TENMAT ADVANCED MATERIALS

ROTOR VANES FOR VACUUM PUMPS AND COMPRESSORS
INNOVATION

**TENMAT** is a leading manufacturer of advanced composite materials and components with over 100 years of experience.

SAFETY

**TENMAT** stands for innovation, safety products, commitment to our customers and the latest quality standards worldwide.

SERVICE

QUALITY

Leading Supplier to the Vacuum Pump & Compressor Industries

**TENMAT**'s proprietary self-lubricating composite FEROFORM materials are widely recognized as the industry standards for demanding applications within the vacuum pump and compressor industries and are used by all major vacuum pump manufacturers worldwide.

Commitment to Quality

**TENMAT** operates an ISO 9001:2008 Quality Management System for the design, development and manufacture of specialised high performance engineering materials and components.
**TENMAT** rotor vanes are used extensively in vacuum pumps and compressors throughout the world. **TENMAT** high quality rotor vanes are available in different grades and customized sizes according to customer specific applications and environmental conditions.

**FEROFORM F200A**
FEROFORM F200A is the market standard material for lubrication free dry running vacuum pump systems.
Applications: Vacuum forming, packaging, laboratory and scientific equipment.

**FEROFORM F43**
FEROFORM F43 has been specifically designed for fully oil flooded high vacuum and two-stage vacuum systems.
Applications: High vacuum pumps, laboratory and scientific equipment.

**FEROFORM F57**
FEROFORM F57 is the industry standard for drip feed oil-lubricated vacuum pumps.
Applications: Pumper trucks, milking pumps, blowers for cement plants, fracking equipment, compressors, refrigeration & ammonia boosters.

**FEROFORM AE2**
Economical, general purpose rotor vane for fully oil-lubricated pumps.

**FEROFORM F57**
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**FEROFORM F43**
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**FEROFORM F200A**
More Information on Page 5

**FEROFORM AE2**
More Information on Page 6
**Key Features:**

- Long Life
- High Temperature Resistance
- High Flexural Strength
- Low Water Swell
- Operates in Drip Feed Oil-Lubricated Systems

FEROFORM F57 rotor vanes are the industry standard for high temperature (in excess of 200°C) heavy duty applications. FEROFORM F57 combines outstanding wear resistance with excellent dimensional stability. Due to their exceptional chemical resistance, FEROFORM F57 rotor vanes are the ideal solution for ammonia boosters and compressors within the refrigeration industry.

FEROFORM F57 is ideal for the Oil & Gas industry, milking pumps, street cleaning pumps and blowers for cement plants. Additional applications for long lasting FEROFORM F57 rotary vanes are tanker discharge pumps, pneumatic transfer air compressors and fracking equipment. FEROFORM F57 is the preferred choice of all major OEMs and the aftermarket worldwide.

FEROFORM F57 is the material of choice for all major milking pump manufacturers around the world. FEROFORM F57 rotor vanes are readily available in standard dimensions and can be manufactured according to customer specifications with lengths up to 1800mm.
FEROFORM F43 rotor vanes have been specifically developed for pumps with forced oil lubrication. The principal areas of use are in single and two-stage high vacuum pumps where FEROFORM F43 exhibits superb stability under vacuum, insensitivity to moisture, excellent strength retention, and low noise.

Due to its unique microstructure, FEROFORM F43 can be machined to tight tolerances and extremely smooth surface finishes. Typical applications include rotary vane pumps on analytical instruments and mass spectrometry.

Applications include general engineering and full flooded high vacuum pumps. FEROFORM F43 is extensively used by OEMs and in the aftermarket for all major pumps makes.

FEROFORM F43 has been shown to outperform cotton phenolics, epoxy glass and carbon fibre rotor vanes in high vacuum pumps.

Key Features:
- Long Life
- Low Noise
- Excellent Chemical Resistance
- Very Low Water Swell
- Superb Stability Under Vacuum
- High Temperature Resistance
- High Stiffness
- High Mechanical Strength
FEROFORM F200A is the market leading resin bonded graphite material. Impregnated with lubricants and with a high stiffness, it is the ideal material for dry running applications.

FEROFORM F200A applications cover all areas where lubrication is not possible: Laboratory, hospital and dental equipment, packaging, vacuum forming, powder discharge compressors, and food processing equipment.

High mechanical strength and shock resistance reduces vane residue in the pump, lowers damage on the pump casing, and gives longer life. A low friction coefficient increases the lifespan of the vane and maximizes pump performance.

FEROFORM F200A is the industry standard rotor vane material for all major dry running vacuum pump manufacturers worldwide.

Key Features:
- Long Life
- Dry Running
- Market Leading Material
- Superb Stability Under Vacuum
- High Temperature Resistance
- Wide Application Range
- High Stiffness
FEROFORM AE2 material is an economical, general purpose laminate, used in fully oil-lubricated pumps and compressors.

With its excellent machinability, FEROFORM AE2 produces high quality, close tolerance components, increasing pump performance.

Applications for FEROFORM AE2 include fully-flooded oil lubricated pumps.

FEROFORM AE2 can be used in many abrasive applications due to its high dimensional stability, and resistance to corrosion and a wide range of chemicals.

Key Features:
- Long Life
- Low Water Swell
- High Stability Under Vacuum
- High Temperature Resistance
- Wide Application Range
- High Mechanical Strength
# MATERIAL PROPERTIES

<table>
<thead>
<tr>
<th>TENMAT</th>
<th>F57</th>
<th>F43</th>
<th>F200A</th>
<th>AE2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applications</strong></td>
<td>Milk pumps, pumper trucks, blowers for cement plants</td>
<td>Fully flooded pumps, laboratory and scientific equipment</td>
<td>Dry running pumps</td>
<td>General purpose fully flooded pumps</td>
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<tr>
<td>Flexural Strength (MPa)</td>
<td>170</td>
<td>450</td>
<td>75</td>
<td>430</td>
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<tr>
<td>Impact Strength (KJ/m²)</td>
<td>60</td>
<td>105</td>
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<td>Compressive Strength (MPa)</td>
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<tr>
<td>Flexural Modulus GPa @20 °C</td>
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<td>23</td>
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<tr>
<td>Thermal Expansion (10⁻⁶/°C)</td>
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<tr>
<td>Normal</td>
<td>42.5</td>
<td>32.7</td>
<td>24.9</td>
<td>52.2</td>
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<tr>
<td>Parallel</td>
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<tr>
<td>Maximum Continuous Operating Temperature °C</td>
<td>200</td>
<td>200</td>
<td>175</td>
<td>180</td>
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<tr>
<td>Density (g/cm³)</td>
<td>1.25</td>
<td>1.75</td>
<td>1.75</td>
<td>1.79</td>
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</tbody>
</table>

The information contained in this data sheet is presented in good faith. They are typical test results tested generally in accordance with BS 2782 and ASTM test methods and should not be used for specifications. TENMAT does not warrant the conformity of its materials to the listed properties or their suitability for any particular purpose.

For further information please contact our Technical Sales Department on +44 161 872 2181.

## AVAILABILITY

**TENMAT** high performance rotor vanes are available in a wide range of dimensions to fit every possible application for vacuum pumps and compressors.

Customized blades can be supplied with lengths up to 1800mm (71”) and thicknesses up to 25.4mm (1”).

**TENMAT**’s state-of-the-art manufacturing and production capabilities allow for a fast turnaround of custom made orders.

Our Technical Services department is available to provide guidance on material selection, part design and technical solutions.
**LEADERS IN INNOVATION**

**TENMAT**’s ongoing commitment to the development of new products and solutions in the field of composite and engineering materials has been recognised in 2012 and 2013 by receiving the highest official award in Great Britain, the prestigious Queen’s Award for Enterprise in the categories Innovation and International Trade.

**Custom Component Manufacture**

**TENMAT** materials can be supplied as semi-finished products or, if required by the customer, our ISO9001-2008 certified machine shop can produce fully machined items to specification.

**Materials Expertise**

With over 100 years of experience in Composite Engineering Materials, **TENMAT** offers customers information on material developments, characteristics, suitability, and applications.

**Technical Ingenuity**

**TENMAT** has been proven to consistently produce industry leading advanced composites, developed in our in-house R&D Technical Laboratories.

**Problem Solvers**

The diverse range of high performance composite materials manufactured by **TENMAT**, offer the engineer a wide array of solutions to improve wear resistance, withstand extreme temperatures, resist high impacts, and survive in harsh, corrosive environments. Our Technical Services department is available to provide guidance on material selection, part design and technical solutions.

**Component Design**

If design services, drawings and fitting instructions are required, **TENMAT** will work with customers in developing the most suitable solution to their particular problem.
TENMAT is committed to the highest standards in customer service and our international staff is looking forward to assist you.

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