



VaporKote

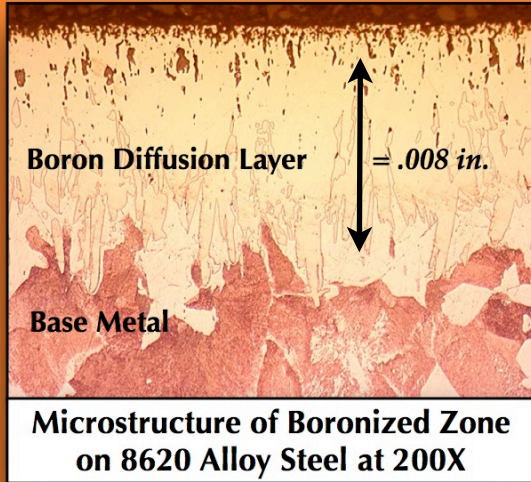


**Diffusion Alloying Processes
For Superior Resistance
To Erosion and Corrosion**



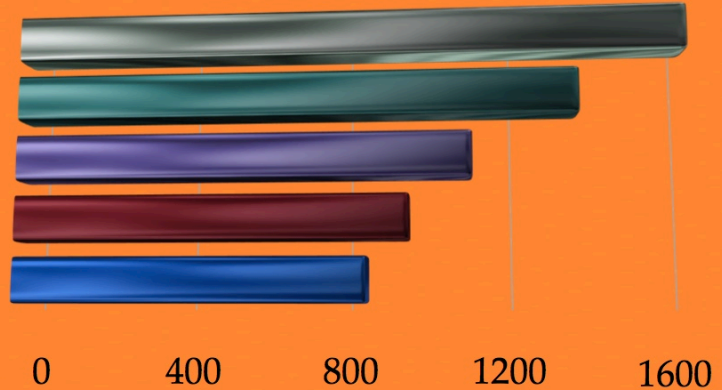
Boronizing

Diffusion Process For Wear & Erosion Resistance



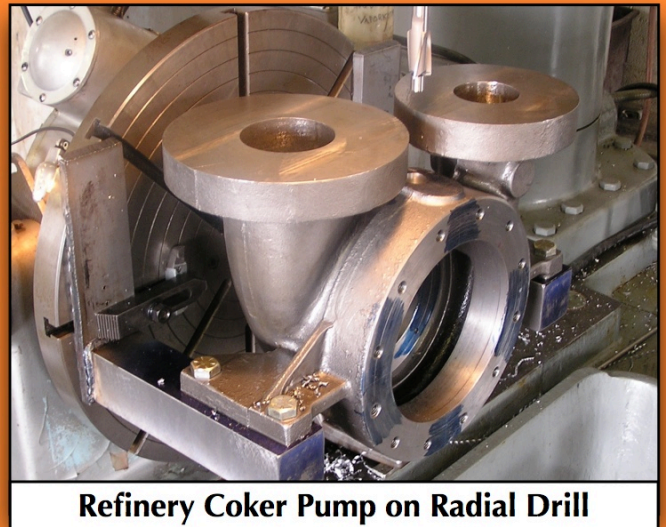
Vickers Hardness Comparison

VaporKoted Steel
Tungsten Carbide
Nitrided Steel
Chrome Plating
Carburized Steel



The VaporKote Advantage

- **Ultra hard** - Achieves RC75+ equivalency, harder than tungsten carbide cutting tools
- **Metallurgical bond** - New surface alloy formed much stronger than mechanical coatings
- **Powder borne** - Not line of sight, all areas accessible and diffusion depth is uniform
- **100% dense** - Not porous, unlike plasma spray coating there are no voids at diffusion zone
- **Versatile** - Untreated areas are masked for ease of machinability and can be welded after boronizing
- **Cost effective** - Batch operation for large & small parts, high volume capabilities



Wet Gas Scrubber Nozzles loaded for Boronizing



Boronized Plungers used in Oil Production

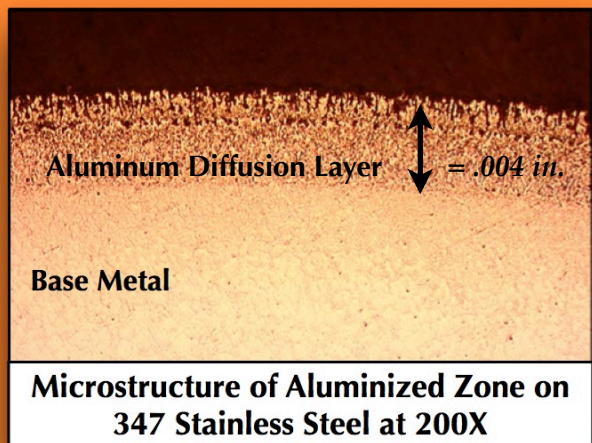


Boronized Impeller for Refinery FCC Service



Aluminizing

Diffusion Process For Corrosion Resistance



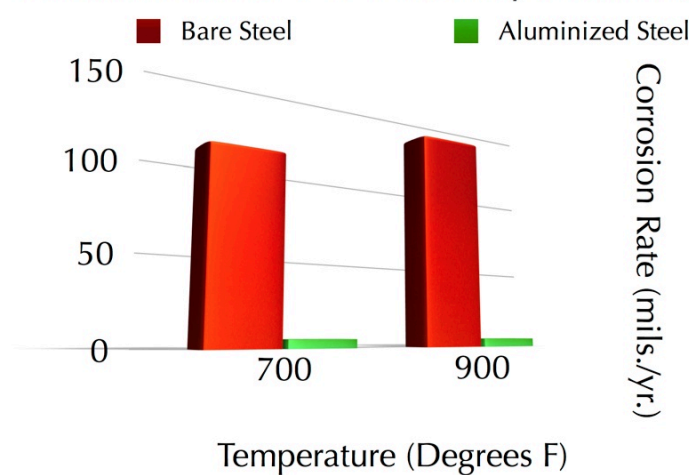
Superior Protection

- **Hydrogen Permeation** - Reduces diffusion rates of H_2
- **Sulfidation** - Protection from H_2S , SO_2 & SO_3 attack
- **Oxidation** - Forms stable aluminum oxide film
- **Carburization** - Prevents carbon diffusion

Powerful Applications

- **Refinery Hydrocrackers & Hydrodesulphurizers** - Heater tubes, catalyst reactor screens, wire cloth & stainless fasteners to reduce scaling
- **Refinery Delayed Coker, Visbreakers, & Ethylene Pyrolysis Furnaces** - Tubes, furnace parts & burner assemblies to prevent coke buildup
- **Refinery Crude Units & Vacuum Units** - Furnace tubes, transfer pipe & trays for protection from naphthenic acid
- **Sulfur & Sulfuric Acid Plants** - Steel piping, tubing, catalyst trays, & nickel alloy burner assemblies for resistance to hot H_2S , SO_2 & SO_3 corrosion
- **Industrial Furnace Components** - Burner nozzles, thermowells, thermocouple protection tubes, heat treating & furnace fixtures.

Corrosion Rate for 9 Cr-1 Mo Alloy Steel in H_2S



Aluminized Wire Cloth
for Hydrocracker Service



High Volume Heat Exchanger Tubing
Aluminized for Sulfuric Acid Plant



Aluminized 347 Stainless Steel
Fasteners

Diffusion Alloying Processes



Machine Shop Capable of Turning
68" Diameter Parts for Repair

VaporKote's chemical vapor deposition processes form an *intermetallic* compound at the surface of the base metal that provides **long lasting protection** against erosion and corrosion.

Are you experiencing problems with harsh service environments?
Contact us today for solutions!



VaporKote Manufactured Boronized
Case and Impeller Wear Rings

(714) 632-8607 Phone
(714) 632-8658 Fax



Since 1987, VaporKote has provided its advanced diffusion processes to industries dealing with severe erosion and corrosion problems.

Now recognized as a leader in the field, VaporKote serves industries worldwide by dramatically extending component service life.



Multiple furnaces for parts up to
8 feet wide and 25 feet long

VaporKote, Inc.
1270 N. Grove St
Anaheim, CA 92806

Erosion & Corrosion Resistance



Metallurgical Laboratory for
Analysis and Quality Assurance

Our boronizing and aluminizing processes **consistently outperform** other surface treatments and more costly untreated materials.

Unlike our competitors, we mix our proprietary formulas on site for superior results and **maximum diffusion depth**.



VaporKote Aluminized Burner
Nozzles for Industrial Furnace

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