

Features and Benefits

A. Who is Tsurumi ?

- **Established in 1924**, Tsurumi is one of the world's most experienced pump manufacturers
- Tsurumi first **started producing submersible pumps in 1953** and through an ongoing and extensive research and development programme, has produced many innovations in submersible pump design.
- Tsurumi's Kyoto Plant is the **world's most modern submersible pump manufacturing plant** - total manufacturing capability: 1.000.000 units per year. Testing facilities with capability testing of large pumps up to 3.000 mm discharge bore.
- Tsurumi produces more submersible pumps per year than any other submersible pump manufacturer in the world (500.000 units per year).
- Tsurumi offers over **1800 different models** of submersible pumps
 - Size range: 25 mm to 2250 mm
 - Power range: 0,15 kW to 300 kW
 - Flow range: 0,02 m³/min to 330 m³/min
- Types of submersible pumps produced:
Semi-Vortex, Vortex, Non Clog, Cutter, Mixed Flow, Axial Flow, Radial Flow Contractor & Dewatering, Sewage & Wastewater, Aerators & Blowers, Decanting Units, Scum Skimmers
- Established dealer network in Europe, North and South America, Asia, Australia and parts of Africa

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B. High-Quality Materials

Utilization of higher quality materials enables Tsurumi to produce submersible pumps that will outlast other pumps that are offered in today's market. Tsurumi's research and development department is involved in an ongoing programme to develop new and superior materials for pumping applications, e.g.:

1. **Silicon Carbide Mechanical Seals:** Outwears all other materials by a wide margin and has a higher temperature limit than the next hardest material. Tungsten Carbide rated to 300 °C, Silicon Carbide rated to 2000°C.
2. **Application appropriate FRP** (Fibreglass Reinforced Plastics) resists corrosion, extreme temperatures, highly impact resistant and is recyclable.
3. **High chrome iron** utilized in abrasive applications.
4. **Ductile cast iron** utilized in abrasive applications.
5. **316 Stainless Steel** (DIN 1.4401/1.4436) utilized in corrosive applications.
6. **Titanium** utilized for seawater applications.
7. **Different Insulation Classes** offered for specific applications (include class B, E, F)
8. **Copper wound, air filled motors** (10% higher efficiency than oil filled motors, retains electrical integrity as compared to aluminium wound motors).

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C. Highest Engineering

Tsurumi utilizes only the highest Engineering, Design and Test Standards and will not compromise them for in order to obtain a competitive edge.

- Dual Inside mechanical Seals with Silicon Carbide** located in a corrosion free oil filled chamber eliminates or minizes the following problems:
 - Seizing of rotating faces, causing destruction of other seal parts (Tungsten Carbide).
 - Seal failure due to run-dry conditions.
 - Short seal life due to abrasive particles in the pumpage (Ceramic vs. Carbon).
 - Fouling or freezing of the bottom rotating unit to the shaft, (not allowing seal closure), due to build up of sludge on the shaft (units with bottom seal running in the pumpage).
 - Offers a wider range of chemical resistance.
 - Due to high closing pressure of the seal spring, seal shock due to water hammer, should it occur during shut down is eliminated.
 - Sealing is not dependent on differential pressure (pressure rating of 1,5 times shut off pressure).
- Seal pressure relief ports** provided on pumps designed to exceed 30m of head at shut off:
 - Protects seal from over rated limits.
 - Protects seal faces from abrasive particles by drawing particles away from them.
- Lip seals or “V”-Rings** located between pumpage and lower seal faces offers added protection from abrasive particles.
- Oil Lifter** (Patent Pending) is supplied as standard on all pumps 0,4kW and larger. Assures lubrication of the top seal faces down to 1/3 of the standard oil level in the oil chamber. Provides for circulation in the oil chamber and therefore dissipates heat evenly.
- Air relief valve**, supplied as standard on all side discharge pumps prevents air locking.
- Circle Thermal Protector** or **Miniature Thermal Protectors** are provided on all three legs in three phase units and in the primary winding of single phase units. Prevents motor failure due to overloading, single phasing or phase imbalance.
- Cable entrance** with combination thermal expansion boot and anti-wicking block.
 - Protects power cable from abrading at point of entry.
 - Extends bending radius thereby preventing kinking.
 - Allows for field replacement using standard submersible cable.
 - Protects Epoxy from cracking due to difference in the coefficient of expansion between cast iron and epoxy.
 - Individual conductor are stripped back and then potted with epoxy providing for a positive water block and eliminating wicking should the power cable be damaged.
 - Units 3,7kW and below are provided with a one piece vulcanized entrance that include all of the above features.