

# Freedom

# ALLOYS

The Maintenance Welding Solution

## New "Tubular" Technology

**FREEDOM ALLOYS** INTRODUCES THE MOST ADVANCED TUBULAR HARDFACING ELECTRODES IN THE WELDING INDUSTRY. THE FOUR NEW "TUBULAR" ELECTRODES, "**FLINT**", "**CRYSTAL**", "**GIBRALTAR**" AND "**HAMMER**", ARE SPECIALLY FORMULATED WITH UNIQUE CARBIDE AND MATRIX CHEMISTRY TO HELP SOLVE THE MOST SEVERE WEAR & IMPACT PROBLEMS.



THE "TUBULARS" ELIMINATE MOISTURE PROBLEMS. NO DISCARDING WET ELECTRODES & NO INFERIOR DEPOSITS.



THE "TUBULARS" ELIMINATE BASE METAL DILUTION AND DISTORTION DUE TO LOW AMPERAGE REQUIREMENTS.

THE "TUBULARS" INCREASE PRODUCTIVITY AND REDUCE COST, DUE TO HIGH DEPOSITION RATES. IT'S NOT UNCOMMON TO DEPOSIT 9 LBS. OF HARDFACING FOR EVERY 10 LBS. PURCHASED. IT WOULD TAKE 15-16 LBS. OF REGULAR HARDFACING ELECTRODES TO DEPOSIT THAT SAME AMOUNT

THE "TUBULARS" CAN BE APPLIED TO CARBON, ALLOY AND MANGANESE STEELS, AS WELL AS CAST IRON.



Serving All American Welding Needs

# CRYSTAL

## THE ULTIMATE TUNGSTEN CARBIDE TUBULAR ELECTRODE FOR EXTREME ABRASION

### FEATURES & BENEFITS

- HIGH DEPOSITION - OVER 90%
- LOW AMPERAGE - LESS BASE METAL DILUTION
- HIGH CARBON STEEL MATRIX - STRONGER CARBIDE BASE
- MAXIMUM TUNGSTEN CARBIDES CONTENTS
- MULTIPLE SIZE TUNGSTEN CARBIDES - BETTER WEAR



### WELDING PROCEDURES

- CLEAN SURFACE AND REMOVE OLD FATIGUED METAL
- HOLD ELECTRODE PERPENDICULAR
- NO WEAVING - STRINGER BEADS ONLY
- NO BACK-WHIP AT END OF BEAD

<b>Diameter</b>	<b>5/32"</b>	<b>1/4"</b>
<b>Part No.</b>	10036	10037
<b>Package Qty.</b>	10#	10#
<b>Rec. Amp.</b>	80/125	100/170
<b>Length</b>	14"	14"

### TECHNICAL DATA

CURRENT: AC/DC  
 CARBIDE HARDNESS: VPN 1200  
 MATRIX HARDNESS: Rc55  
 DEPOSIT HARDNESS: Rc69-73  
 COVERAGE: APPROX. 30 SQ. IN.  
 (1/16" THICK PER POUND)

#### Applications:

Anvil Knives  
 Augers  
 Asphalt Paddles  
 Buckets  
 Cement Die Rings  
 Conveyor Screws  
 Crusher Cone Shaft  
 Cultivator Shovels  
 Debarker Knives  
 Drag Line Buckets  
 Drag Line Chain

Drill Augers  
 Grader Blades  
 Guide Plates  
 Harrow Discs  
 Mud Pump Rotors  
 Paving Mach. Paddles  
 Sand & Slurry Pumps  
 Scrape Blades  
 Screw Conveyors  
 Teeth

#### Industries:

Agriculture  
 Aircraft  
 Automotive  
 Brick & Clay  
 Cement  
 Chemical  
 Dairy  
 Earthmoving  
 Farming  
 Lumber

Machine Shop  
 Manufacturing  
 Mining  
 Power Plants  
 Pulp & Paper  
 Public Utilities  
 Quarries  
 Railroads  
 Steel Mills

# FLINT

## ECONOMICAL TUNGSTEN CARBIDE TUBULAR ELECTRODE FOR SEVERE ABRASION

### FEATURES & BENEFITS

- HIGH DEPOSITION - OVER 90%
- LOW AMPERAGE - LESS BASE METAL DILUTION
- HIGH CARBON STEEL MATRIX - STRONGER CARBIDE BASE
- ONE PASS ONLY REQUIRED IN MOST APPLICATIONS



### WELDING PROCEDURES

- CLEAN SURFACE AND REMOVE OLD FATIGUED METAL
- HOLD ELECTRODE PERPENDICULAR
- NO WEAVING - STRINGER BEADS ONLY
- NO BACK-WHIP AT END OF BEAD

<b>Diameter</b>	<b>5/32"</b>	<b>1/4"</b>
<b>Part No.</b>	10033	10034
<b>Package Qty.</b>	10#	10#
<b>Rec. Amp.</b>	80/125	100/170
<b>Length</b>	14"	14"

### TECHNICAL DATA

CURRENT: AC/DC  
 CARBIDE HARDNESS: VPN 1200  
 MATRIX HARDNESS: Rc55  
 DEPOSIT HARDNESS: Rc60-68  
 COVERAGE: APPROX. 30 SQ. IN.  
 (1/16" THICK PER POUND)

#### Applications:

Anvil Knives  
 Augers  
 Asphalt Paddles  
 Buckets  
 Cement Die Rings  
 Conveyor Screws  
 Crusher Cone Shaft  
 Cultivator Shovels  
 Debarker Knives  
 Drag Line Buckets  
 Drag Line Chain

Drill Augers  
 Grader Blades  
 Guide Plates  
 Harrow Discs  
 Mud Pump Rotors  
 Paving Mach. Paddles  
 Sand & Slurry Pumps  
 Scrape Blades  
 Screw Conveyors  
 Teeth

#### Industries:

Agriculture  
 Aircraft  
 Automotive  
 Brick & Clay  
 Cement  
 Chemical  
 Dairy  
 Earthmoving  
 Farming  
 Lumber

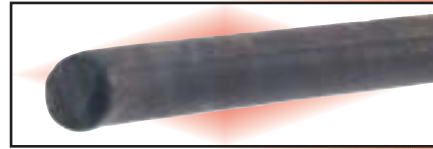
Machine Shop  
 Manufacturing  
 Mining  
 Power Plants  
 Pulp & Paper  
 Public Utilities  
 Quarries  
 Railroads  
 Steel Mills

# GIBRALTAR

## THIN WALL TUBULAR CHROMIUM/COMPLEX CARBIDE ELECTRODE FOR HIGH ABRASION RESISTANCE

### FEATURES & BENEFITS

- HIGH DEPOSITION - OVER 90%
- FASTEST NON-AUTOMATED OVERLAY TECHNIQUE
- LOW AMPERAGE - LESS BASE METAL DILUTION
- ALUMINUM GRIP END CAPS ON 3/8 & 1/2 DIAMETERS
- MULTIPLE POSITION (OVERHEAD NOT RECOMMENDED)



<b>Diameter</b>	<b>1/4"</b>	<b>3/8"</b>	<b>1/2"</b>
<b>Part No.</b>	10039	10040	10041
<b>Package Qty.</b>	10#	10#	10#
<b>Bulk Part No.</b>	10047		
<b>Bulk Pkg. Qty.</b>	50#		
<b>Rec. Amp.</b>	80/125	130/200	180/300
<b>Length</b>	18"	18"	18"

### WELDING PROCEDURES

- CLEAN SURFACE AND REMOVE OLD FATIGUED METAL
- EITHER STRINGER OR WEAVE TECHNIQUE
- HOLD ELECTRODE 10° FROM VERTICAL

### TECHNICAL DATA

CURRENT: DC REVERSE (+) OR AC  
HARDNESS: ROCKWELL Rc 57-60

#### Applications:

Anvil Knives  
Augers  
Asphalt Paddles  
Buckets  
Cement Die Rings  
Conveyor Screws  
Crusher Cone Shaft  
Cultivator Shovels  
Debarker Knives  
Drag Line Buckets  
Drag Line Chain

#### Industries:

Agriculture  
Aircraft  
Automotive  
Brick & Clay  
Cement  
Chemical  
Dairy  
Earthmoving  
Farming  
Lumber  
Machine Shop  
Manufacturing  
Mining  
Power Plants  
Pulp & Paper  
Public Utilities  
Quarries  
Railroads  
Steel Mills

# HAMMER

## THE ULTIMATE MANGANESE TUBULAR ELECTRODE FOR EXTREME IMPACT CONDITIONS

### FEATURES & BENEFITS

- HIGH DEPOSITION - OVER 90%
- FASTEST NON-AUTOMATED OVERLAY TECHNIQUE
- LOW AMPERAGE - LESS BASE METAL DILUTION
- ALUMINUM GRIP END CAPS
- MULTIPLE POSITION (OVERHEAD NOT RECOMMENDED)



<b>Diameter</b>	<b>3/8"</b>
<b>Part No.</b>	10043
<b>Package Qty.</b>	10#
<b>Bulk Part No.</b>	10049
<b>Bulk Pkg. Qty.</b>	50#
<b>Rec. Amp.</b>	120/175
<b>Length</b>	18"

### WELDING PROCEDURES

- CLEAN SURFACE AND REMOVE OLD FATIGUED METAL
- EITHER STRINGER OR WEAVE TECHNIQUE
- HOLD ELECTRODE 10° FROM VERTICAL

### TECHNICAL DATA

CURRENT: DC REVERSE (+) OR AC  
TENSILE STRENGTH: 120,000 PSI  
YIELD STRENGTH: 90,000 PSI  
HARDNESS: Rc 20/26  
WORK HARDNESS: Rc 48/50

#### Applications:

Augers  
Breaker Bars  
Buckets  
Chain Links  
Crushers  
Crossovers  
Drive Sprockets  
Frog Switches  
Grouser Bars  
Hammers  
Hammer Mills  
Idlers  
Locomotive Wheels  
Mandrels  
Railroad Tracks  
Rollers  
Roll Sprinkles  
Swing Hammers  
Tampers

#### Industries:

Agriculture  
Aircraft  
Automotive  
Brick & Clay  
Cement  
Chemical  
Dairy  
Earthmoving  
Farming  
Lumber  
Machine Shop  
Manufacturing  
Mining  
Power Plants  
Pulp & Paper  
Public Utilities  
Quarries  
Railroads  
Steel Mills

# TOUGHEST TUBULAR IN THE MARKET!

## *FLINT - CRYSTAL - GIBRALTAR - HAMMER*

TO COMPLEMENT THE "TUBULARS" IN THE HARDFACING INDUSTRY, FREEDOM ALLOYS ALSO OFFERS:

- **HARDHAT & CRUSHER ELECTRODES**
  - **FREEDOMWEAR • FX PLATE**
- **SOLAR & POLAR POWDER SPRAY**
  - **HARDFACING MIG**



Contact your local  
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