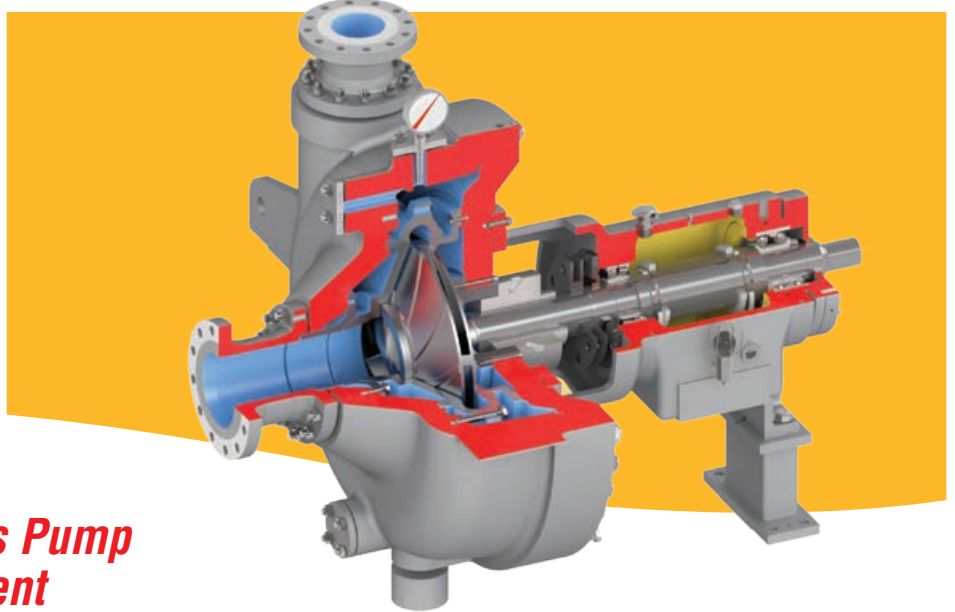




SR-250[®] Enhanced High-Chrome Iron Abrasion and Thermal Shock Resistance for HPX6000 Pump Wear Components

SR-250 is a proprietary, enhanced high-chrome iron that provides the abrasion resistance needed for pumping heavy oils and synthetic fuels, without the risk of thermal shock often associated with these materials.



New Material Solves Pump Warm-up Requirement

The HPX6000 ISO 13709/API 610 slurry pump safely handles abrasive solids at elevated temperatures without the danger of pump casing erosion. However, its standard high-chrome liners and impellers require a gradual warming protocol to protect components from thermal shock. Flowserve has developed an enhanced high-chrome iron for these components — SR-250 — that exhibits exceptional abrasion resistance with unmitigated thermal shock resistance.

Traditionally, the highest levels of abrasion resistance for casing liners and impellers have been achieved through the application of high-chrome iron (HC-250, ASTM A532 Class IIIA). While ideal for abrasive solids, its application in high-temperature processes such as fluid catalytic cracking (FCC) and deep catalytic cracking (DCC) bottoms requires careful attention to warm-up rates and pre-heating of fluids used in API 32 or similar flush plans.

Thermal Shock and Abrasion Resistance

Designed by Flowserve materials scientists and key partners, SR-250 provides the same abrasion resistance as the trusted HC-250, but with thermal shock resistance that eliminates the need for hours-long equipment warm-up procedures. This new material maintains the ASTM A532 Class IIIA designation. Now, HPX6000 pumps can be provided in three different materials for wear components.

Wear Component Material	ASTM Designation	Abrasion Resistance	Thermal Shock Resistance
HC-250	ASTM A532 Class IIIA	High	Low
CA6NM	ASTM A-743	Medium	High
SR-250	ASTM A532 Class IIIA	High	High

Consult Flowserve for specific application recommendations.

Full Range of Hydraulics

The HPX6000 pump is designed to meet a full range of flow, head and pressure requirements. Development of the SR-250 components included all standard casing and impeller sizes to meet the established hydraulic range of the HPX6000.

Operating Parameters

- Flows to 3409 m³/h (15 000 gpm)
- Heads to 244 m (800 ft)
- Pressures to 83 bar (1200 psi)
- Speeds to 3600 rpm

After long hours of operation, casing liner wear surfaces can be machined to re-establish proper operating clearances and restore pump efficiency.

Broad Application Possibilities

The application of SR-250 in HPX6000 pumps is ideal for high-temperature, abrasives-laden applications in refineries and elsewhere. Common applications include:

- FCCU bottoms
- Heavy oil thermal conversion processes
- Vacuum tower bottoms
- Gasification processes
- Bauxite digester applications
- Quench oil applications for ethylene crackers
- Other high-temperature, erosive slurry applications

Rigorously Tested

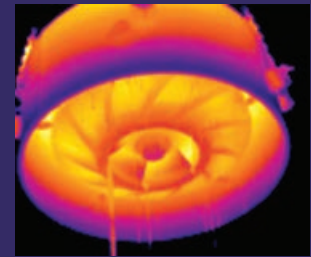
Pumping highly abrasive, high-temperature process streams is tough business. To ensure successful application of SR-250 in the most arduous, high-temperature applications, Flowserve performed thorough testing. Key tests included:

- Comprehensive thermal shock cycling to foreseen, high-temperature application requirements; extensive cold-hot-cold cycling
- Simultaneous application of thermal shock testing while subjecting components to axial and rotational loads to simulate worst case operating scenarios
- Application of internal thermal gradients within components on two different planes

Components met all design and application requirements.



Hot oil submersion testing



Thermal imaging of pump impeller

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