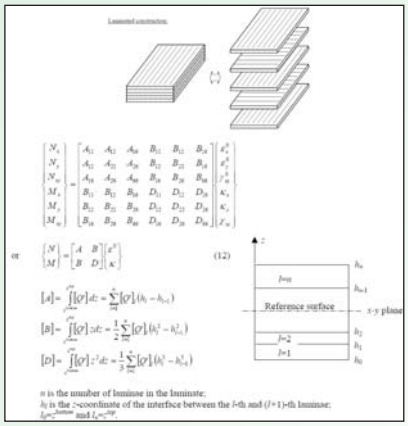
Water meter manhole DN900 x 1700mm (optional stone decoration).

System for storage and supply of underground spring water DN1000/1200 x 9000mm.

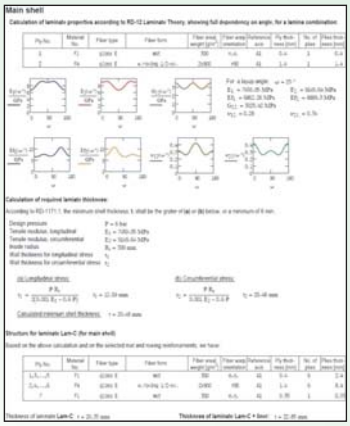
Design cycle using virtual and physical prototyping.



FEA analysis of an entire vessel.



Understanding Classical Laminate Theory is imperative, because its use is required by all composite vessel standards.



Our structural design reports cover all vessel segments, and are thoroughly elaborated in order to fulfill the most rigorous inspection

Certification

Our company was established in 1975 when the founders started to develop and produce composite products for use in the chemical industry. Since 2010 our company is certified according to the ASME Boiler and Pressure Vessel Code Section X (Fiber-Reinforced Plastic Pressure Vessels). Although it is the most widespread vessel standard, it is also the most rigorous, with only 23 certified companies worldwide. Among these we are one of the 4 that are certified for both Class I and Class II vessels. A Class I vessel has its design verified through a destructive 100.000 pressure cycle test on a prototype. A Class II vessel has its design verified through rigorous design analyses and a non destructive Acoustic Emission test.

Our ASME Section X certificate.

Our National Board certificate.

Contact

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