



HARDFACING and BUILDUP ELECTRODES

PRODUCT NAME	PRODUCT DESCRIPTION	HARDNESS	PROCESS
RAILTEC®	A general buildup and underlay electrode with all position capabilities that produces non-cracking, wear resistant, machinable deposits on carbon steel and performs under severe impact loads.	26 - 35 HRC	SMAW DCEP/AC
41 Cr-Ni-Mn	Chrome, nickel, manganese electrode for joining and buildup of manganese steels. Excellent resistance to impact and compressive loads. The deposit work hardens up to 500 HRB.	200 HRB as welded 500 HRB in service	SMAW DCEP/AC
43 ECOFACE®	An economical coated electrode used as a hardfacing on tool steel type applications with metal to metal wear and high stress. Deposit has a combination of toughness, impact resistance, cutting edge retention, and can be age hardened (50 - 54 HRC). Suitable for hard overlays on cutting tools, edges, dies, knives, shears, and crushing equipment. Deposit can also withstand hot and cold pressure and impact while in service.	41 - 45 HRC	SMAW DCEP/AC
60 ECOFACE®	Economical general hardfacing electrode for build-up and hard overlays where high hardness and impact resistance is required. Designed for all position use.	58 - 60 HRC	SMAW DCEP/AC
61 HARDCRO®	High deposition rate that produces highly wear resistant deposits on steel and alloyed steels such as augers, earth moving equipment, bucket teeth, plough shears, and other components subject to severe abrasion. Machinable by grinding only.	61 - 63 HRC	SMAW DCEP/AC
63 HARDCRO®	Chromium carbide electrode for severe abrasion and moderate impact. Deposits on steel or steel alloys.	58 - 63 HRC	SMAW DCEP/AC
64 ECOFACE®	Hardfacing electrode designed for high speed steel applications. Combines tough, high impact resistance with cutting edge retention. Can be heat treated to increase hardness range 63 - 65 HRC.	58 - 62 HRC	SMAW DCEP/AC
67 HARDCRO®	Chromium, vanadium carbide composite electrode for high abrasion conditions with very high deposition rates. A cushion layer is recommended where more than 3 layers are required. Retains hardness at elevated temperatures 400°C (750°F)	Up to 67 HRC	SMAW DCEP/AC
661 T	Chrome carbide tubular electrode for high abrasion and moderate impact at temperatures up to 540°C (1000°F). Applied in 2 to 3 passes and has out of position capabilities.	58 - 62 HRC	SMAW DCEP/AC
667 T	Complex chrome carbide tubular electrode for severe abrasion and high temperature up to 760°C (1400°F). Applied in 2 to 3 passes and has out of position capabilities.	62 - 67 HRC	SMAW DCEP/AC
TUNGCOE® E	A tubular tungsten carbide electrode with approximately 63% fused tungsten carbide embedded in a Ni-B-Si matrix. Used for extreme abrasion, moderate impact, and has corrosion resistance properties.	W ² C >2300 HV MATRIX ~52 HRC	SMAW DCEP/AC
FLEXTUNG® 700	Tungsten carbides embedded in a flexible flux coating with a nickel core wire. Used for extreme abrasion conditions. Available with fused tungsten carbides or, for maximum wear resistance, spherical carbides.	W ² C >2200 HV MATRIX 45-52 HRC	OAW / OFW

HARDFACING and BUILDUP WIRES

PRODUCT NAME	PRODUCT DESCRIPTION	HARDNESS	PROCESS
FCS ECOFACE® AP	Seamless flux cored hardfacing wire. Excellent performance where high abrasion and compressive loads are present. Seamless wire provides trouble free feeding, no moisture pickup, and outstanding welder appeal. All position capabilities.	57 - 62 HRC	FCAW DCEP
FCS 350	An all position, multipass, low alloy build up wire with a high deposition rate that produces crack free weld deposits with good machinability and can be flame cut. It operates in the short-arc transfer mode and produces sound deposits.	30 - 38 HRC	FCAW DCEP
W 1030 CP	A low alloy, high deposition rate, self shielding flux cored wire for build up that can be used on most weldable steels.	29 - 33 HRC	FCAW DCEP
W 1041 CP	Chromium, manganese, austenitic steel flux cored welding wire with outstanding work hardening characteristics. Used for joining and build up on carbon steel and manganese base materials. Work hardens up to 55 HRC.	22 - 26 HRC	FCAW DCEP
W 1060 M	An economical general purpose chromium carbon alloy. This flux cored wire is self shielding and is used for all abrasion conditions under moderate impact.	52 - 58	FCAW DCEP
W 1063	This high chrome carbide wire has excellent resistance to low and high stress abrasion with moderate corrosion resistance. Retains hardness at elevated temperatures. Self-shielding and versatile for all abrasion conditions under low impact.	58 - 62	FCAW DCEP
W 5070 (M)	Flux cored self shielding wire with chromium niobium carbides which provides high abrasion wear resistance up to 550°C (1000°F) under low impact conditions.	60 - 63	FCAW DCEP
TUNGCOE® FCS	Fused tungsten carbide in a Ni-B-Si matrix. For hardfacing on steel, steel alloys, nickel alloys, and stainless steel. Designed for severe abrasion and provides good resistance to heat and corrosion. Also available in mono-crystalline tungsten carbide (MC).	W ² C >2300 HV MATRIX ~47 HRC	MCAW DCEP
TUNGCOE® FCS MC		WC/W ² C >2300 HV MATRIX ~47 HRC	MCAW DCEP

STEEL and STEEL ALLOY ELECTRODES

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	YIELD	ELON-GATION	PROCESS
221 RP	For joining mild steel, this low alloy electrode has an easily controlled forceful arc with deep penetration and all position capabilities. Excellent re-striking and produces sound, crack free welds.	≥ 60ksi 410 MPa	≥ 48 ksi 330 MPa	≥ 22%	SMAW DCEN / AC
222 LOW ALLOY	A low alloy electrode for fabrication and maintenance work. This all position electrode produces smooth, low spatter welds with easy slag removal and excellent welding characteristics.	≥ 60ksi 410 MPa	≥ 48 ksi 330 MPa	≥ 22%	SMAW DCEN(P) / AC
223 XC®	High strength and highly crack resistant electrode for the repair, joining, and build up of medium carbon and cast steels. Outstanding welding characteristics in all positions with low spatter, easy slag removal, and excellent notch toughness properties.	≤ 85ksi 590MPa	≤ 77 ksi 535 MPa	≤ 34%	SMAW DCEP / AC
293 XC	A high tensile, all position, low hydrogen electrode with good weldability that produces smooth, porosity free welds without undercut or spatter. Used for the joining and repair on most carbon steels, low alloy steels, and cast steels.	≥ 100ksi 690MPa	≥ 88 ksi 610MPa	≥ 20%	SMAW DCEP
UNICROM® 265 S	A superior low heat electrode for joining and build up of dissimilar steels where high strength, impact, and corrosion resistant welds are required. This versatile electrode can also be used as a cushion layer and for repairs on various grades of alloyed steels.	≤ 120ksi 830MPa	≤ 85 ksi 588MPa	≤ 30%	SMAW DCEP / AC
277 HIGH ALLOY	With excellent metal to metal wear and strain hardening properties, this highly ductile and crack resistant electrode is used for joining and build up applications. Suitable for manganese frogs/trails and manganese to itself or carbon steel.	≥ 85ksi 590MPa	≥ 58 ksi 400 MPa	≥ 30%	SMAW DCEP / AC
278 HIGH ALLOY	A versatile fabrication and maintenance electrode with all position capabilities. Very crack resistant. Excellent for joining and repair of dissimilar steels, manganese machinery components, cladding carbon steels, and recommended for wear plate installation.	≥ 80ksi 550MPa	≥ 50 ksi 350MPa	≥ 30%	SMAW DCEP / AC

ALUMINUM and MAGNESIUM

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	PROCESS
402 ALUMINUM	A thin flowing, low melting aluminum brazing alloy for use on all weldable grades of aluminum. Has good capillary action with thin flowing, smooth deposits that have good color match with the base metal. Use with Arctec® #71 Flux.	≤ 34 ksi 235 MPa	OAW / OFW TORCH BRAZING
AS 406 ALUMINUM	A bare brazing alloy designed for brazing of zinc base material such as zinc die castings, white metal, and pot metal. This alloy produces strong, dense, and porosity free welds. May also be used for brazing aluminum alloys. Use with Arctec® #73 Flux. Can be applied using T.I.G. (GTAW) equipment.	≤ 47 ksi 325 MPa	OAW / OFW TORCH BRAZING
430 MAGNESIUM	A magnesium alloy for use on all brazable grades of magnesium. Used for joining extruded shapes, sheets, and magnesium castings. The properties of the deposit are equal to that of the base metal in color and strength. Use with Arctec® #75 Flux. Can also be used as GTAW rod.	≤ 35 ksi 240MPa	OAW / OFW GTAW
435 FC ALUMINUM	An aluminum torch rod for use with brazing all weldable grades of aluminum. This alloy contains a flux core which allows for easy application and very economical use. The melting range of the flux is controlled which yields dense, porosity free welds.	≤ 34 ksi 235 MPa	OAW / OFW TORCH BRAZING
440S	A coated electrode for arc welding of aluminum and aluminum alloys. This electrode produces strong, dense, and porosity free welds. Can also be used with an OAW/OFW torch. A very stable arc operates at low amperage with a minimum of spatter and fuming.	≤ 34 ksi 235 MPa	SMAW DCEP

CAST IRON

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	HARDNESS	PROCESS
1 CAST IRON	For economical welding on oxidized, scaly, and corroded castings. Recommended for quantity applications in foundries and for build up on worn sections.	≤ 60ksi 410MPa	350 HB	SMAW DCEP / AC
2 CAST IRON	A high strength welding electrode for cold welding on gray cast iron, malleable cast iron, and spheroidal graphite castings. Can be used to join cast iron to steel, build up and repair on worn castings, heavy equipment, and malleable cast iron components.	≤ 66 ksi 455MPa	190 HB	SMAW DCEP / AC
3 CAST IRON	A high strength, high nickel electrode that is recommended for the repair and build up of broken and worn castings such as machine bases, sprockets, levers, motor housings, frames, and heavy components where bonding quality and machinability is required.	≤ 64ksi 440 MPa	160 HB	SMAW DCEN / AC
SUPERCAST® 90	A specialized bi-metal core provides superior welding characteristics. Developed for depositing sound, porosity and crack free welds on gray, malleable, and nodular cast iron. Recommended for housings, sprockets, bases, levers, and heavy equipment.	≤ 58 ksi 400 MPa	180 HB	SMAW DCEP / AC
SUPERCAST® 8000	A high quality and versatile electrode with a smooth arc and unique core for welding cast iron, alloyed cast iron, and can be used for cast iron to steel. Used for build up, repair, and cladding applications on gear teeth, sprockets, pump housings, machine bases, and engine blocks.	≤ 60ksi 410MPa	180 HB	SMAW DCEP/N / AC
FCS 2300 (wire)	A composite FCAW wire for cast iron repair and joining various types of cast iron and cast iron to steel and alloys. 98% Argon 2% CO ₂ Shielding gas and is machinable.	≤ 70 ksi 480 MPa	190 HB	FCAW DCEP

CALGARY (HEAD OFFICE)

4304 - 10 St NE
403.250.9355
TOLL FREE 866.272.8321

EDMONTON

18031 - 109 Ave NW
780.484.3304
TOLL FREE 866.272.8323

SURREY

13408 - 76 Ave
604.596.6207
TOLL FREE 866.272.8322

WINNIPEG

10 - 1599 Dugald Rd
204.663-9182
TOLL FREE 866.272.8329

STAINLESS STEEL

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	PROCESS
E308L-17	Conforms to AWS A5.4 E308L-17. This electrode is generally used for welding stainless steel base metals with similar composition (19.5% Cr and 10% Ni), such as 304 and a has maximum carbon content of 0.04%. Available in MIG and TIG.	≥ 75ksi 520 MPa	SMAW DCEP / AC
E309L-17	Conforms to AWS A5.4 E309L-17. This electrode is generally used for welding different grades to each other. Such as 304 to mild/low alloy steel. Contains ~23.5% Cr, ~13% Ni and a maximum carbon content of 0.04%. Available in MIG and TIG.	≥ 75ksi 520 MPa	SMAW DCEP / AC
E316L-17	Conforms to AWS A5.4 E316L-17. Used for welding 316 and similar grades of stainless steel with Mo content. Contains ~18.5% Cr, ~12.5% Ni, ~2.5% Mo and a maximum carbon content of 0.04%. Available in MIG and TIG.	≥ 75ksi 520 MPa	SMAW DCEP / AC
E317L-17	Conforms to AWS A5.4 E317L-17. Used for welding similar grades of stainless steel and results in a higher alloy content than 316 and where a higher corrosion is beneficial. Contains ~19.5% Cr, ~13% Ni, ~3.5% Mo and a maximum carbon content of 0.04%. Available in MIG and TIG.	≥ 75ksi 520 MPa	SMAW DCEP / AC
308L FLUX CORED	Conforms to AWS A5.22 E308L-T1-1/T1-4. This FCAW wire is generally used for welding stainless steel base metals with similar composition (~19.5% Cr and ~10% Ni), such as 304 and a has maximum carbon content of 0.04%. CWB CERTIFIED.	≥ 75ksi 520 MPa	FCAW DCEP
309L FLUX CORED	Conforms to AWS A5.22 E309L-T1-1/T1-4. This FCAW wire is generally used for welding similar or different grades to each other. Such as 304 to mild / low alloy steel. Contains ~23.5% Cr, ~13% Ni and a maximum carbon content of 0.04%. CWB CERTIFIED.	≥ 75ksi 520 MPa	FCAW DCEP
316L FLUX CORED	Conforms to AWS A5.22 E316L-T1-1/T1-4. This FCAW wire is used for welding 316 and similar grades of stainless steel with Mo content. Contains ~19% Cr, ~12.5% Ni, ~2.5% Mo and a maximum carbon content of 0.03%. CWB CERTIFIED.	≥ 70ksi 485 MPa	FCAW DCEP
FCS 2780	Designed for joining equipment components of manganese, medium carbon steels, and steels of dissimilar composition. For joining bucket shells, lips, and teeth. For shaft build up and cladding of carbon steel with austenitic stainless steel. Recommended for installation and build up of pipeline ditcher segments and installation of Arctec® Wear Plates.	≥ 75ksi 520 MPa	FCAW DCEP

** Stainless Steel available in other grades. Please inquire.

CUTTING and GOUGING

PRODUCT NAME	PRODUCT DESCRIPTION	PROCESS
88 GOUGING (Airless)	A grooving, chamfering, cutting, and gouging electrode used without compressed air or oxygen. It is a very fast and efficient metal working tool and can be used on all ferrous and nonferrous metals including: manganese steel, cast iron, stainless steel, and aluminum. The electrode performs well on both DC and AC current and can be used in all positions.	SMAW DCEN / AC
COPPER COATED GOUGING CARBONS	Premium copper coated gouging carbon electrodes are designed for use in the air arc cutting process with the use of a DC power source. Permits rapid removal and cutting of various metals, such as carbon, low alloy and stainless steel, cast iron, copper, and nickel alloys. Also suitable for welding joint preparation. Available in round, flat, and jointed form.	CARBON ARC CUTTING DCEN

STEEL and STEEL ALLOY WIRES

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	YIELD	ELONGATION
ARCFUSION XR71	Seamless FCAW wire, H4 classification, all position capabilities and superior impact properties at lower design metal temperatures. Conforms to AWS A5.36 E71T-9M-JH4 and A5.20 E71T-9C/M-JH4. CWB CERTIFIED TO -50°C.	≥590 MPa - M21 ≥85,500 psi ≥560 MPa - 100% CO ₂ ≥81,200 psi	≥500 MPa - M21 ≥72,500 psi ≥470 MPa - 100% CO ₂ ≥68,100 psi	≥26% - M20 ≥26% - M21 ≥28% - 100% CO ₂
ARCFUSION XM71	Seamless MCAW wire, H4 classification, all position capabilities and superior impact properties at lower design metal temperatures. Conforms to AWS A5.36 E71T15-M21-AP5-CS2-H4 and A5.18 E70T-6M-H4. CWB CERTIFIED TO -60°C.	≥600 MPa - M21 ≥87,000 psi ≥560 MPa - 100% CO ₂ ≥81,200 psi	≥500 MPa - M21 ≥72,500 psi ≥460 MPa - 100% CO ₂ ≥ 66,700 psi	≥29% - M21 ≥30% - 100% CO ₂
ARCFUSION XR81	Seamless FCAW wire, H4 classification and ~1% nickel content. All position capabilities and superior impact properties at lower design metal temperatures. Conforms to AWS A5.36 E81T1-M21-AP8-Ni1-H4 and A5.29 E81T1-Ni1C/M-JH4. CWB CERTIFIED TO -60°C.	≥610 MPa - M21 ≥88,400 psi	≥550 MPa - M21 ≥79,700 psi	≥25% - M21
ARCFUSION XM81	Seamless MCAW wire, H4 classification with Ni and Mn content. All position capabilities and superior impact properties at lower design metal temperatures. Conforms to AWS A5.36 E81T15-M21-AP8-Ni1-H4 and A5.28 E80C-Ni1-H4. CWB CERTIFIED TO -60°C.	≥620 MPa - M21 ≥89,900 psi	≥530 MPa p- M21 ≥76,800 psi	≥27% - M21

** Arcfusion Wires available in other grades. Please inquire.

BRONZE and COPPER

PRODUCT NAME	PRODUCT DESCRIPTION	TENSILE	HARDNESS	PROCESS
600 COPPER	A pure copper alloy for build-up and joining of commercial deoxidized copper. This electrode enables oxygen-free types of pure copper to be welded with good, porosity free results. The weld metal contains more than 98% copper.	10 - 28 ksi 70-190 MPa	60 - 70 HB	SMAW DCEP
603 PHB BRONZE	A versatile phosphor bronze alloy developed for joining and cladding. This electrode has a smooth arc and produces a dense, porosity free deposit in all positions with low spatter and easily removable slag. Excellent color match to bronze.	~60 ksi 410 MPa	100 - 120 HB	SMAW DCEP
604 C BRONZE	A phosphor bronze alloy specially developed for joining and cladding operations using alternating current. For use on phosphor bronze, tin bronze, brass, or bronze friction wear strips on booms, cast iron, and galvanized steels.	40 - 50 ksi 275 - 345 MPa	80 - 120 HB	SMAW AC
606 BRONZE	A wear resistant, machinable aluminum bronze electrode containing manganese and nickel. The weld deposit has work hardening capabilities and a low coefficient of friction that makes it suitable for bearing surfaces.	95 - 100 ksi 655 - 670 MPa	~200 HB	SMAW DCEP
610 AL-BRONZE	An all position aluminum bronze welding wire for use with the GMAW welding process. Used for overlays on shafts, propellers, housings, bushings, valve seats, pumps, and other surfaces requiring a bronze wear surface. AWS A5.7 ERcAl-A1.	≥ 55 ksi 380 MPa	80 - 110 HB	GMAW DCEP
618 AL-BRONZE	An all position aluminum bronze welding wire/rod used to weld base metals of steels and cast iron to copper, brass, and bronze. Ideally suited for overlays on shafts, propellers, housings, bushings, valve seats, pumps, and surfaces requiring a bronze wear surface. AWS A5.7 ERcAl-A2.	≥ 60 ksi 415 MPa	130 - 150 HB	GMAW DCEP
656 Si-BRONZE	An all position silicon bronze welding wire for use with the GMAW welding process. Primarily used to weld base metals of steels and cast iron to copper, brass, and bronze. May also be used to weld on galvanized steels. AWS A5.7 ERcSi-A. GTAW rod also available.	≥ 50 ksi 345 MPa	80 - 100 HB	GMAW DCEP
PCO 105	A very fluid, economical, silver bearing phosphor copper brazing alloy. It is used primarily for those applications where close joint fit cannot be maintained. Primary uses are for refrigeration piping, instrumentation, and electrical applications. AWS A5.8 BCuP-3.	~40 ksi 275 MPa		TORCH BRAZING
PCO 115	A very fluid, economical, silver bearing phosphor copper brazing alloy. Similar to PCO 105, but has a lower melting temperature and a higher silver content. Primary uses are for refrigeration piping, instrumentation, and electrical applications. AWS A5.8 BCuP-5.	~50 ksi 345 MPa		TORCH BRAZING

SILVER SOLDER and BRAZING

PRODUCT NAME	PRODUCT DESCRIPTION	PROCESS
1004 FC / BARE	A premium quality flux coated silver brazing rod and CADMIUM FREE. Both forms are low melting and have free flowing characteristics. The rods have good electrical conductivity and very good color match on stainless steel. Also available in bare wire form and used with Arctec® #96 or #98 Flux.	TORCH BRAZING
1005 FC / BARE	A premium quality flux coated high silver brazing rod and CADMIUM FREE. Both forms are low melting and have free flowing characteristics. The rods have good electrical conductivity and very good color match on stainless steel. Also available in bare wire and foil form, uses Arctec® #96 or #98 Flux.	TORCH BRAZING
1018 FC	A high strength, thin flowing, flux coated, nickel braze welding alloy (called nickel silver). Produces high strength joints on practically all ferrous and non-ferrous metals except the white metals.	TORCH BRAZING
1050 FC BUILD UP	A nickel bearing, low fuming, flux coated alloy. Produces deposits with high ductility, corrosion resistance, and resistance to frictional wear. Excellent machinability and good work hardening properties. Used for overlays and build up on surfaces subject to frictional wear and ferrous/non-ferrous metal components.	TORCH BRAZING
1080 FC	A low fuming, flux coated brazing alloy with good wetting action. Superior mechanical properties and meets all specifications for strength, ductility, and soundness in brazing applications. For overlays and joining of steel, cast iron, copper, nickel alloys, and other nonferrous metal except aluminum and magnesium.	TORCH BRAZING



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