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Value, selection, and service is HPP.
We shall exceed our customer expectations for quality service, delivery and product value.
Hpp is your one stop for hardfacing and overlay products, joining consumables for all ferrous and nonferrous metals, mig and tig wires, metal working products and accessories.

With over 45 years experience in the maintenance welding industry, High Performance Products offers the maintenance welder and mechanic the highest quality product line available anywhere in the world. Whether you’re a one man shop or a Fortune 500 company HPP products save you money and time with products designed to help you achieve your uptime goals.

Our sales and technical staff is available to discuss your particular welding and wear applications and design a custom solution. In addition we can provide onsite technical and safety seminars.
GENERAL CHARACTERISTICS
This electrode has been designed to operate on almost any AC or DC welding machine even when the open circuit voltage is very low. The special coating protects the weld deposit from adverse conditions normally encountered in maintenance repair welding. Low amperage requirement controls distortion when welding thin sheet metal; spatter is kept to a minimum. Ideal for field work and out-of-position welding.

TYPICAL APPLICATIONS: Fabrication of thin, medium, heavy, and dissimilar gauge mild steel. Sheets, plates, angle iron, beams, pipes and machine parts can be welded in all positions. Also used for filling holes and build-up of over-machined and worn surfaces. Commonly used on applications requiring short, intermittent and spot welds because of the outstanding restarting characteristics.

- **Welding Parameters**
  - Current: AC or DC either polarity (electrode+ or -)

- **Technical Data:**
  - Tensile Strength as welded: up to 80,000 PSI
  - Yield Strength: up to 68,000 PSI
  - Elongation: approx 24%

**Procedure:**
Remove as much foreign material as practical from the weld area. DC reverse polarity (electrode +) produces deep penetration; DC straight polarity (electrode -) will have shallow penetration and a flatter bead. AC prevents arc blow. A medium arc length should be maintained with either stringer or weave beads. Slag is easily removed with a light chipping hammer.

**HPP 160 ALSO AVAILABLE IN:**
- Mild Steel Mig: .030, .035, .045,
- Mild Steel Tig: 1/16”, 3/32”
**GENERAL CHARACTERISTICS**
All position, low hydrogen iron powder type electrode with a fast and efficient metal transfer. Deposits have outstanding elongation and ductility and provide crack free welds under highly stressed conditions. The slag is easily removed from the smooth welds, which are easily machined.

**TYPICAL APPLICATIONS:** HPP 164 is designed to weld low alloy high strength steels such as T-1, Hy-80, Hy-90, Hy-100, SSS 100 and JAlloy 90 and 100. Commonly used to fabricate tanks, containers, covers and high strength pipe. Also recommended for welding low alloy steels containing nickel, manganese, molybdenum, and chromium such as I-beams, angle iron, scaffolding, and super-structures. Weldments can be used “as welded” or “stress relieved”.

- **Welding Parameters**
<table>
<thead>
<tr>
<th>Diameter</th>
<th>3/32”</th>
<th>1/8”</th>
<th>5/32”</th>
<th>3/16”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>70-120</td>
<td>100-150</td>
<td>120-210</td>
<td>200-275</td>
</tr>
<tr>
<td>Current..</td>
<td>AC or DC reverse polarity (electrode+)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Technical Data:**
  - Tensile Strength as welded.................up to 113,000 PSI
  - Yield Strength..................................up to 104,000 PSI
  - Elongation........................................approx 23%

**Procedure:** No preheat is necessary when welding low carbon steels. When joining heavy sections to thin sections and when low alloy or higher carbon steels are welded, a preheat of 400°F to 600°F (200°C-300°C) is recommended. Maintain a short arc with either stringer or weave beads. Allow deposit to cool normally before chipping off slag. To stress relieve, heat to 1025°F (550°C) and maintain for 1 hour.

**HPP 164 ALSO AVAILABLE IN:**
- High Strength Flux Cored Mig .045, 1/16, 5/64
HPP165 is a high tensile strength ferritic electrode. This high quality, all position low amperage electrode features rapid deposition. Deposits have good ductility, are dense, crack-free and of x-ray quality. HPP165 is excellent for steels sensitive to cracking when welded with conventional mild steel electrodes.

TYPICAL APPLICATIONS: For "tramp" and "problem" steels high in sulphur, phosphorus or other elements added to improve the machinability of steel. For fabrication of "H" and "I" beams, angle and channel iron, pipelines and all other steel structures. For circular tube to plate welds and other type joints subject to stress and strain.

- **Welding Parameters**
  - Diameter: 3/32" 1/8" 5/32" 3/16" 1/4"
  - Amperage: 60-100 110-150 140-200 220-280 300-375
  - Current: AC or DC Reverse Polarity (electrode+)
  - Tensile strength: up to 80,000 PSI

- **Procedure:**
  - Area to be welded should be cleaned thoroughly. Surface contamination must be removed and beveled or chamfer where required. Maintain close arc length. Vertical joints should be welded from bottom up, using rapid weave technique. Do not whip. Use drag technique to make horizontal fillet welds. Slag is easily removed.

HPP168 has a special violet colored flux that establishes immediate recognition.

TYPICAL APPLICATIONS: For joining common steels where extra strength is required in the weld.

- **Welding Parameters**
  - Diameter: 3/32" 1/8" 5/32"
  - Amperage: 60-80 70-110 120-150
  - Current: AC or DC Reverse Polarity (electrode+)
  - Welding Positions: Flat, Vertical up, Vertical down, Horizontal, Overhead

- **Technical Data**
  - Tensile strength: 97,000 PSI
  - Yield strength: 78,000 PSI
  - Elongation: approx. 17%
HPP 166

**LO-HYDRO**

PREMIUM QUALITY, LOW-HYDROGEN ELECTRODE WITH MOISTURE GUARD COATING. FOR X-RAY QUALITY WELDS ON CONSTRUCTION STEELS

**GENERAL CHARACTERISTICS**

HPP 166 is a premium quality, iron powder low-hydrogen electrode designed for joining construction grade and problem steels. Product features a moisture guard coating to minimize hydrogen embrittlement and underbead cracking. Weldability is excellent on both AC or DC reverse polarity. The first choice for x-ray quality welds featuring high impact resistance.

**TYPICAL APPLICATIONS:** Used primarily on carbon and medium tensile steels, especially under conditions of restraint. Excellent for high sulphur and “tramp” steels. Used extensively on construction grades, for shipbuilding, pipelines, boiler plate, cast steel and cryogenic grades.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>3/32”</th>
<th>1/8”</th>
<th>5/32”</th>
<th>3/16”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>60-100</td>
<td>110-150</td>
<td>140-200</td>
<td>220-280</td>
</tr>
<tr>
<td>Current</td>
<td>AC or DC reverse polarity (electrode+)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Technical Data:**
  
  Tensile Strength as welded.................up to 76,000 PSI
  Yield Strength........................................up to 69,000 PSI
  Elongation ........................................approx. 31-33%
  Reduction in Area.................................75-80%

**Procedure:** Area to be welded should be clean and free of surface contamination such as rust, scale, grease, etc. On DC, use reverse polarity (electrode +). Preheat of 300°F – 450°F should be employed with heavy sections and hardenable grades of base metal. For x-ray quality, maintain a short arc gap. On vertical welds, start at bottom and weave slightly while pausing at the edges. For root passes, set a minimum gap (3/32” for 1/8” electrodes) and run stringer beads. For fill and cover passes, a weaving technique is best employed.
GENERAL CHARACTERISTICS
Because maintenance shops often have old or inexpensive welding equipment, HPP150 has been formulated to provide the best possible arc stability, even under adverse conditions. It is amazingly stable on low, open circuit voltages, AC buzz box welding machines. The weld metal transfer is especially smooth and there is almost no spatter. Arc restrike is instantaneous. We have even managed to make the slag virtually self-releasing. It is without a doubt the best possible product to use on unknown steels and dissimilar metal combinations.

TYPICAL APPLICATIONS: Due to its exceptional strength and crack resistance, it is ideal for repairing tools, dies, spring steel, and any dissimilar metal combinations, with the exception of the aluminum and copper alloys. Because the weld metal is so tough, it is recommended for repairing worn parts, and also as an underlayment for hardfacing. Because of its low amperage requirements and exceptional ease of its use, it is the first choice for both home hobbyists and maintenance welders.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>1/16”</th>
<th>3/32”</th>
<th>1/8”</th>
<th>5/32”</th>
<th>3/16”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>25-35</td>
<td>35-70</td>
<td>60-110</td>
<td>75-140</td>
<td>130-200</td>
</tr>
<tr>
<td>Current</td>
<td>.................DC Reverse Polarity (electrode+)</td>
<td></td>
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</tbody>
</table>

- **Technical Data:**
  
  Tensile Strength as welded.................up to 128,000 PSI  
  work hardened.......................up to 186,000 PSI  
  Yield Strength....................................up to 90,000 PSI  
  Elongation......................................approx 32%  
  Hardness........................................320 (BHN)

Procedure: The area in which the weld is to be made should be free of rust, grease, paint and other materials which cause weld contamination. A 90° vee should be used when joining heavy sections. High carbon steels should be preheated to 350°F(177°C). The interpass temperature should be kept below 500°F (260°C). Alignment should be maintained by the use of fixtures, tack welds, or other types of mechanical support. Maintain a short arc length and use stringer beads. Avoid weaving whenever possible.
GENERAL CHARACTERISTICS
A low heat input electrode designed to produce the highest tensile welds. It can be used in all positions to produce smooth, porosity free welds without undercut or spatter.

TYPICAL APPLICATIONS: Welding of low, medium, and high alloy steels requiring the highest strength and quality. Ideal for repair of tools, dies, springs, carbon steels, stainless steels, pressure vessels, aircraft steels, vanadium-moly spring steels and as an underlayment or pad prior to applying hard-facing alloys. Commonly used for joining stainless steels of unknown analysis and these steels to carbon steels. Also used for rebuilding shafts and blades used in the chemical, construction and mining industries, and for broken stud removal.

- **Welding Parameters**
  - Diameter: 1/16” 3/32” 1/8” 5/32” 3/16”
  - Amperage: 30-40 40-80 65-120 90-150 140-220
  - Current: AC or DC Reverse Polarity (electrode+)

- **Technical Data:**
  - Tensile Strength as welded: up to 120,000 PSI
  - Work hardened: up to 180,000 PSI
  - Yield Strength: up to 90,000 PSI
  - Elongation: approx 28%
  - Hardness: 300 (BHN)

**Procedure:** Prepare joint area by removing foreign material. Bevel heavy sections to form a 90° vee. Preheat high carbon steels to 400°F (204°C). Use jigs, fixtures and tack welds to maintain alignment. Hold a short arc. Stringer beads are preferred to prevent overheating. Allow to cool before removing slag. Deposits will take a high polish when subjected to wear.

**HPP 151 ALSO AVAILABLE IN:**
- Dissimilar Steel Mig .035, .045,
- Dissimilar Steel Tig 1/16, 1/8, 3/32
**HPP 101**

**GENERAL CHARACTERISTICS**
Finest Out of Position Welding Alloy. HPP 101 has superior restrike that reduces electrode stub loss. No special welding techniques are required. X-ray quality weld deposits. HPP101 has a high Molyebdenum content for corrosion resistance.

**TYPICAL APPLICATIONS:** Ideal for welding 204,304,304L ,316,316L and other common grades of austenitic stainless steel. Perfect for extra low carbon versions. Other applications include: Food processing equipment, stainless piping, thin installations and corrosive chemical handling.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>3/32”</th>
<th>1/8”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>50-75</td>
<td>70-90</td>
</tr>
<tr>
<td>Current</td>
<td>DC Reverse Polarity (electrode+)</td>
<td></td>
</tr>
</tbody>
</table>

- **Technical Data:**
  
  | Tensile Strength | 84,000 PSI |
  | Elongation       | 40% |

**Procedure:** Welding in vertical down position, maintain a tight arc and tip the electrode 10 degrees in the direction of travel. Straight stringer beads will yield the best results.

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**HPP 102**

**GENERAL CHARACTERISTICS**
Stainless steel electrode for vertical down welding of austenitic stainless steel. Resistant to intergranular corrosion.

**TYPICAL APPLICATIONS:** Vertical down welding for pipe lines, sheet metal and other applications where excellent weldability is needed.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>3/32”</th>
<th>1/8”</th>
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</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>50-75</td>
<td>85-105</td>
</tr>
<tr>
<td>Current</td>
<td>AC OR DC Reverse Polarity (electrode+)</td>
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</tr>
</tbody>
</table>

- **Technical Data:**
  
  | Tensile Strength | up to 73,000 PSI |
  | Elongation       | 40% |

**Procedure:** Remove foreign material and unsound metal from surface to be welded. Deposit must be applied as stringer beads. Prevent excessive heat build-up and allow part to cool slowly.
**STAINLESS STEEL**

**SPECIAL LOW CARBON ELECTRODE**

**FOR MOLYBDENUM-BEARING STAINLESS STEELS**

**GENERAL CHARACTERISTICS**

All position electrode that deposits a fast, smooth, corrosion resistant weld without spatter. The special coating produces a slag, which provides excellent protection to the weld deposit, yet is very easy to remove after slight cooling. The low carbon content prevents carbides from being formed at the grain boundaries and resultant intergranular corrosion.

**TYPICAL APPLICATIONS:** Welding 302, 304, 308, 316L Stainless steels. Fabricating and repair of standard and low carbon, molybdenum-bearing, austenitic stainless steels. Commonly used to weld tanks, pipes, fittings, etc. in chemical plants and paper mills. Also used by the food, dairy and distillery industries. Ideal as a protective overlay, for steel that must resist corrosion.

- **Welding Parameters**
  
  Diameter: 3/32"  1/8"  
  Amperage: 40-90  75-120  
  Current: AC or DC Reverse Polarity (electrode+)

- **Technical Data:**
  
  Tensile Strength: up to 100,000 PSI  
  Yield Strength: up to 65,000 PSI  
  Elongation: approx 40%  
  Corrosion Resistance: very good

**Procedure:** Thoroughly clean weld area of all foreign material. A 60° bevel should be used when butt welding parts 3/16" (5.0mm) and heavier. Do not preheat. Tack parts to maintain alignment. Hold a medium short arc with electrode tilted 15° in the direction of travel. Prevent excessive heat build-up during welding operations. Remove slag between passes. Allow to cool slowly.

**HPP 103 ALSO AVAILABLE IN:**

Stainless Steel Mig .035  
Stainless Steel Tig 1/16, 1/8, 3/32
**GENERAL CHARACTERISTICS**
Unique flux coating on alloyed core wire produces dense, strong, crack-resistant welds on all types of cast iron. Especially good for contaminated, old, oil-soaked, dirty base metal. Also recommended for joining cast iron to steel. Use on gray, ductile, Meehanite and nodular cast iron. Deposits are machinable.

**TYPICAL APPLICATIONS:** Use on sewer pipe, machine bases, transmission or gear housings, sprockets, repair of or build-up on gears and any repair of cast iron to steel.

- **Welding Parameters**
  - Diameter: 3/32” 1/8” 5/32” 3/16”
  - Amperage: 40-70 70-110 90-130 110-170
  - Current: AC or DC reverse polarity (electrode+)

- **Technical Data:**
  - Tensile Strength: up to 75,000 PSI
  - Hardness: 210 (BHN)

**Procedure:** On heavy sections, remove worn, cracked metal and bevel joint using a grinding wheel. When repairing cracks, drill “stop” holes at either end to prevent spreading while welding. On very heavy sections, preheat to approximately 400°F. Use short stringer beads for root pass and peen lightly after removing slag. Use a short to medium arc and the lowest amperage possible to minimize base metal over-heating. When breaking arc, always back whip into weld crater. Weaving two times rod diameter is acceptable for cover beads on multi-pass work. Weld joints should be allowed to cool slowly for maximum strength and machinability.

**HPP 310 ALSO AVAILABLE IN:**
- Premium Cast Iron Mig .035, .045
**GENERAL CHARACTERISTICS**
Specially formulated coating gives a pulsed arc for low temperature welding of cast irons. When properly applied the arc will penetrate surface skin and contaminants to produce a porosity free weld. The heat affected zone is not hardened and stress cracks are almost always avoided.

**TYPICAL APPLICATIONS:** Low temperature welding of cast iron in all positions. Repair breaks and cracks in engine blocks, gear housings and machine bases. Ideal for filling holes and building up worn or missing sections which must be machined to final dimension after welding. Also for joining cast iron to steel, iron, stainless steel, etc.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>3/32”</th>
<th>1/8”</th>
<th>5/32”</th>
<th>3/16”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>30-70</td>
<td>55-110</td>
<td>75-135</td>
<td>100-175</td>
</tr>
</tbody>
</table>
  
  Current .................... AC or DC straight polarity (electrode-)

- **Technical Data:**
  
  | Tensile Strength .................... up to 50,000 PSI |
  | Hardness ................................ 160 (BHN) |
  | Color Match ............................ similar to cast iron |

**Procedure:** Clean weld area if possible. Bevel joint to form a “U” Groove. A hole should be drilled at each end of all cracks to prevent spreading during welding. Select lowest possible amperage. Maintain a medium long arc with electrode tilted slightly in the direction of travel. Short stringer beads or narrow weave beads should be used to prevent excessive heat build-up. When breaking a the arc always fill the crater and drag rod back over the weld deposit. Peening while still hot will help reduce stresses. When restriking the arc start on previously deposited weld metal, not the base material. Allow part to cool slowly.
GENERAL CHARACTERISTICS

- Reduce repair and down time. Easiest method of removing failed welds and metal removal.
- Extremely controllable arc. Simple technique to learn. Use on standard arc welder – doesn’t require air.
- Noise and smoke reduction compared to arc air system.

TYPICAL APPLICATIONS:
Removes all types of metal. Easily removes hardsurfacing. Quickly gouges cracks to be welded. Pierce holes quickly. Absolutely essential for cast iron repair preparation, it leaves a u-shaped groove to avoid notch sensitivity, seals the porous cast iron surface for optimum adhesion and aids in pre-heating the base metal in the weld area.

- **Welding Parameters**
  
<table>
<thead>
<tr>
<th>Diameter</th>
<th>1/8</th>
<th>5/32</th>
<th>3/32</th>
<th>3/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage</td>
<td>200 – 250</td>
<td>220 – 330</td>
<td>100 – 170</td>
<td>300 – 450</td>
</tr>
</tbody>
</table>

  Recommended Current: AC or DC Straight Polarity (electrode -)
  WELD POSITIONS: Flat, Vertical up, Vertical down, Horizontal, Overhead

- **Procedures**: Hold electrode nearly flat to metal surface. Initiate arc and use a quick push motion to blast the molten metal away from your line of travel. Limit depth on any one pass to one half the diameter of the electrode.
**HPP 220**

**PREMIUM TOOL STEEL**

**ELECTRODE FOR REPAIR AND HARD-FACING OF “HIGH SPEED” AND “HOT WORKING” STEELS**

**GENERAL CHARACTERISTICS**

This electrode is specially formulated for use on high speed and hot working steels. Tungsten, molybdenum and vanadium have been alloyed with other elements to produce a deposit that will maintain a sharp edge on high speed tools yet can withstand elevated temperatures that are normally encountered with these tools. When applied to hot working tools, the deposit will retain its hardness and resistance to wear at high operating temperatures.

**TYPICAL APPLICATIONS:** Build-up and hard-facing of molding plates, mandrels, hot shears, reamers, turning and planning tools, drawing mandrels and dies, circle cutting tools, trimming plates, stencils, punches, cams, lathe tools, mill cutters and sliding surfaces.

- **Welding Parameters**
  - Diameter: 3/32” 1/8”
  - Amperage: 45-90 80-120
  - Current: AC or DC either polarity (electrode+ or -)

- **Technical Data:**
  - Hardness as welded: 58-62 RC
  - Hardness heat treated: 63-65 RC
  - Hot Hardness: approx. 56 RC at 1100°F (600°C)

**Procedure:** Remove all foreign material from weld area. When the base metal is tool steel, preheat part to 800-1100°F (425-600°C); maintain this temperature during the entire welding operation. No preheat is required when making deposits on low carbon steel but a minimum of 3 layers is necessary to overcome dilution. Do not quench after welding, remove slag and reheat to 1000°F (540°C), allow to cool slowly. The deposit can then be ground to final dimension.

**HPP 220 ALSO AVAILABLE IN:**

- Premium Tool Steel Mig -- Flux Core .045, 1/16, 7/64
- Premium Tool Steel Mig -- Metal Core .045, 1/16
HPP 221

SEVERE IMPACT HARD-FACING
JOINING AND BUILD-UP ALLOY FOR SEVERE IMPACT AND COMPRESSION RESISTANCE

GENERAL CHARACTERISTICS
HPP 221 is a tough, high-strength electrode for use where high impact and high compression strength is needed. Weldable in all positions. HPP 221 applies easily with minimum spatter loss. The non-popping slag is easily removed. Deposits are nonmagnetic and can be flame-cut or forged.

TYPICAL APPLICATIONS: Excellent for manganese or manganese-to-steel applications. Specially formulated for use on railroad industry. Additionally, it's good compressive strength makes it ideal as build-up prior to hard-facing. Also excellent for high impact situations like crusher roll build-up, crusher jaws, hammer mill hammers, bucket teeth, etc. No limit to deposit thickness

- **Welding Parameters**
  
  Diameter  
  5/32”  3/16”  1/4”
  Amperage  
  125-170  160-225  225-390
  Current……………………AC or DC either polarity (electrode+ or -)

- **Technical Data:**
  
  Tensile Strength………………………………………………..up to 116,000 PSI
  Hardness (as welded)………………………………………..83-91 RB
  Hardness (as work hardened)……………………………..42-47 RC
  Elongation………………………………………………..38%
  Machinability………………………………………………with carbide tools
  Forgeability………………………………………………..Yes

**Procedure:** Remove all dirt, grease and surface scale. Use suggested amperage to get proper weld shape. Keep weld interpass temperature as low as possible; do not exceed 500°F (260°C).
**GENERAL CHARACTERISTICS**
This high chromium, high manganese alloy is for joining and rebuilding manganese and carbon steel parts. The high alloy deposits are very tough and will take extreme impact and abrasion conditions. Has excellent weldability with very low spatter. Operates easily in all positions.

**TYPICAL APPLICATIONS:** For rebuilding and joining austenitic manganese steels and manganese steels to other steel combinations. Especially designed for high impact applications such as rail frogs and switch points, roller crushers, hammers, shovel tracks. HPP 222 is also excellent for use as a base for harder overlays.

- **Welding Parameters**
  - Diameter: 1/8”, 5/32”, 3/16”
  - Amperage: 110-135, 125-190, 150-250
  - Current: AC or DC reverse polarity (electrode+)

- **Technical Data:**
  - Hardness (as deposited): 16-19 RC
  - Hardness (as work hardened): 48 RC

**Procedure:** Deposits may be placed with either the stringer bead or weaving technique. This electrode deposits easily in all positions with excellent build-up quality. Avoid over-heating on manganese steel base metals. Deposits work harden rapidly.

**HPP 222 ALSO AVAILABLE IN:**
High Impact Build-up Mig .045, 1/16, 7/64
**GENERAL CHARACTERISTICS**
High deposition rate electrode that produces smooth beads and in most cases the slag comes off by itself. The arc is easily controlled and prevents excessive dilution with the base metal. The high chromium content of these electrodes makes the weld deposits maintain their resistance even at elevated temperatures.

**TYPICAL APPLICATIONS:** Parts subjected to severe abrasion as well as light impact such as equipment for processing soil, rock, coal, cement, grinding plates, dredger teeth, conveyor screws, coal augers, agitators, earth augers and scrapers. Also, for surfaces that must resist abrasion combined with scaling such as open-hearth tools, grates, conveying chains in annealing furnaces and manipulators.

- **Welding Parameters**
  - **Diameter**
    - 1/8”
    - 5/32”
    - 3/16”
  - **Amperage**
    - 80-125
    - 100-160
    - 125-190
  - **Current**
    - AC or DC reverse polarity (electrode+)

- **Technical Data:**
  - Hardness (as welded)…………………………..56-60 RC

**Procedure:** Remove foreign material and unsound metal from surface to be welded. For best results and long service life an elastic cushion layer of HPP 222 should be applied to the part before surfacing with this electrode. When making the final surface with HPP 224 keep electrode vertical to the work piece and maintain a short arc. Deposits must be kept thin, never more than two layers thick. To prevent excessive local heat build up in the part, alternate welding area. Allow part to cool slowly.
HPP 225M

GENERAL CHARACTERISTICS

HPP225M is an outstanding **Open Arc Wire**. HPP225M deposits are excellent work hardening high chromium austenitic manganese steel alloys. It can be used for build-up or overlay on manganese steel, carbon and low alloy steels. It can also join austenitic manganese steel to carbon steel and low alloy steel. Deposits are very tough and work harden rapidly under high impact.

**TYPICAL APPLICATIONS:** Crusher rolls & cones, hammer mill hammers, impactor bars, railroad frogs & crossings.

- **Welding Parameters**
  - Diameter: 0.045” 1/16” 7/64”
  - Amperage: 145-195 150-275 175-500
  - Voltage: 18 – 24 25 – 28 28-32
  - Shielding Gas: None None None
  - Wire Extension: 1/2” – 3/4” 3/4” – 1 ¼” 1” – 1 ½”
  - Current: DC Reverse Polarity (electrode+)

- **Technical Data**
  - Deposit Layers: Multiple
  - Hardness as Deposit: RC 18-23
  - Work Hardened: HRC 50-55
  - Impact Resistance: High
  - Abrasive Resistance: Fair
  - Surface Cross Check: None
  - Flame Cut: No
  - Machinability: Poor

HPP 226M

SEVERE ABRASION & IMPACT

GENERAL CHARACTERISTICS

Deposit of HPP226M is a medium chromium carbide surfacing alloy. It has excellent combination of abrasion resistance and impact resistance properties. The weld metal has high toughness and less stress relief check cracks.

**TYPICAL APPLICATIONS:** Cone crusher bowls & mantles, hammer mill hammers, grader blades & roll crushers

- **Welding Parameters**
  - Diameter: 0.045” 1/16” 7/64”
  - Amperage: 150 - 200 175 – 350 300-700
  - Voltage: 24 – 28 30-36
  - Shielding Gas: Open arc wire or CO₂
  - Wire Extension: 1/2” – ¾” ½” – 1” 1” – 1 ½”
  - Current: DC Reverse Polarity (electrode+)

- **Technical Data**
  - Hardness (two layers): RC 40 – 45
  - Abrasion Resistance: Outstanding
  - Impact Strength: Good
  - Deposits: Grinding only
  - Machinability: Grinding only
  - Deposit cross check: yes
  - Thickness: 2 – 3 layers recommended

* (Multiple layers with proper procedures)
**HPP 251**

**IMPACT & ABRASION HARD-FACING**

**SEVERE ABRASION RESISTANCE**

**MEDIUM IMPACT RESISTANCE**

**GOOD OXIDATION RESISTANCE**

**SPECIAL CHARACTERISTICS**

- All position
- Ac/DC Operation
- Low Dilution
- Moisture resistant Coating
- High Deposition
- Low Heat Input
- High Efficiency
- Requires Low Amperage

**GENERAL CHARACTERISTICS**

HPP251 tubular hardfacing electrode is designed for use on cast irons, manganese steels, low alloy and carbon steels. Resistant to high abrasive wear and small particle abrasion. Use for applications where impact as well as abrasion are encountered.

**TYPICAL APPLICATIONS:** Use for severe abrasion and medium impact. This alloy has good hot harness up to 1000°F. Designed for crusher tools, jaw crushers, crusher mantles and liners, hammer mill hammers, bucket teeth and edges. Low amperage requirements result in low dilution and higher hardness.

- **Technical Data:**
  - Diameter: 1/4”, 3/8”, 1/2”
  - Amperage: 85-135, 130-190, 200-430
  - Current: AC or DC either polarity (electrode + or -)
  - Hardness as welded: RC 55-60

**Procedure:** Remove fatigued or unsound metal. No preheat is necessary on carbon steels or cast irons.

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**HPP 252**

**HIGH CHROME CARBIDE HARD-FACING**

**HIGH RESISTANCE TO SEVERE ABRASION FROM FINE PARTICLES,**

**CONTAINS CARBIDES IN AUSTENITIC MATRIX**

**SPECIAL CHARACTERISTICS**

- All position
- Ac/DC Operation
- Low Dilution
- Moisture resistant Coating
- High Deposition
- Low Heat Input
- High Efficiency
- Requires Low Amperage

**GENERAL CHARACTERISTICS**

HPP252 Tubular hardfacing electrode is designed to hardsurface all steels and iron subjected to severe abrasion. Excellent for fine particle abrasion. Deposits take on a high polish in service.

**TYPICAL APPLICATIONS:** Use for parts subjected to severe abrasion such as brick extrusion augers, muller plows, pan scraper blades, bulldozer end bits, conveyor chains in annealing furnaces and other equipment used in rock, coal, cement and ceramic industry where small particle abrasion is a problem.

- **Technical Data:**
  - Diameter: 1/4”, 3/8”, 1/2”
  - Amperage: 85-135, 130-190, 200-430
  - Current: AC or DC either polarity (electrode + or -)
  - Hardness as welded: RC 55-60

**Procedure:** Remove fatigued or unsound metal. A padding may be used when a thick build up is needed. No preheat is necessary on carbon steels or cast irons.

**HPP 252 ALSO AVAILABLE IN:**

High Chrome Carbide H.F. Mig .045, 1/16
HPP 253

HIGH TEMP ABRASION HARD-FACING
ULTIMATE ELECTRODE FOR ABRASION, IMPACT AND HEAT RESISTANCE IN SEVERE ENVIRONMENTS

SPECIAL CHARACTERISTICS
* All position
* AC/DC Operation
* Low Dilution

SEVERE ENVIRONMENTS
* Moisture resistant Coating
* High Deposition
* Low Heat Input
* High Efficiency
* Requires Low Amperage

GENERAL CHARACTERISTICS
HPP253 weld metal is composed of complex carbides of chromium, tungsten, molybdenum, columbium and vanadium. This results in a deposit highly resistant to fine particle abrasion and erosion at temperatures up to 1500°F.

TYPICAL APPLICATIONS: Conveyors for hot coke, slag and cement. Kiln grates, crushers and other equipment subjected to abrasion and erosion at elevated temperatures. Very good for extreme abrasion with impact such as crusher cones and mantles in taconite crushing operations. Excellent for feed chutes handling hot abrasive materials.

- Technical Data:
  Diameter
  Amperage
  Current
  Matrix Hardness
  Carbide Hardness

Procedure: Remove all foreign material, fatigued and unsound material. Do not deposit more than two layers of HPP253.

HPP 254

GENERAL CHARACTERISTICS
A coated tubular electrode with vanadium carbides in a tough matrix. The unique feature of vanadium carbide is that it will dissolve during welding and will reform upon solidification. Deposit contains vanadium carbide, which is close to the wear resistance of tungsten carbide. Ideal for components subject to extreme earth abrasion.

TYPICAL APPLICATIONS:
Scrapping, cutting, digging and handling of highly abrasive earth-like materials. Examples are: dredge cutter blades, augers, conveyor flights, scraper blades and tool joints.

Welding Parameters:
Diameter
Amperage
Current

Technical Data:
Abrasion Resistance
Impact Strength
Machinability
Thickness
Deposit cross check

HPP 254 also available in:
Vanrode Mig  1/16, 3/32, 7/64
**GENERAL CHARACTERISTICS**

HPP 673 is an unique electrode for arc welding or brazing aluminum and aluminum alloys. Welds are strong, dense and free of porosity on both production and maintenance applications. Arc is exceptionally stable, operates at low amps with a minimum of spatter and fuming. Weld deposits have good color match and corrosion resistance. Ideal for welding heat-treated aluminum parts. Ideal for outdoor use when Mig and Tig is often not suitable. Slag is virtually self-releasing. May be also used as a brazing rod with oxy-acetylene torch.

**TYPICAL APPLICATIONS:** Reparing of automotive, truck and bus parts. Also for tanks, pipes, ladders, shelves, refrigeration equipment, foundry patterns and many other aluminum parts. Suitable for 1100, 3003, 6061, 6062, 6063, 5052 types of aluminum and many other types.

- **Welding Parameters**
  - Diameter: 3/32” 1/8” 5/32”
  - Amperage: 50-80 80-130 100-160
  - Current: DC Reverse Polarity (electrode+)

- **Technical Data:**
  - Tensile Strength: up to 34,000 PSI
  - Elongation: approx 20%
  - Hardness: 40-55 (BHN)

**Procedure:** Thoroughly clean weld area of all foreign material, including oil, lubricants and grease. A 70° – 90° bevel should be used when butt welding base materials 1/8” or thicker. No preheat is necessary on thin gauge material. However, flatter, smoother welds are produced on heavier sections if they are preheated to approximately 400°F. Hold electrode vertical to the work piece and maintain short arc length. Stringer beads should be used. Remove slag between passes. Restart arc on existing weld deposits. Allow part to cool slowly. Chip off all slag before quenching. For complete slag removal use a wire brush with a 10% sulfuric acid and hot water solution. Rinse with clean hot water.

**HPP 673 ALSO AVAILABLE IN:**

- High Performance Mig .030, .035, .045, 3/64
- High Performance Tig 1/16, 1/8, 3/32
**GENERAL CHARACTERISTICS**
Smooth, stable arc on both AC or DC machines. Minimum spatter and good slag removal.

**TYPICAL APPLICATIONS**: Use for welding silicon bronze, copper, malleable iron. A good choice for welding steel to cast iron, dirty or burned cast iron and malleable iron. Has many uses for repair of gears and sprockets on farm implements.

- **Welding Parameters**
  - Diameter: 1/8”
  - Amperage: 75-115
  - Current: AC or DC Reverse polarity (electrode +)
  - Tensile strength: up to 65,000 PSI
  - Hardness: 80-100 (BHN)

- **Procedure:**
  Weld area should be clean as possible. Heavy sections should be beveled using HPP 401 or grinder. Preheat to 400°F for best results. Each pass should be thoroughly cleaned. Slag entrapment should be avoided. Peening of the deposit will increase its strength and reduce internal stress.

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**GENERAL CHARACTERISTICS**
Smooth running high purity copper electrode designed for both overlay and fabrication of conventional grades of copper and copper alloys.

**TYPICAL APPLICATIONS**: For surfacing, build-up and fabricate electrolytic and deoxidized copper parts. Ideal for applications requiring high corrosion resistance, thermal and electrical conductivity. Also commonly used to copper clad steel and cast iron, especially heavy sections.

- **Welding Parameters**
  - Diameter: 1/8”, 5/32”, 3/16”
  - Amperage: 100-130, 140-170, 170-200
  - Current: AC or DC Reverse Polarity (electrode +)

- **Technical Data**
  - Tensile strength: up to 31,000 PSI
  - Elongation: approx 35%
  - Hardness: 50-60 (BHN)
  - Corrosion Resistance: excellent
  - Electrical Conductivity: very good

- **Procedure:** Clean joint area of all oxides and other foreign material. Bevel sections which are more than 3/16” thick. Thin gauge sections do not require preheat but heavier sections require preheating to 750 –1100 degrees F. Use the largest diameter electrode possible and maintain a short arc. Allow to cool before removing slag.
**GENERAL CHARACTERISTICS**

High-alloyed bronze electrode contains aluminum, nickel, and manganese. The unique formula with flux coating makes this electrode outstanding for a wide range of applications.

**TYPICAL APPLICATIONS:** Structural joining, repair and surfacing of high manganese steel, nickel and iron-containing aluminum bronzes, steel, tin bronzes (phosphor bronze), brass and copper. Also for cast iron surfacing. Commonly used on ship propellers, turbines, valves, thrust bearings, stirrer blades, guides, suction rolls and parts of hydraulic equipment. Construction of machines, fittings, instruments and pumps for the chemical and paper industries. Dissimilar metals are also joined with this electrode.

- **Welding Parameters**
  - Diameter: 1/8” 5/32”
  - Amperage: 90-125 120-150
  - Current: DC Reverse Polarity Only (electrode +)
  - Tensile strength: up to 100,000 PSI
  - Yield strength: up to 63,000 PSI
  - Hardness: 200 (BHN)
  - Elongation: approx 20%
  - Corrosion Resistance: very good

- **Procedure:**
  - Preheat copper base metals to 570°F; do not heat other materials. Maintain a short arc. Apply thin layers using either stringer beads or weave beads. Remove slag between passes. Allow part to cool slowly. In most applications it will not be necessary to machine the surface after welding.

**HIGH PERFORMANCE BRAZE**

**ULTIMATE SILVER ALLOY FOR A WIDE RANGE OF COPPER AND COPPER ALLOY BRAZING**

**GENERAL CHARACTERISTICS**

This alloy is self-fluxing on copper to copper joints. It can be applied with the oxy/fuel torch, induction, furnace or any other suitable means of heat.

**TYPICAL APPLICATIONS:** Loose fitting joints (.003” to .006).

- **Technical Data:**
  - Diameter: 1/8”
  - Liquidus: 1465°F
  - Solidus: 1190°F
  - Brazing Range: 1300 – 1500°F

- **Procedure:** The joint should be clean and free of foreign matter. Use a slightly carburizing flame keeping the torch in motion. When the flux liquefies, add filler metal and allow it to flow throughout the joint. Remove flux residue with a wire brush and hot water.
SUPER RED BRAZE
SPECIAL MULTI-TEMP NICKEL SILVER ALLOY FOR HIGH STRENGTH JOINING AND WEAR RESISTANT BUILDUP TORCH OR INDUCTION

GENERAL CHARACTERISTICS
For general maintenance repair with the torch. At 1400°F – 1600°F the deposit has controlled fluidity which makes it ideal for surfacing and buildup of parts subjected to frictional wear. When the temperature is increased to 1650°F – 1750°F the alloy becomes very thin flowing and will product high strength joints with only .001” to .003” clearance.

TYPICAL APPLICATIONS:
1. Low temperature – overlaying and buildup of gear teeth, bearings, shafts, valve seats, wedge bars and steering knuckles.
2. High temperature – for close fitting joints on broken drills, mill cutters, furniture and bicycle assemblies, attaching carbide cutting tips and many other applications requiring high strengths.

This alloy is designed to buildup and join carbon steels, alloy steels, cast iron and many non-ferrous materials to themselves or multiple combinations.

• Welding Parameters
  Diameter  1/16”  3/32”  1/8”  3/16”

• Technical Data:
  Tensile Strength .................up to 70,000 PSI
  Hardness..............................140-200 (BHN)
  Working Temperature........1400°F-1750°F(760°C-955°C)
  Remelt temperature..........approx. 1800°F (980°C)

Procedure: Rough grind surfaces to be joined or built up. Always use a neutral flame concentrated on the base metal, not on the molten alloy. Keep torch in constant motion to prevent overheating of the local areas. When used as a joining alloy, small rods are recommended. For surfacing and build up the larger diameter rods should be used. Additional passes can be applied without the need of removing flux residue from previous passes. Allow part to cool slowly. Remove flux by chipping and wire brushing.
**ORANGE SILVER BRAZE**  
**CADMIUM FREE, PREMIUM HIGH STRENGTH, SUPER ACTIVE, FLUX COATED SILVER BRAZING ALLOY**

**GENERAL CHARACTERISTICS**  
Torch, Furnace, Induction

HPP524F has excellent wetting action on a wide range of metals, especially stainless steels and carbides. This alloy is cadmium free, non-toxic and easier to use due to the elimination of the glare in the flame. HPP524F is the most economical substitute for the higher silver alloys.

**TYPICAL APPLICATIONS:** with the absence of cadmium, HPP524F is perfect for the food and drug industries. Use it to join similar and dissimilar metals such as copper, nickel, stainless steel, brass, bronze, Inconell** and Monel**. Excellent for carbides, light gauge metals, heat treated parts and tight fitting joints. Color is silver to light yellow, similar to polished brass.

- **Technical Data:**
  - Diameter: 1/16”
  - Tensile strength: up to 73,000 PSI
  - Elongation: approx. 24%
  - Working temperature: approx. 1275°F
  - Corrosion resistance: good

- **Procedure:**
  Prepare surfaces to be joined by mechanical or chemical cleaning. Fixture parts to maintain alignment. Joint clearance should not exceed .003”. Heat parts uniformly with a slightly carburizing flame, place the flux directly on the heated joint. When the flux becomes clear and fluid, melt a small amount of alloy onto the joint and continue heating to uniformly spread the alloy through the entire joint area. DO NOT OVERHEAT THE BASE METAL. Allow the part to cool slowly, then remove flux residue with warm water.

**PINK SILVER BRAZE**  
**THE ULTIMATE HIGH SILVER BRAZING ALLOY, CADMIUM FREE, FOR JOINING FERROUS AND NON-FERROUS METALS**

**GENERAL CHARACTERISTICS**

The cadmium free, high silver content makes HPP525F the ultimate choice for joining ferrous and non-ferrous metals. Ideal for food and pharmaceutical as well as general industrial use.

**TYPICAL APPLICATIONS:** Use for joining and repairing stainless steel components, especially when color match is critical. Ideal for tubing, instruments, switches, ornamental trim and laboratory equipment. Universal alloy for general maintenance and repair.

- **Technical Data**
  - Diameter: 1/8” 3/32”
  - Tensile strength: up to 76,000 PSI
  - Elongation: approx 22%
  - Working temperature: approx 1220°F
  - Corrosion Resistance: good
  - Color match: good on stainless steel
  - Electrical Conductivity: good

- **Procedure**
  Prepare surfaces to be joined by mechanical or chemical cleaning. Fixture parts to maintain alignment. Joint clearance should not exceed .003”. Heat parts uniformly with a slightly carburizing flame, place the flux directly on the heated joint. When the flux becomes clear and fluid, melt a small amount of alloy onto the joint and continue heating to uniformly spread the alloy through the entire joint area. DO NOT OVERHEAT THE BASE METAL. Allow the part to cool slowly, then remove flux residue with warm water.
HPP 526

**GENERAL CHARACTERISTICS**
HPP 526 possesses a low brazing temperature allowing it to flow freely into narrow clearance capillary joints. Suitable for work in tight spaces. Its narrow melting range is appropriate for rapid or slow methods of heating. *This filler metal contains cadmium.*

**TYPICAL APPLICATIONS:**
It is used for joining most ferrous and non-ferrous metals except aluminum and magnesium. HPP526 has good brazing properties and is suitable either for pre-placement in the joint or for manual feeding into the joint. Joint clearances of 0.001 to 0.005” (0.0225 to 0.13mm) are recommended for proper capillary action.

- **Technical Data:**
  - Diameter: 1/16”
  - Melting Range: 1125°F
  - Density: 4.96 TO/Cu.In.
  - Identification: Blue
  - Color as brazed: Light Yellow
  - Tensile Strength: 88,000 PSI

HPP 521AC

**GENERAL CHARACTERISTICS**
High strength silver solder, free of cadmium, lead, zinc, and other impurities. It has a close color match to stainless steel. Solder joints can be readily plated and have good corrosion resistance.

**TYPICAL APPLICATIONS:** Ideal for use on stainless steel, carbon steels, nickel, nickel alloys, copper, bronze and brass, when higher strengths are required than normally found with conventional solders. Widely used in food and dairy industries and general maintenance and repair. Great for applications in the jewelry industry. Not suitable for electrical applications.

- **Technical Data:**
  - Diameter: 1/16” x 9’ coil
  - Tensile strength: up to 15,000PSI
  - Working temperature: 430°F
  - Hardness: 15 (BHN)
  - Color match: excellent on stainless steel
  - Corrosion resistance: good
  - Electrical conductivity: very good

- **Procedure:** Joint area must be clean of all foreign material. Apply solder with any heat source until flow-out is complete. After part has cooled slowly, wash flux residue off with warm water.
**USES:**
Use for all silver brazing alloys.

**TYPICAL DATA:**
Active range is 1000 degrees to 1700 degrees F.

**PROCEDURE:**
Prepare surfaces to be joined by mechanical or chemical cleaning. Fixture parts to maintain alignment. Joint clearance should not exceed .003”. Heat parts uniformly with a slightly carburizing flame. Place HPP500 directly on the heated joint. When the flux becomes clear and fluid, melt a small amount of alloy onto the joint and continue heating to uniformly spread the alloy through the entire joint area. DO NOT OVERHEAT THE BASE METAL. Allow the part to cool slowly, then remove flux residue with warm water.

**GENERAL CHARACTERISTICS**
An easy to mold compound that is used as a heat dam and insulator to protect metal and other materials from the effects of heat. The dough-like consistency of HPP89 makes it easy to mold around intricate parts. It will adhere to most surfaces making it ideal for use as a jigging fixture or insulator for parts to be welded. HPP89 will not distort or shrink when heated.

**TYPICAL APPLICATIONS:**
Can be used as a heat sink to absorb heat and avoid surface discoloration on heat sensitive parts. It can be used as a heat dam to prevent heat from traveling to areas that can be damaged by heat, such as valves, other fittings, O-rings, packing glands, glass, and paint. HPP89 is ideal to hold or position difficult to align parts. HPP89 will keep distortion down when welding on light gauge metals such as stainless steel.

- **Technical Data:**
  - Asbestos free – Does not contain any toxic elements.
  - Can be reused.
  - Maintains shape when heated.
  - Can be reconstituted using water.
  - Withstand temperature to 3000 degrees F.

- **Procedure:**
  Position each of the parts to be joined in a mound of HPP89 large enough to support its weight. Adjust the alignment as necessary before welding. For parts that need to be protected from heat, cover the area with a layer of HPP89. For high temperature applications or where heat is applied for a prolonged time, use a thicker coating. HPP89 can also be used to protect non-metallic parts along side the welding area. If moisture would be harmful to the protected area, a piece of plastic wrap should be applied first.
CHROME CARBIDE
OVERLAY WEAR PLATE

GENERAL CHARACTERISTICS:

Standard mild steel base plate with chrome carbide overlay for longer life in applications requiring high resistance against wear by abrasion along with moderate impact, providing you with extended equipment service life and less down time. Large areas can be easily hardsurfaced with the overlay wearplate with minimum labor and time.

- Single and double pass overlay is available
- Various sizes available
- Detailed information with composition and hardness is available upon request

TYPICAL APPLICATIONS:

Chrome Carbide Overlay Plates are used in many industries:

- Logging
- Quarries
- Agriculture
- Mining
- Dredging
- Papermills
- Steelworks
- Refineries
- Cement
- Powerplants
- Sawmills

Contact your Sales Rep for quotes pertaining to specific to your application
**HPP MODEL 10**

**PYROFACER TORCH**

Torch designed specifically to be used with the HPP hot spray powder alloys to perform buildup and hardsurfacing on maintenance and repair applications efficiently & economically.

*Torch includes:
#20 single orifice powder injector tip*

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### Single Orifice Powder Injector Tip Assembly

<table>
<thead>
<tr>
<th>Tip Number</th>
<th>Orifice</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6</td>
<td>.042”</td>
</tr>
<tr>
<td>#9</td>
<td>.052”</td>
</tr>
<tr>
<td>#15</td>
<td>.059”</td>
</tr>
<tr>
<td>#20</td>
<td>.073”</td>
</tr>
<tr>
<td>#40</td>
<td>.098”</td>
</tr>
<tr>
<td>#55</td>
<td>.113”</td>
</tr>
</tbody>
</table>

*Tip numbers indicate approximate flow in cu. ft. per hour of each gas.*

### Multiflame Orifice Powder Injector Tip Assembly

<table>
<thead>
<tr>
<th>Tip Number</th>
<th>Orifice</th>
</tr>
</thead>
<tbody>
<tr>
<td>#20</td>
<td>3—.040”</td>
</tr>
<tr>
<td>#40</td>
<td>7—.040”</td>
</tr>
<tr>
<td>#55</td>
<td>9—.040”</td>
</tr>
</tbody>
</table>

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**Part # | Description**
---|---
1 Torch Handle w/mixer
2 Torch Handle w/o mixer
3 Mixer only
4 Small “O” ring—mixer
5 Large “O” ring—mixer
6 Powder Hopper Assembly
7 Model 10 Hex body
8 Hopper Cap Screw
9 Powder Feed Lever
10 Valve Bar
11 Valve Bar Screw
12 Powder Feed Valve (rubber)
13 Spring
14 Pivot Pin
15 Powder Bottle
16 Injector Sub Assembly (specify size)
17 “O” ring—powder injector
18 “O” ring—powder injector
19 “O” ring—powder injector
20 Tip Coupling Nut
21 6” Tip Barrel (for #6, #9, #15, #20 Tips)
22 8” Tip Barrel (for #40 & #55 Tips)
23 Complete Tip Assembly (specify size) (for single orifice tips)
24 Tip end (copper) only (specify size) (for single orifice tips)
25 Complete Tip Assembly #20 multiflame (3—.040 orifices)
26 Complete Tip Assembly #40 multiflame (7—.040 orifices)
26a Complete Tip Assembly #40 multiflame (7—.040 orifices)
27 #20 Multiflame Tip End only
28 #40 Multiflame Tip End only
28a #55 Multiflame Tip End only
29 Adapter for #40 or #55 Multiflame Tip Ends
GENERAL CHARACTERISTICS

A self fluxing alloy powder to be used with the Model 10 Powder Torch. When sprayed with torch it makes a metallurgical bond to all steels, cast iron, nickel, iron and cobalt base alloys. The deposit can be as thin or thick as needed. It has excellent bonding characteristics to base metal without dilution, and produces machinable deposits. Provides an excellent cushion layer for thick build up followed by hardfacing spray deposits.

Powder spraying would be used to fill casting defects, repair gouged or damaged surfaces, cracks, broken edges, etc. Excellent results for cast iron applications. Deposits can be fully machinable, filed, ground or polished to a shine. Provides excellent ductility and has a high wear resistance deposit for longer service life.

TYPICAL APPLICATIONS:

- Hydraulic Rams
- Cast iron molds
- Screw Conveyors
- Cylinders
- Feed Rolls
- Blades
- Crank Cases
- Shafts
- Dies
- Cams
- Tools
- Augers
- Keyways
- Auto Parts
- Agricultural Parts
- Motor Housings
- Gears & Sprockets

• Technical Data:

Deposit Hardness:

<table>
<thead>
<tr>
<th>Hardness</th>
<th>Powder Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB 90-95</td>
<td>HPP #620</td>
</tr>
<tr>
<td>Rc 38-42</td>
<td>HPP #630</td>
</tr>
<tr>
<td>Rc 58-62</td>
<td>HPP #680</td>
</tr>
<tr>
<td>Rc 68-72</td>
<td>HPP #688</td>
</tr>
</tbody>
</table>
HPP Powders

Cold Spray Powders
635, 665, 685
606 Bond Coat

Specially formulated powders for all low temperature powder spray torches.

635 – Aluminum Bronze –
A copper based alloy powder for build-up on metal surfaces.
Excellent for coating soft bearing surfaces & provides excellent hard surface wear and friction properties.
Can be built up to thicknesses in excess of 0.250"

Technical:
Deposit Hardness – RB 65 to 75
Melting Temperature 1900 °F (1040°C)
Bonding Temperature min 200 °F over bond coat

Applications:
Soft bearing surfaces,
Worn-out or mis-machined parts
Pistons & housings, hydraulic press sleeves

665 – Nickel base inconel –
A nickel base alloy powder for build up that is machinable
Provides excellent corrosion, oxidation & friction wear.
Can be built up to thicknesses in excess of 0.125"

Technical:
Deposit Hardness – RB 75 to 83
Melting Temperature 1900 °F (1040°C)
Bonding Temperature min 200 °F over bond coat

Applications:
General purpose build-up
Crank shafts, journals, impeller shafts

685 – Chrome Nickel –
A chrome nickel base alloy powder for hard wear & cavitation resistance.
Excellent for abrasion and metal to metal wear. Deposits are grindable
Can be built up to thicknesses in excess of 0.080"

Technical:
Deposit Hardness – RC 32 to 39
Melting Temperature 1850°F (1010°C)
Bonding Temperature min 200 °F over bond coat

Applications:
Hard surface shafts
Wear plates, spindles,

606 Bond Coat – Underlayment Bonding Compound
Nickel based self bonding powder used as initial thin layer on oxide-free clean surfaces (except copper).
Provides excellent surface adhesion and bonding to the overlay cold spray powder. alloys.
Excellent for copper base alloys, low alloy steels & heat treatable alloys
Bond coat layer .004” to .010”

Technical: Bond Strength on smooth surface 3500 psi

Note: FOR ALL COLD SPRAY PROCEDURES

MAX BASE METAL TEMPERATURE – 500°
A CUT ABOVE THE REST

ADVANTAGE WHEELS Type 27 Hard Steel

Depressed Center Wheels
Type 27 - Depressed Center Wheels are available with either 7/8" conventional arbor holes or 5/8"-11 threaded arbor Quick-Spin type as an integral part of the wheel. The wide flat area of contact serves as a guide to prevent digging into flat surfaces.

- HPP 7-224 — 4 1/2 x 1/4 x 7/8
- HPP 7-324 — 4 1/2 x 1/4 x 7/8 with hub


Small Diameter Cut-Off Wheels
Small Diameter Cut-Off Wheels are reinforced with multiple layers of fiberglass. They are able to withstand severe peripheral, side, and wedge stresses. This assures maximum safety even where joining, slotting, notching, or cutoff work would normally create a hazard.

- HPP 7-102 — 3 x .035 x 3/8
- HPP 7-413 — 3 x 1/16 x 3/8

Applications: Decking, Light Gauge Metals, Metal Studding, Metal Tubing

HPP 3044
1/16"-1/2" by 64ths 29Pc 135sp
Heavy Duty Job Lgth Drill Set

Heavy Duty sets are gold surface treated for lubricity. Made of M2 tool steel and cobalt. Cut Flute design for all sets. Packaged in a durable case with a locking cover.

Individual Bits and Silver & Deming Style available also.