Technical Data Sheet

Phenolic Refractory Binder Metaphen® REF

Revision: October 2025

Product Description

Phenolic binders are widely used in refractory and foundry industries due to their excellent thermal stability and high mechanical strength at elevated temperatures. In the production of refractories, the phenolic binder primarily fulfills two critical functions:

- Providing the necessary adhesion during molding and development of refractory powder mixtures for pre-forming
- Contributing carbon content during the high-temperature stage of the final product

Metaphen® REF, developed by Metasan, is an industrial-grade liquid binder specifically formulated for the manufacture of magnesia–graphite refractories. Designed on an advanced novolac-type phenolic resin base, this liquid product offers outstanding performance in high-temperature processing due to its low water content and high solid content. The binder produces a high carbon yield during firing, significantly improving the refractory's thermal shock resistance, hydrophobic surface characteristics, and structural integrity.

Benefits

- Superior mechanical strength after firing
- High carbon content
- Excellent mixing compatibility with refractory powders.

Mixing & Shaping Procedure

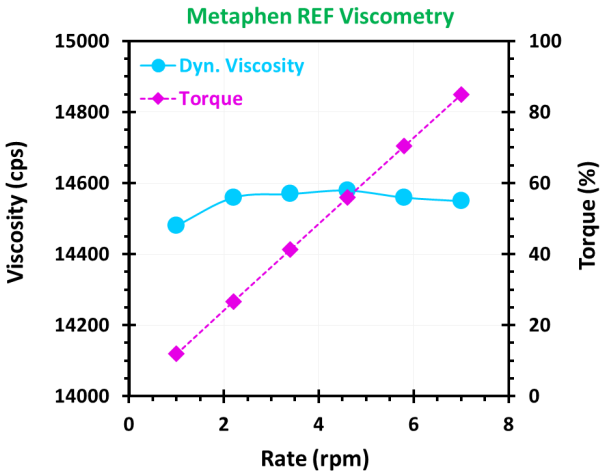
During mixing, the refractory powder is blended with 2–5 wt.% of Metaphen® REF binder using an Eirich intensive mixer. Since certain mineral components in the refractory powder may react with water, the liquid novolac binder must be free of water. After homogeneous mixing, the binder-containing powder is poured into molds and compacted under high pressure to form the desired shape. The formed bricks are then heated up to 150 °C to ensure curing of the binder.

Final curing Process

After preliminary curing, the formed refractory bricks are cured in a high-temperature furnace at the sintering temperature required for the ceramic base powder.

Storage conditions

Store in a cool and dry place, away from direct sunlight, in tightly sealed containers. The recommended shelf life is 6–9 months when stored below 20 °C.



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Product Specification

Property	Unit	Value	Standard
Appearance	-	Transparent Liquid	-
Viscosity (Anton Paar, 25±1 °C, Spindle L3, 1–7 rpm)	mPa.s	14200 – 14600	ASTM D445
Solid Content	%	75 ± 1	ASTM D2369
Water Content	%	≤ 1.5	ASTM D5155

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