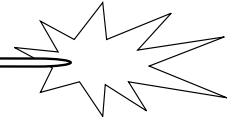


**VINCULUM**

THE CONNECTING MEDIUM

**Welding Products****A****Assortments**

- Drill Bits
 - IBS Type 187 Spotweld SW-30
- Solder Combos SW-3
- Welding Rod
 - Hi-Alloy SW-10
 - Vinculum Welding Electrode Assortment SW-26

B**Butane Products**

- Refill (42g) SW-28
- Torch
 - Excalibur Butane Solder Torch Kit SW-26, SW-27

D**“Dam-It” SW-4****Drill Bits**

- Assortments
 - IBS Type 187 Spotweld SW-30
- IBS Type 187
 - Spotweld SW-30

G**Grinding Wheels**

- Spot Weld Grinding Wheels SW-30

H**Heat Shield Compound**

- “Dam-It” SW-4

M**MIG Wire SW-22, SW-23, SW-25**

- Alum-Alloy 4043 SW-23
- Diverse-Alloy SW-22, SW-23
- Dual Shield, Flux Core SW-25
- Mid-Alloy SW-21
- MRO Stainless SW-24

S**Safety Accessories**

- STORM® Series Brazing Safety Glasses SW-31

Solder

- 60/40 Rosin Core Solder SW-2
- Assortments
 - Solder Combo Assortments SW-28

- NOKORODE® Regular Paste Flux SW-2
- Silvabrite 100% Solder SW-2
- Silver Bearing Solder SW-2

T**Tools**

- Solder & Welding
 - Big Shot Butane Torch SW-28
 - Hot Shot Butane Torch SW-28
- Welding Products & Accessories
 - Butane Refill (42g) SW-28
 - Excalibur Butane Solder Torch Kit SW-26, SW-27

Torches

- Big Shot SW-28
- Hot Shot SW-28

W**Welding Rod**

- All Position Stainless SW-20
- Alum-Alloy SW-13
- Braze-Alloy SW-14
- Comparison Chart
- Competitive Product SW-7
- Diverse-alloy SW-9
- Groovy SW-17
- Hi-Alloy SW-11
- Mid-Alloy SW-8
- MIG Wire
 - Alum-Alloy 4043 SW-23
 - Diverse-Alloy SW-22, SW-23
 - Dual Shield, Flux Core SW-25
 - Mid-Alloy SW-21
 - MRO Stainless SW-24
- MRO Cast SW-19
- MRO Stainless SW-16
- “Quicksilver” Brazing Alloy SW-15
- Stainless SW-16
- Ultralloy SW-12



IBS, INCORPORATED

Vinculum S05

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Silver Bearing Solder

Low Temperature

The highest strength, lowest melting point silver solder alloy for stainless steel, dissimilar metals and chrome plating.

- 500% stronger than common solders.
- Superior corrosion resistance with bright, shiny deposits.



IBS No.	Description	Qty
46001	1 oz. syringe	1
46000	9 ft. x 1/16 coil, acid core 96.5% tin - 3.5% silver	1

Silvabrite 100® Solder

Lead Free

Silvabrite 100® was developed to meet market demands for a safe and easy-to-use solder for drinking water systems and other applications. Silvabrite 100® is a lead-free and antimony free, non-toxic solder which contains the same metals used in dental fillings.

Features/Benefits:

- Lead-free composition — safe for use in drinking water systems.
- Low melting point — excellent penetration, flow and wetting out action means fast application and less waste.
- Wide melting range — 440°F to 500°F for maximum control.
- Excellent "capping off" ability.
- Tin, copper and silver composition — provides higher shear, creep and tensile strength than 50/50 for strong corrosion resistant leak-tight joints.



IBS No.	Description	Qty
460013	1/8 X 1# spool	1

60/40 Rosin Core Solder

Most Popular Solder for Electrical Applications

- Rosin flux is completely non-corrosive and non-conductive.
- Quick acting rosin flux dissolves surface oxides for good wetting and strong connections.
- Meets Fed. Spec. QQ-S-571
- 60% Tin / 40% Lead.
- Made in the USA



IBS No.	Description	Qty
46044	.031 x 1# Spool	1
46045	.062 x 1# Spool	1
46046	.093 x 1# Spool	1

NOKORODE®

Regular Paste Flux

Will not freeze or decompose. No odor. Lead free. Recommended for use on all solder alloys including 95/5 and all lead-free solders. Meets specification O-F-506, Type 1A and A-A-51145, MIL-F04995-2.



IBS No.	Description	Qty
460014	1.7 oz. jar	1



SOLDER COMBOS



One of our bestselling assortments just got better! Solder Combos available in any combination - 2 of our Low Temperature Silver Bearing Solder in coil, paste, or one of each and includes the new **MICROTORCH BUTANE TORCH!**

MICROTORCH BUTANE TORCH
IBS No. 125738 (T03)
Retail Value \$39.95

At only 5-1/4" high with a 2500°F flame, the **MICROTORCH** is ideal for all types of professional use. Refillable with premium grade Butane Refill (**IBS No. 95007 - T03**)

Low Temperature Silver Bearing Soft Solder - the highest strength, lowest melting point silver solder alloy for stainless steel, dissimilar metals and chrome plating, available in coil, or syringe paste.

- 500% stronger than common solders
- Superior corrosion resistance with bright, shiny deposits

IBS No.	Description
418P	1 Solder Paste Syringe 1 Coil 1 Torch 1 Butane Refill
425P	2 Solder Paste Syringes 1 Torch 1 Butane Refill
426P	2 Solder Coils 1 Torch 1 Butane Refill

TYPICAL APPLICATIONS

- Stainless Escalator Parts
- Copper Tubing
- Air Pressure Tubing
- Chrome Plating
- Gas Lines
- Hospital Equipment
- Electrical Connections
- Water Pipes
- Dissimilar Metals
- Stainless Tables, Pans, Vats & Vessels

ONLY \$69.95
a \$91.00 value!

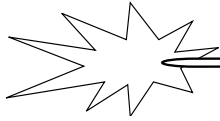


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



“Dam-It”

IBS No. 46060

Heat Resistant Material For Insulating and Positioning Parts for Welding

- Easy To Use
- Adheres To Most Surfaces
- Withstands Temperatures to 3000° F
- Maintains Shape When Heated
- Asbestos-free and non-toxic
- Reusable
- Helps Prevent Heat Distortion
- Can Be Reconstituted Using Water



Can't get that part to stay in place? Is heat distortion a problem? Then just say "DAM-IT!" **DAM-IT** is a product specially designed to handle these types of problems and more. **DAM-IT** easily holds or positions small and difficult to align parts for welding, brazing or soldering. It is an easy to mold compound that can be used as a heat dam and insulator to protect metal and other material from the effects of heat. The dough-like consistency of DAM-IT makes it easy to mold around intricate parts. It will adhere to most surfaces making it ideal for use as a jiggling fixture or insulator for parts to be welded and it will not distort or shrink when heated.

Applications: It can be used as a heat sink to absorb heat and avoid surface distortion on heat sensitive parts. It can also be used as a heat dam to prevent heat from traveling to areas that can be damaged by heat, such as seats, gaskets, glass and wiring. It will also prevent discoloration and will keep distortion down when welding on light gauge metals such as stainless steel. It is ideal for positioning or holding difficult to align parts.

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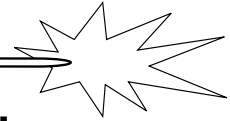
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VINCULUM

THE CONNECTING MEDIUM



Premium Quality Arc Welding Electrodes

**Researched And Engineered To Meet
The Maintenance Welder's Total Needs**

**Precisely Formulated, Coated Electrodes
For The Welding Of Virtually All Metals**

- Cast Iron
- “Problem” Steels
- Aluminum
- Hardfacing
- Stainless Steel
- Dissimilar Metals
- Cutting Electrodes

Vinculum™ Means Connecting

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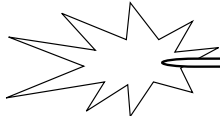


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VINCULUM

THE CONNECTING MEDIUM



Standard "off the shelf" welding electrodes are mass produced for the limited demands of production welding!

Production welding has been greatly simplified!

1. The metals being used are clean.
2. Special jigs and fixtures are used for ease of application.
3. Production welding matches a single electrode to a metal of known analysis.
4. Day after day welding on the same job makes production welding easier.

IBS - Vinculum™ is formulated for the multiple problems of maintenance welding...Produces faster, easier, stronger, x-ray quality welds!

Maintenance welding is still extremely complex!

1. Unlike production, the maintenance welder must often weld rusty, oily, or painted metals.
2. Many welds must be made in hard to reach places with poor fit-up.
3. The exact chemistry of the metals being welded is seldom known.
4. The repair or maintenance welder must weld cast iron one day and stainless, tool, or alloy steels another day, with equal skill...Every job is different and difficult.

IBS-Vinculum™ is made only for maintenance welding!

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Vinculum S05



IBS-Vinculum™ Welding Products Comparison Chart

The **Vinculum™** products listed below are available only through **INDUSTRIAL BOLT & SUPPLY, INC.**

Vinculum	MG Name	MG #	Karalloy	Bowman	Eutectic	Lawson	Certanium	X-Ergon	Rockmont	Choice	Mech.	
Mid-alloy	Gricon 33	500			885	Beautyweld	350	701		104	Tartan A	Torque II
Hi-alloy	Gricon 29	600	Super Tensile	Super Tensile	990	680 680CGS	300	707 770		100 1000	Brutus A AA	Torque IV
Groovy	Gricon 53	570	Grooving	Grooving	920	Exotrode	100	100		161	Electa	Torque Gouge-cut
Alum-alloy	Grilumin 14	400	Aluminum	Aluminum	980	2101 2109	450	608		141	Neptune A	Torque Aluminum
Braze-alloy	Grisil 1	130	Nickel	Nickel	914	16/185	400	70/87		201 202/271	Brutus G	
Stainless	Grinos 2	650	Silver FC	Silver FC	895	Stain B		710		121 123	Gemini A	Torque XI
Fix-a-cast	Gricast 89	289			880	2233	200	889			Jupiter A	Torque VI
Hi-abrasion	Gridur 18	770	Abrasion II	Abrasion II	770	6006		247/250		716	Omega N	
Low Hydro	Gricon 15	540	Posi-Weld	Posi-Weld	25160	66		703/704		103	Polaris A	



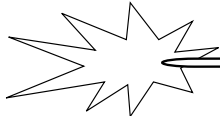


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



Mid-Alloy

Premium General Purpose Alloy

For Low Carbon Steels

AC or DC
All Position

VINCULUM™ MID-ALLOY is designed to operate on all welding machines, even small AC type transformers when the open circuit voltage is very low. The specially formulated coating protects the deposit from adverse conditions normally encountered in maintenance welding. An ideal electrode for field repair work and out of position welding.

Features:

- Low amperage electrode
- Minimum spatter & Easy slag removal

Benefits:

- Controlled distortion
- Fast clean-up - Saving time

Applications

Use for fabrication of thin, medium, heavy and dissimilar gauge mild steel.

- Machine parts
- Sheets and Angle iron
- Beams
- Filling holes
- Pipes
- Build up

The outstanding restart characteristics of this electrode allow it to be used on applications requiring short, intermittent or spot welds.

Procedures:

As much foreign material as practical should be removed from the weld area. Deep penetration can be accomplished by using DC reverse polarity (electrode +). Limited penetration and a flatter bead will result from using DC straight polarity (electrode -). Arc blow can be prevented by using AC. Maintain medium arc length with either stringer or weave beads. Slag can be easily removed with a light chipping hammer.

Technical Data:

Tensile Strength.....up to 80,000 psi
 Yield Strength.....up to 68,000 psi
 Elongation %approx. 24%
 CurrentAC or DC either polarity
 ColorGold

IBS No.	Diameter	Amperage	Qty - lbs
46002	3/32	35 - 80	5, 10
46004	1/8	65 - 125	5, 10
46006	5/32	90 - 160	5,10

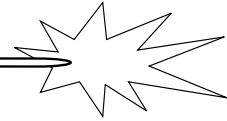
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VINCULUM

THE CONNECTING MEDIUM



Diverse-alloy

A Premium High Strength Electrode For Welding High Strength Low Alloy Steels and Abrasion Resisting Plate AC or DC Reverse Polarity (Electrode +)

This superior quality, low-hydrogen electrode is the welder's choice for high strength, machinability and affordability. **DIVERSE-ALLOY** is excellent for welding most high-strength low alloy steels. It is recommended for the repair of heavy equipment and joints subjected to high stresses because of its high strength. The moisture resistant coating assures dense, crack-free deposits for outstanding impact resistance at all temperatures, and X-ray quality welds. This makes **DIVERSE-ALLOY** the ideal electrode for wear plate, steel fabrication and pipe welding. Engineered flux provides the flexibility of all position welding. **DIVERSE-ALLOY** deposits are easily cut with a torch and machinable for machine parts repairs.

Features

- 100,000 PSI
- All position
- 30% elongation
- Rapid deposition
- Machinable
- Torch cuttable
- High impact resistance
- Crack-free X-ray quality deposits

Benefits

These features combine to offer reduced failure and labor costs plus maximum use of your valuable maintenance dollar.

Applications:

Use for welding High Strength Low Alloy (HSLA) steels and AR plates to themselves and in dissimilar combinations where good ductility is desired even at low temperatures. Use on any carbon or HSLA steel application where high tensile strength and ductility are desired. Excellent for steel fabrication and pipe welding.

Procedures:

Prepare weld by removing any fatigued metal. Bevel or chamfer heavy sections to a 90° vee. Short arc gap should be maintained. Use weave technique working from bottom up for vertical welding. Use stringer beads or slight weave on flat and horizontal fillets, but avoid whipping. Remove all slag between passes.

Technical Data:

Tensile Strength up to 93,000 psi
(70 kg/mm²)
Elongation % approx. 32
Current AC or DC Reverse Polarity
(Electrode +)

IBS No. by lb.	Diameter	Amperage	mm
46041	3/32	60 - 100	2.5
46042	1/8	100 - 150	3.25
46043	5/32	140 - 200	4.0





IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



If Broken Bolts, Taps, Drills, Or E-Z Outs Are A Problem...



Then Vinculum™ Hi-Alloy Specialty Welding Rod Is The Answer!

Now Available In Three Convenient Assortments!

IBS No. 300P

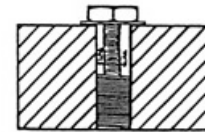
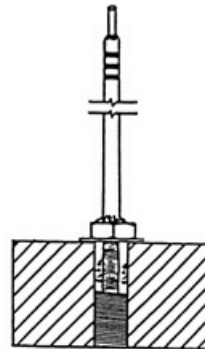
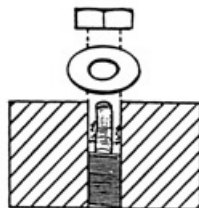
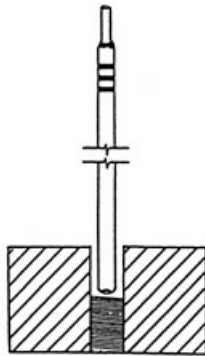
3 lbs each
5/64" • 46008
3/32" • 46010
1/8" • 46012

IBS No. 350P

2 lbs each
5/64" • 46008
3/32" • 46010
1/8" • 46012

IBS No. 375P

1 lb each
5/64" • 46008
3/32" • 46010
1/8" • 46012



- Place the IBS Hi-Alloy rod vertically in center of hole without touching the edges. By remaining at the center, the flux will prevent the stud from fusing to the walls.
- Strike an arc & build up using short duration welds, making sure that the arc does not wander & weld the build-up to the edges. Allow the weld to cool between passes.
- Chip the slag at the center to expose the weld metal before the next step.
- Place a washer with an ID less than the ID over the hole itself, creating a spacer.
- Choose a nut of equal or greater size than the head of the broken bolt.
- Place the nut on the washer centered over the hole. Weld through the nut & washer so the weld pool fuses to the nut. Continue welding until the cavity of the nut is filled.
- The weld deposit, along with the nut & washer will create a new structure that will act as an extension of the original fastener.
- Allow the work area to cool before proceeding.
- To remove the fastener, use hand tools only. DO NOT use an impact wrench of any kind.
- Back out the fastener with hand tools. After removal, run a tap over the threads to remove the slag residue.

VINCULUM

"THE CONNECTING MEDIUM"

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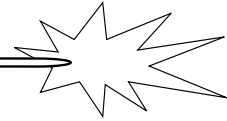
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VINCULUM

THE CONNECTING MEDIUM



Hi-Alloy Welding Rod
A Superior Super Strength Electrode
 For Welding Alloy and Dissimilar Steels
 AC or DC Reverse Polarity • All Position

The Perfect Choice For Removing Broken Bolts, Studs, Taps & E-Z Outs!

VINCULUM™ HI-ALLOY is designed to weld low, medium and high alloy steels where super strength and high quality welds are desirable.

Features:

- Used for broken stud removal
- Replaces large size E-Z outs
- Joins any stainless to carbon steels
- Less errors and guess work

Welds:

- Low, medium and high alloy steels
- Spring steels
- Carbon Steels
- Stainless steel to carbon steel
- Stainless steel
- Manganese
- Any combination of weldable steels
- Cast steels
- Tool and die steel

Applications:

- Camshafts
- Drive Shafts • Gears
- Scraper teeth and arms
- Crane booms
- Dies
- Excellent underlayment prior to hardfacing
- Shovel buckets
- Rollers

Procedures:

Remove all foreign material from joint area. Heavy sections should be beveled to form a 90° vee. High carbon steel should be preheated to 400° F (204°C). Maintain alignment by use of jigs, fixtures and tack welds. Use stringer beads to prevent overheating and maintain a short arc. Allow to cool prior to removing slag.

Technical Data:

Tensile Strength - welded..... up to 120,000 psi
 work hardened..... up to 180,000 psi
 Yield strength..... up to 90,000 psi
 Elongation %..... approx. 28%
 Hardness (HB)..... approx. 300
 Current.....AC or DC Reverse Polarity
 (Electrode +)
 Color..... Blue

IBS No.	Diameter	Amperage	Extracts Bolt
46008	5/64	25 - 55	5/16
46010	3/32	40 - 80	3/8
46012	1/8	65 - 120	1
46014	5/32	90 - 150	2-1/2

HI-ALLOY ROD IS SOLD IN 5 & 10 LB PACKAGES



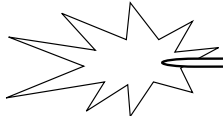


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



Ultralloy

The Ultimate Electrode for Welding All Types of Steels, Without Any Danger of Cracking or Breakage

AC or DC Reverse Polarity (Electrode +)
Especially Recommended for AC

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A premium electrode designed to produce the highest tensile weld. formulated to provide improved arc stability under adverse conditions where old or inexpensive welding equipment is used. It is amazingly stable on low, open circuit voltages and AC buzz boxes. The weld metal transfer creates smooth porosity-free welds with almost no spatter. Arc re-strike is instantaneous, virtually self-releasing slag.

Applications:

Due to exceptional strength and crack resistance, **ULTRALLOY** is ideal for repairing tools, dies, spring steel, carbon steel, stainless steel and any dissimilar metal combinations, with the exception of aluminum, cast iron and copper alloys. Due to the strength of the weld metal it is ideal for repairing worn parts and as an underlayment prior to hardfacing. Excellent for rebuilding blades and shafts used in construction, mining, and chemical industries. Truly the home hobbyist and maintenance welder's first choice for general applications.

Procedures:

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 joint should be used when joining heavy sections. Preheat is necessary only for high carbon steels, which should be preheated to 350° (204°C), the inter-pass 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.

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 approx 320
Current AC or DC
..... Reverse Polarity (Electrode +)
Color Green

IBS No.	Diameter	Amperage
46082	3/32	60 - 80
46084	1/8	90- 110
46086	5/32	75 - 140

ULTRALLOY ROD IS SOLD IN 5 & 10 LB PACKAGES



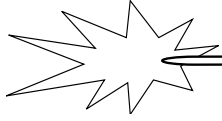


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



Braze-Alloy

High Strength Brazing Alloy

Torch or Induction

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VINCULUM™ BRAZE-ALLOY is a premium grade, flux coated, high strength alloy for general maintenance repair with a torch. It is an excellent choice for the build-up of parts subjected to high frictional wear and to repair gears with broken teeth. Also, at slightly higher temperatures its exceptional thin flow characteristics make it ideal for repairing broken bits, attaching carbide tips, etc.

Applications:

(Low temperature)

Build up of

- Valve seats
- Wedge bars
- Steering knuckles
- Gear teeth
- Reamers
- Shafts
- Bearings

(High temperature)

- Tool steel
- Cast iron
- Alloy steels
- Brass-Copper
- Galvanized iron
- Thin sheet metal

Procedures:

Clean joint area. This thin flowing alloy will have maximum strength with a joint clearance of .001" to .003" Using a neutral flame, heat the part uniformly until the flux is liquefied. Add sufficient alloy to fill the joint. Additional passes can be applied without the need to remove flux residue from previous passes.

Allow the part to cool slowly. Remove the flux by chipping and wire brushing.

Technical Data:

Tensile strength up to 113,000 psi
 Hardness (HB) 140 - 200
 Working temperature 1400° - 1750° F
 Remelt temperature approx. 1800° F
 Color Red

IBS No.	Dia. x Length
46020	3/32 x 18"
46022	1/16 x 18"
46023	1/8 x 18"

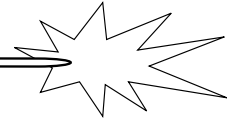
BRAZE-ALLOY ROD IS SOLD IN 5 & 10 LB PACKAGES





VINCULUM

THE CONNECTING MEDIUM



“Quicksilver” Brazing Alloy

56 % Silver, Cadmium Free

for joining Ferrous and Non-Ferrous metals

Torch, Furnace or Induction

VINCULUM™ “QUICKSILVER” BRAZING ALLOY features an exclusive thermal flux coating that makes this high silver, cadmium free brazing rod unique. The flux provides excellent cleaning action on most metals and does not blacken. It is ideal for food and pharmaceutical applications since it is cadmium free.

Applications:

Used in the food and dairy industry for joining stainless steels. Ideal for general maintenance and repair. For the repair and assembly of laboratory apparatus, control devices, instruments, tubing, trim work, switches, etc.

Procedures:

Joint must be clean. For maximum strength, joint clearances should not exceed .003". Maintain alignment by use of fixtures and jigs. Heat parts broadly with a slightly carburizing flame. Place thermal flux on the heated joint. When the flux becomes clear and fluid, melt a small amount of alloy onto the joint.

Continue heating until the alloy flows into the joint. **Base Metal Must Not Be Over Heated.** After part has cooled slowly, remove flux residue with warm water.

Technical Data:

Tensile strength..... up to 76,000 psi
Working temperature..... approx. 1220° F
Corrosion resistance..... Good
Color match..... Good on stainless steel
Electrical conductivity..... Good
Elongation %approx. 22

IBS No.	Dia. x Length	Pkg Qty
46056	1/16 x 18"	Each
46055	3/64 x 18"	Each

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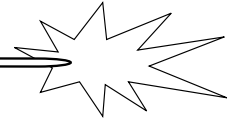
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VINCULUM

THE CONNECTING MEDIUM



Groovy Premium High Speed Gouging And Chamfering Electrode

AC or DC Straight Polarity All Position

VINCULUM™ GROOVY is designed to remove metal fast and efficiently without special skills or special equipment, expensive gases or compressed gas.

Features:

- Special coating for a forceful arc blow
- Restrike capability is excellent
- Cut is smooth & uniform from all positions
- Eliminates need for compressed air or oxygen
- Easy to use. Time saver
- No special skills required

Cuts:

- Cast iron
- Aluminum
- Stainless steel
- Carbon Steel
- Copper
- Nickel
- Manganese
- Bronze

Applications:

Can be used to remove unwanted or defective weld metal, to prepare parts prior to welding, to remove risers and reduce large area of metal prior to machining.

Procedures:

Use DC straight polarity (electrode -) for clean, high speed cuts. The electrode should be held at a low angle to the work piece (10° - 15°). With the electrode pointed in the direction of desired groove, strike the arc and push the electrode as fast as the metal is removed. A short arc should be maintained. The maximum depth of the groove should not be greater than the diameter of the core wire. For deeper grooves use multiple passes.

Technical Data:

Current AC or DC Straight Polarity
.. (Electrode -)
Color Gray

IBS No.	Diameter	Amperage
46015	1/8	160-300

GROOVY IS SOLD IN 5 & 10 LB PACKAGES



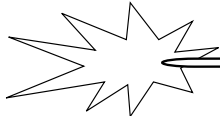


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



Hi-Abrasion Premium Hard Surfacing Electrode For Severe Abrasion

AC or DC Reverse Polarity

VINCULUM™ HI-ABRASION is designed for parts subjected to severe abrasion and light impact. Also for surfaces that must resist abrasion combined with scaling.

Features:

- High deposition rate
- Self releasing slag
- Excessive dilution with base metal easily prevented
- High chromium content to maintain abrasion resistance
- Smooth beads
- Easily controlled arc

Applications:

- Equipment for processing coal, rock, soil, cement and ceramic matter
- Grinding plates
- Conveying chains
- Open-hearth tools
- Earth augers
- Earth scrapers
- Annealing furnaces
- Rock crushers

Procedures:

All unsound metal or foreign material should be removed from the surface to be welded. An elastic cushion layer should be applied before surfacing for best results. On carbon and manganese steel use **VINCULUM™ HI-ALLOY**. When making the final surface, keep the electrode vertical to the work piece and maintain a short arc. Thin deposits never more than two layers thick should be used. Alternate welding area to prevent excessive local heat build-up. Allow part to cool slowly.

Technical Data:

Hardness RC 56 - 60
 Current AC or DC Reverse Polarity
 (Electrode +)
 Color Gray

IBS No.	Diameter	Amperage
46035	1/8	80 - 125
46037	5/32	100- 160

HI-ABRASION ROD IS SOLD IN 5 & 10 LB PACKAGES

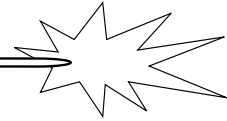
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VINCULUM

THE CONNECTING MEDIUM



MRO Cast

Specially Designed for Dirty Cast Iron - The Problem Solver to Use When All Others Fail

AC or DC Reverse Polarity (Electrode +)

VINCULUM™ MRO CAST has a unique flux coating on alloyed cored wire which 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.

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.

Procedures:

On heavy sections, remove worn, cracked metal, and bevel joint using **VINCULUM™ GROOVY** (46015 - 1/8") , or an **IBS Hi-Alloy Grinding Wheel** (see page PA-7 for grinding wheels). When repairing cracks, drill a "stop" hole at either end to prevent spreading while welding. On very heavy sections, preheat to approximately 400°F. Use short stringer beats for root pass and peen lightly after removing slag. Use a short to medium arc and lowest amperage possible to minimize base metal over-heating. When breaking arc, always back whip onto weld crater. Weaving two times rod diameter is acceptable for cover beads on multi-pass work. Weld joints should be allowed to slow cool for maximum strength and machinability.

Technical Data:

Tensile Strength.....	up to 75,000 psi (517N/mm ²)
Hardness	Brinnell 210
Current	AC or DC Reverse Polarity (Electrode +)

IBS No.	Diameter	Amperage
46030	3/32	40 - 70
46031	1/8	70- 110

MRO CAST Is SOLD IN 5 & 10 LB PACKAGES



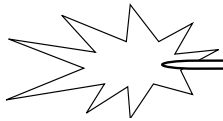


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



All Position Stainless

Special vertical position stainless steel electrode

- Unique “Fast-Freeze” coating simplifies vertical down and up welding.
- Ideal for poor fit-up joints in all positions.
- Controlled weld puddle allows for filling holes on stainless steels.

INTERNATIONAL SPECIFICATIONS	AWS/ASME IIC SFA F.5 E 316L-16
	DIN 8556 E19123L R 23
	ISO 3581 E19.12.3L R 23
	BS 2926 - 1984 19.12.3L R

APPLICATIONS:

Especially suited for vertical down and up welding of thin to medium gauge molybdenum bearing stainless steels.

MICROSTRUCTURE:

Austenite with 3-9% ferrite. Typical ferrite number is 6.

ALL WELD METAL ANALYSIS (TYPICAL WEIGHT %)									
C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Fe
.018	.9	.75	.01	.02	19	12	2.65	.1	bal

WELDING TECHNIQUES:

For vertical welding, set amperage at high end of the scale. Maintain a sharp angle with the electrode pointing upward. Whip the electrode quickly back and forth while moving up or down. Electrode may show a red color from the excess amperage which is normal.

Technical Data:

Tensile strength..... up to 80,000 psi
 Yield strength 56,000 psi
 CurrentDC Reverse (+) or AC
 Elongation42%
 HardnessRockwell B96, Brinnell 209
 Welding Positions..... Flat, Vertical Up
Vertical Down, Horizontal, Overhead
 Color Ivory

IBS No.	Diameter	Amperage
46065	3/32 x 12"	60 - 80
46066	1/8 x 14"	90- 110

ALL POSITION STAINLESS IS SOLD IN 5 & 10 LB PKGS.

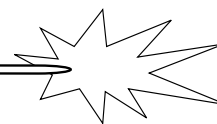


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VINCULUM

THE CONNECTING MEDIUM



MIG Wire: Mid-Alloy Mild Steel MIG Wire for Multi-Pass Welds

GENERAL CHARACTERISTICS:

Mid-Alloy MIG Wire has excellent fluidity and bead appearance. High manganese and silicon content provides deoxidation when welding through mill scale and on rusty or oily surfaces. This is the wire to use when welding conditions are less than perfect. In a CO2 atmosphere, Mid-Alloy MIG Wire produces a quiet, stable arc. It has out-of-position usability when using small diameters and short circuiting transfer.

APPLICATIONS:

Produces porosity free welds in applications where poor fit-ups, scale and rust are encountered. Use on steel castings, shaft build-up, tanks, truck bodies, farm and construction equipment.

RECOMMENDED WELDING PARAMETERS DCEP:

Diameter	Volts	Gas Flow Amps	Electrical (cfh)	Stick-Out
.024 (.6mm)	12-18	15-120	20	1/4" -3/8"
.030 (.8mm)	14-24	25-100	20	1/4" -3/8"
.035 (.9mm)	15-24	50-150	20	1/4" -3/8"

ALL WELD METAL ANALYSIS (TYPICAL WEIGHT %)				
C	Mn	P	S	Si
.08	1.59	.016	.010	1.00

TECHNICAL DATA:

Tensile Strength.....up to 85,900 psi (59 kg/mm²)
 Current.....DCEP
 Yield Strength.....up To 66,300 psi (46 kf/mm²)
 Elongation.....approx. 27
 Charpy V-Notch @ -20°F.....39 ft. lbs

MIG WIRE: MID-ALLOY

IBS No.	Dia.	Volts	Gas Flow Amps	Spool Size	Stickout	Qty
46104	.023	12-18	15-120	2 lb.	1/4"-3/8"	1
46105	.030	14-24	25-180	2 lb.	1/4"-3/8"	1
46106	.035	15-24	60-225	2 lb.	1/4"-3/8"	1
46114	.045	17-34	100-325	2 lb.	3/8"-3/4"	1
46107	.023	12-18	15-120	10 lb.	1/4"-3/8"	1
46108	.030	14-24	25-180	10 lb.	1/4"-3/8"	1
46109	.035	15-24	60-225	10 lb.	1/4"-3/8"	1
46115	.045	17-34	100-325	10 lb.	3/8"-3/4"	1
46116	.035	15-24	60-225	33 lb.	1/4"-3/8"	1
46117	.045	17-34	100-325	33 lb.	3/8"-3/4"	1



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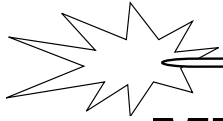


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



MIG Wire: Flux Core Gasless

For Use on Thin Gauge Galvanized & Mild Steel

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GENERAL CHARACTERISTICS:

This self-shielded, flux-cored mild steel wire is designed for single pass, semi-automatic welding applications encountered by the maintenance and repair welder. It is excellent for carbon steels, galvanized steels and zinc coated steels. The specially formulated flux contained inside the wire eliminates the need for an external shielding gas and provides the necessary slag to produce high quality welds. Vinculum Diverse-Alloy MIG Wire is excellent for use with small constant current wire feeders which are lightweight.

APPLICATIONS:

Fabrication and repair of lightweight structural steel, trailers, tanks, hoppers and machinery parts. Excellent for use on fillet and lap welds on thin gauge steel where burn through is a problem with other wires and electrodes. An ideal electrode to use in drafty or windy conditions where gas-shielded wires cannot be used.

RECOMMENDED WELDING PARAMETERS DCEN(-):

Diameter	Volts	Amps	Stick-Out
.030	14-17	25-100	3/8"-1/2"
.035	13-19	50-150	3/8"-1/2"

TECHNICAL DATA:

Tensile Strength.....up to 83,000 psi (572 N/mm²)
Current.....DCEN (electrode -)
AWS Specification.....AWS A5.20 SFA 5/2- E71T-GS

MIG WIRE: DIVERSE-ALLOY

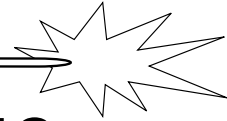
IBS No.	Diameter	Volts	Amperage	Spool Size	Stickout	Qty
46100	.030	14-17	25-100	2 lb.	3/8"-1/2"	1
46101	.035	13-19	50-150	2 lb.	3/8"-1/2"	1
46102	.030	14-17	25-100	10 lb.	3/8"-1/2"	1
46103	.035	13-19	50-150	10 lb.	3/8"-1/2"	1





VINCULUM

THE CONNECTING MEDIUM



MIG Wire: Alum-Alloy 4043

For Use on Heat-Treatable Welding Alloys & 6XXX Series Alloys

GENERAL CHARACTERISTICS:

Alum-Alloy 4043 MIG is a great choice for the welding of heat-treatable base alloys and more specifically the 6XXX series alloys. It has a lower melting point and more fluidity than the 5XXX series filler alloys and is preferred by welders because of its favorable operating characteristics. ER4043 type wires are also less sensitive to weld cracking than the 6XXX series base alloys. 4043 is suitable for sustained elevating temperature service, i.e. above 150°F.

FEATURES:

- Superior wire surface finish for the best feedability and arc performance.
- Optimal manufacturing process to precisely control chemical composition.
- State-of-the art testing equipment to ensure trouble-free performance of the weld wire.
- Manufactured under quality system certified to ISO 9001 requirements.

SPECIFICATION:

- Conforms to ANSI/AWS A5.10 (ER & R) AMS 4190
- ISO designation: AlSi5

APPLICATION:

- For welding 6XXX alloys, and most casting alloys.
- Good all-purpose filler alloy.
- Automotive components such as frame and drive shafts.
- Bicycle frames.

TECHNICAL DATA:

Melting Range	1065°F - 1170°F
Conductivity.....	42% IACS (-O)
Density.....	0.097 lbs./cu.in.
Resistance to corrosion.....	B (Gen) A (SCC)
Anodize Color.....	Gray

MIG WIRE: ALUMA-ALLOY 4043

IBS No.	Diameter	Volts	Amperage	Spool Size	Qty
46130	.030	100-130	18-22	1 lb.	1
46131	.035	85-120	20-23	1 lb.	1
46132	3/64	125-150	20-24	1 lb.	1



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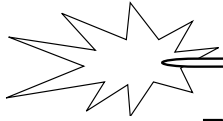


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Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



MIG Wire: MRO Stainless

For Type 316 Stainless Steel and other AISI Grade
(304, 304L, 308, 308L, 316 & 316L)
Meets AWS A5.9-9.3 under class ER316L Si

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GENERAL CHARACTERISTICS:

MRO Stainless is suitable for welding AISI grades 316L & 308L when improved resistance to pitting corrosion is required. Deposits have superior resistance under salt-water conditions. When optimally applied, weld deposits are smooth and free from out-gassing and porosity.

APPLICATIONS:

Typical applications include valve and pump trim, digester tanks, pulp, paper and textile processing equipment, marine applications, evaporators, etc., with improved performance due to the molybdenum content.

TECHNICAL DATA:

Typical Tensile Strengthup to 75,000 psi
Typical Yield Strength up to58,000 psi
Typical Elongation (1=5d) min.....35%
Typical Hardness (BHN)160
Impact Strength.....35 Ft-lbs at -320°F (-160°C)
Current.....DCEP (+)
Typical Ferrite Number.....10 - DeLong Diagram

Diameters:	0.035" (0.9mm)	0.045" (13.2mm)
Short Arc Amperage:	65-145	120-175
Spray Arc Amperage:	145-225	180-260

Short-Arc Shielding Gas: 90% Ar + 7.5% He + 2.5%CO ₂ @ 25-25 scfh	75% Ar+25% CO ₂ @ 25-28 scfh
Spray-Arc Shielding Gas: 98% Ar 2% O ₂ @ 35-40 scfh	98% Ar 2% O ₂ @ 35-40 scfh

MIG WIRE: MRO STAINLESS

IBS No.	Diameter	Amperage Short Arc	Amperage Spray Arc	Spool Size	Qty
46110	.035 (0.9mm)	65-145	145-225	2 lb.	1
46111	.045(1.2mm)	120-175	180-260	2 lb.	1
46112	.035 (0.9mm)	65-145	145-225	10 lb.	1
46113	.045 (1.2mm)	120-175	180-260	10 lb.	1





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VINCULUM

THE CONNECTING MEDIUM



Vinculum Welding Electrode Assortment

STEEL & CAST IRON

IBS No. 754R • 5 Items • 9 lbs.

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IBS, Inc.
SPECIALTY PRODUCTS FOR MAINTENANCE & REPAIR
(800) 678-1906 • www.industrialbolt.com

Vinculum Welding Electrode Assortment Steel & Cast Iron

Assortment No. 754R

<p>46015 1/8 GROOVY VINCULUM Premium High Speed Gouging And Chamfering Electrode</p>	<p>VINCULUM™ GROOVY is designed to remove metal fast and efficiently without special skills or special equipment, expensive gases or compressed gas. Color: Gray</p>	<p>Technical Data: Current..... AC or DC Straight Polarity (Electrode -)</p>
<p>46031 1/8 MRO CAST VINCULUM Specially Designed for Dirty Cast Iron - The Problem Solver to Use When All Others Fail</p>	<p>Vinculum™ MRO CAST has a unique flux coating on alloyed cored wire which 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. Color: Dark Gray/Black</p>	<p>Technical Data: Tensile Strength..... up to 75,000 psi (517N/mm2) Hardness.....Brinell 210 Current..... AC or DC Reverse Polarity (Electrode+)</p>
<p>46012 1/8 HI ALLOY VINCULUM A Superior Super Strength Electrode For Welding Alloy and Dissimilar Steels</p>	<p>VINCULUM™ HI-Alloy is designed to weld low, medium and high alloy steels where super strength and high quality welds are desirable. Color: Blue</p>	<p>Technical Data: Tensile Strength - welded..... up to 120,000 psi work hardened..... up to 180,000 psi Yield strength..... up to 90,000 psi Elongation %..... approx. 38% Hardness (HB)..... approx. 300 Current..... AC or DC Reverse Polarity (Electrode+)</p>
<p>46042 1/8 VINCULUM DIVERSE-ALLOY A Premium High Strength Electrode For Welding High Strength Low Alloy Steels and Abrasion</p>	<p>DIVERSE-ALLOY is excellent for welding most high-strength low alloy steels. It is recommended for the repair of heavy equipment and joints subjected to high stresses because of its high strength. The moisture resistant coating assures dense, crack-free deposits for outstanding impact resistance at all temperatures, and X-ray quality welds. Color: White</p>	<p>Technical Data: Tensile Strength..... up to 93,000 psi (70 kg/mm2) Elongation %..... approx. 32 Current..... AC or DC Reverse Polarity (Electrode+)</p>
<p>46004 1/8 MID ALLOY VINCULUM Premium General Purpose Alloy For Low Carbon Steels</p>	<p>Vinculum™ Mid-Alloy is designed to operate on all welding machines, even small AC type transformers when the open circuit voltage is very low. The specially formulated coating protects the deposit from adverse conditions normally encountered in maintenance welding. An ideal electrode for field repair work and out of position welding. Color: Gold</p>	<p>Technical Data: Tensile Strength..... up to 80,000 psi Yield Strength..... up to 68,000 psi Elongation %..... approx. 24% Current..... AC or DC either polarity</p>



Excalibur Butane Solder Torch Kit
IBS No. 141060



A self-igniting and cordless Soldering Iron, Hot Air Blower and Butane Torch complete in 1 great tool! The Piezo electric instant ignition system provides a quick start-up in any mode.

Includes a wide range of tips, wrench, sponge and a tube of solder for all your needs.

5 TIPS IN TOTAL

The Excalibur comes with 5 interchangeable tips: 1 Reflector, 1 Hot Air Blower, 1 Hot Knife, 1 3.5mm Chisel Tip, and 13mm Diagonal Tip
One tube of solder and cleaning sponge are also included.



IMPACT RESISTANT CASE

Includes a handy, impact-resistant travel case for complete mobility, moves easily from the workshop to the field. Case holds everything cleanly for quick, hassle-free storage.

FEATURES

- Sturdy & compact tool case
- Interchangeable tips - 5 in all
- Tube of 60/40 Coiled Silver Solder
- Tip cleaning sponge
- 2500°F Flame
- Easy start ignition switch

IDEAL FOR:

- Electronic system repair
- Automotive
- Industrial
- Woodworking
- Lapidary
- Optical
- General Maintenance
- Professional repair jobs



IBS, INCORPORATED

Vinculum S05

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Solder Combo Assortments (Z08)

One of our bestselling assortments just got better! Solder combos available in any combination — 2 of our Low Temperature Silver Bearing Solder in coil, paste, or one of each and includes the new **MICROTORCH BUTANE TORCH!**

MICROTORCH BUTANE TORCH

IBS No. 125738 (T03)
Retail Value \$39.95

At only 5-1/4" high with a 2500°F flame, the **MICROTORCH** is ideal for all types of professional use. Refillable with premium grade Butane Refill. (IBS No. 95007 - T03).

Low temperature silver bearing soft solder — the highest strength, lowest melting point silver solder alloy for stainless steel, dissimilar metals and chrome plating, available in coil, or syringe paste.

- 500% stronger than common solders.
- Superior corrosion resistance with bright, shiny deposits.



IBS No.	Description
418P	1 Solder Paste Syringe 1 Coil 1 Torch 1 Butane Refill
425P	2 Solder Paste Syringes 1 Torch 1 Butane Refill
426P	2 Solder Coils 1 Torch 1 Butane Refill

Industrial Butane Torch

Powerful, portable, refillable and anti-flare with a flame temperature of over 2500°F, the Industrial Butane Torch is ideal for automotive, plumbing, and professional repair shop use.



Functions & Uses:

- Lead Gutters
- Toughen Metal
- Stripping Paint
- Automotive Repair
- Sweat Ftgs & Joints
- Lay or Remove Tiles
- Loose Bolts
- Plumbing
- Dry Cements

IBS No.	Description	Qty
125739	Industrial Butane Torch	1

Microtorch Butane Torch



At only 5-1/4" high with a 2500° flame, the **Microtorch** is ideal for all types of professional use. Refillable with premium grade butane (IBS No. 95007). A versatile and handy addition to any professional workshop.

IBS No.	Description	Qty
125738	Microtorch Butane Torch	1

Butane Refill



Universal tip fuels most leading butane lighters

Low in non-volatile contaminants which can cause burner valve to clog, affecting flame height and function.

WARNING: USE THIS PRODUCT ONLY AS DIRECTED ON THE PACKAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS CAN BE HARMFUL OR FATAL.

KEEP OUT OF REACH OF CHILDREN. DO NOT DISTRIBUTE TO MINORS.

IBS No.	Description	Qty
95007	Butane Refill 42g	1



Markal® Silver-Streak® Pencils



Markal® Silver-Streak® welders pencil offers torch resistant, highly visible marks that will not burn or rub off like soapstone. The new welders pencil writes on all types of metal surfaces, even oily, wet surfaces, making these pencils an economical must for any welder or fabricator.

- **Economical, high-strength** pencil is ideal for marking all types of metal surfaces — even oily, rusty or wet surfaces.
- Perfect for **metal layout and fabrication work**.
- Marks **resistant to torch flames**; will not rub off or burn off like soapstone.
- **Highly visible marks** illuminate when cutting or welding.
- **Durable marks** will not scratch or abrade metal surfaces.
- **Hexagonal shape** reduces barrel roll unlike competitive brands.
- Sharpen with any standard pencil sharpener.



IBS No.	Color	Qty
96101	Markal Silver Streak Pencil	12
96006	Markal Silver Streak Mechanical Round	1
96007	Markal Silver Streak Mech REFILL 6PK	1

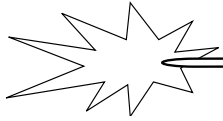


IBS, INCORPORATED

Vinculum S05

VINCULUM

THE CONNECTING MEDIUM



IBS Type 187 Spotweld Drill Bits



This rugged, high performance drill bit is designed to effectively cut auto body panel spot welds. The high red hardness of cobalt steel permits speeds up to 30% greater than H.S.S. drills. Cobalt Steel is substantially more abrasion resistant, resulting in very long wearing cutting edges.

IBS TYPE 187 SPOTWELD DRILL BITS

IBS No.	Diameter MM	Approx Spotweld Size (IN)	Overall Length (IN)	Flat Length (IN)	Pkg Qty
19341	8.0	1/3	2.25	none	1
19342	10.00	3/8	2.25	none	1
19343	8.0 TE	1/3	2.25	none	1
19344	10.0 TE	3/8	2.25	none	1
19340	IBS Type 187 Spotweld Drill Bit Assortment 4 Pc Set Contains one of each size listed above (P15)				



*TE - Twin End Drill Bits

These twin end drill bits will cut twice as many as spot welds with the added advantage of longer reach ot drill the less accessible spotwelds.



Spot Weld Grinding Wheels (P27)

- Easier to re-weld the same spot - no holes through both pieces of sheet metal
- Burr free grinds - saves time and labor
- Improves shop efficiency - requires equal or less time than drilling without ever changing tools
- No need for disassembly of parts - wheels angle into tight places
- Lowers per weld removal costs - one wheel removes more than one drill
- Less inventory - one size wheel for all spot weld applications
- Eliminates the need for multiple tools - one wheel can be used to both remove and smooth spot welds.

SPOTWELD GRINDING WHEELS

IBS No.	DIMENSIONS Dia. x Th. x Arb	Max RPM	Pkg Qty
69320	3 x 1/4 x 1/4	20,372	5
69323	3 x 3/8 x 1/4	20,372	5
69028	Arbor for Spot Weld Wheels		1

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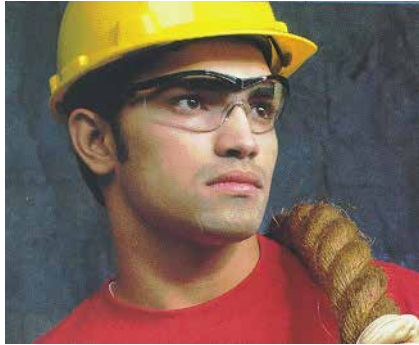
THE CONNECTING MEDIUM



STORM® Series Brazing Safety Glasses (S07)

by Crews, Inc.

MEETS OR EXCEEDS ANSI Z87. Safety Standards



- Ratchet action temples combined with non-slip rubber head grips creates a customized fit.
- Wrap-around lens constructed of lightweight, scratch-resistant polycarbonate delivers advanced visual acuity and protection.
- Interchangeable lenses.
- Provides 99.9% UV protection.

STORM® SERIES BRAZING SAFETY GLASSES*



Brazing Glasses Shade 3.0 Green IBS No. 128063	Brazing Glasses Shade 5.0 Green IBS No. 128064
* STORM Series Glasses come with black frame unless otherwise noted.	

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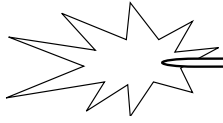




IBS, INCORPORATED

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THE CONNECTING MEDIUM

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The Mark of Our Quality is in Our Service

07-13-18