The latest “Modular Water Tank” technology in the world is NOW IN TURKEY;

**GRP (Composite)**

**MODULAR WATER TANKS**

Potable water and ordinary water that can cause any kind of corrosion can easily be stored.

No problem occurs;
Either **WITHIN THE BUILDING**
Or in **OPEN SPACE**
Or **UNDERGROUND**

**NEVER-ENDING LIFE AND MAXIMUM CLEANNESS.**
WHAT IS GRP (GLASS REINFORCED POLYESTER), HOW IS IT PRODUCED?

A very special composite material which is produced by exposing special thermoset resin and thermopolyester glass fibre to specific possesses together at very high pressures.

A VERY BALANCED, DURABLE, LONG-LASTING, LIGHT and INDISPENSABLE material due to its production techniques and the additives inside.

It is the first preference in the field of water storage all throughout the world.

THE AREAS WHERE GRP TANKS ARE USED

GRP tanks have many usage areas as they are both clean and long-lasting (corrosion resistant).

Some of its usage areas are given below:

* Potable water tanks,
* Rain water and well waters, sea water tanks,
* Reverse-osmosis water (waters with very low and high waters) tanks,
* Fire water tanks, swimming pools, balance tanks,
* Distillation and process tanks,
* Brown (Cesspool) and grey (domestic waste water) tanks,
* Industrial process, chiller, cooler, water tanks,
* Hot water and chemical material storage tanks,
* Agricultural irrigation areas.

WHAT DOES GRP TECHNOLOGY PROVIDE YOU?

* It is the highest point where MODULAR WATER TANK TECHNOLOGY has reached. It preserves water and itself without causing and contamination.
* It is a technological product which is EVER-LASTING, HYGIENIC and which RESISTS INNER AND OUTER CONDITIONS and contains no WATER-SOLUBLE material.
* Apart from these advantages, GRP is also an ECONOMIC and COMMERCIAL solution compared to the similar products.
* It gets affected neither by CONDUCTIVITY and HARDNESS of the water nor the pH value or ADDITIVES. It is HIGHLY RESISTANT to CORROSION and is EVER-LASTING.
* MICROBES CANNOT HOLD AND REPRODUCE within the tank as the tank surfaces are very SHINY and SMOOTH. No MOSS IS FORMED and no BACTERIA can live or reproduce inside it as its light transmittance is close to zero.
* It has INSULATION FEATURE. It’s heat transmittance is 250 times lower than metal. It conserves the water inside it at the same temperature.
* It has easy MAINTENANCE and low MAINTENANCE COSTS as it is long-lasting and very resistant to corrosion.
* It does not dissolve in water, does not leave chemical substance into water because of its strong chemical and mechanical structure and therefore can be used hygienically as POTABLE WATER TANK.
* IT IS AN ENVIRONMENT-FRIENDLY PRODUCT that is produced with low energy costs, carried and assembled with low costs and does not leave WASTE to the nature.
* Sea water and some chemicals CAN BE STORED.
* It can easily be used INDOORS and OUTDOORS.
* It does not expand because of temperature differences as it’s expansion coefficient is close to zero and “NO TENSION OCCURS” on the material.
* It can be produced at LARGE CAPACITIES that range from 2 m³ to 10,000 m³.
* It is easy to SHIP AND ASSEMBLE.
ENVIRONMENT-FRIENDLY PRODUCT

The importance placed on the environment and living conditions increases day by day and people work on this matter more sensitively. Development of green houses, use of contaminants, not using energy-consuming materials in their production and use are the simplest examples of this understanding.

GRP is a totally environment-friendly product in modular water tanks. Do you know why?

- It is a very long-lasting product. The design life is given as 40 years for GRP tanks.
- The energy spent in shipment transfer and assembly is lower compared to metal tanks as they are lighter.
- The panels, which are produced under both pressure and high temperature, do not spoil and do not conduct material exchange with the water. Therefore, the water inside the tank always remains clean and hygienic.
- Waste material amount is close to zero during production of GRP tanks.
- As no moss or microbe forms within GRP tanks, it is both very rare and easy to clean and maintain them. Therefore, the chemical wastes to be used for cleaning is at minimum level.
- As the tank panels are very long-lasting, they can be used many times and for different tanks.

THEIR COMPARISON TO OTHER TYPE OF TANKS

<table>
<thead>
<tr>
<th>TANK TYPE</th>
<th>WATER QUALITY</th>
<th>WATER TIGHTNESS</th>
<th>CORROSION RESISTANCE</th>
<th>EASE OF SHIPMENT and ASSEMBLY</th>
<th>ADAPTATION TO CHANGES</th>
<th>EASE OF MAINTENANCE</th>
<th>INSULATION FEATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAINLESS TANKS</td>
<td>****</td>
<td>****</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>GALVANIZED TANKS</td>
<td>**</td>
<td>****</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>RAINFORCED CONCRETE TANKS</td>
<td>*</td>
<td>*</td>
<td>**</td>
<td>*</td>
<td>–</td>
<td>–</td>
<td>*</td>
</tr>
<tr>
<td>PAINTED TANKS</td>
<td>*</td>
<td>***</td>
<td>*</td>
<td>***</td>
<td>***</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>GRP TANKS</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
</tr>
</tbody>
</table>

MATERIAL, MECHANICAL AND THERMAL PROPERTIES

GRP is a material that has superior mechanical and thermal properties and high corrosion resistance and that is %75 lighter than metal.

The major properties of materials that can be used in design and calculations are given in the tables.

MATERIAL PROPERTIES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>1.8 kg/m²</td>
</tr>
<tr>
<td>Tension Resistance</td>
<td>1020 kgf/cm²</td>
</tr>
<tr>
<td>Compression Resistance</td>
<td>3010 kgf/cm²</td>
</tr>
<tr>
<td>Cutting Resistance</td>
<td>960 kgf/cm</td>
</tr>
<tr>
<td>Impact Resistance</td>
<td>52,5 kgf-cm/cm²</td>
</tr>
<tr>
<td>Bending Resistance</td>
<td>1650 kgf/cm²</td>
</tr>
<tr>
<td>Elasticity Module</td>
<td>1,4x10 kgf/cm²</td>
</tr>
</tbody>
</table>

THERMAL PROPERTIES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Expansion</td>
<td>2,16x10⁻⁵</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>Bare Panel 0,15 Kcal/mhr °C</td>
</tr>
<tr>
<td></td>
<td>Insulated Panel 0,02 Kcal/mhr °C</td>
</tr>
<tr>
<td>Total Heat Transmittance Coefficient</td>
<td>Bare Panel 5,0 Kcal/mhr °C</td>
</tr>
<tr>
<td></td>
<td>Insulated Panel 1,0 Kcal/m hr °C</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>less %0,2</td>
</tr>
<tr>
<td>Cavity</td>
<td>less %2</td>
</tr>
<tr>
<td>Light Transmittance</td>
<td>Coloured 0,00%</td>
</tr>
<tr>
<td></td>
<td>White-Beige less %0,01 less</td>
</tr>
</tbody>
</table>
**DESIGN CRITERIA and PRINCIPLES**

The most optimum and durable GRP plates have been formed by using "the most developed special numerical stress analysis methods" during design of the plates. In this way, the most economical and durable tank facility is provided for you.

Stress analysis conducted by using indefinite element methods.

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**INSULATION PROPERTY and INSULATED PANELS**

The GRP panel itself has insulation property. Even if no additional insulation material is used, GRP plates transmit 250 times more heat than metal.

The table below roughly shows the insulation property.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>HEAT TRANSMITTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEEL</td>
<td>37</td>
</tr>
<tr>
<td>STEEL (INSULATED)</td>
<td>0.15</td>
</tr>
<tr>
<td>GRP (INSULATED)</td>
<td>0.017</td>
</tr>
</tbody>
</table>

- If insulated panel is used in addition to the system, polyethylene foam decreases even more as the net thickness of the insulated panel can be seen in the table.
- GRP tanks have minimum freezing risk and have no risk of surface sweating caused by the condensation on the surface due to its high temperature insulation property.

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**THE HOTTEST SUMMER THE COLDEST WINTER DO NOT MATTER FOR GRP TANK**

We thought of everything for you; YOU CAN ASSEMBLE and USE your GRP tanks even in winter conditions without facing any risk of freezing, by USING SPECIAL INSULATION TECHNIQUES and FROST BREAKER HEATERS. Even without facing any considerable heat loss...

No problem arises even IF IT IS TOO HOT, you are outdoors and directly subject to sun light!

**THE GRP TANKS THAT RESIST ULTRAVIOLET SUNLIGHT are at YOUR SERVICE again.**
**DIFFERENT PANEL ALTERNATIVES**

Meksis has different panel alternatives for each different application.

Some of our panel types:

- 1000 x 1000mm Panel
- 1000 x 1500mm Panel
- 1000 x 500mm Panel

**“WE DO NOT ACCEPT SOLUTIONLESSNESS”**

A SOLUTION ALWAYS EXISTS in Meksis for every place.

**SOME MAIN PARTS**

- GRP Cover
- Manhole Panel
- Flash Connections
- Nipple Connections
- Vent cowls
- Special APDM Gaskets
- Special Filters
- Level Indicator

**SECTIONAL TANK PRODUCTION ALTERNATIVES**

Sectional Tank Applications

Tanks at various sizes indoors and outdoors with capacities ranging from 1 m$^3$ to 10,000 m$^3$.

**TANK PRODUCTION ALTERNATIVES**

Tanks at various sizes indoors and outdoors with capacities ranging from 1 m$^3$ to 10,000 m$^3$. 

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### DIFFERENT AREAS OF USE

GRP tanks can easily be used on high platforms as they are light and can be placed underground.

### DIFFERENT TANK APPLICATIONS

There is an opportunity to produce tanks of different forms in line with the conditions.

### TANK BASE FORMS

There are two types of alternatives for shaping tank bases

**A- EXTERNALLY ASSEMBLED TOP**

The tank is put on concrete footings and bolts of the base plates laid underneath are tightened from outside (from below).

- **Its advantage is:** It is easy to intervene in case of a leakage in the tank and the tank base is easy and practical to clean.
- **Its disadvantage:** The tank height increases 500 mm and footing costs and base material costs are high.

B- INTERNALLY ASSEMBLED TOP

The tank base is made by tightening the bolts from inside on a flat and solid ground.

- **Its disadvantage is:** That cleaning the tank base gets a bit harder while.
- **Its advantage is:** That footing and tank plate costs are low and height of the tank does not increase because of the footing.
THE TESTS RUN IN ITS MANUFACTURE

The material and the finished product undergo many tests during GRP Tank manufacture and raw material manufacture.

Some experiments conducted and experiment methods are given below.

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>TEST STANDARDS</th>
<th>UNIT</th>
<th>STANDARD VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACTION TENSILE</td>
<td>DIN 53464</td>
<td>%</td>
<td>0.15 ± 0.005</td>
</tr>
<tr>
<td>TENSILE STRENGTH 23°C</td>
<td>DIN EN ISO 527-4</td>
<td>N/mm²</td>
<td>80 ± 0.5</td>
</tr>
<tr>
<td>BENDING STRENGTH 23°C</td>
<td>DIN EN ISO 14125</td>
<td>N/mm²</td>
<td>150 ± 0.5</td>
</tr>
<tr>
<td>HARDNESS</td>
<td>EN 59</td>
<td>Barkol</td>
<td>70 ± 0.1</td>
</tr>
<tr>
<td>IZOD IMPACT RESISTANCE</td>
<td>DIN EN ISO 180</td>
<td>kj/m²</td>
<td>60 ± 0.5</td>
</tr>
<tr>
<td>NON-FLAMMABILITY</td>
<td>UL-94</td>
<td>HB</td>
<td>HB</td>
</tr>
<tr>
<td>SURFACE CONDUCTIVITY</td>
<td>DIN 53482</td>
<td>Ohm.cm</td>
<td>1E + 11s</td>
</tr>
<tr>
<td>ELASTIC ENERGY</td>
<td>ISO 6603-2</td>
<td>J</td>
<td>10 ± 0.1</td>
</tr>
<tr>
<td>GLOW WIRE TEST</td>
<td>IEC 60690-2-1</td>
<td>°C</td>
<td>960 ± 0.5</td>
</tr>
</tbody>
</table>

CERTIFICATE and DOCUMENTS

Some of the certificates we have.

EASE OF PACKAGING and SHIPMENT

As all parts are standard and very light, it can be shipped to anywhere in the world easily, simply and safely on palettes. The packages can be opened easily and assembly can start.

Again, as some parts are manufactured in standard, light and special moulds with zero tolerance, they can easily be assembled. No special machine or equipment is required for assembly.
**TANK OUTLOOK and MAIN PARTS**

- Steps
- Externally supported tank assembly if desired
- Side plates
- Maintenance manholes
- Vents
- Top plates
- Water inlet-outlet blow-off holes
- Inner stay and support systems
- Bottom base plates
- Special water discharge design

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**GRP MODULAR WATER TANKS**

The Latest “Modular Water Tank” Technology in The World is NOW IN TURKEY.

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<table>
<thead>
<tr>
<th>TYPE</th>
<th>HEIGHT (mt) / &quot;C&quot;</th>
<th>CAPACITY m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP 10.10.x</td>
<td>1 1 1 1.5 2 2.5 3</td>
<td>3.5 4 4.5</td>
</tr>
<tr>
<td>GRP 10.20.x</td>
<td>1 2 2 3 4 5 6 7</td>
<td>7 8 9</td>
</tr>
<tr>
<td>GRP 10.30.x</td>
<td>1 3 3 4 5 10 12 15 20</td>
<td>20 25 30</td>
</tr>
<tr>
<td>GRP 10.40.x</td>
<td>1 4 4 5 10 12 15 20 25</td>
<td>25 30 35</td>
</tr>
<tr>
<td>GRP 10.50.x</td>
<td>1 5 5 6 10 12 15 20 25</td>
<td>25 30 35</td>
</tr>
</tbody>
</table>

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*The sizes can be changed. Manufacture can be conducted at smaller or bigger capacities.*

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GRP (Composite)
MODULER WATER TANKS

Meksis is at our industry’s and people’s service with its 28-year experience in industrializing Turkey.