

# HARDFACING POWDERS

## TECHNICAL DATA SHEET



## SPECIALTY METAL THERMAL SPRAY POWDERS

Whether your finished part requires low, medium or high degrees of hardness, machinability, impact and abrasion resistance or corrosion resistance, we have a powder to meet your coating needs. We offer a wide selection of thermal spray alloys in the proper mesh sizes required to optimize any thermal spray process.

The information below illustrates some of the standard alloys available from AMETEK Specialty Metal Products (SMP).

**We also manufacture custom atomized powders for special applications.**

**Hardfacing** is a process of spraying or welding metallic powders onto a workpiece or substrate to give it a specific hardness, wear resistance, or corrosion resistance. This process requires the appropriate alloy and particle size distribution for a specific deposition technology. Appropriately selected powders yield the best properties and manufacturing efficiencies.

## ALLOY CHARACTERISTICS

### LARGE VARIETY OF CHOICES TO MEET YOUR THERMAL SPRAY REQUIREMENTS

#### PF20

Good machinability. High impact resistance. High ductility. High tensile strength. Deposits can be hand finished. Recommended for repair of cast iron parts.

#### PF25

Deposit has good machinability and impact resistance, slightly harder than PF20. Excellent corrosion resistance. May be used for repairs to cast iron parts or overlay where nickel base alloy is required.

#### PF35

For coatings requiring intermediate hardness, excellent machinability and resistance to corrosion, heat and cracking. Use on shafts, sleeves, and wear surfaces.

#### PF40

High build up capability. Good impact and abrasion resistance. Excellent machinability. Suggested for use where precision finish is required.

#### PF50

Intermediate hardness. Excellent weldability and crack resistance. Use on polish rods, liners, shafts, valve gates, and coupling.

#### PF55

Excellent abrasion and corrosion resistance. Good hardness. Ideally suited for boiler coating applications.

#### PF60

Non machinable. Finish surface by grinding. Excellent abrasion and corrosion resistance. High hardness. Excellent weldability. Use on couplings, shafts, polish rods, plungers, and valves.

#### PI600

Excellent machinability. Work hardens in service. Good wear and corrosion resistance. Use on motor shafts and pump sleeves.

#### 316L

Produces corrosion resistant work hardenable finish. Excellent machinability.

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### IDEAL FOR OIL AND GAS, INDUSTRIAL AND AGRICULTURE APPLICATIONS

Equipment used in Oil and Gas, Heavy Industry and Agriculture must be able to withstand high levels of corrosion, wear, or heat. Drill rods, shafts, tubes, couplings, cutter bars, augers, cylinders and related components are especially vulnerable to the effects of wear and corrosion, and must be treated specially to maximize life. To meet this challenge, AMETEK SMP has engineered powders designed specifically for hardfacing applications.

AMETEK SMP powders are manufactured to have the precise size, shape, and low oxygen content required for optimal thermal spraying characteristics. In addition, our thermal spray powders are available in a wide variety of alloys to give the workpiece its finished qualities-whether it's good machinability, abrasion resistance, corrosion resistance, ductility or high tensile strength.

AMETEK SMP metal powders are produced under the strictest

quality control procedures, and tested in accordance with standard MPIF and ASTM practices. This rigorous testing ensures uniform particle sizes and compositions with unmatched lot-to-lot consistency.

#### ALSO AVAILABLE

- Nickel base Alloys
- Nickel-Chrome-Boron Systems – AMS 4775, 4776, 4777, 4778, 4779
- Nickel-Chrome Molybdenum
- Tool Steels up to 70+ HRC
- Copper-Nickel
- Cobalt Alloys
- Aluminides
- Stainless Steel
- Aluminum Bronze

#### Powders for all torches:

HVOF, HVOF, plasma spray, spray and fuse, and puddle torch.

#### TYPICAL HARDFACING POWDER COMPOSITIONS

| ALLOY | C   | CR   | FE   | NI   | B   | SI  | CU   | MO   | CO | RC. HARDNESS | MELT TEMP (F°) |
|-------|-----|------|------|------|-----|-----|------|------|----|--------------|----------------|
| PF20  | .03 | -    | 1.5  | BAL  | 1.5 | 2.5 | -    | -    | -  | 12 - 20      | 2000           |
| PF25  | .06 | -    | 1.5  | BAL  | 1.5 | 3.5 | -    | -    | -  | 20 - 30      | 1975           |
| PF35  | .05 | 10.5 | 2.0  | BAL  | 2.0 | 3.3 | -    | -    | -  | 32 - 40      | 1925           |
| PF40  | .30 | 7.5  | 1.5  | BAL  | 1.4 | 4.0 | -    | -    | -  | 40 - 48      | 1925           |
| PF50  | .65 | 14.0 | 4.2  | BAL  | 2.8 | 3.8 | -    | -    | -  | 48 - 54      | 1900           |
| PF55  | .65 | 15.0 | 4.5  | BAL  | 3.3 | 4.0 | 3.5  | 3.5  | -  | 50 - 60      | 1900           |
| PF60  | .90 | 16.5 | 4.5  | BAL  | 3.3 | 4.3 | -    | -    | -  | 56 - 62      | 1900           |
| 316L  | .03 | 17.0 | BAL  | 12.0 | -   | 0.8 | -    | 2.5  | -  | Rb78         | 2525           |
| 80/20 | -   | 20.0 | -    | 80.0 | -   | -   | -    | -    | -  | -            | -              |
| *HAC  | .05 | 15.5 | 8.0  | BAL  | -   | 0.8 | -    | 16.0 | -  | .            | .              |
| *I600 | .02 | 14.0 | 10.0 | BAL  | -   | 1.0 | -    | -    | -  | Rb74         | 2600           |
| *M400 | .02 | -    | -    | 66.5 | -   | 0.5 | 32.5 | -    | -  | .            | .              |

\*HAC is AMETEK's equivalent to HASTELLOY C. HASTELLOY is a Cabot Corporation trademarked product. I600 is AMETEK's equivalent to INCONEL 600. INCONEL is an International Nickel Company, Inc. trademarked product. M400 is AMETEK's equivalent to MONEL 400. MONEL is an International Nickel Company, Inc. trademarked product.



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