

# Hardfacing Wires

## Hardfacing Wires Product Line

### Build-Up

Restoring worn parts to their original dimensions

	Open-Arc Tubular Wires	Gas-Shielded Tubular Wires	
	Tube-Alloy Build Up-O* Tube-Alloy AP-O* Tube-Alloy 218-O* Tube-Alloy 219-O Tube-Alloy 242-O	Tube-Alloy Build Up-G* VertiWear AP*	

### Overlay

Providing additional resistance to wear

Application	Open-Arc Tubular Wires	Gas-Shielded Tubular Wires	Metal-Cored Submerged-Arc Tubular Wires
<b>Metal to Metal</b>	Tube-Alloy Build Up-O* Tube-Alloy 258-O* ArmorWear*  Tube-Alloy 242-O	Tube-Alloy Build Up-G* Tube-Alloy 258-G*  VertiWear 600  Tube-Alloy 260-G	Tube-Alloy BU-S Tube-Alloy 258-S Tube-Alloy 252-S Tube-Alloy 242-S Tube-Alloy 242-S Mod Tube-Alloy 8620-S Tube-Alloy 810-S Tube-Alloy 861-S Tube-Alloy 868-S Tube-Alloy 877-S Tube-Alloy 852-S Tube-Alloy 954-S Tube-Alloy 252-S Tube-Alloy A2JL-S Tube-Alloy 887-S Tube-Alloy A250-S Tube-Alloy A420M-S Tube-Alloy 865-S Mod
<b>Impact</b>	Tube-Alloy AP-O* Tube-Alloy 218-O* Tube-Alloy 219-O	VertiWear AP*	
<b>Abrasion</b>	Tube-Alloy 255-O* Tube-Alloy 240-O* Tube-Alloy 258TiC-O Tube-Alloy 244-O Tube-Alloy A43-O	Tube-Alloy 255-G*	

### Special Alloys & Flux

	Open-Arc Tubular Wires	Flux	
	GP-O	MK-N	

\* BOLD items are main line products

# Hardfacing Wires

## Tube-Alloy® Build Up-O

Tube-Alloy® Build Up-O deposit is a low alloy steel. It is designed for build-up on mild and low alloy steels only. The weld metals have good compressive strength and impact resistance, making it an excellent base for more abrasion-resistant alloys. The deposit has excellent resistance to cracking, even in multiple layers, and is within the machinable range.

### Typical Applications

- bucket teeth & lips
- crane wheels
- dragline buckets
- dragline chain
- dredge ladder rolls
- gear teeth
- kiln trunnion
- mine car wheels
- spindles
- steel shafts
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.12
Manganese .....	2.80
Silicon .....	0.80
Chromium .....	1.20
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair	
Impact Resistance	Very Good	
Machinability	Excellent	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	4130 Steel
1	30	36
2	28	30
3	25	26

Can be flame cut  
Magnetic  
Heat Treatable

### Diameter and Polarity

.045"  
1/16"  
7/64"  
DCEP

## Tube-Alloy® 218-O

Tube-Alloy® 218-O is a work hardening austenitic manganese steel alloy. It can be used for build-up or overlay on austenitic manganese steel only. It can also be used for joining austenitic manganese steel to manganese steel. Deposits are extremely tough and work harden rapidly under high impact.

### Typical Applications

- bucket teeth
- crusher jaws & cones
- dredge pump casings
- gyratory crusher mantles & cones
- hammer mill hammers
- impactor crusher bars
- manganese steel railroad crossovers & frogs

### Typical Deposit Analysis %

Carbon .....	1.00
Manganese .....	15.00
Silicon .....	0.40
Chromium .....	3.10
Nickel .....	0.40
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Excellent
Tensile Strength (psi)	120,000 (XX MPa)
Yield Strength (psi)	80,000 (XX MPa)
Elongation in 2"	32%
Machinability	Difficult
Hardness:	
As Deposited	15-22 Rc
Work Hardened	50-55 Rc
Flame Cutting	Difficult
Nonmagnetic	

### Diameter and Polarity

.045"  
1/16"  
7/64"

## Tube-Alloy® AP-O

Tube-Alloy® AP-O deposit is a premium work hardening austenitic manganese steel alloy. It can be used for build-up or overlay on austenitic manganese steel, carbon steel and low alloy steel. It can also be used for joining austenitic manganese steel to manganese steel, carbon steel and low alloy steel. The weld metal has higher toughness than conventional manganese steel weld metal.

### Typical Applications

- bucket teeth & lips
- crusher jaws & cones
- dragline buckets
- dredge cutter heads & teeth
- grizzly bars & fingers
- gyratory crusher mantles & cones
- hammer mill hammers
- hydroelectric turbines
- impactor crusher bars
- muller tires
- pulverizer hammers
- similar to those for Tube-Alloy® 218-O, especially where the base metal verification is questionable or where contamination may be an issue
- sizing screens

### Typical Deposit Analysis %

Carbon .....	0.42
Manganese .....	16.50
Silicon .....	0.30
Chromium .....	13.00
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Excellent
Tensile Strength (psi)	124,000 (XX MPa)
Yield Strength (psi)	83,000 (XX MPa)
Elongation in 2"	40%
Machinability	Difficult
Hardness:	
As Deposited	18-24 Rc
Work Hardened	50-55 Rc
Cannot be flame cut	
Nonmagnetic	

### Diameter and Polarity

1/16"  
7/64"  
DCEP

# Hardfacing Wires

## Tube-Alloy® 258-0

Tube-Alloy® 258-0 deposit is a premium martensitic alloy steel of the hard, tough H-12 tool steel composition. It has excellent resistance to adhesive (metal-to-metal) wear. It is designed to surface mild and low alloy steel components subject to moderate abrasive wear and/or high temperature (up to 1000°F). Proper preheat is required for crackfree deposits.

### Typical Applications

- coupling boxes
- dragline chain
- kiln trunnions
- mill guides
- spindles
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.45
Manganese .....	1.40
Silicon .....	0.80
Chromium .....	6.00
Molybdenum.....	1.50
Tungsten .....	1.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Grind only

Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	4130 Steel
1	49	51
2	53	54
3	57	57

Flame cutting is difficult  
Magnetic  
Heat Treatable and Forgeable  
Maintains Hot Hardness to 1000°F

### Diameter and Polarity

.045"  
1/16"  
7/64"  
DCEP

## Tube-Alloy® 240-0

Tube-Alloy® 240-0 deposit is a chromium carbide surfacing alloy. It can be used on components subject to severe abrasive wear and heavy impact. The weld metal has higher toughness than conventional chromium carbide due to fewer stress relief-check cracks.

### Typical Applications

- ammonia knives
- augers
- bucket teeth & lips
- bulldozer end bits & blades
- conveyer screws
- crusher jaws & cones
- crusher rolls
- cultivator chisels & sweeps
- dragline buckets
- dredge pump impellers & side plates
- hammer mill hammers
- impactor crusher bars
- manganese pump shells
- mill guides
- muller tires
- pipeline ball joints
- pulverizer hammers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- sizing screens

### Typical Deposit Analysis %

Carbon .....	3.20
Manganese .....	0.80
Silicon .....	1.90
Chromium .....	15.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Very Good
Impact Resistance	Fair
Machinability	Grinding only
Thickness	3-5 Layers Maximum

Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	12-14% Manganese
1	40	35
2	48	42
3	52	50

Can be flame cut  
Deposit will relief-check crack

### Diameter and Polarity

.045"  
1/16"  
7/64"  
DCEP

## Tube-Alloy® 255-0

Tube-Alloy® 255-0 deposit is a premium high chromium carbide surfacing alloy. It can be used on components subject to extremely severe abrasive wear and moderate impact. It can also be used where high temperature (up to 1250°F) wear resistance is required. The weld metals will stress relief-check crack. Can be run as submerged arc by using MK-N neutral flux.

### Typical Applications

- ammonia knives
- augers
- bucket teeth & lips
- bulldozer blades
- bulldozer end bits & blades
- cement chutes
- coal feeder screws
- coal pulverizer hammers, rolls & table
- coke chutes
- coke pusher shoes
- conveyor screws
- dredge pump inlet nozzle & side plates
- fan blades
- grizzlybars & fingers
- gyratory crusher
- mantles & cones
- manganese pump shells
- muller tires
- ore & coal chutes
- pipeline ball joints
- pug mill paddles
- ripper shanks
- road rippers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- similar to those for Tube-Alloy® 240-0 where additional abrasion resistance is required
- sizing screens
- subsoiler teeth

### Typical Deposit Analysis %

Carbon .....	4.50
Manganese .....	0.90
Silicon .....	0.50
Chromium .....	26.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent
Impact Resistance	Poor
Machinability	Grinding only
Thickness	3 Layers Maximum

Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	12-14% Manganese
1	54	48
2	56	50
3	58	53

Cannot be flame cut  
Deposit will relief-check crack readily  
Maintains Hot Hardness to 1250°F

### Diameter and Polarity

1/16"  
7/64"  
DCEP

# Hardfacing Wires

## Tube-Alloy® 242-O

Tube-Alloy® 242-O is a self-shielded, fluxcored wire that deposits a premium martensitic alloy steel. It has excellent resistance to adhesive (metal-to-metal) wear. The deposit has good resistance to abrasion and impact making it a versatile overlay alloy. It is designed for use as an overlay on carbon and low alloy steels or as a base of Tube-Alloy Build Up-O. With proper preheating, crackfree deposits can be obtained. Tube-Alloy 242-O should never be used for joining.

### Typical Applications

- carbon steel rolls
- crane wheels
- dragline chain
- frogs & switch points
- idlers
- low alloy steel railroad crossovers and rail ends
- steel shafts
- tractor rollers

### Typical Deposit Analysis %

Carbon .....	0.25
Manganese .....	1.30
Silicon .....	0.70
Chromium .....	4.00
Molybdenum .....	0.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinable	
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	36
2	39
3	42
Can be flame cut	
Magnetic	

### Diameter and Polarity

.045"  
1/16"  
7/64"  
DCEP

## Armorwear™

ArmorWear is a self-shielded, flux-cored wire that deposits a premium martensitic alloy steel of H-12 tool steel composition. It has excellent resistance to adhesive (metal-to-metal) wear. It also has good resistance to abrasion and impact, and maintains its hardness up to 1000°F. It is designed for use as an overlay on carbon and low alloy steels. Because of its high hardenability, proper preheat may be required for crack-free deposits, particularly on low alloy steels. ArmorWear is formulated to optimize performance with the small 110/220V type wire welding machines.

### Typical Applications

- bucket lips and teeth
- cultivator chisels and sweeps
- plow shares, scraper blades
- shanks, knives, teeth
- kiln trunnions
- spindles
- pump components

### Typical Deposit Analysis %

Carbon .....	0.40
Manganese .....	1.00
Silicon .....	0.40
Chromium .....	5.80
Molybdenum .....	1.50
Tungsten .....	1.40
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Grind only
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	47
2	49
3	53
Flame cutting is difficult	
Magnetic	
Heat Treatable and Forgeable	
Maintains Hot Hardness to 1000°F	

### Diameter and Polarity

.035"  
DCEN

## Tube-Alloy® 219-O

Tube-Alloy® 219-O is a work hardening austenitic manganese steel alloy. The high carbon and manganese content allows for a fully austenitic first layer on carbon steel. Deposits are extremely tough and work harden rapidly under high impact. It can be used for most railroad track maintenance applications.

### Typical Applications

- manganese steel railroad crossovers & frogs
- similar to 218-O, except that it is slightly harder in the "as deposited" condition, and work hardens quicker

### Typical Deposit Analysis %

Carbon .....	1.00
Manganese .....	20.00
Silicon .....	0.60
Chromium .....	4.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Excellent
Tensile Strength (psi)	137,000 (XX MPa)
Yield Strength (psi)	91,000 (XX MPa)
Elongation in 2"	34%
Machinability	Difficult
Hardness:	
As Deposited	16-23 Rc
Work Hardened	50-55 Rc
Flame cutting is difficult	

### Diameter and Polarity

1/16"  
7/64"  
DCEP

# Hardfacing Wires

## Tube-Alloy® 258TiC-O

Tube-Alloy® 218 TiC-O deposit is a martensitic alloy steel containing a high volume fraction of titanium carbides. It is particularly good for resisting high stress abrasive wear. The alloy has good hot hardness. Deposits can be applied crack-free with proper procedures.

### Typical Applications

- paving agitator screws

### Typical Deposit Analysis %

Carbon .....	2.10
Manganese .....	1.30
Silicon .....	1.80
Chromium .....	7.00
Molybdenum .....	1.60
Titanium .....	6.00
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent
Impact Resistance	Good
Machinability	Grinding only

Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	60
2	55
3-8	48

Cannot be flame cut  
Magnetic  
Maintains hot hardness to 1000°F

### Diameter and Polarity

1/16"  
7/64"  
DCEP

## Tube-Alloy® 244-O

Tube-Alloy® 244-O deposit is a medium alloy carbide steel. It is designed primarily for the automatic rebuilding of dredge pump shells. Deposits do stress relief-check crack.

### Typical Applications

- dredge pump impellers & side plates
- pipeline ball joints
- pump shells

### Typical Deposit Analysis %

Carbon .....	2.50
Manganese .....	1.60
Silicon .....	2.00
Chromium .....	9.00
Copper .....	0.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Very Good	
Impact Resistance	Fair	
Machinability	Very Difficult	
Thickness	3-5 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	12-14% Manganese
1	34	24
2	37	33
3	40	38

Cannot be flame cut  
Slightly Magnetic  
Deposit will relief-check crack

### Diameter and Polarity

7/64"  
DCEP

## Tube-Alloy® A43-O

Tube-Alloy® A43-O deposit is a premium high chromium-columbium carbide surfacing alloy. It can be used on components subject to extremely severe high and low stress abrasive wear and moderate impact. It can also be used where high temperature (up to 1250°F) wear resistance is required. The deposit will stress relief-check crack readily. Can be run as submerged arc by using MK-N neutral flux.

### Typical Applications

- augers
- bucket lips & teeth
- coal feeder screws
- coal pulverizer rolls & table
- coke chutes
- coke pusher shoes
- conveyor screws
- dredge cutter heads & teeth
- dredge pump inlet nozzle & side plates
- fan blades
- grizzly bars & fingers
- muller tires
- paving agitator screws
- pipeline ball joints
- pug mill paddles
- scraper blades
- sheepsfoot tampers
- sizing screws

### Typical Deposit Analysis %

Carbon .....	5.50
Manganese .....	0.20
Silicon .....	1.00
Chromium .....	22.00
Columbium .....	6.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent	
Impact Resistance	Poor	
Machinability	Grinding only	
Thickness	3 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	12-14% Manganese
1	58	48
2-3	62	56

Cannot be flame cut

### Diameter and Polarity

1/16"  
7/64"  
DCEP

# Hardfacing Wires

## VertiWear® 600

VertiWear® 600 deposits a multipurpose martensitic steel alloy. It can be used to surface mild and low alloy components subject to moderate abrasive wear and medium to high impact. Excellent operator appeal in all positions.

### Typical Applications

- coupling boxes
- dragline chain
- dredge ladder rolls
- kiln trunnions
- mill guides
- sliding metal parts
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.40
Manganese .....	0.75
Silicon .....	0.60
Chromium .....	6.50
Molybdenum .....	1.00
Vanadium .....	0.05
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Very Good
Machinability	Good
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	52
2	56
3-8	57
Flame cutting is difficult	
Magnetic	

### Diameter and Polarity

.045"  
1/16"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

## Tube-Alloy® 255-G

Tube-Alloy® 255-G is a small-diameter, gas-shielded premium hardfacing wire that deposits an extremely wear-resistant chromium-carbide overlay. It is designed for overlay on carbon, low alloy, cast iron, and austenitic manganese base metals. It outlasts competitive wires which deposit martensitic deposits 9 to 1.

### Typical Applications

- ammonia knives
- augers
- bucket teeth & lips
- bulldozer end bits and blades
- cement chutes
- coal feeder screws
- coal pulverizer hammers, rolls and table
- coke chutes
- coke pusher shoes
- conveyer screws
- crusher jaws and cones
- cultivator chisels and sweeps
- dragline buckets
- dredge cutter heads and teeth
- dredge pump inlet nozzle & side plates
- fan blades
- grizzly bars and fingers
- gyratory crusher mantles and cones
- manganese pump shells
- muller tires
- ore and coal chutes
- pipeline ball joints
- pug mill paddles
- ripper shanks
- road rippers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- sizing screens
- subsoiler teeth

### Typical Deposit Analysis %

Carbon .....	5.30
Manganese .....	1.00
Silicon .....	0.40
Chromium .....	18.00
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent	
Impact Resistance	Poor	
Machinability	Grinding is Difficult	
Thickness	3 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	Manganese Steel
1	58	47
2	61	51
3	65	54

Cannot be flame cut  
Deposit will relief-check crack readily  
Maintains hot hardness to 1250°F

### Diameter and Polarity

.045"  
DCEP  
Gas-Shielded  
98/2 (Ar/CO<sub>2</sub>)  
75/25 (Ar/CO<sub>2</sub>)

## VertiWear® AP

VertiWear® AP is a premium, work-hardening austenitic manganese steel alloy. This fluxcored, all-position wire can be used for buildup or overlay on austenitic manganese steel. It can also be used for joining austenitic manganese steel to manganese steel, carbon steel and low alloy steel. The deposit has excellent impact resistance.

### Typical Applications

- bucket teeth and lips
- crusher jaws and cones
- dragline buckets
- dredge cutter heads and teeth
- grizzly bars and fingers
- gyratory crusher mantles and cones
- hammer mill hammers
- hydroelectric turbines
- impactor crusher bars
- muller tires
- pulverizer hammers
- sizing screens

### Typical Deposit Analysis %

Carbon .....	0.45
Manganese .....	14.00
Silicon .....	0.50
Chromium .....	13.50
Nickel .....	0.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Excellent
Machinability	Fair
Hardness:	
Work Hardened	50-55 Rc
No. of Layers	1020 Steel
1	24 Rc
2	20 Rc
3-8	18 Rc
Cannot be flame cut	

### Diameter and Polarity

.045"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

## Tube-Alloy® Build Up-G

Tube-Alloy® Build Up-G is a gas-shielded, metal-cored wire designed for build-up on carbon and low alloy steels. The weld metals have good compressive strength and impact resistance, making them excellent bases for more abrasion-resistant alloys.

### Typical Applications

- bucket teeth & lips
- crane wheels
- dragline buckets
- dragline chain
- dredge ladder rolls
- gear teeth
- kiln trunnions
- mine car wheels
- spindles
- steel shafts
- wobblers ends

### Typical Deposit Analysis %

Carbon .....	0.26
Manganese .....	1.73
Silicon .....	0.32
Chromium .....	1.85
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Good
Hardness	25 Rc
Can be flame cut	
Magnetic	

### Diameter and Polarity

.045"  
1/16"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

## Tube-Alloy® 258-G

(Formerly known as HW-7)

Tube-Alloy® 258-G is a metal-cored, gas-shielded wire which deposits a sound hot work tool steel alloy of the AISI H-12 type. It is extremely resistant to thermal shock and erosion at working temperatures. The alloy has good dimensional stability and uniform heat-treatment response, making it ideally suited for fabrication, modification, and repair of dies and other tool steel parts.

### Typical Applications

- clean out rings
- die holders
- dummy blocks
- extrusion dies
- forming dies
- forging dies
- gripper dies
- guide rolls
- header dies
- hot forming dies
- mandrels
- swaging dies

### Typical Deposit Analysis %

Carbon .....	0.40
Manganese .....	1.00
Silicon .....	0.55
Chromium .....	5.00
Molybdenum.....	1.45
Tungsten .....	1.25
Vanadium .....	0.40
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Nonmachinable in As-Welded Condition	Grinding only
Hardness, as deposited, RC	
No. of Layers	A36 Plate
1	52
2	53
3	57
Temp.	Typical Hardness
950°F	54
Flame Cutting Difficult	
Good Resistance to softening at elevated temperatures	
Heat treatable	
Good Dimensional Stability	

### Diameter and Polarity

.045"  
1/16"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

## Tube-Alloy® 260-G

Tube-Alloy® 260-G is a gas-shielded, metal-cored wire that deposits a martensitic alloy steel. It is designed for use as an overlay on carbon and low alloy steels. It has very good resistance to adhesive (metal-to-metal) wear and good resistance to abrasion and impact.

### Typical Applications

- coupling boxes
- dragline chain
- kiln trunnions
- mill guides
- spindles
- wobblers ends

### Typical Deposit Analysis %

Carbon .....	0.70
Manganese .....	2.00
Silicon .....	1.00
Chromium .....	8.00
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Grinding only
Hardness:	
As Deposited	55-60 RC
Cannot be flame cut	
Magnetic	

### Diameter and Polarity

.045"  
1/16"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

# Hardfacing Wires

## Tube-Alloy® BU-S

Tube-Alloy® BU-S deposit is a low alloy steel composition. It can be used for build-up on mild and low alloy steel components. The weld metal has good compressive strength, making it an excellent base for surfacing.

### Typical Applications

- crane wheels
- dredge ladder rolls
- mine car wheels
- spindles
- table rolls
- tractor idlers & rollers

### Typical Deposit Analysis %

Carbon .....0.12  
 Manganese .....1.80  
 Silicon .....0.80  
 Chromium .....0.70  
 Iron .....Balance  
 HF-N/SWX HF-N Flux

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Excellent
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel    1045 Steel
1	20            35
2	26            34
3	30            31

Can be flame cut  
 Strongly Magnetic

### Diameter and Polarity

3/32"  
 1/8"  
 5/32"  
 DCEP

## Tube-Alloy® 8620-S

Tube-Alloy® 8620-S deposit is a low alloy steel composition. Its sound, tough deposit makes it an excellent choice for steel mill roll build-up.

### Typical Applications

- continuous caster rolls
- table rolls

### Typical Deposit Analysis %

Carbon .....0.17  
 Manganese .....0.80  
 Silicon .....0.40  
 Chromium .....0.50  
 Molybdenum.....0.20  
 Nickel.....0.40  
 Iron .....Balance  
 HF-N/SWX HF-N Flux

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Excellent
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	12
2	19
3-8	21

Can be flame cut  
 Strongly Magnetic

### Diameter and Polarity

3/32"  
 1/8"  
 DCEP

## Tube-Alloy® 861-S

Tube-Alloy® 861-S deposit is a premium chrome-molybdenum steel composition. It can be used as build-up or overlay for steel mill roll applications. It offers superior resistance to softening in service versus mild steel deposits.

### Typical Applications

- continuous caster rolls
- straightener rolls
- table rolls

### Typical Deposit Analysis %

Carbon .....0.15  
 Manganese .....0.90  
 Silicon .....0.50  
 Chromium .....1.70  
 Molybdenum.....0.60  
 Iron .....Balance  
 HF-N/SWX HF-N Flux

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Fair
Machinability	Very Good
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	21
2	28
3	30

Cannot be flame cut  
 Magnetic

### Diameter and Polarity

1/8"  
 DCEP



# Hardfacing Wires

## Tube-Alloy® 877-S

Tube-Alloy® 877-S deposit is a low alloy steel composition. It is a sound, tough, build-up alloy designed for use on steel mill con-cast rolls. Mechanical properties are outstanding.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon .....	0.10
Manganese .....	1.00
Silicon .....	0.60
Chromium .....	1.00
Molybdenum.....	0.40
Nickel.....	1.30
Iron.....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Excellent
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	22
2	23
3-8	24

Can be flame cut  
Strongly Magnetic

### Diameter and Polarity

1/8"  
DCEP

## Tube-Alloy® 242-S MOD

Tube-Alloy® 242-S Mod deposit is a low alloy medium hardness martensitic steel. It can be used as a hardfacing overlay where good abrasion resistance and machinability are required.

### Typical Applications

- crane wheels
- tractor idlers & rollers

### Typical Deposit Analysis %

Carbon .....	0.14
Manganese .....	1.90
Silicon.....	0.80
Chromium .....	3.00
Molybdenum.....	0.80
Iron.....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Good	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	29	44
2	38	45
3	39	40

Can be flame cut  
Strongly magnetic

### Diameter and Polarity

1/8"  
DCEP

## Tube-Alloy® 258-S

Tube-Alloy® 258-S deposit is a premium martensitic steel alloy. It is a hard, tough H-12 tool steel composition. It can be used as an overlay on steel mill rolls where high hardness and abrasion resistance are more important than fire cracking.

### Typical Applications

- spindles
- table rolls

### Typical Deposit Analysis %

Carbon .....	0.34
Manganese .....	1.50
Silicon.....	0.50
Chromium .....	6.00
Molybdenum.....	1.50
Tungsten .....	1.40
Iron.....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Difficult with carbide tools
Thickness	As required

Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	46	52
2	48	53
3	53	54

Flame cutting is difficult  
Magnetic

### Diameter and Polarity

3/32"  
1/8"  
DCEP

# Hardfacing Wires

## Tube-Alloy® A2JL-S

Tube-Alloy® A2JL-S deposit is a modified stainless steel composition. It offers good resistance to metal-to-metal wear corrosion and thermal fatigue fire cracking.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon	0.04
Manganese	0.80
Silicon	0.60
Chromium	13.50
Molybdenum	1.00
Nickel	2.00
Iron	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic
w/controlled ferrite	
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Good with carbide tools
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1-3	40
4-8	33
Cannot be flame cut	
Slightly Magnetic	

### Diameter and Polarity

1/8"  
DCEP

## Tube-Alloy® 887-S

Tube-Alloy® 887-S is a premium martensitic stainless steel alloy. It is a hard, tough composition that offers good resistance to metal-to-metal wear, corrosion and thermal fatigue.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon	0.14
Manganese	0.88
Silicon	0.55
Chromium	12.50
Vanadium	0.23
Nickel	3.13
Molybdenum	1.50
Nb	0.18
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Fair
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	32
2	38
3	40
Cannot be flame cut	
Magnetic	

### Diameter and Polarity

3/32"  
1/8"  
DCEP

## Tube-Alloy® A250-S

Tube-Alloy® A250-S deposit is a modified 420 stainless steel composition. It offers good resistance to fire cracking and corrosion frequently encountered by steel mill rolls.

### Typical Applications

- continuous caster rolls
- table rolls

### Typical Deposit Analysis %

Carbon	0.19
Manganese	1.00
Silicon	0.50
Chromium	12.30
Iron	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic	
Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Good with carbide tools	
Thickness	As required	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	44	46
2	46	50
3	48	50
Cannot be flame cut		
Slightly Magnetic		

### Diameter and Polarity

1/8"  
DCEP

# Hardfacing Wires

## Tube-Alloy® A420M-S

Tube-Alloy® A420M-S deposit is a modified high carbon 420 stainless steel composition. It offers higher hardness than standard 420 stainless steel deposits, resulting in longer roll life where thermal fatigue is not the prime consideration.

### Typical Applications

- back-up rolls
- continuous caster rolls
- plate leveler rolls
- straightener rolls

### Typical Deposit Analysis %

Carbon .....	0.24
Manganese .....	1.60
Silicon .....	0.70
Chromium .....	14.70
Iron .....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic	
Abrasion Resistance	Very Good	
Impact Resistance	Fair	
Machinability	Fair with carbide tools	
Thickness	As required	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	46	48
2	49	52
3-8	53	56
Cannot be flame cut		
Slightly Magnetic		

### Diameter and Polarity

1/8"  
DCEP

## Tube-Alloy® 865-S MOD

Tube-Alloy® 865-S Mod deposit is a modified stainless steel composition. It offers good resistance to metal-to-metal wear, corrosion and the ultimate resistance to thermal fatigue fire cracking frequently encountered by steel mill rolls.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon .....	0.18
Manganese .....	1.10
Silicon .....	0.40
Chromium .....	13.50
Molybdenum.....	1.00
Nickel.....	2.70
Vanadium .....	0.20
Columbium.....	0.20
Iron .....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic	
Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Fair with carbide tools	
Thickness	As required	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	
1	45	
2	46	
3-8	48	
Cannot be flame cut		
Magnetic		

### Diameter and Polarity

1/8"  
DCEP

## Tube-Alloy® 952-S

Tube-Alloy® 952-S is a premium modified high carbon martensitic stainless steel that produces higher hardnesses than standard 420 types. It offers excellent toughness for higher impact applications along with good resistance to abrasive wear. This alloy can be used in higher temperature applications (up to 1050°F). It should not be used where thermal fatigue fire cracking is the prime consideration. It is a high-deposition rate wire that produces sound, porosity-free, crack-free weld deposits.

### Typical Applications

- straightener rolls
- plate leveler rolls
- edger rolls
- descale rolls
- back-up rolls
- aluminum caster rolls cores

### Typical Deposit Analysis %

Carbon .....	0.27
Manganese .....	1.20
Silicon .....	0.60
Chromium .....	12.80
Tungsten .....	1.40
Molybdenum.....	1.80
Nickel.....	0.60
Vanadium .....	0.19
Niobium .....	0.18
Iron .....	Balance
HF-N/SWX HF-N Flux	

### Typical Properties

Microstructure	Martensitic	
Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Good with carbide tools	
Thickness	As required	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	40	44
2	45	49
3	49	49
Flame cutting is difficult		
Magnetic		

### Diameter and Polarity

3/32"  
1/8"  
DCEP

# Hardfacing Wires

## GP-0

Hobart GP-0 is a multipurpose wire recommended for joining dissimilar metals and hard to weld steels. It can be used for any high-strength application where wear, impact, heat and corrosion resistant properties are required.

### Typical Applications

- welding attachments to manganese castings
- welding grouser bars to grousers
- welding T-1 steel lips to manganese buckets

### Typical Deposit Analysis %

Carbon .....	0.06
Manganese .....	1.00
Silicon .....	0.50
Chromium .....	26.50
Nickel .....	9.00
Iron .....	Balance

### Typical Properties

Tensile Strength (psi)	120,000 (XX MPa)
Yield Strength (psi)	90,000 (XX MPa)
Elongation in 2"	27%
Machinability	Good
Thickness	As required
Cannot be flame cut	
Nonmagnetic	

### Diameter and Polarity

1/16"  
DCEP

## HF-N & SWX HF-N

### Benefits:

- provides excellent element recovery; suitable for use with the entire range of Hobart SAW hardfacing wires
- offers good wetting action to provide smooth, uniform, hardfacing weld beads
- provides excellent slag release, even at high currents
- can be used with an oscillating technique and twin-wire torch configuration for maximized bead width and productivity
- SWX HF-N is supplied in moisture-proof packaging that eliminates the need to re-dry unopened product

### Typical Applications:

- SAW hardfacing
- steel mills
- continuous casting rolls

### Flux Type:

Agglomerated fluoride-basic flux

### Basicity Index (Boniszewski): 2.6

### Alloy Transfer: None

### Density: ~1.2 kg/L

### Grain Size: 0.2 – 1.6 mm/ 10 – 65 mesh

### Type of Current: DCEP

### Primary Flux Composition:

Al <sub>2</sub> O <sub>3</sub> + MnO .....	~19%
CaO + MgO .....	~34%
SiO <sub>2</sub> + TiO <sub>2</sub> .....	~18%
CaF <sub>2</sub> .....	~29%

### Commonly Used With:

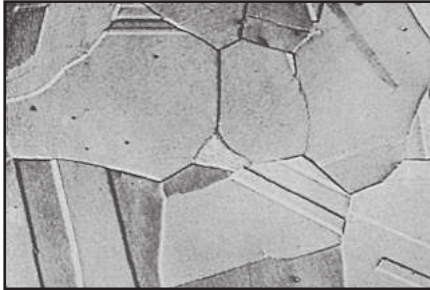
- Tube-Alloy<sup>®</sup> 242-S MOD
- Tube-Alloy<sup>®</sup> 810-S
- Tube-Alloy<sup>®</sup> 8620-S
- Tube-Alloy<sup>®</sup> 865-S MOD
- Tube-Alloy<sup>®</sup> 875-S
- Tube-Alloy<sup>®</sup> 952-S
- Tube-Alloy<sup>®</sup> A250-S
- Tube-Alloy<sup>®</sup> A2JL-S
- Tube-Alloy<sup>®</sup> BU-S

### Packaging Available:

- SWX HF-N
- 55 lb. (25 kg) Bag
- SWX HF-N
- 55 lb. (25 kg) EAE Bag
- 2200 lb. (1000 kg) DoubleBag™

## TECHNICAL SECTION

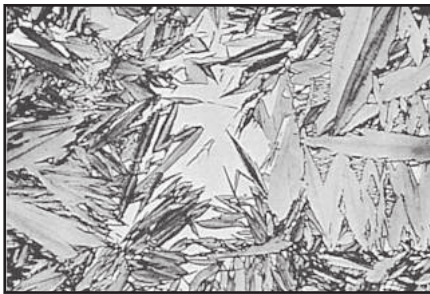
### Hardfacing Wire Alloy Classification



Photomicrograph of austenite.

#### Austenitic Alloys

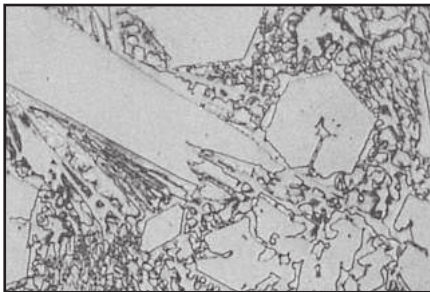
Austenitic alloys are extremely tough, ductile and workhardenable. They offer excellent impact resistance and fair abrasion resistance (which improves as it work-hardens). These alloys will normally work-harden to a surface hardness up to 50 HRC and still retain their good impact resistance.



Photomicrograph of martensite.

#### Martensitic Alloys

Martensite is formed in steels by rapid cooling rates. Most of the hardfacing alloys are air hardenable and heat treatable. They provide a good balance of impact and abrasion resistance. Martensitic alloys also have relatively high compression strength and excellent metal-to-metal wear resistance.



Photomicrograph of large carbides in a carbide eutectic matrix.

#### Carbide Alloys

Carbide alloys are very much like asphalt. There are carbides (gravel) and matrix (tar). The carbides are what give the excellent abrasion resistance while the matrix (tar) holds the carbides in place and offers some impact resistance. Carbides are extremely hard and brittle. They cannot handle impact. The more carbides there are the higher the abrasion resistance but the lower the impact resistance.

#### Hobart Austenitic Products

Tube-Alloy 218-O  
Tube-Alloy 219-O  
Tube-Alloy AP-O  
VertiWear AP

#### Hobart Martensitic Products

Tube-Alloy Build Up-O  
Tube-Alloy Build Up-G  
Tube-Alloy 242-O  
Tube-Alloy 258-O  
Tube-Alloy 258-G  
Tube-Alloy 260-G  
VertiWear 600  
ArmorWear

#### Hobart Carbide Products

Tube-Alloy 244-O  
Tube-Alloy 258 TiC-O  
Tube-Alloy 240-O  
Tube-Alloy 255-O  
Tube-Alloy 255-G  
Tube-Alloy A43-O

### Hardfacing Wire/Stick Electrode Equivalent

Open- Arc Wire	Gas-Shielded Wire		Stick Electrode
	Flux-Cored	Metal-Cored	
Tube-Alloy 218-O	—	—	Hardalloy 118
Tube-Alloy AP-O	VertiWear AP	—	Chrome-Mang
Tube-Alloy Build Up-O	—	Tube-Alloy Build Up-G	Hardalloy 32
Tube-Alloy 258-O/ArmorWear	—	Tube-Alloy 258-G	Hardalloy 58
	VertiWear 600	—	—
	Tube-Alloy 260-G	—	—
Tube-Alloy 240-O	—	—	Hardalloy 140
Tube-Alloy 255-O	—	Tube-Alloy 255-G	Hardalloy 155
Tube-Alloy 219-O	—	—	—
Tube-Alloy 242-O	—	—	Hardalloy M-932
—	—	—	Hardalloy 48
—	—	—	Hardalloy 40 TiC
Tube-Alloy 258 TiC-O	—	—	Hardalloy 65
Tube-Alloy A43-O	—	—	—
Tube-Alloy 244-O	—	—	—

# Hardfacing Wires

## TECHNICAL SECTION

### General Operating Parameters of Tube-Alloy G Flux-Cored Gas-Shielded Surfacing Wires

<b>.045" Diameter</b>		<b>1/16" Diameter</b>	
Use 1/2" to 1" wire stickout DC (electrode positive)		Use 1" to 1-1/2" wire stickout DC (electrode positive)	
Amps	Volts	Amps	Volts
120-160	19-23	225-275	23-25
160-190	24-25	275-350	24-27
190-230	26-27	350-400	26-29

### Typical Deposition Rates of Tube-Alloy G Flux-Cored Gas-Shielded Surfacing Wires

<b>.045" Diameter</b>		<b>1/16" Diameter</b>	
Amps	lb/hr	Amps	lb/hr
130	4	220	6
180	7	250	10
220	10	300	14

### General Operating Parameters of Tube-Alloy O Flux-Cored Open-Arc Surfacing Wires

<b>.045" Diameter</b>		<b>1/16" Diameter</b>		<b>7/64" Diameter</b>	
Use 1/2" to 1" wire stickout DC (electrode positive)		Use 1" to 1-1/2" wire stickout DC (electrode positive)		Use 1-1/2" to 2" wire stickout DC (electrode positive)	
Amps	Volts	Amps	Volts	Amps	Volts
120-160	19-23	225-275	23-25	350-400	24-27
160-190	24-25	275-350	24-27	400-450	26-29
190-230	26-27	350-400	26-29	450-500	28-32
With slight weave and 7 ipm travel speed average bead height will be 1/8" and width 3/8".					

### Typical Deposition Rates of Tube-Alloy O Flux-Cored Open-Arc Surfacing Wires

<b>.045" Diameter</b>		<b>1/16" Diameter</b>		<b>7/64" Diameter</b>	
Amps	lb/hr	Amps	lb/hr	Amps	lb/hr
130	4	220	6	300	11
180	7	250	10	350	14
220	10	300	14	400	18

### General Operating Parameters of Tube-Alloy O Flux-Cored Open-Arc Surfacing Wires

<b>3/32" (2.4 mm)</b>			<b>1/8" (3.2 mm)</b>			<b>5/32" (4.0 mm)</b>		
Use 1" to 1-1/4" (25-32 mm) wire stickout. Travel speed of 12" - 16" (305 - 406 mm) per minute.			Use 1-1/4" to 1-1/2" (32-38 mm) wire stickout. Travel speed of 14" - 18" (356-456 mm) per minute.			Use 1-1/4" to 1-1/2" (32-38 mm) wire stickout. Travel speed of 16" - 20" (406 - 508 mm) per minute.		
Amps	Volts	lb/hr	Amps	Volts	lb/hr	Amps	Volts	lb350/hr
350-500	25-29	14-22	400-450	26-28	16	450-500	28-30	18
			450-500	27-30	20	500-600	29-32	23
			500-550	29-32	24			

## TECHNICAL SECTION

### Comparative Index of Flux-Cored Open-Arc Hardfacing Wires

Hobart	Certanium	Eutectic	Lincoln	Stoody	Welding Alloys
Tube-Alloy AP-O	282 FC	3005-A, 3302	15CrMn	110	19/9/6-O, AP-O
Tube-Alloy Build Up-O	283 FC	3110, 3010-A	BU, 33	Build-Up	T-O
Tube-Alloy 218-O	—	3220-A	M	Dynamang, Nicro-Mang, Foundry Co-Mang	NM-O
Tube-Alloy 219-O	282 FC	—	—	120, Trackwear, Nicro-Mang Plus	—
Tube-Alloy 240-O	284 FC	4025-A	50	12, SA/53, 131, 133,134	MC-O, HC333-O/G
Tube-Alloy 242-O	—	—	40-O	Super Build-Up, Rail End 932	P-O, R-O
Tube-Alloy 244-O	—	—	—	117	—
Tube-Alloy 255-O	247 FC	4601-A	60-O	100HC, 101HC, 101HD, 100XHP	HC2-O, HC3-O, HC333- O/G
Tube-Alloy 258-O/ ArmorWear	281 FC	4415	55, T&D	102, 965-O	R-O, W-O, L-O
Tube-Alloy 258 TIC-O	246 FC	—	—	600	TiC-O
Tube-Alloy A43-O	—	—	—	SA/Super-20	CN-O, CN2-O
GP-O	706 FC	690	—	Versalloy, GP-O	—

### Comparative Index of Flux-Cored Gas-Shielded Hardfacing Wires

Hobart	Certanium	Lincoln	Hobart	Stoody
Tube-Alloy Build Up-G	283 FC	—	FabTuf 250	Build-Up AP-G
Tube-Alloy 255-G	—	—	—	—
Tube-Alloy 258-G	—	T&D	—	102
VertiWear 600	—	55	FabTuf 960	695AP-G
Tube-Alloy 260-G	—	55	FabTuf 960	695AP-G
VertiWear AP	—	15CrMn	—	110

For other product comparisons please go to our Hardfacing Product Cross-Reference Guide at [www.hobartbrothers.com](http://www.hobartbrothers.com)



# Hardfacing Wires

## TECHNICAL SECTION

### Suggested Hobart Tubular Wire per Industry Application

#### Dredging Industry

Application Build-Up	Overlay	Hobart Wire
Dredge Bucket Lips	—	240-0, 255-0, 255-G
Dredge Cutter Heads & Teeth	AP-0, AP	255-0, 255-G, A43-0
Dredge Pump Casings	218-0	—
Dredge Pump Inlet Nozzle	—	255-0, 255-G, A43-0
Dredge Ladder Rolls	BU-0, BU-G, BU-S	—
Dredge Pump Impellers	—	244-0, 240-0
Dredge Pump Side Plates	—	244-0, 240-0, 255-0, 255-G, A43-0
Pipeline Ball Joints	—	244-0, 240-0, 255-0, 255-G, A43-0
Pump Shells (Carbon Steel)	—	244-0
Pump Shells (Manganese)	—	244-0, 240-0, 255-0, 255-G

#### Heavy Equipment/Mining Industries

Application Build-Up	Overlay	Hobart Wire
Augers	—	240-0, 255-0, 255-G, A43-0
Bucket Lips/Teeth	BU-0, BU-G	240-0, 255-0, 255-G, A43-0
Bulldozer Blades	—	240-0, 255-0, 255-G
Bulldozer End Bits	—	240-0, 255-0, 255-G
Crane Wheels	BU-0, BU-G, BU-S	242-0, 242-S
Dragline Buckets	BU-0, BU-G, AP-0, AP	240-0, 255-0, 255-G
Dragline Chain	BU-0, BU-G	242-0, 258-0, 258-G, VertiWear 600
Mine Car Wheels	BU-0, BU-G, BU-S	242-S, 252-S
Ore/Coal Chutes	—	255-0, 255-G
Paving Agitator Screws	—	258 TIC-0, A43-0
Power Shovel Bucket Lips/Teeth	BU-0, BU-G, AP-0, AP	240-0, 255-0, 255-G
Pug Mill Paddles	—	255-0, 255-G
Road Rippers	—	255-0, 255-G, A43-0
Scraper Blades	—	240-0, 255-0, 255-G, A43-0
Sheepsfoot Tampers	—	240-0, 255-0, 255-G, A43-0
Steel Shafts	BU-0, BU-G	242-0
Tractor Idlers/Rollers	—	BU-S, 242-S, 252-S

#### Crushing/Quarry Industries

Application Build-Up	Overlay	Hobart Wire
Bucket Lips	—	240-0, 255-0, 255-G, A43-0
Bucket Teeth (Manganese Steel)	218-0, AP-0, AP	240-0, 255-0, 255-G, A43-0
Bulldozer End Bits	—	240-0, 255-0, 255-G
Cement Chutes	—	255-0, 255-G
Conveyor Screws	—	240-0, 255-0, 255-G, A43-0
Crusher Jaws/Cones	218-0, AP-0, AP	240-0, 255-0, 255-G
Crusher Rolls	—	240-0
Gear Teeth	BU-0, BU-G	—
Gyratory Crusher Mantles/Cones	218-0, AP-0, AP	255-0, 255-G
Hammer Mill Hammers	218-0, AP-0, AP	240-0
Impactor Crusher Bars	218-0, AP-0, AP	240-0
Kiln Trunnions	BU-0, BU-G	258-0, 258-G, 258-S
Muller Tires	AP-0, AP	240-0, 255-0, 255-G, A43-0
Pug Mill Paddles	—	255-0, 255-G, A43-0
Pulverizer Hammers	AP-0, AP	240-0
Sizing Screens	AP-0, AP	240-0, 255-0, 255-G, A43-0
Steel Shafts	BU-0, BU-G	242-0

#### Iron & Steel Industry

Application Build-Up	Overlay	Hobart Wire
Blast Furnace Bell's Burden Area	—	A45-0
Coke Chutes	—	255-0, 255-G, A43-0
Coke Pusher Shoes	—	255-0, 255-G, A43-0
Con Caster Rolls	8620-S, 861-S	A250-S, 865-S Mod
Coupling Boxes	BU-0, BU-G	258-0, 258-G, VertiWear 600
Crane Wheels	BU-0, BU-G, BU-S	242-S
Gear Teeth	BU-0, BU-G	—
Grizzly Bars & Fingers	AP-0, AP	255-0, 255-G, A43-0
Mill Guides	—	258-0, 258-G, 240-0
Pug Mill Paddles	—	255-0, 255-G, A43-0
Screw Conveyors	—	240-0, 255-0, 255-G
Sheets in Blast Furnace Bell	—	—
Sinter Breaker Bars	—	—
Sinter Plant Parts	—	—
Spindles	BU-0, BU-G, BU-S	258-0, 258-G, 258-S
Steel Shafts	BU-0, BU-G	242-0
Straightener Rolls	861-S	A420M-S
Table Rolls	BU-S, 8620-S, 861-S	A250-S, 258-S
Wobbler Ends	BU-0, BU-G	258-0, 258-G

#### Agriculture

Application Overlay	Hobart Wire
Ammonia Knives	240-0, 255-0, 255-G
Cultivator Chisels & Sweeps	240-0, 255-0, 255-G
Mill Hammers	258 TIC-0
Ripper Shanks	255-0, 255-G
Steel Shafts	242-0
Subsoiler Teeth	255-0, 255-G

#### Railroad Industry

Application Overlay	Hobart Wire
Crossovers (Low Alloy Steel)	242-0
Crossovers (Manganese Steel)	218-0, 219-0, AP-0, AP
Frogs (Carbon Steel)	242-0
Frogs (Manganese Steel)	218-0, 219-0, AP-0, AP
Rail Ends (Low Alloy Steel)	242-0
Switch Points (Low Alloy Steel)	242-0

#### Power Generation Industry

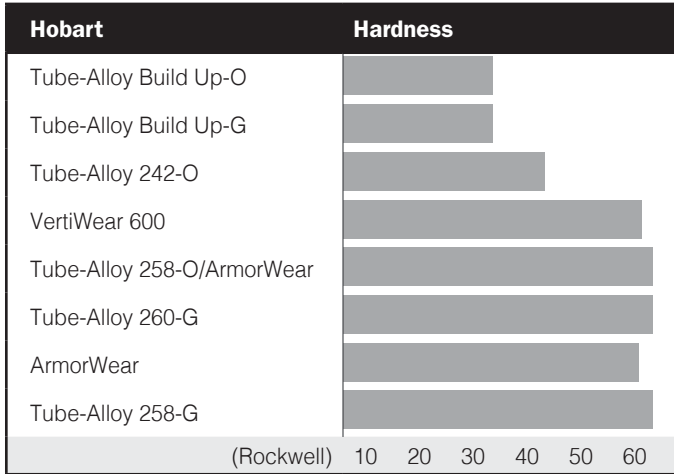
Application Overlay	Hobart Wire
Coal Feeder Screws	255-0, 255-G, A43-0
Coal Pulverizer Hammers	255-0, 255-G
Coal Pulverizer Rolls	255-0, 255-G, A43-0
Coal Pulverizer Table	255-0, 255-G, A43-0
Fan Blades	255-0, 255-G, A43-0
Hydroelectric Turbines	AP-0, AP

BU = Build-Up

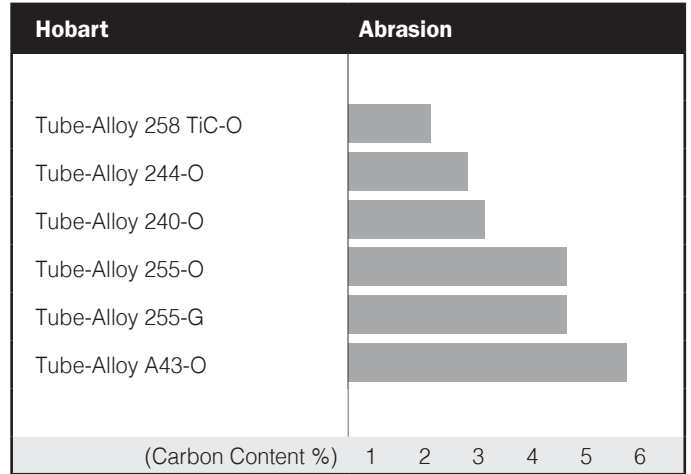


## TECHNICAL SECTION

### Metal-to-Metal Wear Resistance



### Abrasion Resistance

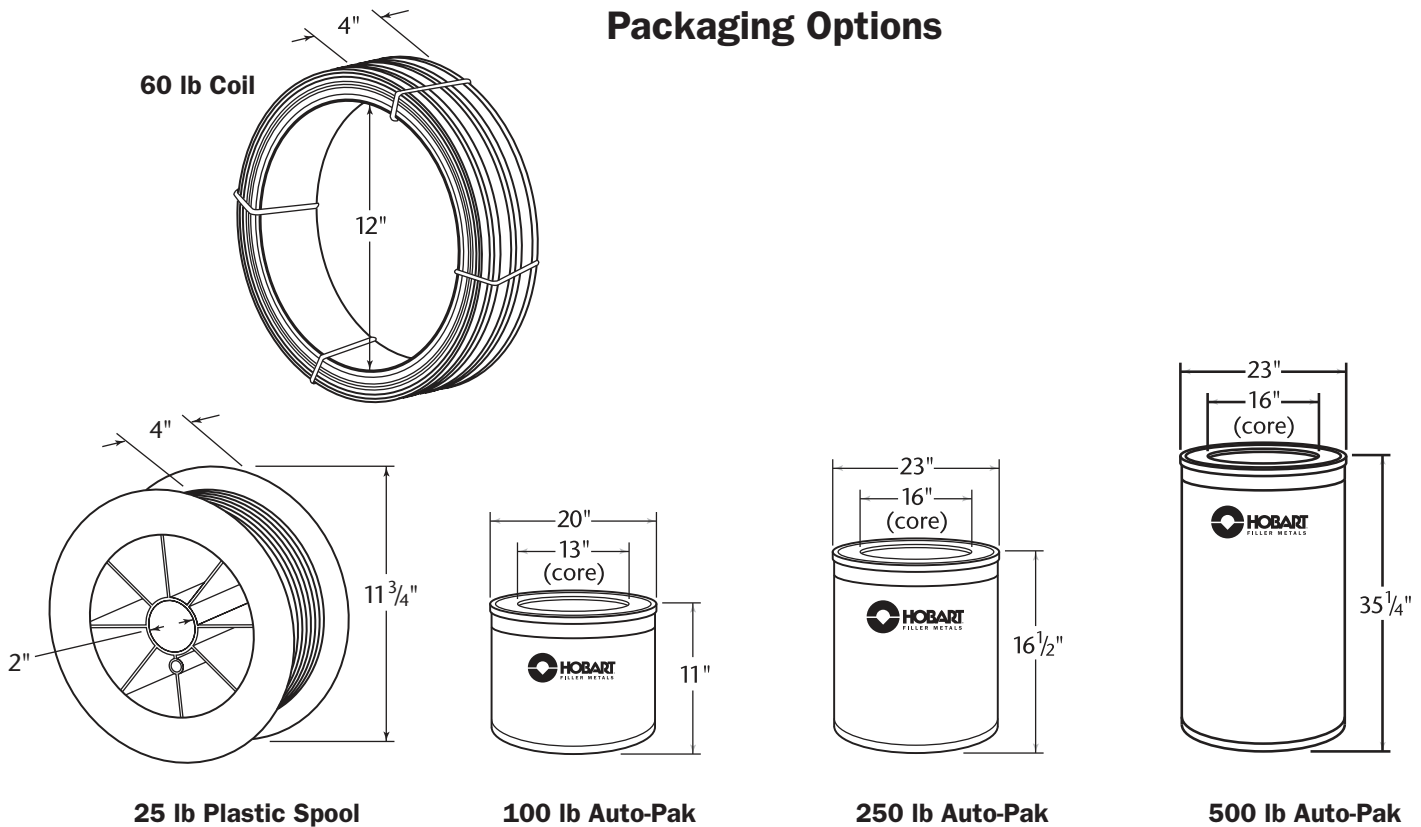


### Metal-to-Metal Wear Resistance

Hobart Type	Pallet Weight (lb)		Pallet Dimensions			Number of Items Per Pallet
	Net	Gross (est)	Depth	Width	Height	
25 lb Spool	500	605	24"	24"	27"	20 (25 lb Spools)
60 lb Coil	1680	1743	36"	36"	35"	28 (60 lb Coils)

Note: Please contact factory for Auto-Pak pallet requirements

### Packaging Options



# Hardfacing Wires

## TECHNICAL SECTION

### Tensile Strength to Hardness Conversion Chart

Brinell Hardness No. (BHN)	Vickers Hardness No. (VHN)	Rockwell		Approximate Tensile Strength, 1000psi
		C (HRC)	B (HRB)	
898	—	—	—	440
857	—	—	—	420
817	—	—	—	401
780	1150	70	—	384
745	1050	68	—	368
712	960	66	—	352
682	885	64	—	337
653	820	62	—	324
627	765	60	—	311
601	717	58	—	298
578	675	57	—	287
555	633	55	120	276
534	598	53	119	266
514	567	52	119	256
495	540	50	117	247
477	515	49	117	238
461	494	47	116	229
444	472	46	115	220
429	454	45	115	212
415	437	44	114	204
401	420	42	113	196
388	404	41	112	189
375	389	40	112	182
363	375	38	110	176
352	363	37	110	170
341	350	36	109	165
331	339	35	109	160
321	327	34	108	155
311	316	33	108	150
302	305	32	107	146
293	296	31	106	142
285	287	30	105	138
277	279	29	104	134
269	270	28	104	131
262	263	26	103	128
255	256	25	102	125
248	248	24	102	122
241	241	23	100	119
235	235	22	99	116
229	229	21	98	113

Brinell Hardness No. (BHN)	Vickers Hardness No. (VHN)	Rockwell		Approximate Tensile Strength, 1000psi
		C (HRC)	B (HRB)	
223	223	20	97	110
217	217	18	96	107
212	212	17	96	104
207	207	16	95	101
202	202	15	94	99
197	197	13	93	97
192	192	12	92	95
187	187	10	91	93
183	183	9	90	91
179	179	8	89	89
174	174	7	88	87
170	170	6	87	85
166	166	4	86	83
163	163	3	85	82
159	159	2	84	80
156	156	1	83	78
153	153	—	82	76
149	149	—	81	75
146	146	—	80	74
143	143	—	79	72
140	140	—	78	71
137	137	—	77	70
134	134	—	76	68
131	131	—	74	66
128	128	—	73	65
126	126	—	72	64
124	124	—	71	63
121	121	—	70	62
118	118	—	69	61
116	116	—	68	60
114	114	—	67	59
112	112	—	66	58
109	109	—	65	56
107	107	—	64	56
105	105	—	62	54
103	103	—	61	53
101	101	—	60	52
99	99	—	59	51
97	97	—	57	50
95	95	—	56	49

## TECHNICAL SECTION

### Typical Composition and Suggested Preheat Temperatures for Several Steel Mill Roll Alloys

Alloy	C	Mn	Si	Cr	Ni	Mo	V	W	Suggested Preheat (°F)*
AISI 1020	.20	.45	.25						300-500
AISI 1030	.30	.75	.25						400-550
AISI 1040	.40	.75	.25						450-600
AISI 8620	.20	.80	.28	.50	.55	.20			500-700
AISI 4130	.30	.50	.28	.90		.20			600-700
AISI 4140	.40	.55	.28	.90		.20			650-700
AISI 4320	.20	.55	.28	.50	1.80	.25			600-700
AISI 4340	.40	.70	.28	.80	1.80	.25			650-700
H-12	.35	.30	1.00	5.00		1.50	.30	1.40	700-800
52100	1.00	.30	.28	1.40					700-800
CAST IRON†	3.25	.80	2.00						700-800
INTERNATIONAL	.40	.55	.30	1.10	1.40	.15			700-800
DIN 21 Cr.Mo.V.5-11	.20	.40	.45	1.35	.20	1.10	.30		700-800
DIN 1700G 13Cr.Mo 44	.15	.55	.25	.85		.45			600-800
EFC 21	.23	.40	.45	1.35		1.10	.30		700-800

† Gray or unalloyed ductile (nodular) iron.

- Soak time varies with Roll Mass (usually 1/2 hour per inch of roll diameter once the surface has reached soak temperature).

### Oven Storage and Reconditioning of Filler Metals

Welding electrodes, wire, and flux may be damaged by atmospheric moisture. The following table recommends proper storage conditions, and time and temperature for reconditioning electrodes that have absorbed excess moisture.

Notes for table: Pallets and unopened cartons of electrodes and wire should be stored away from exposure to water in the form of rain, snow, spray, or humidity. Only hermetically sealed cans are safe against these conditions. Damaged cartons permit entry of damp air which may be picked up by the product and lower its quality. Humidity below 50% should be avoided for 6010, 6011, 6012 and 6013 electrodes. At no times should these classes of electrodes be stored in an oven above 175°F.

The instruction, “Dry at Room Temperature” in the table signifies that the humidity should be below 70% and the temperature should be within the limits 40°F and 120°F.

When reconditioning flux, it is important that the complete mass be brought up to the temperature desired. If the flux is held in large containers, this can take a very long time – perhaps over 24 hours. In thin layers, reduction in moisture can be accomplished in as little as one hour, for example, in layers one to two inches thick. Fossil fuel burners (natural gas, oil, etc.) are not recommended.

CAUTION: Welding characteristics of agglomerated flux may suffer if temperature exceeds 650°F.

Item Designation	Storage of Contents of Open Cartons*	Reconditioning*
Sub-Arc Fluxes	250°F	600°F
Mild Steel Solid Wire	Dry at room temperature	Not recommended
Tubular Wires – Speed-Alloy®, Tube-Alloy®, In-Flux® 0, ChromaWeld, FabCO®, Fabshield®, FabCOR®, MEGAFIL	Dry at room temperature	Not recommended