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Feroform F44

Ultra-durable sliding vanes for one-stage and two-stage high vacuum, oil sealed vacuum pumps

Feroform F44 has been specially developed as a solution for manufacturers of next generation oil-flooded vacuum pumps, who need tighter tolerances, longer-life, and better resistance vanes. The specialist formulation improves laminate bonding to yield ultra-durable vanes which withstand extreme operating conditions.

Wear Components

Product Description

Feroform F44 is an ultra-strong material designed for high-vacuum oil-sealed pumps. The specialist formulation uses an abrasion-resistant glass fibre to reinforce a temperature-resistant phenolic resin. The outcome is better vacuum generation from the pump, better pump efficiency, stable vacuum level, reduced oil consumption, and reduced noise.

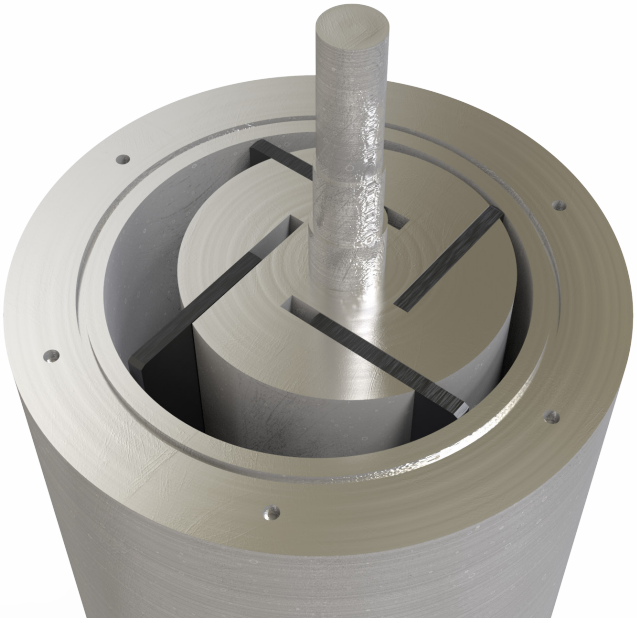
F44 rotor vanes are suitable for use in high-speed oil-flooded vacuum pumps. They are also considered future-proofed for the next generation of heavy-duty pumps. Feroform F44 offers vast improvements in flatness, abrasion resistance, temperature resistance, chemical resistance, lamination strength, and flexural strength. One focus is long-term thermal stability. Laboratory tests prove that F44 is nearly 3 times more stable under extreme temperature versus the next-best alternative. F44 retains significantly more flexural strength, even when exposed to 200C for 100 hours.

In operation, Feroform F44 vanes maintain higher flexural strength for longer service periods at elevated temperatures. This greatly increases the useful operational lifetime of the vanes - enabling vacuum pumps to operate harder for longer. The performance of the vacuum pump depends directly on the capabilities of the vane. The harder a vane can work before degradation, the better the vacuum available from the pump. Improvement in vacuum generation is made possible thanks to tighter running clearances against the bowl, and smoother sliding within the rotor slot.

F44 vanes have set the bar for vane flatness. The specialist F44 formulation can be machined to tightest tolerances with extremely smooth flat surfaces, showing flatness tolerances as good as 0.04. The excellent dimensional stability of F44 protects these tight running clearances, further improving vacuum with minimal leakage. F44 solves the previous problem of delamination of rotor vanes.

Product Advantages

- The Feroform F44 formulation gives a better vane lamination strength, increasing performance and lifetime
- Vacuum pumps operate quieter since Feroform F44 vanes reduce vibration and friction
- Operators can achieve max running speeds due to Feroform F44 vanes being stable under high vacuum
- Feroform F44 enables no loss of vacuum efficiency due to excellent wear properties and stability
- Minimum leakage when designing tighter running clearances of Feroform F44 vanes
- Less oil needed to lubricate pump thanks to the lower friction level of Feroform F44 vanes
- Feroform F44 offers improved vane strength, wear performance, and resistance to heat & chemicals



Physical Properties

Property	Units	F44
Density	g/cm³	1.75
Flexural Strength	MPa	
20 °C		375
20 °C after 4 days @ 150 °C		240
20 °C after 4 days @ 200 °C		190
Flexural Modulus	GPa	
20 °C		20
20 °C after 4 days @ 150 °C		15
20 °C after 4 days @ 200 °C		14
Compressive Strength	MPa	420
Tensile Strength	MPa	220
Charpy Impact Notched	kJ/m²	72
Brinell Hardness	kgf/mm²	40
Swell in Water (24 hours)	%	
20 °C		<0.2
80 °C		<0.2
Swell in Oil (24 hours)	%	
20 °C		<0.2
80 °C		<0.2
Coefficient of Thermal Expansion	x 10-6/°C	
Parallel		12
Perpendicular		42
Maximum Operating Temperature	°C	
Continuous		200
Intermittent		225
Vacuum Shrinkage length (96 hours @ 125 °C)	%	<0.1

Test Evidence

Market leading manufacturers specify Feroform F44 sliding vanes.

Approved Applications

Feroform F44 sliding vanes have been specified by market-leading manufacturers of one-stage and two-stage high vacuum sliding vane vacuum pumps, typically for equipment used in the following sectors:

- **Analytical & laboratory**
- **Chemical & petrochemical**
- **Pharmaceutical**
- **Vacuum forming**
- **Medical**
- **Cryogenic**

Sizes

Standard vanes are made to various bespoke dimensions. Standard material size ranges up to 25mm thickness, 1200 mm width, above 1500mm long. Larger vanes possible upon request.

Intended use

Composite vane for sliding vane rotary vacuum pumps

Packaging

Tenmat has the ability to mark individual vanes with customer specific branding or job numbers for full traceability. Bespoke packaging can be done to customer specification.

Storage

- To be stored in dry location
- Keep in packaging until ready to use
- Take care not to exceed safe working loads and heights for storage shelves and racks

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