

CHOOSING THE RIGHT COATING

A practical guide for chemical processing equipment

START WITH THE SERVICE CONDITION

The best coating is determined by the actual failure mode, process chemistry, temperature, mechanical load, and component geometry. Use this matrix to narrow the options, then confirm the selection against operating history and repair requirements.



HVOF thermal spray applied to a rotating shaft at HFW.

FAILURE-MODE DECISION MATRIX

PRIMARY FAILURE MODE	OPTIONS TO EVALUATE	SELECTION NOTE
Corrosion / chemical attack	Nickel-based alloys, including Colmonoy® and Hastelloy®; HFW 512; or ceramics	Match chemistry, temperature, and substrate.
Abrasion / erosion	HFW 443, chrome oxide, HVOF tungsten carbide, or cobalt-based alloys like Stellite®	Use tungsten carbide when corrosion is secondary.
Wear + corrosion	HFW 443, HFW 512, chrome oxide, nickel alloys, or cobalt-based alloys like Stellite	Severity and impact determine spray vs. overlay.
Impact / heavy load	Hardfacing weld overlay using Colmonoy, Hastelloy, or Stellite	Metallurgical bond supports severe mechanical demand.

THERMAL SPRAY VS. HARDFACING: UNDERSTAND THE BOND

THERMAL SPRAY

Bond:	Mechanical
Heat input:	Minimal
Typical thickness:	0.010-0.050 in.
Best fit:	Corrosion and moderate wear

HARDFACING WELD OVERLAY

Bond:	Metallurgical
Heat input:	Higher
Restoration:	Significant dimensional buildup
Best fit:	Heavy wear, impact, and corrosion

HFW PROPRIETARY MATERIAL OPTIONS

HFW PROPRIETARY MATERIALS

HFW 443

HFW proprietary material for combined wear and corrosion.

HFW 512

Nickel-based thermal spray alloy for wear and corrosion.

ONE-SOURCE RELIABILITY AT HFW

HFW combines manufacturing engineering support, thermal spraying, hardface welding, machining, and precision grinding to serve as a turnkey repair and manufacturing services provider, backed by more than 75 years of industrial experience.

DISCUSS YOUR APPLICATION

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