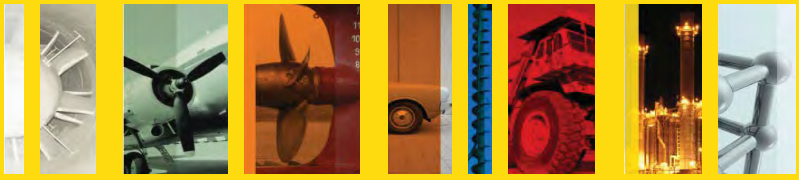


More than 100 years' experience in finding solutions for your business.

Australian Castolin Eutectic

Consumables and Equipment range

Specialist Welding
Thermal Spray
Surface Treatment
Brazing and Wear Solutions

Castolin Eutectic®
Eutectic Castolin

Edition September 2014

YOUR RESOURCE FOR PROTECTION, REPAIR AND JOINING SOLUTIONS

Whatever your industry, Smenco and Castolin Eutectic has the solutions for Wear and Fusion problems. For more than a century at the forefront of wear and fusion materials technology, Castolin Eutectic have been at your service with the largest and most experienced field support to meet your specific applications. With a vast product range of alloys, processes, functional finished parts and fully automated systems in the areas of Welding, Brazing and Coating technologies, your business can become ***STRONGER*** with ***Castolin Eutectic.***

WEAR TECHNOLOGIES

High load, high wear is an expensive but avoidable cost to your business. Our proven technology provides exceptionally cost-effective and ***STRONGER*** wear resistance solutions to the unnecessary expense and down-time caused through abrasion, erosion, corrosion or heat.

FUSION TECHNOLOGIES

Specialist, stronger joints need specialist ***FUSION*** technology, and Castolin Eutectic uses specialised Welding, Brazing and Coating processes to achieve this. Our systems and products are designed both for OEMs and end users, and they range from simple user-friendly manual applications to major automated high volume systems. You'll enjoy clear benefits from partnering with Smenco and Castolin Eutectic:

- Significantly improved profits through improved productivity and enhanced equipment durability
- Higher quality manufactured products, with highest possible safety assured
- Expertise and experience in all industrial markets
- Accessibility world wide - more than 800 engineers and technicians in the field everyday

We are different

- We have proven application know-how and an industry focus.
- We are close to our customers' needs.
- We have well trained representatives and access to international Castolin experience.
- We have a value philosophy placing your needs first.
- We provide tailor made innovative solutions through a broad range of products and applications.

Customer Approach

- Analyse the requirements together with the customer, partnership approach.
- Look for most economical long term solution producing ***"the life prolonging factor"***.
- Provide solutions through application expertise, wear analysis, process technology, surface engineering.
- Customer support tools: Terolink, Tour Guide, demonstration, wear measurement, metallurgical analysis.
- Castolin Eutectic Market Centres all over the world.
- Continuous assessment to ensure positive long lasting experiences.
- Specialised Product Managers for the different business areas.

Smenco Pty Ltd

SMENCO is one of Australia's largest importers and distributors of welding equipment, welding related equipment and consumables with high quality brands; Castolin Eutectic being our "Flagship" product for traditional maintenance and repair industries. Throughout Australia we have a national network of technical sales staff, repair technicians, warehouse personnel and administration staff ready to consult with you. Smenco will supply, commission and, most importantly, support customers with the aim of producing high quality effective solutions.

Additional services such as specific product training can be tailored to suit your needs and industry requirements. Ongoing training and support can be conducted within Smenco offices throughout Australia or your workshop therefore providing targeted and effective backup for your investments.

Together we can make a difference.

Our exclusive, extra high deposition, ***XHD*** *electrodes provide top quality solutions including wear preventive coating, joining and overlaying reclamation applications. Maintenance designed with controlled chemistry and deposit structure, they bring an improved Life Prolonging Factor* ***(LPF)*** *to increase the service life of parts treated, plus Maximum Safety Margin* ***(MSM)*****.** *XHD technology features enhanced weldability, even in position, slag which is self lifting. High deposition speeds and yield to keep heat input to a minimum to reduce the danger of overheating, structural changes or distortion of the work piece.*

Steel Welding Electrodes

Product	Applications / Features	Mechanical Properties
6666 EUTECTRODE **2.4 mm** **3.2 mm** **4.0 mm** Low Hydrogen	**PRINCIPAL APPLICATIONS:** Machine frames, supports, pressure piping & tubing, flanges, angles, beams, channels, joints subject to stresses. **OUTSTANDING FEATURES:** "Welder Friendly'' - Ease of Deposition; All position; Superior Elongation Characteristics; Superior Impact Strength. **RECOMMENDATIONS:** An advanced Biphericallly extruded flux coated, low hydrogen electrode for use with low to medium Carbon steels (max. 0.4 carbon equivalent), construction steels, Galvanized steel, Rusty or Oily steels, low alloy steels containing Mn, Cr, Mo, V; free machining steels and Quench & Tempered steels.	Tensile Strength: 550 MPa Yield Strength: 430 MPa Elongation: 25-30% Impact Strength: approx. 60 J -30°C Service Temp: -60°C to 350°C
777 DYNATRODE **2.4 mm** **3.2 mm** **4.0 mm** General Purpose Steel	**PRINCIPAL APPLICATIONS:** Containers, ducts, tanks **OTHER USES:** Machine guards; angle iron and expanded metal **OUTSTANDING FEATURES:** All position**;** Works off all AC or DC power sources**;** Instantaneous strike/re-strike; Ideally suited to single pass filleting. **RECOMMENDATIONS:** For low carbon steel sheet, forms and plates. Easy to use. Rapid deposition, excellent deposit appearance and self-releasing slag. A universal, all position, mild steel welding electrode, producing quality weld deposits with superb bead appearance, regardless of power source, current or polarity. Arc is quiet, producing a spray type deposition with a high degree of arc ionization. Superior wash in filleting applications. Especially recommended as a contact electrode.	Tensile Strength: 520MPa 75,000 PSI
CE 9450 EUTECTRODE **2.4 mm** **3.2 mm** **4.0 mm** High strength	**PRINCIPAL APPLICATIONS:** Low to high carbon steels and stainless steel. CE9450 can be used for joining and overlaying tool steels, high alloy steels and dissimilar combinations in highly stressed parts. **RECOMMENDATIONS:** For combinations of similar and dissimilar steels, and joining steels of different thicknesses, joining steels to stainless steels. Use for SPEED and ECONOMY as well as HIGH QUALITY welds.	Tensile Strength: 800 MPa Yield Strength: 650 MPa Elongation: 20-25% Hardness 250-300 HRb
680 CGS XUPER **2.4 mm** **3.2 mm** **4.0 mm** **4.8 mm** Super high strength multi alloy	**PRINCIPAL APPLICATIONS:** Dies, tools, springs, cushion layer **OTHER USES:** Joining dissimilar steels; machinable build-up and overlay **OUTSTANDING FEATURES:** Controlled grain structure/strength and ductility; Spray type metal transfer; Superb weldability for all steels; Low amperage easy strike-restrike. FrigidArc coating plus high-alloy core generates highly ionized arc for "spray-type" transfer of weld metal. Outstanding strength and corrosion resistance with ease of handling and uniformity. NucleO CGS provides controlled grain structure for high strength, high elongation, toughness and ductility. **RECOMMENDATIONS:** Tool and die repairs, rebuilding gear teeth, repairing cracks in machine casings, buttering layers and repairs on earthmoving and drilling equipment, and rebuilding worn shafts. Difficult to weld steels and steel alloys.	Tensile Strength: 830MPa 120,000 PSI Yield Strength: 640 MPa Elongation: 25-30% Hardness 240-280 HRb

Steel Welding Electrodes

Product	Applications / Features	Mechanical Properties
XHD 2222 **2.4 mm** **3.2 mm** **4.0 mm** High strength high ductility.	**PRINCIPAL APPLICATIONS:** Stressed parts subject to cracking, e.g. screens, lifting lugs etc. **OTHER USES:** Massive sections joining, kiln tyres, gears, dissimilar metal combinations. **OUTSTANDING FEATURES:** Outstanding Elongation - up to 45%; Outstanding Toughness and Strength; Multi-Pass Deposits on Massive Sections; X-Ray Quality Welds; Ultimate for Heat Cycling Service. **RECOMMENDATIONS:** Excellent weldability, mechanical strength, crack and corrosion resistance. Joining and weld protective coatings on all steels, especially difficult to weld types. Low, medium, high carbon - low, medium, high alloy –clad steels, 9% nickel steels, cryogenic steels, all nickel alloys - Monel, Inconel, Hastelloys, Nimonics, Nichrome. Ideal for use in various applications in earthmoving equipment, manganese steels, dams, axles etc.	Tensile Strength: 620 MPa 90,000 PSI Elongation: Up to 45%
XHD 6868 **2.4 mm** **3.2 mm** **4.0 mm** Build up & joining	**PRINCIPAL APPLICATIONS:** Earthmoving equipment, extrusion cylinders & screws **OTHER USES:** Coupling sleeves, valve seats, cushion layer for TeroCote overlays, jack cylinders **OUTSTANDING FEATURES:** Remarkable deposition characteristics**;** Easy slag removal**;** All position**;** High resistance to cracking **RECOMMENDATIONS:** Electrode with high yield and extremely high deposition speed for overlay, repairs and joining of "difficult-to-weld" steels. Solves the everyday problem steel welding applications in industry. Use for high strength, ductile joining and cladding of carbon and alloy steels, including tool and die, spring and manganese steels.	Tensile Strength: 800MPa 115,000 PSI Typ Yield Strength: 600 Mpa Elongation 2-25% Hardness as welded 220 HRb
7018 RS Low Hydrogen **2.4 mm** **3.2 mm** **4.0 mm**	7018RS is a premium quality, iron powder low hydrogen electrode designed for joining construction grade and problem steels. The product features a moisture guard™ coating to minimize hydrogen embittlement and under-bead cracking. Weldability is excellent on both AC and DC reverse polarity. The first choice for x-ray quality welds featuring high impact resistance. **TECHNICAL SPECIFICATIONS:** AWS/ASMESFA 5.1 E7018; AS/NZ E4818-AH10 **PRINCIPAL APPLICATIONS:** Used primarily on carbon and medium tensile steels, especially under conditions of restraint. Excellent for high sulphur and tramp steels. Used extensively on construction grades for shipbuilding, pipelines, boilerplate, cast steel and cryogenic grades.	Typical Tensile Strength: 524Mpa Typical Yield Strength: 476Mpa Elongation 31 – 33% Reduction in area: 75 – 80%
Beautyweld II **Joining** **1.6 mm** **2.4 mm** **3.2 mm** **4.0 mm**	**PRINCIPAL APPLICATIONS: Thin gauge sheetmetal and plate. Galvanised components and where dirty or wet surfaces are a problem.** **OUTSTANDING FEATURES:** All positional easy to use low carbon steel electrode. Very high quality good looking weld deposits with extremely easy to remove slag. Excellent re-strike properties. Current AC/DCEP (+) Sizes available 1.6, 2.4, 3.2 and 4.0 mm	Tensile strength: 74,000 Psi Typical hardness: HRb 95 After work hardening HRc 30

Cast Iron Welding Electrodes

This is where we started over 100 years ago. A pioneer in the welding of cast iron, C+E today offers a range of solutions for all needs. Castolin Cast Iron electrodes produce low heat input for minimum distortion and many other features important in maintenance welding, such as easy striking and improved weldability. C+E alloys produce attractive non-porous and crack free deposits, which are easy to machine and they are applicable even on old and contaminated cast iron parts.

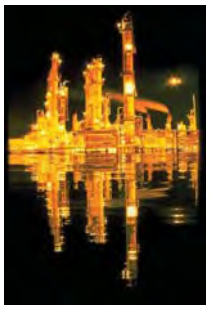
Product	Applications / Features	Mechanical Properties
27 Eutectrode  **Sealing oil soaked surface**	**PRINCIPAL APPLICATIONS:** Sealing of oil soaked cast iron, defects. **OTHER APPLICATIONS:** Seal butter layer over contamination **OUTSTANDING FEATURES:** Nickel free deposit, improved crack resistivity, excellent colour match to cast iron. **RECOMMENDATIONS:** For all cast iron repair welding not requiring post machining. Weld metal cracking tendencies are greatly minimised. Nickel-free deposits, colour match cast iron and will oxidise in a similar fashion. Exceptional performance on oxidised or contaminated surfaces. Not machinable or able to be drilled.	Tensile Strength: 415 MPa 60,000 PSI
2-44 XYRON  **Pump housings**	**PRINCIPAL APPLICATIONS:** Pump housings, pump rotors **OTHER APPLICATIONS:** Compressors, valves, gear boxes **OUTSTANDING FEATURES:** Controlled penetration; Oxide-dissolving arc; Either polarity with DC; Non-conductive coating prevents side arcing. **RECOMMENDATIONS:** For all types of machinable repairs on old, contaminated, oil-soaked grey and alloyed castings, especially maintenance work in position. Controlled penetration provides sufficient force to penetrate surface contaminants, but prevents excessive base metal dilution. Sound, dense deposits are fully machinable. Used for thin as well as thick sections. Especially suitable for joining cast iron to steel.	Tensile Strength: 335 MPa 53,000 PSI
2240 XUPER  **Nodular Iron (SG)**	**PRINCIPAL APPLICATIONS:** Nodular iron castings, housings **OTHER APPLICATIONS:** Foundry defects, cast iron die cladding & build up **OUTSTANDING FEATURES:** Nodular deposits provide improved crack resistivity, exceptional all-position weldability and excellent machinability. **RECOMMENDATIONS:** For superior penetration of contaminated surfaces on all ductile iron, such as nodular (spheroidal graphite) and malleable, as well as grey cast iron applications and fabrication to steel. Fully machinable. Recommended for crack-resistant joining, overlaying, building up and filling porosity. Use on both heavy and thin sections.	Tensile Strength: 380-415 MPa 55-60,000 PSI
2233N XUPER  **Machine bases**	**PRINCIPAL APPLICATIONS:** Machine bases, Valves **OTHER APPLICATIONS:** Pumps and differential housings, cast iron dies **OUTSTANDING FEATURES:** For joints subject to hydrostatic pressure; Steel to Cast Iron; Excellent crack resistance; Machinable deposits. **RECOMMENDATIONS:** For crack-sensitive applications such as castings involving hydrostatic pressure, joints under restraint, dissimilar thicknesses and the general welding of very heavy sections. Excellent for joining cast iron to steel. Circumferential pipe welds, especially heavy wall thicknesses, can be made without danger of cracking. Dense welds are completely machinable.	Tensile Strength: 495 MPa 72,500 PSI
3055 CasTec  **GP Cast Iron**	**General purpose cast iron, high volume repair. Nickel iron alloy** **DESCRIPTION:** CasTec 3055 is a specially balanced nickel/iron alloy coated electrode designed for welding a great variety of cast irons. Deposits are dense and free of cracks. The FrigidArc coating with strong drive produces an easy-to maintain arc. CasTec 3055 can be deposited in all positions: overhead, vertical, horizontal or flat. It is recommended for high volume welding because of the alloy's easy handling and rapid deposition capabilities. **BASE METALS:** Recommended for welding alloy cast irons and steel to cast iron.	Tensile Strength: 380 MPa
3099 CasTec  **99% Nickel**	**General purpose, machinable cast iron repair. Nickel alloy** **DESCRIPTION:** CasTec 3099 electrodes are graphite coated and deposit a nickel alloy with exceptional ductility, high tensile strength and good machinability. The deposits are dense, crack free and base metal dilution is minimized. Use for joining, coating, building up missing sections, and filling cracks and pores. Deposits are dense, porosity free, and machining is easy, even with a file, because the deposit contains no hard spots, inclusions, entrapped slag, or cross cracks. **BASE METALS:** Recommended for grey cast irons. Weld steel to cast iron.	Tensile Strength: 365 MPa

More Cast Iron welding products are available. Please ask your local Representative.
Wires are available also; see Endotec DO-23 and OA223

Stainless Steel Welding Electrodes

Product	Applications / Features	Mechanical Properties
307 (E307-17) EUTECTRODE	StainTrode 307-17 AC-DC Rev., For Stainless Steels An all purpose austenitic stainless steel electrode. **USES:** Rutile coated MMA electrode with approximately 110% metal recovery. Fully austenitic and non magnetic deposit, corrosion resistant up to 300 °C, resists thermal cycle and scale up to 850 °C (air). High impact resistance and ductility, work hardens under impact.	Tensile Strength: 610 MPa. Yield Strength: 445 MPa. Elongation: (in 50mm) 40% AWS A5.4: E307-17
308 (E308-17) EUTECTRODE	StainTrode 308-17 AC-DC Rev., For Stainless Steels An all purpose austenitic stainless steel electrode for welding 18/8 chromium-nickel types 301, 302, 304, 305 and 308. **USES:** For metallic arc welding 18/8 and 19/9 types of stainless steel in all positions. Use for joining or overlaying. Ideal as a protective overlay on steel where medium hardness and complete corrosion resistance are required. For applications requiring excellent resistance to impact, heat and scaling	Tensile Strength: 590 MPa. Elongation: (in 50mm) 40% AWS A5.4: E308-17
309 (E309-17) EUTECTRODE	StainTrode 309-17 AC-DC Rev., For Stainless Steels Stainless steel electrode for welding stainless steel type 309. **USES:** High strength metallic arc welding of type 309 stainless steel. Typical applications are welded furnace parts, heat exchangers, heat treating fixtures, annealing boxes and covers, mufflers. All position.	Tensile Strength: 640 MPa Elongation: (in 50 mm) 30% AWS A5.4: E309Mol-17
310 (E310-17) EUTECTRODE	StainTrode 310-17 AC-DC Rev., For Stainless Steels For welding type 310 stainless steel where high strength and oxidation resistance at elevated temperature is needed. **USES:** For metallic arc welding stainless steel types 310 and 314. Also used for types 403, 405, 410, 430, 442 and 446 when preheat and post heat are not possible. (Deposits are not heat treatable.) Especially suitable for elevated temperature applications. Typical applications: Heat exchangers, heat treating boxes, furnace parts and stainless to mild steel.	Tensile Strength: 600 MPa Elongation (in 50 mm) : 35% AWS A5.4: E310-17
316L (E316L-17) EUTECTRODE	StainTrode 316L-17 AC-DC Rev., For Stainless Steels A molybdenum bearing extra low carbon austenitic electrode for welding type 316L stainless steels. **USES:** For arc welding of molybdenum bearing stainless steel type 316L in the fabrication of equipment and chemical vessels. Deposits provide excellent resistance to pitting corrosion caused by sulphuric acid and other acids used in metal-treatment, petrochemical and pharmaceutical industries.	Tensile Strength: 595 MPa Elongation: (in 50mm) : 40% AWS A5.4: E316L-17
318 (E318-17) EUTECTRODE	StainTrode 318 Rutile type electrode depositing austenitic stainless steel stabilised with niobium. It has increased corrosion resistance, notably to inter-crystalline corrosion and pitting up to 400 °C and in air oxidation up to 800 °C.	Tensile Strength: 620 MPa Elongation: (in 50mm) : 35% AWS A5.4: E318-17
2209 (E2209-17) EUTECTRODE	**PROPERTIES:** Very good resistance to pitting, crevice corrosion and stress corrosion cracking in chloride containing agents up to service temperatures of 250°C. Polishable to full brightness. **USES:** For welding of ferritic-austenitic duplex-steels, i.e.: X2 CrNiMoSi 19,5, X2 CrNiMoN 22,5,3 – 2205 and for mixed joints with un- and low alloyed structural steels, as well as austenitic stainless steels.	Tensile Strength: 850MPa Yield Strength: 850MPa Hardness: 240BHN AWS A5.4: E2209-17

Additional stainless steel welding products are available. Please ask your local Representative.



*Eutectic's **TEROMATEC** open arc (flux cored) wires are available for **mild steel**, **stainless steel**, **alloy steels** and **cast iron** welding and wear facing applications.*

A flux cored wire is a tubular wire with a metallic powder flux inside. The primary advantage to flux cored wire over GMAW or stick welding is higher deposition rates, deeper penetration, improved bead appearance and is more cost effective.

Flux cored wire has a larger ball type transfer and produces low spatter levels. In addition, flux cored wire produces a rounder penetration profile with excellent sidewall fusion.

TeroMatec® Open Arc (Flux core) Welding

Product	Applications / Features	Mechanical Properties
OA 56 Hard Facing	OA 56 is an economical flux cored open arc wire producing hard overlays suitable for areas requiring abrasion and impact resistance. **FEATURES:** Resists Abrasion; Resists Impact; Resists Metal to Metal Wear; Multi Layer Build up (up to 3 layers).	Typical Hardness: 55-60 HRc
OA 223 **Joining Cast Iron**	Flux cored (gasless) wire for joining and overlay on cast iron, the nickel-iron weld metal provides a high strength machinable deposit which has a high resistance to cracking with good base metal colour match. **PRINCIPAL APPLICATIONS:** For joining grey SG malleable irons; Casting defect build-ups; Pump castings, motor bases, etc; Joining cast irons to iron-steel. **OUTSTANDING FEATURES:** smooth running characteristic; can be used with Co2 gas for higher voltage use where flat beads are required; can be used on most cast irons and cast iron to steel.	Tensile Strength: 470 MPa Yield Strength: 310 Mpa Elongation: 16%
OA 690 **Joining**	Semi-automatic application without shielding gas and without water cooling, for outdoor field welding of combinations of carbon and alloy steels. NucleO CGS produces fine grain structure for high strength, crack resistance, excellent ductility, corrosion and impact/resistance. **PRINCIPAL APPLICATIONS:** Structural steel, earthmoving equipment **OTHER USES:** Tough, wear-resistant cladding **OUTSTANDING FEATURES:** No shielding gas required; Wide base metal versatility; Impact, heat and corrosion resistance; Rapid deposition.	Tensile Strength: 620 Mpa 90,000 PSI Elongation: 50% Hardness: Rb 80 – 90
OA 2020 **Joining**	For applications involving high-speed joining or build-up of large areas using automatic and semiautomatic welding systems. Typical applications include installation of wear plates, maintenance of heavy mining and construction equipment and repair of tanks, railroad equipment and agricultural implements. Not recommended for use in low temperature applications. **PRINCIPAL APPLICATIONS:** Mining and construction equipment; agricultural implements, repair of tanks, joining. **OUTSTANDING FEATURES:** No shielding gas required; Ideal for field fabrication; Excellent for high deposition requirements; No stub loss; Easy slag removal.	Tensile Strength: 600 Mpa 87,000 PSI

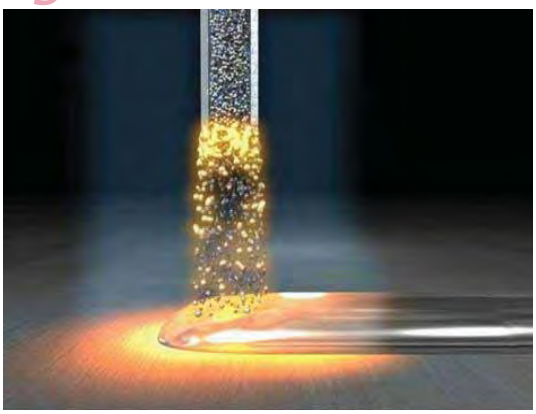




TeroMatec® Open Arc (Flux core) Welding

Product	Applications / Features	Mechanical Properties
OA 3110 **Hard Facing**	Continuous electrode without shielding gas, for rebuilding and anti-wear coating of large parts, including guide rollers and running-gear components on tracked vehicles. **OUTSTANDING FEATURES:** Excellent resistance to deformation through compression; Multipass deposits possible; Dense, highly magnetic deposit; High deposition rate; For semi-automatic welding using reverse polarity arc transfer. Similar Arc Welding electrodes: **Eutectrode 2B**	Hardness: Approx. HRc 30–35
OA 3205 **Hard Facing**	High chromium manganese austenitic alloy for wear-preventive coating of carbon steels, low or high alloy steels and 14% manganese steels. Build-up and surfacing on steel mill wobblers, rail frogs and crossovers, shovel pads and crusher roll hammers. For use as a final overlay where impact is too great for harder and less tough materials. Also use as a high strength joining alloy for manganese, manganese to carbon, and manganese to several alloy steels. Produces tough, strong, crack-resistant deposits that work harden. Deposits resist deformation and spalling. Excellent cushion or padding for harder overlays. **PRINCIPAL APPLICATIONS:** Steel mill wobblers, rail frogs; Crusher rolls, hammers, shovel pads. **OUTSTANDING FEATURES:** No shielding gas needed; For build-up and overlay; Excellent for high deposition applications; Excellent crack resistance; Deposits resist deformation and spalling. Similar Arc Welding electrodes: **Eutectrode 40 / Mantrak 1N**	Hardness: HRc 25 Work hardens to HRc 50
OA 4603 **Hard Facing**	A gasless high-chromium-iron tubular wire used for severe abrasion applications. **PRINCIPAL APPLICATIONS:** For use on alloy steels, construction steels and 12-14% manganese steels that may include crusher equipment, conveyor screws, earthmoving equipment, dredging pumps and buckets and mining slurry pumps. **OUTSTANDING FEATURES:** Weld deposits contain a high volume of primary chromium carbides; excellent low stress abrasion resistance; outstanding tolerance to dilution. Similar Arc Welding electrodes: **EutecTrode 5003 / EutecTrode 6006**	Hardness: 59 HRc Wear (ASTM G65) mm3: 20
OA 4601 **Hard Facing**	Very high chrome alloy for all steels. Designed especially for severe abrasion resistance. Typical uses include over-laying crusher rolls, jaw crushers, screw conveyors, cement die rings, augers, tampers, hammers, gyratory crusher and mantles, dredge pump parts, pusher shoes, catalyst pipes and valves and bucket teeth. **PRINCIPAL APPLICATIONS:** Crusher rolls, jaw crushers **OTHER USES:** Screw conveyors, bucket teeth, augers **OUTSTANDING FEATURES:** No shielding gas required; Excellent resistance to all types of wear; Superior abrasion resistance; Good corrosion resistance Similar Arc Welding electrodes: **EutecTrode 5003 / EutecTrode 6006.**	Hardness: HRc 55 - 60

EnDOtec® Metal Cored Welding Wires



Specific to the Castolin Group, ***EnDOtec*** *is a group of gas shielded, metal alloy cored wires, ideal for maintenance and repair applications as well as batch manufacturing where the highest integrity welding, efficiency and productivity are required.*
Castolin Eutectic ***EnDOtec*** *wires will provide:*

- *Higher Deposit Efficiency – 90 to 95%*
  Flux-Cored wires generally deliver 80-90%;
  Electrodes generally deliver 60-70%
- ***EnDOtec*** *= High Deposition Rates 2 to 12 kg/h*
  Electrodes generally deposit 0.5 to 4 kg/h
- ***EnDOtec*** *= Less Dilution – Typically 10 to 30%*
  Flux-Cored wires generally produce 15 to 30% Electrodes produce 25 to 30%, while solid MIG wires = 20 to 30%
- ***EnDOtec*** *Lower Heat Transfer – less distortion leading to more trustable deposits*
- ***EnDOtec*** *Wider Alloy Capability*

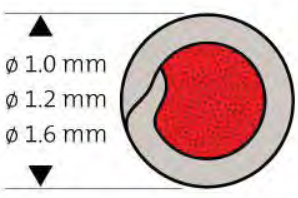
Product	Applications / Features	Mechanical Properties
EnDOtec DO*02 **Joining Buttering** **1.2mm** **1.6mm**	EnDOtec DO*02 has been developed for semiautomatic welding of difficult to-weld steels and/or thick section steel parts. It is ideal for joining dissimilar martensitic or austenitic stainless steels. It can be applied either as a buttering layer or as an E+C TeroCote coating for protection against impact and high pressure. **TYPICAL APPLICATIONS:** Armour plate, manganese steels; steel alloy furnace components; superheated steam outlets; for building and buttering layers, multi-pass protective coatings; rail truck wheels; drive sprockets. **FEATURES**: Up to 40% elongation, excellent crack resistance, high resistance to metal/metal friction, very good resistance to thermal cycling and oxidation at working temperatures of up to 600°C, excellent work hardening, high ductility; slightly magnetic & machinable deposit. Alternative Arc Welding electrodes: **680 CGS / 680 S**	Tensile Strength Rm: 650 MPa Yield Strength Rp0.2: 350 MPa Elongation A5: 30-40% Impact Strength: 70J 20°C; 55J-20° C; 45J-60°C Hardness as welded 10 HRc Hardness after work hardening: 350 VHN30 (35HRc)
EnDOtec DO*04 **Hard Facing** **1.6mm**	An exclusive, small-diameter special alloy**,** EnDOtec DO*04 offers E+C TEROCOTE protective coatings of high hardness (~50 HRc in one pass) ideal for machine parts subject to metal/metal friction cavitation, corrosion and oxidation at high temperatures. **FEATURES:** Excellent corrosion and oxidation resistance at temperatures up to 650°C, excellent metal/metal friction resistance at high temperatures, ideal for use as cladding with no risk of cracking (hardness ~50 HRC); tough, creep resistant deposit; good corrosion resistance in high temperature gaseous media: combustion chamber, diesel engine, valves, etc.; no buttering layer necessary when coating heat resistant steels of CrMo/CrMoV type; good corrosion resistance in saline environment, with cavitation resistance.	Hardness as welded: 500 - 540 HV30 Hardness after work hardening: 540 - 570 HV30 Quenching temp: 1040°C, for hardness of 470 HV30
EnDOtec DO*05 **Hard Facing** **1.6mm**	EnDOtec DO*05 has been developed for protective coating of parts subject to impact, metal/metal friction and abrasion. This non-magnetic deposit, with a high content of chromium and manganese, is ideal protection for carbon steels, high alloy steels and manganese steels. **TYPICAL APPLICATIONS:** For rebuilding applications, buttering layers and protective coatings on: Hammers and bars, Drills, Rollers, Dragline teeth and leading edges, Drive sprockets. **FEATURES:** High resistance to impacting pressure and metal to metal friction, exceptional work-hardening ability.	Tensile Strength Rm: 900 MPa Yield Strength RpO.2: 580 MPa Elongation:25-35% Hardness after welding: 25 HRc After work Hardening: 43 HRc

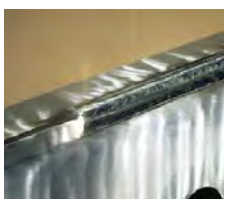
EnDOtec® Metal Cored Welding Wires

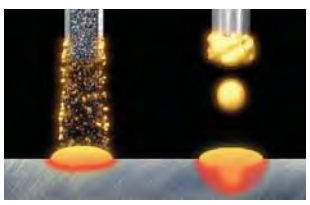
Product	Applications / Features	Mechanical Properties
EnDOtec DO*11  **Hard Facing** **1.6mm**	The slag-free deposit features a high density of hard, cast tungsten carbide particles evenly distributed in a nickel alloy matrix which is further reinforced with very fine precipitates formed by recrystallisation. Exceptional resistance to abrasive/erosive particles with moderate impact and is specifically for service in hot or corrosive environments. **TYPICAL APPLICATIONS:** Designed for antiwear protective coatings on carbon steels, alloy steels, stainless steels and nickel alloys. Typical industries include agricultural, food, beverage, organic oils, pulp and paper, chemical processing. Oil pressing parts, transport screws, cellulose mixing blades, paddles, conveyors, bone mill hammers etc. **FEATURES:** Deposit weld is 50% tungsten carbide, crack resistant, low heat input, stable arc, all positional, high deposition rate.	Hardness after welding: 55 HRc
EnDOtec DO*14  **Hard Facing** **1.2mm** **1.6mm**	EnDOtec DO*14 has been developed as a protective overlay of parts subjected to combined wear phenomena: abrasion, impact and pressure. It is ideal for application on plain carbon steels, ferritic and martensitic steels, both low and high alloy steels and manganese steels. **TYPICAL APPLICATIONS**: Buckets and Shovels, Hot and Cold Shear Blades, Hot Forming and Forging Dies, Excavating Equipment, Rams and Punches. **FEATURES:** Resists impact and abrasion; hard, tough deposits are crack free; good heat-resistance for tooling applications to 500°C; deposits respond to heat treatment; multiple layer capability. Deposits are machinable with carbide tools; resists spalling and impact induced cracking; available in 13.6kg (spools) 300mm.	Typical hardness: 45 HRc Able to be flame hardened. Electrode closest match 6899XHD
EnDOtec DO*15  **Hard Facing** **1.6mm**	EnDOtec DO*15 has been developed for protective coating of parts subject to combined wear phenomena: pressure, abrasion and severe impact. The deposit is formable and can be heat treated. It is ideal for coating carbon steels, both low and high alloy steels and manganese steels. **TYPICAL APPLICATIONS:** For the protective coating of drills, conveyor chains, gravel pumps, hot and cold forming tools. **FEATURES:** Magnetic deposit; very low dilution with base metal; very stable arc for coating edges, precision coatings; available in 15kg wire cage in diameters 1.2mm and 1.6mm ANNEALING TEMPERATURE: 750-800°C HARDNESS: 21 HRc TEMPERING TEMPERATURE: 500°C Hardness = 55 HRc 550°C = 55 HRc; 600°C = 48 HRc; 650°C = 40 HRc	Hardness as welded: 55-60 HRc **Heat treatment:** Quenching temp: 1000-1060°C Hardness: (cooling in oil or air) 57 HRc Electrode closest match 6899XHD
EnDOtec DO*23  **Joining Cast Iron** **1.0mm** **1.2mm**	EnDOtec DO*23 has been specifically developed for low heat input semiautomatic joining, rebuilding and E+C TeroCote anti-wear protective coating of **Cast Iron**. It can also be used to join cast iron to steels. Exceptional crack resistance under high restraint. **TYPICAL APPLICATIONS:** For spheroidal graphite cast iron, grey cast iron and malleable cast iron work pieces, as well as for joining cast iron to steels; casings for pumps and valves; machine tool beds; turbine sealing rings; textile industry machines; machining errors on castings. **FEATURES:** No cracks or porosity, even with multipass deposits; excellent wetting and bonding on contaminated surfaces; no peening required for joints that are not restrained; low heat input due to low welding current and fast travel speed; very good crack resistance.	Tensile Strength: 470 Mpa Elongation: 15% Hardness after welding: 190 HB30 Electrode closest match Xuper 2233
EnDOtec DO*30  **Hard Facing** **1.2mm** **1.6mm**	The deposit offers exceptional resistance to fine particle abrasion and erosion under moderate impact, thanks to a structural matrix which is tough and reinforced by extra-hard particles. **TYPICAL APPLICATIONS:** For protective coating of parts most subject to wear in activities such as public works, brick and tile, quarries, dredging. It is especially suitable in mining/cement making for: mixer blades and scrapers, rotary excavator buckets, auger flights **FEATURES:** Alloy characteristics including hardness fully transferred in just one pass; excellent weldability and arc stability, in all positions.	Hardness after welding: 63-68 HRc Electrode closest match Eutectrode 700

EnDOtec® Metal Cored Welding Wires

Product	Applications / Features	Mechanical Properties
EnDOtec DO*48 **Tungsten Hard Facing** **1.6mm**	DO*48 has been designed specifically for anti wear protective coatings on carbon steels, alloy steels and cast iron. **TYPICAL APPLICATIONS** include mining, quarries, drilling, tunnelling, public works, extrusion press parts, transport screws, mixer blades, paddles, conveyors, scraper blades, cylinder crushers, pump rotors and bodies, etc. **FEATURES:** The slag-free deposit features a high density of hard, cast tungsten carbide particles evenly distributed in a ferrous alloy matrix which is further reinforced with very fine precipitates formed by re-crystallisation. This gives exceptional resistance to abrasive-erosive particles combined with moderate impact at ambient temperatures.	Hardness after welding HRc: 55 Micro hardness of carbides (HV): 2300 Electrode closest match N112
EnDOtec DO*55 **Hard Facing Tool and die** **1.2mm** **1.6mm**	DO*55 specifically developed for E+C TeroCote anti-wear protective coatings on cutting, stamping and drop forging tools, as well as injection moulds for casting aluminium or forming plastics. **TYPICAL APPLICATIONS** Metal forging and hot injection moulding. **FEATURES:** Low coefficient of thermal expansion, simplified heat treatment, machinable, excellent edge retention, creep and corrosion resistant, highly suitable for polishing, easy to use, low heat input and low dilution, maximum weld metal recovery and faster deposition rates. Similar GTAW wire product: **TIG45355W**	Hardness after welding HRc 35 Hardness after heat treatment HRc 58
EnDOtec DO*60 **Hard Facing Stellite 6 type** **1.2 & 1.6mm**	A stellite type alloy containing cobalt, chromium and tungsten, this deposit is especially suited for carbon steels, low and high alloy steels, stainless steels, manganese steels, nickel and monel. **TYPICAL APPLICATIONS:** For protective coatings on valve shutters and caps combustion and whirl chambers, screw conveyors for chemical and food processing industries; woodworking tools; hot shear blades. **FEATURES:** Excellent resistance to corrosion, erosion and cavitation, plus resistance to metal/metal friction; low heat input for low dilution; ductile deposit, machinable by cutting tool; high hot hardness; excellent bead appearance, no spatter, stable arc, especially with arc modulation; “Stellite 6” type deposit; available in 15kg wire cage in 1.6mm diameter.	Hardness: 40-45 HRc Electrode closest match N9060 Tig 906
EnDOtec DO*65 **Joining Steels** **1.2mm** **1.6mm**	Ideal for joining fabrication steels (550 N/mm2), and for reconditioning cast steel parts marred by shrinkage cavities. **TYPICAL APPLICATIONS:** For applications requiring high deposition rates with good penetration and excellent deposit mechanical properties, including: equipment used in public works; railway equipment; tanks, containers; travelling cranes. **FEATURES:** Exceptional metallurgical bonding; Yield superior to 95%; excellent bead appearance; low hydrogen content for extra resistance to cold cracking; excellent arc characteristics with short arc transfer or spray transfer; all positional; available in 15kg plastic spool in diameters 1.2mm and 1.6mm.	Tensile Strength Rm: 575 MPa Yield Strength: 570 MPa Elongation A5: 26% Impact Strength: 100J 20°C
EnDOtec DO*80 **Hard Facing Stellite 21 type** **1.2mm** **1.6mm**	A stellite type alloy containing cobalt, chromium, nickel, molybdenum and manganese this deposit gives work hardenable protective coatings suitable for carbon steels, low-to-high alloy steels, stainless and manganese steels, nickel and monel. **TYPICAL APPLICATIONS:** For protective coating applications on hot cutting blades; stripper points; forging, hot forming tools; valve seats; extrusion press plungers. **FEATURES:** Exceptional increase of hardness under impact; excellent resistance to heat and corrosion; excellent resistance to metal/metal friction combined with corrosion resistance; superior crack resistance, for both repair and E+C TeroCote protective coatings, over large surfaces; ductile deposit, machinable by cutting tool; exceptional all-positional weldability; Stellite 21 Type Deposit; available in 15kg wire cage in 1.6mm diameter.	Hardness as welded 300-350 Vhn30 33-37 HRc Hardness after work hardening: 500 VHN30 48 HRc Electrode closest match N9080







NanoAlloy EnDOtec® Metal Cored Welding

EnDOtec NanoAlloy 390, the "Flagship" of Nano range is a patented, gas shielded, metal cored alloy wire, ideal for maintenance and repair applications or batch manufacturing where highest integrity welding, efficiency and productivity are required. The slag-free deposit contains a high volume fraction of ultra-hard, complex Boro carbides uniformly distributed within an iron alloy matrix. The unique nanoscale type microstructure ensures exceptional performance against wear by severe abrasion & erosion retaining elevated bulk hardness properties to 750°C.

Increased Service Life - NanoAlloy®'s are characterised by high volume fractions of ultra-hard, complex Boro carbides (M23(BC) 6), metal carbides (MC) and metal borides (M2B) which are very finely dispersed within an alpha-Fe alloy matrix sub-micron refined. Composite wear-facing alloys typically consist of ultra-hard, angular tungsten carbide phases suspended within a relatively softer matrix binder (Ni or Fe based). In service, erosive or abrasive particles will rapidly attack the softer matrix to gradually expose the harder WC phases which either break or become detached. This effect is particularly evident when spherical shaped WC phases are involved. The resultant lost wear resistance causes premature failure or shorter service life with associated costly downtime losses. The same erosive or abrasive particles are thus unable to attack any "weak spots" due to the high, homogeneous wear resistance throughout the entire NanoAlloy® deposit. This results in longer, reliable service life, ***lower operating costs and significant productivity gains****.*

Less Weld Metal Required - It is important to understand that for any given wear-facing deposit volume requirement, ***37% LESS kg*** *are necessary with EnDOtec DO390 due to its lower density (7.6 gm/cc compared with Ni + WC based alloys (12 gm/cc).*

It was developed for protective coatings with extreme resistance to abrasion and erosion on carbon steels, alloy steels and stainless steels. Typical industries include steel, cement, waste recycling, power generation, foundries, chemical processing, mining, materials handling, petrochemical, etc. Transport screws, furnace chutes, exhaust fans, cyclones, conveyors, mixer blades, paddles, scrapers, press screws, material screens etc.

Cutting Teeth for Dredging Industry
Abrasion + Impact Resistance

Bucket Teeth for Quarry Industry
Abrasion + Impact Resistance

DO 390 can be built up to a thickness of up to 12.5mm (1/2 inch)

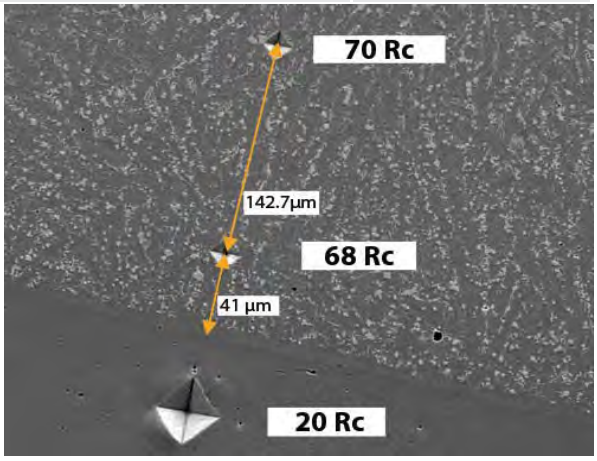
Shredder Hammer for Waste & Recycling Industry.
Abrasion + Impact + Heat Resistance

Clay Mixer Screws for Brick & Tile
Abrasion + Impact resistance

Sinter Crusher Hammers for Steel Ind.
Abrasion + Impact resistance

NanoAlloy® EnDOtec® Metal Cored Welding

Product	Applications / Features	Mechanical Properties
Eutectic DO*380 REDEFINING STEEL® **Hard Facing** **1.2mm** **1.6mm**	**Overlay Description** **DO 380 GMAW OAW** is an iron based steel alloy with a near nanoscale (submicron) microstructure that features exceptional abrasive wear resistance with superior toughness and no high-cost nickel, tungsten and molybdenum in material chemistry. **Key Performance Characteristics** • 67 - 70 HRc single and double pass weld deposits. • Cost effective alternative to complex carbides: iron-based chemistry contains no tungsten, no molybdenum and no nickel. • Provides exceptional wear resistance lasting significantly longer than most chrome carbide and complex carbide alloys. • High resistance to abrasion while maintaining high toughness. • Crystalline microstructure is engineered to submicron (400 nm) size. • Maintains high hardness after exposure to high temperatures.	Hardness after welding HRc: 67-70 ASTM G65-04 Procedure A 6000 cycles mass loss = 0.12–0.14g. Weld deposit Density 7.36 g/cm³
Eutectic DO*385 REDEFINING STEEL® **Hard Facing** **1.2mm** **1.6mm**	**Overlay Description** **DO 385 GMAW OAW** is an iron based steel alloy with a near nanoscale (submicron) microstructure that includes chromium, molybdenum and niobium in the material chemistry, resulting in an overlay wear solution well suited for the toughest jobs in the most extreme service environments. **Key Performance Characteristics** • 66 - 71 HRc single and double pass weld deposits. • Exceptional resistance to severe sliding abrasion. • Provides longer lasting wear life than most chrome-carbide and complex carbide alloys. • Improved impact resistance results from complex boro-carbide phases surrounded by ductile phases that form during welding.	Hardness after welding HRc: 66-71 ASTM G65-04 Procedure A 6000 cycles mass loss = 0.09–0.11g. Weld deposit Density 7.36 g/cm³
Eutectic DO*390 REDEFINING STEEL® **Hard Facing** **1.2mm** **1.6mm**	**Overlay Description** **DO 390 GMAW OAW** is an iron based steel alloy with a near nanoscale (submicron) microstructure that features extreme abrasion resistance with high toughness, high volume of hard phases and superior high temperature hardness. SHS 9192 is an alternative to chrome and tungsten carbides. **Key Performance Characteristics** • 69 - 72 HRc single and double pass weld deposits • Extreme resistance to abrasion while maintaining high toughness • Alternative weld material to: · Tungsten carbides · Chrome carbides · Complex carbides · Stick weld material loaded with carbides · Tungsten carbide laden Teflon® sheet overlays • Maintains high hardness after exposure to high temperatures.	Hardness after welding HRc: 69-72 ASTM G65-04 Procedure A 6000 cycles mass loss = 0.09–0.11g. Weld deposit Density 7.68 g/cm³



Low dilution, predictable wear rates. Properties and hardness remain consistent throughout the entire hard facing layer.

Wear Facing Welding Electrodes

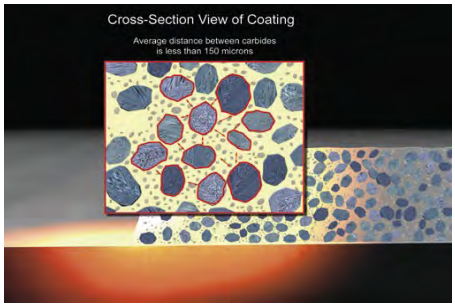
Product	Applications / Features	Mechanical Properties
ManTrak 1N  **Freight rail track & points**	**PRINCIPAL APPLICATIONS:** Build up / overlay manganese steel rail frogs, frog inserts and cross over points. **OUTSTANDING FEATURES:** High resistance to compressive forces, undiluted deposits are non-magnetic, superior work hardening properties, can be flame cut. **RECOMMENDATIONS:** Used extensively throughout the world rail networks especially for heavy freight rails such as Iron Ore transport. Excellent hardness match to rail.	Typical Hardness: (as deposited) HRb 85 Typical work hardness: HRc 45
2B EutecTrode  **Build up**	**PRINCIPAL APPLICATIONS:** Sprockets, rollers, concrete mixer blades, hammers and cushion layers for harder coatings. **RECOMMENDATIONS:** For use on ferrous metals that require precision machining for finishing where the surface is subjected to mild abrasion with heavy impact or pressure. Excellent as a cushion for hard surfacing. **OUTSTANDING FEATURES:** Resists: Mild Abrasion; High Impact; High Pressure; Fully machinable deposits; Dense, porosity free welds.	Hardness: HRc: 28-32
6HSS ToolTectic  **High speed steel**	**PRINCIPAL APPLICATION:** Composite high-speed-steel dies **OTHER USES:** Tools, trimming dies, shears, punches **OUTSTANDING FEATURES:** Heat treatable deposits; High speed steel overlays; Excellent cutting, shaving and piercing qualities; All position electrode. **RECOMMENDATIONS:** Provides maximum hardness of edges at high temperatures. For use where cutting, shaving, or piercing qualities are required. Excellent for knife edges, and machine tool parts subject to heavy frictional wear. Ideal for building composite blanking or punching dies.	Hardness: HRc 58-62 (as welded)
40 EutecTrode  **Rail track and frogs**	**PRINCIPAL APPLICATIONS:** For overlay and joining manganese steels **OTHER USES:** Buckets, teeth, crushers, hammer mills **OUTSTANDING FEATURES:** Can be flame cut; All position electrode; Withstands severe impact and compression; Undiluted deposits, non-magnetic. **RECOMMENDATIONS:** All positional electrode for cladding and joining manganese steel and joining manganese steel wear plates, pads, etc. to carbon and low alloy steel structures such as buckets, shovels, crusher jaws etc. It is also used for increasing the service capability of carbon and low alloy steels by adding a work-hardening manganese steel surface. Weld deposits of EutecTrode 40 feature superior resistance to severe-impact and compressive forces.	Yield Strength: 415 MPa 60,000 PSI Tensile Strength: 795 MPa 115,000 PSI HARDNESS: HRb 80-90 Work hardens to HRc 45-50
N112 ULTIMIUM  **Ultra high abrasion resistance**	**PRINCIPAL APPLICATIONS:** Blades, scrapers, ash conveyors **OTHER USES:** Augers, tongs, “Speedy Dots” under loader buckets. **OUTSTANDING FEATURES:** Deposits solid, homogeneous tungsten carbide; NucleO-C catalyst for optimum wear; Ultimate resistance to abrasion and friction; Super-hard overlays on all steels. **RECOMMENDATIONS:** Deposits are rich in homogeneous tungsten carbide. Superior density throughout with uniform hardness. Overlays to be contour ground will offer highest resistance to abrasion and friction, and provide impact, heat and corrosion resistance similar to solid tungsten carbide. For frictional and abrasive applications.	Hardness: HRc 68-72
700 ABRATEC  **General purpose hard facing**	**PRINCIPAL APPLICATIONS:** Dredger teeth, buckets, shovels **OTHER USES:** Conveying equipment, cultivators **OUTSTANDING FEATURES:** Extra hard abrasion resistant overlays on steels; Withstands severest wear; For carbon, alloy & manganese steels; Minimal dilution. **RECOMMENDATIONS:** For hard overlays on wearing surfaces and edges exposed to heavy and severe abrasive wear. Typical applications include: dredger teeth, buckets, conveying equipment, conveyor screws, shovels, cultivators, skids, pulverisers, excavator parts and all other applications where abrasion is encountered. For hard protective coatings on new parts such as chisel points, and plough shares. Because of the excellent wear characteristics and low dilution of the base metal, parts will outwear uncoated parts by as much as 500%.	Hardness: HRc 60-65.

Wear Facing Welding Electrodes

Product	Applications / Features	Mechanical Properties
5003  **Impact Abrasion**	**For superior resistance to abrasion and mild impact/pressure.** **DESCRIPTION:** Eutectic 5003 weld deposits consist of dense, tough matrix containing uniform/dispersed needles of hard complex chromium carbides. The well balanced combination of alloying elements provides Eutectic 5003 with its excellent resistance to abrasion, even when combined with other service conditions, including impact, corrosion and/or higher than normal temperatures. **MAIN FEATURES:** Excellent resistance to: Abrasion, Impact, Pressure, Corrosion; Smooth deposits help reduce wear; Low dilution with base metal.	Hardness: 55-60 HRc
6006 CHROMCARB  **High impact Abrasion**	**PRINCIPAL APPLICATIONS:** Augers, screws, conveyors, hammer mills. **OUTSTANDING FEATURES:** High hardness at elevated temperatures; NucleO-C catalyst for superior wear resistance; Superior for abrasion accompanied by impact; Excellent compressive strength **RECOMMENDATIONS:** Deposits are highly resistant to abrasive wear, especially when accompanied by impact and/or in oxidizing or corrosive atmospheres. It's special Frigid Arc coating permits contact welding. Arc stability and smooth metal transfer reduce dilution of base metal, to maintain the highest degree of hardness. Good slag cover reduces cooling speed to protect against danger of cracking. Use to overlay carbon and alloy steels, manganese steel and cast iron. Where high impact is involved, a buffer layer of EutecTrode 40 is first recommended.	Hardness: HRc 57-60.
XHD 6804  **Hot work stamping tools**	Alloy developed for coating high and low alloy steels and tool-steels. **APPLICATIONS:** Draw plates, chucks, plungers for hot-extrusion **OTHER USES:** Stamping and trimming dies, kiln parts, pump shafts. Coating of parts subjected to wear from metal on metal friction at temperatures up to 650°C. **OUTSTANDING FEATURES:** Contact heat quickly removed; Maximum hardness after one pass; Excellent resistance to metal on metal friction up to 650°C; Extensive overlays possible without any risk of overheating; Very tough and creep resistant; Bonding layer normally not necessary; Exceptional weldability; Very good resistance to oxidation**.** Exceptional welding capabilities with a stable arc and perfect metal transfer; Smooth flow without spatter; Excellent wetting.	Hardness after welding: 420-520 HV Hardness after work hardening: 480-580 HV
N9010  **Stellite 1 type**	**PRINCIPAL APPLICATIONS:** For cobalt based wear resistant coatings **OUTSTANDING FEATURES:** CastoDur 9010 shows a fine microstructure consisting of cobalt rich matrix with precipitates of Chromium and Tungsten carbides. It has a good resistance to pressure and impact. It also has good all round resistance to the secondary wear factors, particularly corrosion and heat.	Hardness: HRc 54-59
N9060  **Stellite 6 type**	**PRINCIPAL APPLICATIONS:** Valve seats, pump shafts, sleeves **OTHER USES:** Timber cutters, screw conveyors **OUTSTANDING FEATURES:** Exceptional resistance to corrosion, abrasion, heat, friction and impact; Retains hardness over a wide range of temperatures; Good hot and cold cutting properties. **RECOMMENDATIONS:** For applications which require an overlay, with hot hardness and/or corrosion resistant properties, particularly in range 650°-800°C. Use for overlaying acid pump shafts, screw conveyor blades, blades for grinders and crushers, valve seats and faces. In fact on any moving parts in contact with corrosive gases, acids, petro-chemicals etc. Ideal for edging hot cutting blades.	Hardness: HRc 40-45
N9080  **Stellite 21 type**	**PRINCIPAL APPLICATIONS:** Hot forging, cutting tools, shear blades **OTHER USES:** Extrusion dies, ingot tongs, steam valves, seats **OUTSTANDING FEATURES:** Resistance to impact, friction and abrasion; High edge retention at elevated temperatures; High machinability; Resistance to corrosive and oxidizing media. **RECOMMENDATIONS:** EutecTrode 9080 works well on all carbon and alloy steels. It is well suited to overlays on curved and contoured surfaces. Use for parts which operate under high temperature and/or pressure combined with wear factors such as friction, impact, oxidation and corrosion.	Hardness: HRc 30 Hardness after work hardening: HRc 45-50
6899 XHD  **Hot cutting & punching**	**PRINCIPAL APPLICATIONS:** Ingot tongs, forging dies, press dies and punches, cutting and trimming dies. **OUTSTANDING FEATURES:** Excellent Resistance to impact plus heat; Will not chip or spall, resists cracking; High resistance to corrosion and oxidation. **RECOMMENDATIONS:** XHD 6899 is a key repair alloy in any industry where metal is worked, and especially where the working equipment is subjected to heat as well as impact and corrosion. Since such metal-working operations occur in a broad cross-section of industry, applications for XHD 68-99 can be pinpointed by operation more readily than by industry. Cold-heading, Shearing, Drawing, Spinning, Extruding, Stamping, Forging, Swaging, Hammering, Trimming, Punching, Twisting, Rolling.	Hardness: HRc 22–28 After work hardening HRc 36–42 Tensile Strength: 740 MPa 106,000 PSI

Wear Facing Brazing Alloys

Product	Applications / Features	Mechanical Properties
185XFC EUTECROD **Build up**	**PRINCIPAL APPLICATIONS:** Gear teeth, shafts, bearing seats **OTHER USES:** Propellers, pump impellers **OUTSTANDING FEATURES:** Outstanding frictional wear resistance; Contains Atmosin for double action cleaning; Highly machinable, non-peeling; Excellent control on multi-pass build-ups. **RECOMMENDATIONS:** Atmosin in flux for superior cleansing/deoxidizing and wettability, with no smoke, fumes or glare. For overlays on surfaces requiring high resistance to frictional wear. Superior weldability and control. Ideal for building up broken or worn gear teeth, worn bearings, valve seats and pistons. Tough, high strength joints.	Hardness:130 BHN as deposited 200 BHN work-hardened Bonding temp: 760°-850°C Tensile Strength: 585 MPa 85 000 PSI
8800 DrillTec **Drilling**	**PRINCIPAL APPLICATIONS:** Junk bits, rotary cutting tools **OTHER USES:** Masonry drills, horseshoes, earthmoving equipment **OUTSTANDING FEATURES:** Low temperature manufacture preserves carbides; Utmost abrasion resistance and cutting action; Atmosin for double action cleaning. **RECOMMENDATIONS:** Composite rod of unique structure to deposit hard carbides uniformly within a nonferrous matrix. Controlled low temperature manufacture preserves deoxidizers in alloy, and sharpness and angularity of carbides. Tungsten carbide chips can be applied for specialized applications to cast iron, steel and copper alloys. Excellent for abrasion and impact applications as extremely tough copper alloy matrix withstands extensive shock loading. Improved weldability permits bonding at well below the critical temperatures of ferrous metals. Especially advantageous for improvising carbide-tipped drills.	Carbide Mesh Size Ranges: 6.2mm + 5.0mm 5.0mm + 3.2mm 3.2mm + 1.5mm
8811 ULTIMIUM **Scrapers**	**PRINCIPAL APPLICATIONS:** Guide plates, scrapers, mixer blades **OTHER USES:** Teeth, drill heads, mud pump rotors **OUTSTANDING FEATURES:** Resistance to abrasion and cutting action; Uniform distribution of virgin carbides for longer wear life; No melting of base metal **RECOMMENDATIONS:** For TeroCote protective coatings on steels, nickel alloys and cast iron. Deposits tungsten carbide in a nickel alloy matrix, to resist cutting type wear. Deposits have maximum concentration of extra hard virgin carbides with sharpness and angularity. Excellent resistance to cutting, abrasion, erosion, corrosion and heat.	SIZE* 5mm dia. Hardness: Tungsten Carbide Max service temp: 700°C
9000 EUTECBOR **Cams**	**PRINCIPAL APPLICATIONS:** Cams, augers, mixer blades, patterns, guides, screws **OUTSTANDING FEATURES:** Polishes in service; Low heat application; High hardness and corrosion resistance; Outstanding frictional wear resistance **RECOMMENDATIONS:** For TeroCote protective coatings requiring severe abrasion-and-corrosion resisting deposits, and compressive load strength at elevated temperatures. For use on steel, alloyed steel, cast iron, high chromium and nickel alloys. Non-magnetic and non-heat treatable. Deposits accept a high polish and resist pitting and galling.	Hardness: HRc 55-62 Bonding temp: 965°C
7888T **Drilling protection for stabilisers.**	**Carbide-**bearing cord for flame process for heavy duty protection against erosion and abrasion **DESCRIPTION:** 7888 T is a high-performance anti-wear product in the form of a flexible cord, comprising a nickel core wire, covered with an elastic binder containing a mixture of carbides and nickel alloy powder. The latter has a uniquely effective self-fluxing action, which gives 7888 T outstanding wetting properties. As a result, a smooth, even protective coat can be deposited quickly and easily, greatly reducing the risk of overheating the base material. Each spool of 7888 T carries one continuous length of cord of rigorously consistent diameter and without joins, for improved reliability with automated or robotics feeder systems. 7888 T deposits an extremely durable protective coating comprising a dense mass of ultra hard tungsten carbides (~65% by weight) embedded in a tough nickel-chromium alloy matrix. This structure offers extremely effective protection against erosive and abrasive attack by a wide variety of materials. The matrix composition helps to absorb impact and improves resistance to corrosion, while the angular profile of the finely crystallised carbides makes it very difficult to dislocate them from the matrix. Deposit appearance: smooth, matt metallic grey.	Hardness, matrix (HV30): ~370 Micro-hardness, carbides (HV1): >2300 Carbide granulometry 0.2-0.7 mm: Cord diameter 5.0 mm: Core wire diameter 1.2mm Max. service Temperature (°C): ~700



GMAW (Mig) Welding Wires

Product	Applications / Features
GS 70S-4	AWS A5.18 ER70S-4 For low hydrogen gas shielded arc welding of mild steels, low and medium carbon steels. Copper coated double-deoxidised wire for better, stable arc action. Use with Argon-base or C02 gas shielding.
GS 70S-6	AWS A5.18 ER70S-6 Precision wound GMAW wire for mild and medium strength steels. Copper coated, wire tensile strength 500 MPa
GS 71T-1	AWS A5.18-20 E71T-1 The wires have a rutile base slag. They are used DC electrode positive with C02 and Argon C02 shielding gases. C02 shielding provides a globular transfer whereas Argon C02 produces a spray transfer. Lower arc voltages are recommended for Argon shielding gases. Slag coverage is full and generally self-removing.
GS 71T-5	AWS A5.20 E71T-5 AS2203-1 – 1990 The wires have a lime fluoride base slag and are often referred to as Basic wires. They are designed for DC electrode negative with both C02 and Argon C02 shielding gases. Slag coverage may not be complete and slag is easily removed. Weld deposits from basic wires generally have better impact and crack resistance to wire from the rutile group.
GS 308L	AWS A5.9 ER308LSi A gas shielded 308 stainless steel wire for welding 18/8 stainless steel such as 304L, 304N, 304LN, 304, 304N, 321, 347. GS308L produces a low-carbon 20/10 stainless steel designed to give good resistance to corrosion. High silicon content gives good arc stability and fluidity producing excellent weld appearance with minimal porosity and spatter particularly in short circuit transfer.
GS 309L	AWS A5.9 ER309LSi A gas shielded 309L stainless steel wire designed for welding stainless steel 304 and 18/8 stainless when severe corrosion conditions exist. Also used for welding stainless to mild steel and for joining 304 and 18/8 clad stainless. Can be used for GTAW and SAW if desired.
GS 312	AWS A5.9 ER312 A gas shielded 29/9 stainless steel wire suitable for the GMAW, GTAW and SAW process. Produces high strength, crack resistant joints and can be used for welding stainless to mild steel and dissimilar stainless steels.
GS 316L	AWS A5.9 ER316LSi A gas shielded 316L silicon bearing stainless steel wire suitable for the GMAW and GTAW process. Produces low carbon weld metal of the 18/13/3 type with excellent resistance to corrosion. Contains high silicon to give better arc stability and better fluidity.
GS 347	AWS A5.9 ER347 A gas shielded 19/9 Niobium stabilized stainless steel wire designed for welding Ti and Nb/Cb stabilised 18/10 stainless steels. Used for high temperature applications above 400°C. The stabilized weld deposit provides resistance to inter-granular corrosion. GS347 can be used for GMAW, GTAW and SAW if desired.
GS 4043 AL	AWS A5.10 ER4043 A gas shielded aluminium - 5% Silicon alloy wire suitable for use with GMAW, GTAW, PAW and electron beam welding. GS4043 can also be used with the oxy-acetylene process if desired.
45554	MAG wire for welding austenitic steels with manganese and welding steels that are difficult to weld or thick sections. MPa 660 (ER 307 Si)

Many other GMAW products are available on request. Please ask your local Representative.

GMAW (Mig) Solid Welding Wires

Product	Applications / Features
GS 5356 AL **Aluminium**	AWS A5.10 ER5356 A gas shielded Aluminium - 5% Magnesium alloy wire suitable for use with GMAW, GTAW, PAW, and electron beam welding etc. Used for welding 5XXX, 6XXX and 7005 alloys. Excellent for cryogenic applications.
GS CU **Copper**	AWS A5.7 ER Cu A gas shielded copper wire containing phosphorus and silicon as deoxidisers. Used for welding oxygen free, deoxidised, and electrolytic tough pitch coppers. Can be used with oxy-acetylene process if desired.
GS ALBR 2 **Aly Bronze**	AWS A5.7 ER Cu Al-A2 A gas shielded aluminium bronze wire used for joining and overlaying aluminium bronze; manganese, silicon bronzes; some copper-nickel alloys, steels, cast irons and dissimilar combinations such as aluminium bronze to steel. GSALBR2 provides excellent wear and corrosion resistant surfaces.
GS PHOSBR **Phos Bronze**	AWS A5.7 ER Cu Sn-A Used for joining copper, brass, bronze including high strength bronze. Low coefficient of friction when running against steel faces. Excellent corrosion resistance in salt water. Does not suffer from dezincification.
GS SILBR **Sil Bronze**	AWS A5.7 ER Cu Si-A A gas shielded silicon bronze wire used for welding copper, copper-silicon (Si bronze), copper -zinc (brass), alloys to themselves and to steel. High corrosion resistance, strength and toughness. Can be used with the oxy-acetylene process if desired.
45252 CastoMag® **Steel join and ID welding**	AWS ER80S-B2 Highly alloyed chrome molybdenum solid-wire continuous electrode, designed for the semiautomatic welding of non-alloyed steels, high-yield point low-alloy steels and boiler-plate steels. The deposit is heat-tolerant and offers joints with service temperature of up to 550°C. It also features good resistance to cracking caused by alkaline corrosion. The deposit's inherent wear-resistant characteristics can be further increased by the application of nitriding and cementation treatments.
GS 35 **Hardfacing**	Gas shielded metal arc all positional copper coated wear facing wire, deposits are typical 35 Rc. For applications where abrasions with impact are a problem, resists spalling under impact and compressive wear. Suitable for multi pass build up.
45351 CastoMag® Hardfacing	Gas shielded metal arc all positional copper coated wear facing wire; deposits are heat treatable, deposits of up to 60 HRc. For applications where abrasions with impact are a problem, also suitable for elevated temperatures, resists spalling under impact.
GS 110 High Strength	GS 110 is a low alloyed GMAW wire type Ni, Cr, Mo for joining high strength and quench and temper steels.
GS 56 Hardfacing	GS 56 is an economical wire producing hard overlays (56 HRc) suitable for areas requiring abrasion and impact resistance. The weld metal is medium alloy martensitic steel useful for 2 -3 layer applications.
GS Ni99 Nickel	GS Ni99 is a Gas Shielded 99% Nickel wire suitable for GMAW. Producing high strength, crack resistant joints and suitable for overlay of cast iron.

Many other GMAW products are available on request. Please ask your local Representative.

GTAW (Tig) Solid Welding Wires

Product	Applications / Features
TIG 5HSS Tool steel	TeroCoating alloy for use on composite high speed steel. For use where cutting, shaving or piercing qualities are required. High speed-steel type deposit. HRc 58-62 (as welded) HRc 64-65 (heat treated)
TIG 21 Aluminium alloy	For use with all Aluminium types and combinations, except where 5XXX series Al/Mg alloys form part of assembly. An Aluminium/silicon alloy with good strength, ductility and corrosion resistance. Tensile strength: 227 MPa
TIG 182 (45706) Copper alloys	For joining copper, copper-silicon and copper zinc base metals to themselves and to steel. Ideal to weld galvanised steel to minimize damage to zinc coating and help preserve corrosion resistance. A copper based alloy containing silicon and manganese. High strength alloy with corrosion resistance generally equal to copper. Tensile strength: 427 MPa
TIG 680 Dissimilar steel alloys	Joining and repair of dissimilar alloy steels. For high alloy, spring, tool and die steels. Very high strength joining. A high chrome-nickel alloy. Good machinability. Tensile strength: 827 MPa
ME006 Grade 6 alloy	A Cobalt based Grade 6 type (Cr Co W) wear resistant alloy especially useful for high temperature applications. Oxidation resistance to 800°C. Good aptitude to polishing and machining. "Stellite 6" type alloy in sizes 2.4, 3.2, 4.0, 5.0, 6.4 and 8mm. Hardness: 38-47 HRc
TIG 912 Grade 12 alloy	For applications requiring hardness with abrasion and erosion resistance. A cobalt base alloy with chrome and tungsten. Mild impact conditions only. “Stellite 12’’ type alloy. Hardness: 46-51 HRc
TIG 1851 Aluminium bronze	For joining and overlaying aluminium-bronze, copper alloys, other non-ferrous and ferrous materials. Excellent for joining copper alloys to steel. An aluminium-bronze alloy for high strength, ductile, corrosion resistant joining and overlaying. Tensile strength: 620 MPa 140-230 BHN
TIG 45612 Dissimilar steels and thick sections	For joining and overlaying high nickel alloys and dissimilar metal combinations. Ideal for elevated temperature or heat cycling applications. A nickel “super alloy’’ with high strength, exceptional elongation and corrosion resistance. Excellent thermal cycling properties and oxidation resistance. Tensile strength: 689 MPa
TIG 308L	For welding 300 series 18/8 and 19/9, 304L. AWS A5.9 ER308LS.
TIG 309L	For welding types 309-309L dissimilar joints of 300 series to ferritic stress. AWS A5.9 ER309LS.
TIG 310L	For welding types 310 & 309. AWS A5.9 ER310.
TIG 316L	For welding 316 and 316L molybdenum brazing stainless also 304 3cr12. AWS A5.9 ER316LS.
TIG 312	Joining and repair of dissimilar alloy steels. For high alloy, spring, tool and die steels. Very high strength joining. A high chrome-nickel alloy. Good machinability. Tensile strength: 827 MPa AWS A5.9 ER312.
TIG 2209	For welding duplex stainless steel 2205. AWS A5.9 ER2209.
TIG 224 Cast Iron	GTA high nickel alloy for repairing thin section Grey Cast Irons and especially useful for joining iron castings to steel. Tensile strength: 344 MPa Typ hardness: 90 HRb

Additional Products

Product	Applications / Features
XHD2100 EUTECTRODE  **Aluminium repair Arc weld**	**PRINCIPAL APPLICATIONS:** Truck bodies, frames, cast aluminium housings **OTHER USES:** MMAW repairs to many aluminium components **OUTSTANDING FEATURES:** Fast welding speed, superior mechanical properties, low spatter, compatible with many aluminium alloy grades, high electrical and thermal conductivity, deposits accept the anodising process. **RECOMMENDATIONS:** Most aluminium alloys can be welded but XHD2100 is especially recommended for non heat treatable alloys. Aluminium magnesium (3000, 4000, 5000 & 6000 series). Other alloys which are heat treatable will suffer some loss of strength in the HAZ however deposits are frequently acceptable. **Size:** 3.2mm **Tensile Strength:** 100-200 MPA, 15-30,000 Psi
EXOTRODE  **Metal preparation gouging**	**PRINCIPAL APPLICATIONS:** Chamfer and gouge all metals, using any of a wide range of power sources, including low amperage small AC welders. Ideally suited for veeing cracks prior to welding; rough machining; removal of bushings, rivet heads and studs. Also for preparing sections, gouging out old or defective weld metal, removing flash and risers, excess metal; also cutting and piercing.
Eutectrode 285  **Join/overlay copper alloys**	**PRINCIPAL APPLICATIONS:** Axle stops, bearings, bushings, gear housings, impellors, propellers, pumps, valve parts. **Description** Versatile DC electrode for repairing castings and fabricating assemblies, of copper alloys. Joining and overlaying copper alloys, cast iron and steel, plus joining copper alloys to grey cast iron and steel. Top quality bronze bearings can be fabricated using steel as a base and Eutectrode 285 as an overlay, significantly reducing the overall cost. **Tensile strength** 275-345 Mpa **Machinability:** Excellent **Hardness:** 60 HRb **Corrosion resistance:** Good
1855XHD  **AL Bronze, metal to metal**	**PRINCIPAL APPLICATIONS** 1855XHD is ideal for corrosion resistance of coating large surfaces used in the chemical industry. It may be used for assembling complex aluminium bronze alloys, for rebuilding and modifying aluminium bronze parts or for coating parts subject to intense metal to metal friction. Ship propellers, propeller shaft sleeves, rudder components, turbine and pump housings, mixer blades, gear wheels, screw-shaft carrier rings, side plates, valve housings, roller extension segments, valve gates, turbine injector needles, forming matrices, pump turbines, winch components, rotary seals, shaping tools, bearings, heat exchanger plates, rotary valves, gearings. **DESCRIPTION** Very good resistance to cavitation, excellent resistance to marine corrosion, very high tensile strength, high elongation, low friction coefficient, very easily machinable. Aluminium bronze alloys are used to resist corrosion by sea water. 1855XHD allows an entire range of these alloys to be welded with a Maximum Safety Margin. When the precise chemical composition of the base metal is unknown, 1855XHD can be used as it provides an elongation higher than that of traditional aluminium bronzes with comparable tensile strength. **Tensile Strength** 680 Mpa **Yield Strength** 430 Mpa **Elongation A5%** 30% **Hardness** 175 HRb
TUNGSTEN CHIPS  **Hard Facing**	**DESCRIPTION:** Material is straight grade or Wc + Co, i.e. no mixed crystals. Only selected raw material, which is graded before manufacture, is used during reduction. Cobalt content on material varies between 6 and 8% per batch. TYPICAL GRADE SIZES: **MESH MILLIMETRES** 16 x 20 1.18 x 0.85mm 12 x 20 1.7 x 0.85mm 10 x 16 2.0 x 1.18mm 20 x 30 0.85 x 0.60mm 12 x 16 1.7 x 1.18mm 12 x 30 1.7 x 0.60mm Applied in conjunction with a MIG welding process using specially developed Eutectic wires e.g. CastoMag 45351, GS35 to maximize matrix hardness. GS70S4, GS70S6 are used for basic steel matrix.

Many other products are available on request. Please ask your local Representative.

Brazing and Silver Solder

Product	Material Type	Applications / Features
16 XFC **Steel & Steel Alloy**	Steel Carbide tipping Tube frames	Exceptional high strength flux coated copper base brazing type alloy with nickel content, for joining of all carbon and alloy steels, including tool steel, carbides, and galvanised products. Provides superior wettability with minimum joint preparation and finishing. Tensile strength 690 Mpa (100,000 psi) Bonding temperature 760°C to 850°C Colour code Sky blue flux coating.
18 XFC **Bronze**	Bronze alloys, pumps, valves. Galv parts	Xuper 18 XFC is enhanced with tin to improve the ease of wetting on bronze alloys, and particularly when brazing zinc-coated sheet stock. Thin-flowing and build-up properties impart application versatility with ease-of-use. Recommended for brazing low and high zinc brasses and for most tin bronzes. Tensile strength 485 Mpa (70,000 psi) Bonding temperature 860°C to 893°C Colour code: Deep yellow flux coating
51 S **Aluminium**	Aluminium to dissimilar metal Zinc die cast	Low temperature alloy for joining, filling and sealing Aluminium to dissimilar metals such as copper, brass, steel , etc. Use with oxy-acet gas torch, furnace, induction or soldering. Tensile strength 48 Mpa (7,000 psi) Bonding temperature 160°C
157 **157 PA** **Stainless**	Stainless steel Food handling	EutecRod 157 & StainTin 157PA are respectively rod & paste soldering alloys particularly suitable for stainless steel assemblies, brass and bronze components, nickel alloys, and most carbon steels when used with Eutectic Flux 157. Deposits are corrosion resistant and do not tarnish in service. Tensile strength 105 Mpa (15,000 psi)
180 B **Copper**	Electric motors, air conditioning Bus bars	EutecRod 180 is copper-phosphorus alloys with excellent braze-ability on copper-base alloys when used with FloTectic® 1100… high activity brazing flux. Tensile strength 290 Mpa (42,000 psi)
185 XFC **Steels & Cast**	Bearing surface Cast steel Cast iron	Xuper 185 XFC is a premium flux-coated brazing rod for applications involving wear due to frictional compressive forces. The controlled nickel addition improves application toughness and depresses fuming tendencies for welder-friendly use. Tensile strength 586 Mpa (85,000 psi) Colour code: Bright pink
190 **190 PA** **Aluminium**	Furniture tube, light tubes, refrigeration.	EutecRod 190 provides exceptional thin-flowing properties when oxy-fuel brazing sheet, tubing and most wrought forms of aluminium. Excellent colour match with smooth, uniform fillets. Properties are highly compatible with aluminium grades 3xxx & 4xxx. Tensile strength 262 Mpa (34,000 psi) Bonding temperature 560°C Also available in paste.
1020 XFC **Multi Alloys**	Stainless steel High strength Food handling	Xuper 1020 XFC is a specially coated rod with a flexible reduced-glare flux. Ideal for difficult-to-get-to locations. Suitable for most ferrous and non-ferrous metals with a good colour match on stainless steel. Tensile strength 585 Mpa (85,000 psi) Colour code bright pink flux coating.
CastoTin 1	Tin bearing, bus bars, etc.	Complete soldering paste, containing alloy and flux. It offers maximum savings by suspending the flux in a colloidal solution. For tinning and soldering all metals except aluminium and magnesium. Tinning bearings, bus bars and current collector bars.
1618 **Silweld**	Dissimilar metals, thin gauge, electrical parts.	Eutec Silweld 1618 is a cadmium-free, high silver pre-placement paste for use with most commonly used brazing processes. Because the metal component is finely ground, heat up times are greatly reduced and the activity of the carrier flux is not compromised. Suitable for use on most brasses & bronzes, cupro-nickel alloys, stainless steels, carbon steels, etc. Tensile strength 585 Mpa (85,000 psi)
1800 PA **Multi Alloys**	Joining multi alloys	Silver-zinc-copper-tin brazing alloy in paste form for capillary joining of stainless steel, ferrous, copper and nickel alloy parts. Very high silver content for improved wetting and very strong joints. Ready to use paste containing the ideal proportions of atomised filler alloy powder and optimised flux, held together by special inert organic binding agent.

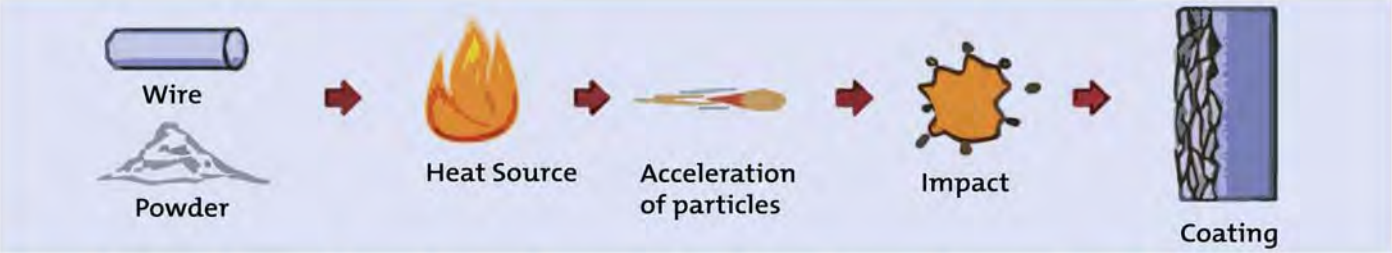
Many more Brazing alloys are available upon request. Please ask your local Representative.

Thermal Spray Introduction

Coating overview

There are many different coating ways to protect against wear, repair and rebuild your parts, each with their respective advantages and constraints. Below you will find simplified overviews of the different coating processes, to get a quick initial choice for your application.

Simplified thermal spray



Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding		Deposition yield	Energy	Equipment investment
RotoTec	Powder. Metals & polymer	All metals	Low	3 (10)*	Medium to large	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Medium to high	Medium to high	Combustion gases	Low
ProXon	Powder. Metals	All metals	Low	2 (5)*	Medium to large	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Medium	Medium to high	Combustion gases	Low
Meta-Ceram	Powder. Ceramic	All metals	Low	0,4 (1)*	Medium	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Low	Medium	Combustion gases	Low
Eutalloy	Powder. Self-fluxing alloys	Steels, cast iron, (aluminium bronze) *	Medium to high	2 (10)*	Small & precise	Homoge-neous	Negligible	Very good. Diffusion	Medium	Medium	Combustion gases	Low
Eutalloy SF	Powder. Self-fluxing alloys	Steels & cast iron	High	2 (6)*	Medium to large	Homoge-neous	Negligible	Very good. Diffusion	High	High	Combustion gases	Low
Eutalloy RW	Powder. Self-fluxing alloys	Steels & cast iron	High	2 (6)*	Medium	Homoge-neous	Negligible	Very good. Diffusion	Medium to high	Medium to high	Combustion gases	Low
EuTroLoy	Powder or wire. Metals	Steels, cast iron, (aluminium bronze) *	Medium to high	2 (20)*	Large	Homoge-neous	Negligible	Excellent. Fusion	Medium to high	High	Electricity & shielding gas	Medium
EuTronic Arc	Wire. Metals	All metals	Low	1 (20)*	Very large	Lamelar	3 to 10%	Good. Mechanical & micro-diffusion	Very high	Medium	Electricity & compressed air	Medium

Simplified surfacing polymer overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment investment
MeCaTeC	Paste or fluid. Polymer	All metals & others	None	10 (20)*	Large	Hetero-geneous	Negligible	Good. Chemical	Medium	High	None	Negligible

Best Second choice

(....) * request special precaution or coating material

Powder Spray Fusing

Eutalloy® - Eutalloy® SF

Simplified overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment investment
Eutalloy	Powder. Self-fluxing alloys	Steels, cast iron, (aluminium bronze) *	Medium to high	2 (10)*	Small & precise	Homoge-neous	Negligible	Very good. Diffusion	Medium	Medium	Combustion gases	Low
Eutalloy SF	Powder. Self-fluxing alloys	Steels & cast iron	High	2 (6)*	Medium to large	Homoge-neous	Negligible	Very good. Diffusion	High	High	Combustion gases	Low

Best **Second choice**

Powder Spray Fusing

Eutalloy® - Eutalloy® SF

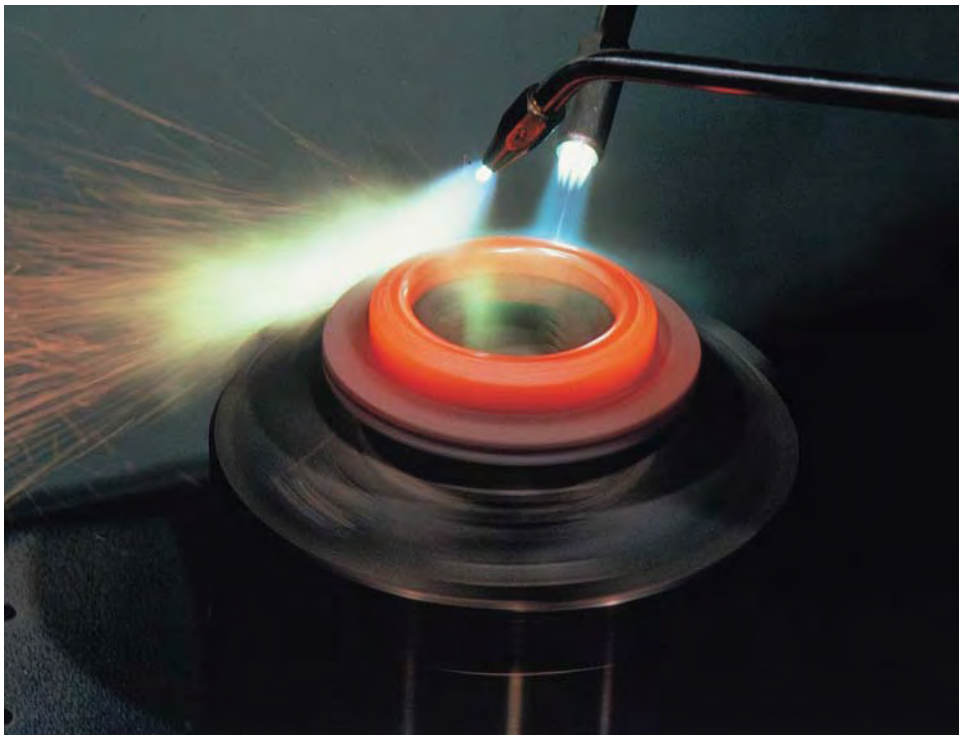
Basic principles of Eutalloy® process
Function

The powder is introduced into the torch flame and sprayed in a semi -molten state onto the preheated part, for fusion. Bonding is achieved by diffusion of the alloys into the base metal.

Metallurgical bonding with no dilution of Eutalloy® alloy, on stainless steel (enlarged x 500).

A) Deposit
B) Diffusion zone
C) Base metal

Bonding of the coating alloy and base metal is similar to that obtained in brazing: a liquid phase is linked with a solid phase, by diffusion. The wetting qualities of alloys are due to the synergistic nature of certain constituents. These resist oxide formation on the substrate surface during spraying, and promote bonding with the base metal. An oxide free surface is essential. Melting ranges, depending on the type of alloy, vary between 850°C and 1100°C. Spraying distances vary between 6 and 20 mm.



Advantages

Eutalloy® provides a wide range of benefits compared with conventional arc welding process and PTA processes:

- No dilution of the base material.
- Best purity and performance of the coating alloy.
- Homogeneous and pore free coatings.
- Smooth surface for low post welding machining and also when compared with cold thermal spraying.
- Higher bond strength.
- Better shock resistance.
- Thicker coatings capabilities.

Applications

The Eutalloy® process is designed for protective coating of machine parts and tools subject to a variety of wear phenomena. Eutalloy®-type oxy acetylene torches are capable of delivering a wide range of alloys in powder form. The Eutalloy ® system has a coating dimension range from 0.10 mm to thicknesses of several millimetres. The spraying followed by fusion method can fine-coat to 0.05 mm. The hardness of a deposit can vary from 15 to 65 HRC, depending on the alloy composition. Such deposits are perfectly homogeneous and dense.

Technical data

- Flame temperature: 3200 °C
- Particle velocity: not relevant
- Deposition rate: 2 to 6 kg/h
- Coating material: Self-fluxing
- Ni, Co or Fe base in powder form
- Coating thickness: 0.05to10 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)

Powder Spray Fusing

Eutalloy® Equipment

SuperJet-S-Eutalloy®

SuperJet-S- Eutalloy® is an oxy-acetylene thermal spray torch, which delivers very precise anti-wear protective coatings, thanks to its sensitive controls. Alloy powders are sprayed onto the part to be coated and are fused simultaneously. Diffusion bonding with the base metal ensures that it does not reach its melting point. The dense coating is not affected by dilution and retains all its designed properties. For thermal spraying of Eutalloy® powders.

Advantages

- Flexible, multi purpose and fast.
- Rapid shut-off of acetylene and oxygen while maintaining setting.
- Reliable and precise coatings.
- Usable in all positions on a wide range of base metals, including steels, alloy steels, stainless steels and cast-iron.

SuperJet-S- Eutalloy® Kit

Contents of equipment case:

1 torch with heat shield.
3 tip assemblies for different flame sizes to be used according to the size of the part or type of coating required.

Also included are Eutalloy® powders for a wide range of applications.

Alloy types: 10680 10009 10185, and 10112.
Masking solution to protect the adjacent areas from undesirable overspray.

Accessories such as:

- adjustable spanner
- spark lighter
- welding goggles
- hose couplings
- set of nozzle cleaners *
- set of injector cleaners
- special screwdriver *
- cleaning pad *
- set of Teflon washers *

* packed in a plastic box

Other kits with different content are available on request. Please ask your local Castolin Eutectic company, Smenco Pty Ltd.

KoolTip Eutalloy® Option Kit

Special water cooled tip assemblies called KoolTip® kits are recommended whenever the SuperJet -S- torch is subject to high duty cycle usage or prolonged thermal reflections.

C6 water-cooled tip assembly kit contents:

- assembly with cooling device
- set of connecting water hoses
- special heat shield

Accessories such as:

- spark lighter
- welding goggles
- nozzle cleaner *
- injector cleaner *
- set of Teflon washers *

* packed in a plastic box.

Powder Spray Fusing

Eutalloy® Powders

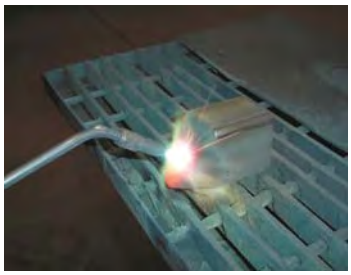


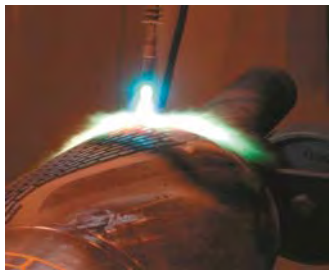

Product	Product Type	Applications / Features	Properties
Eutalloy 10009 BoroTec 500g, 2.5kg, 5 kg	Alloy Ni + 27% Cr,B,Si,Fe,C	Resurfacing cams, pushers, stops, guide wheels, filter press cake stone remover for sugar mill, decanting screw, steam gate components. Coating elements subject to friction. Finish by grinding Low friction coefficient. Good resistance to corrosion, erosion and abrasion under light load.	~63 HRc. ASTM G65 Wear 30mm³ vol, loss Service Temp 550°C (1020°F)
Eutalloy 10011 GritAlloy 700g, 2.5kg, 5 kg	Alloy 80% WC-W2C+ NiCrBSiFeC	Coating elements of chains, transport screw, wiper segments, brick die frames, claw excavators, rock drill, brush cutter rake, debarking knives. Excellent resistance to abrasion by fine to coarse sized abrasives.	~65 HRc. 80% tungsten carbides ASTM G65 Wear 8mm³ vol, loss Service Temp 550°C (1020°F)
Eutalloy 10092 Eutallite 700g, 2.5kg, 5 kg	Alloy Co+64% (Ni-Cr-W-B-Si)	A tough cobalt-base coating that will resist softening and scaling at elevated temperatures. High alloying additions of chromium and tungsten insure good hot hardness properties. Finishing by grinding.	~48 HRc ASTM G65 Wear 50mm³ vol, loss Service Temp 845° C (1550°F)
Eutalloy 10112 TungTec 500g, 2.5kg, 5 kg	Alloy 60% WC-W2C+ NiCrBSiFeC	Coating of machine parts used in the transport, handling and proces-sing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw, etc. Excellent resistance to erosion and abrasion by fine to coarse sized abrasives	~64 HRc. 60% tungsten carbides ASTM G65 Wear 9mm³ vol, loss Service Temp 550° C (1020°F)
Eutalloy 10185 BronzoChrom 500g, 2.5kg, 5 kg	Alloy Ni + 6% BSiFe	Coating of cast iron and steel moulds for plastic material and glass. Recoating shafts, eccentrics, bearings Soldering tungsten carbide biscuits on drilling stabilizers, etc. Well suited for metal-to-metal friction. Machinable with cutting tool.	~42 HRc. ASTM G65 Wear N/A Service Temp 760° C (1400°F) Excellent corrosion resistance.
Eutalloy 10224 NiTec 500g, 2.5kg, 5 kg	Alloy Ni + 4% BSiFe	Repairing glass mould edges, gear teeth, exhaust manifolds, pump bodies, brakes on drawing tools. Bonding layer before welding with electrode on cast iron that is difficult to weld, etc. Appropriate for new or worn cast iron.	~90 HRb. ASTM G65 Wear N/A Service Temp 760° C (1400°F) Good resistance to corrosion. Machinable with cutting tool.
Eutalloy 10680 ChromTec 500g, 2.5kg, 5 kg	Alloy Ni + 5% BSiFe	Repair of gears, cast steel, cast iron valve seats, moulds, keyways, bearing seating. Renewing drawing tools Correction of machining errors, etc. Finish by machining. Good resistance to shocks and oxidation while hot.	~95 HRb. Shear Strength 75,000 psi ASTM G65 Wear N/A Service Temp 760° C (1400°F)
Eutalloy 10999 Diamax 500g, 5 kg	Alloy NiCrBSiFe+ Tungsten Carbide	Coating of fan blades, cutting knives, screws, rasps. Distributor blades for fertilizer sprea-ders, cyclone blades, hopper for sand spreading machines, mouths of bag-gers, etc.	~80 – 85 HRa. 15% tungsten carbides Excellent resistance to erosion and abrasion by fine abrasives.

Many more powder types and specifications are available upon request. In addition we can manufacture custom blends and alloys to suit your specific requirements.

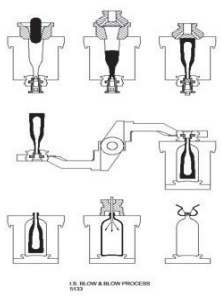
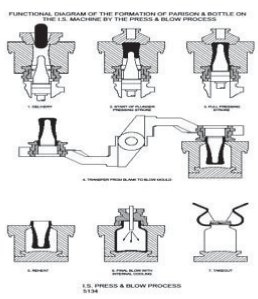
Powder Spray Fusing

Eutalloy® Powders for Glass Industry



Product	Product Type	Applications / Features	Properties
Eutalloy LTPE 8418 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy	Repair of mould damage on the seams or edges. Easy to machine or file.	~ 240 HV30 (~18 HRC) Grain size -106 µm. Low energy input for the fusion. Spot repairs.
Eutalloy LTPE 8422 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy	Repair or protection of mould components: seams, blow heads, guide rings.	~ 270 HV30 (~22 HRC) Grain size -106 µm. Low energy input for the fusion. Small to medium repairs.
Eutalloy LTPE 8426 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy	Brazing of tungsten carbides on stabilizers. Extensive repairs and preventive coatings on seams, edges and guides.	~26 HRC (~300 HV30) Grain size -106 µm. Low energy input for the fusion. Fast deposition.
Eutalloy LTPE 8431 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Fast repairs and extensive preventive coatings on mould edges and guides.	~31 HRC Grain size -106 µm. Low energy input for the fusion. Good wetting properties and fast deposition.
Eutalloy LTPE 8435 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Extensive repairs and preventive coatings on neck rings or blow head.	~35 HRC Grain size -106 µm. Low energy input for the fusion. Enhanced fluidity and fast deposition.
Eutalloy LTPE 8440 4.5 kg 12.5 kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Enhanced weldability at high hardness level on bottom plates, baffles and guide plates.	~40 HRC Grain size -106 µm. Low energy input for the fusion. Fast deposition with enhanced fluidity.

Powder Spray Fusing

Eutalloy® SF Process - One Step Spray & Fuse for high yield

Function

The Eutalloy® SF flame spraying process is designed to deposit a range of wear resistant powder coatings with high deposit efficiency. It uses the CastoDyn DS 8000 oxy-acetylene powder spray system equipped with an SF Lance to coat onto slowly moving or stationary even surfaces of massive steel parts in a one step spray & fuse operation.

The water cooled SF Lance robust design has been engineered to perform higher powder deposition spraying rates with simultaneous fusion capabilities. This creates wear resistant requisite coatings from 0.8 mm to 3 mm thickness with strong metallurgical diffusion bonds to the steel substrate.

Advantages

- High deposition yield.
- No dilution of the base material.
- Best purity and performance of the coating alloy.
- Homogeneous and pore free coatings.
- Smooth surface for low post machining .
- High bond strength.
- Good shock resistance.
- Thick coatings capabilities.

Applications

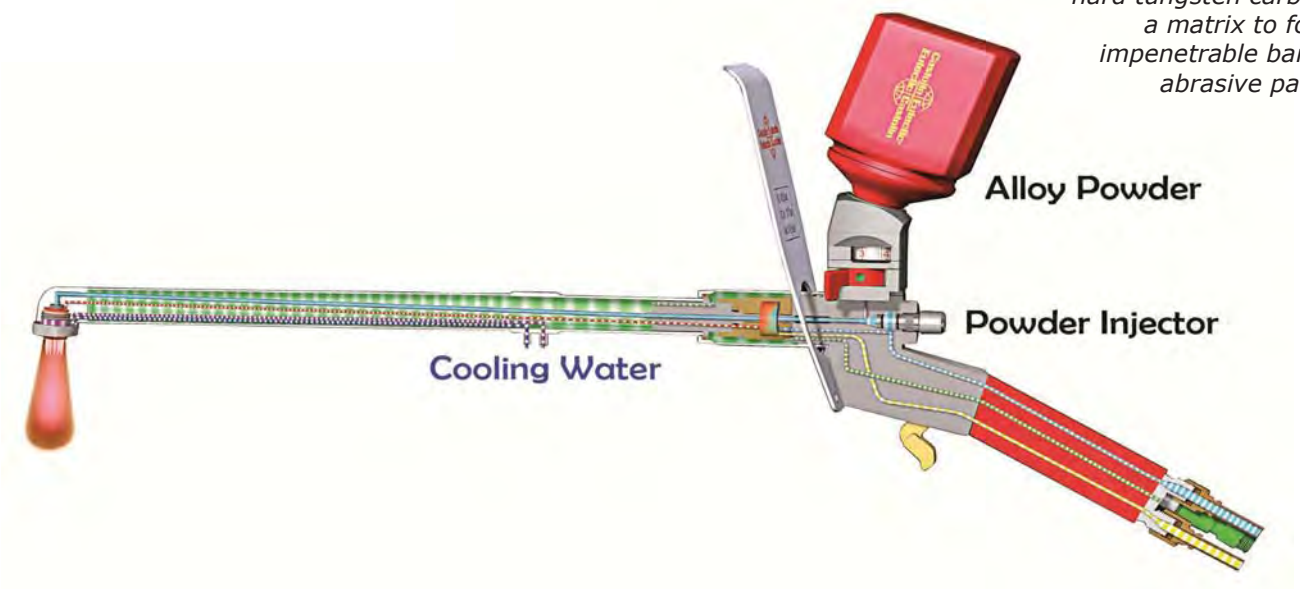
A range of self fluxing Eutalloy® SF powder alloys has been developed to meet the precise granulometry and morphology tolerances of the SF Lance system thus ensuring highest possible deposition rates combined with efficient yield, reliable deposit quality and ease of application.

This comprehensive range of corrosion resistant nickel based Eutalloy® SF powder alloys is available to meet different hardness and machinability requirements when protecting industrial machine parts in service against wear by friction, abrasion, erosion, pressure etc.

Technical data

- Flame temperature: 3200 °C
- Particle velocity: not relevant
- Deposition rate: 2 to 10 kg/h
- Coating material: Self-fluxing
- Ni, Co or Fe base in powder form
- Coating thickness: 0.8 to 3 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)

Coating with densely packed hard tungsten carbides in a matrix to form an impenetrable barrier to abrasive particles.



Powder Spray Fusing

Eutalloy® SF Equipment & Accessories

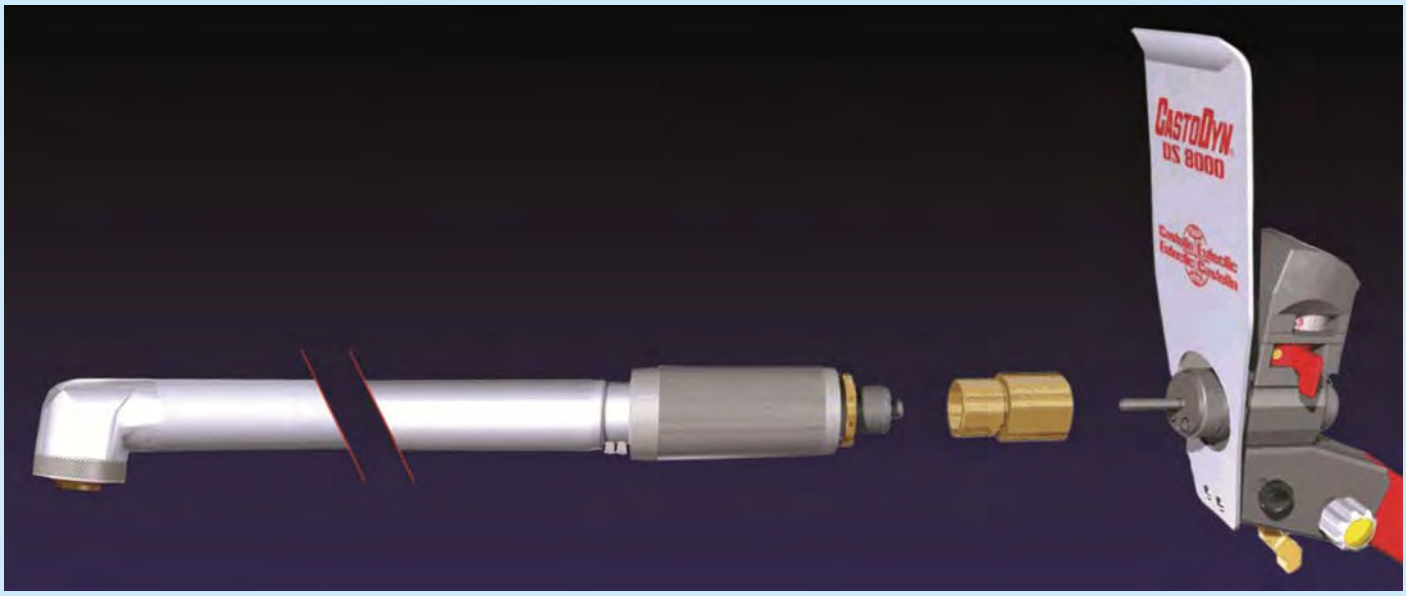
CastoDyn SF Lance

The CastoDyn SF Lance kit increases the already wide range of applications by allowing the CDS 8000 to perform spraying with simultaneous fusion.

Standard Spray Module	SSM 50	SSM 51	SSM 52 optional
Deposition rate	4-9 kg/h	2-4 kg/h	1-2 kg/h
Typical Yield	>90 %	>90 %	>90 %
Oxygen flow rate	2000 NI/h	1000 NI/h	500 NI/h
Acetylene flow rate-Flame	1900 NL/MN	950 NL/MN	475 NL/MN
Oxygen flow rate - Carrier gas	330 NL/MN	240 NL/MN	80 NL/MN
Flame power	~ 28 KW	~ 14 KW	~ 7 KW
Deposit thickness (one pass)	1-3 mm	0,8-2,5 mm	0,8-2 mm

Advantages

- Increased energy output for highest deposition rate.
- Advanced nozzle design delivers exceptional yield (>90%)
- Consumable : Eutalloy® SF powders



Schematic showing the assembly of SF Lance on CastoDyn DS 8000

Castolin Eutectic's modular CDS 8000 torch performs more flame spraying processes, with more alloy powder types than any other comparable system. Its robust, water-cooled design permits sustained high-intensity spraying, and is ideal for both automated and manual applications.

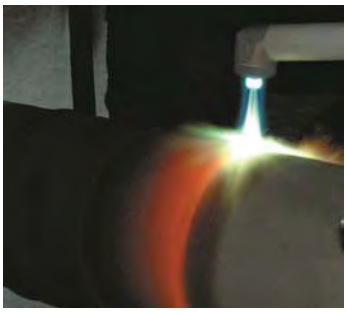
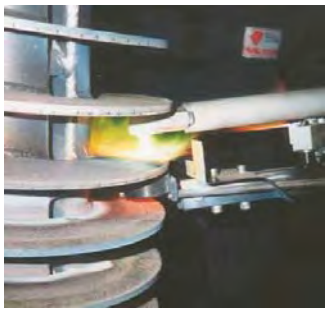
CastoDyn® SF Lance

The kit's two Standard Spray Modules (SSM 50 and SSM 51) offer different flame powers, so workplaces of any mass or thickness can be coated. Additional kits, options and configurations are available upon request. Please ask your local Representative.

Powder Spray Fusing

Eutalloy® SF Powders



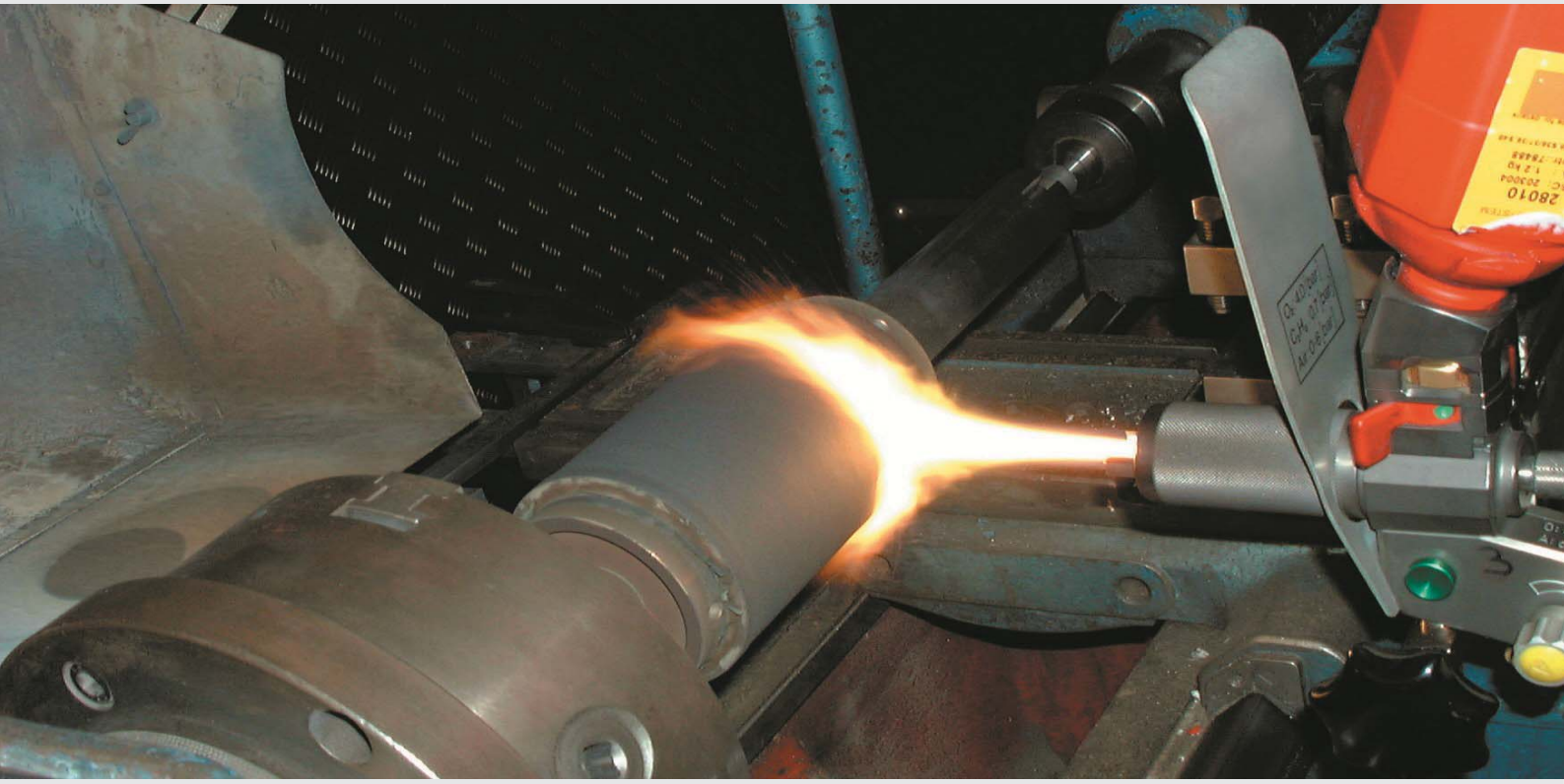
Product	Product Type	Applications / Features	Properties
Eutalloy SF 15211 4.5 kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	All round powder for anti-abrasion.	~60 HRC 60% tungsten carbides Excellent resistance to erosion and abrasion by fine to coarse sized abrasives
Eutalloy SF PE 8213 4.5 kg 12.5 kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For thick coatings. Stabilizer in oil and gas drilling industry.	~55 HRC 55% tungsten carbides. Excellent crack resistance. Abrasion and corrosion resistance
Eutalloy SF PE 8215 4.5 kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For smooth coatings and parts subject to severe abrasion such as agriculture parts, centrifugal screws.	~850 HV30 60% tungsten carbides. Excellent abrasion resistance even by fine particles.
Eutalloy SF PE 8217 12.5 kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For parts needing a rough surface and subject to severe abrasion such as scraper blades, drill heads, scraper parts.	~62 HRC 70% tungsten carbides Best edge build-up capability. Abrasion and corrosion resistance.

Many more Eutalloy SF alloys are available, Please ask your local Representative.

Powder Cold Flame Spraying

RotoTec® Proxon® MetaCeram® Eutalloy® RW

Powder Cold or Hot Flame Spraying



Simplified overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment invest-ment
RotoTec	Powder. Metals & polymer	All metals	Low	3 (10)*	Medium to large	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Medium to high	Medium to high	Combustion gases	Low
ProXon	Powder. Metals	All metals	Low	2 (5)*	Medium to large	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Medium	Medium to high	Combustion gases	Low
Meta-Ceram	Powder. Ceramic	All metals	Low	0,4 (1)*	Medium	Lamelar	5 to 15%	Good. Mechanical & micro-diffusion	Low	Medium	Combustion gases	Low
Eutalloy RW	Powder. Self-fluxing alloys	Steels & cast iron	High	2 (6)*	Medium	Homoge-neous	Negligible	Very good. Diffusion	Medium to high	Medium to high	Combustion gases	Low

Best **Second choice**

(...) * request special precaution or spray powder

Powder Cold Flame Spraying

RotoTec® Proxon® MetaCeram® Process Cold Spraying

Function

RotoTec®, ProXon® & MetaCeram® are «cold» processes whereby a new alloy or ceramic is reliably coated onto a cylindrical surface of a metal workpiece or part. The sprayed coatings are applied to the desired thickness at temperatures that do not overly stress, change the base metal properties or create distortion. These «cold» processes mean that the part should not exceed about 150°C during coating.
These thermal spray powders are categorized into the following processes:

- ProXon® process where the self-bonding powders are «cold» sprayed in «one-step».
- RotoTec® & MetaCeram® processes where the powders are sprayed in «two-steps».
  The first step is to «cold» spray a bond coat to ensure the bonding with the part. The second step is to «cold» spray a final coating with the required wear resistance properties.

Advantages

- Low heat input to the base metal minimizes distortion, warping and changes in the base metal.
- «Cold» is key to simplicity, efficiency, speed and reliability.
- Wide range of powders can be sprayed.
- Spraying equipment is inexpensive.
- Easy to handle.
- The low level of noise and fumes during spraying facilitates setting up a new low cost spraying facility.

Applications

«Cold» powder flame sprayed coatings have a very broad field of applications. Both metals and ceramics are sprayed for different application needs.

In particular, parts suitable for coating consist of those which can be rotated and require repair due to wear on surfaces which are cylindrical in shape. This represents a wide range of applications, consisting of shafts, journals, rolls and bearings on areas such as bearing seats, press fits, seal and packing zones.

Technical data

- Flame temperature: 3200 °C
- Particle velocity: up to 50 m/s
- Deposition rate: 1 to 6 kg/h
- Coating material: Alloys and ceramics in powder form.
- Coating density: 85 - 95%
- Noise level: 70 - 80 dB(A)

These «cold» thermal spray powders are applied with a flame powder spray system, such as the oxy-acetylene CastoDyn DS 8000. The powder is fed with help of injector effect or a carrier gas (nitrogen, argon or air) into a gas flame (often acetylene/oxygen). The flame heats the powder particles and propels the droplets towards the substrate forming a dense coating with good bonding properties. Due to the moderate transfer of heat to the powder particles and to the work piece, the base metal stays relatively cool.

Microstructure of a "cold" Sprayed coating

Powder Cold Flame Spraying

Proxon® MetaCeram® Powders



Product	Product Type	Applications / Features	Properties
RotoTec® 50000	Alloy Ni-Al-Mo	Bond coat for RotoTec® 19000 and MetaCeram 25000 and 28000 powder families, on all metals except Cu and Mg.	Fusion reaction during spraying creates strong bond with substrate.
RotoTec® 19850	Alloy Cu-Al	Compressor pistons, trunnions and pulleys.	Typ hardness HRb 65-75 Very good machinability by turning. Low coefficient of friction.
ProXon® 21021	Alloy Ni-Al-Mo	Bearing seatings, guides, slides, feathering sides. Press fit bearings.	Typ hardness HRb 75-80 Used without bonding layer. Max. service temperature 800 °C. Thick deposit capability (<3mm).
ProXon® 21022	Alloy Ni-Al-Mo-Cr B, Si	Pump and motor shafts, bearing fits, seal surfaces, general reclamation repairs.	Typ hardness HRb 80 Used without bonding layer. Max. service temperature 650 °C. Thick deposit capability (<3mm).
ProXon® 21023	Alloy Fe-Ni-Al	Bearing seatings, guides, slides, feathering sides.	Typ hardness HRb 90 Used without bonding layer. Max. service temperature 800 °C. Thick deposit capability (<3mm).
ProXon® 21031	Alloy Ni-Cr-Al-Fe-Mo	For components subject to wear and corrosion such as fan blades, shaft sleeves and roller bearing seats	Typ hardness HRb 90 Used without bonding layer. Thick deposit capability (<3mm).
ProXon® 21071	Alloy Cu-Al	Compressor pistons, trunnions and pulleys.	Typ hardness HRb 60-70 Used without bonding layer. Good machinability. Low coefficient of friction. Thick deposit capability (<4mm).
Low Temperature Powder Alloys			
RotoTec® LT 29230 Zinc	Zn base	Sign panels, pylons, gantries, metallic structures, machine casing, port equipment, repair of accidental damage to galvanized structures.	Zn >99% - Low melting temperature. Sacrificial layers ensuring cathodic protection of ferrous supports against corrosive atmospheric phenomena.
RotoTec® LT 29240 Babbit	Alloy Sn-Sb-Cu	Antifriction alloys. Resurfacing bearings. The best adhesion is obtained by preparatory tinning using CastoTin 1.	Excellent behaviour under friction. Low melting temperature.

Many more powder alloys are available upon request. Please ask your local Representative.

Powder Cold Flame Spraying

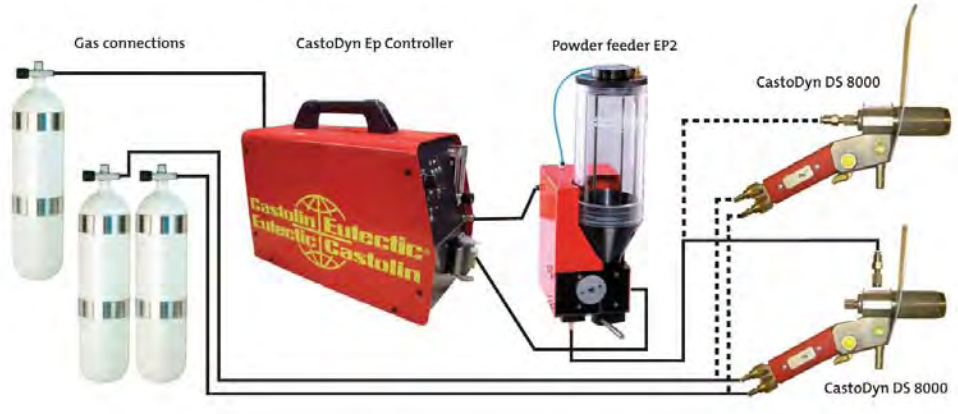
MetaCeram®

Ceramic and refractory powders for "Cold" two step spray process

Product	Product Type	Applications / Features	Properties
RotoTec® 50000	Alloy Ni-Al-Mo	Bond coat for RotoTec® 19000 and MetaCeram 25000 and 28000 powder families, on all metals except Cu and Mg.	Fusion reaction during spraying creates strong bond with substrate.
MetaCeram® 28010 25010	Cr2O3	On RotoTec 51000 bonding layer. Cable gland seatings, shaft protector sleeves, seam ring joint seatings, plungers, pump shafts, feed chutes. High hardness, excellent resistance to corrosion, low coefficient of friction.	Microhardness ~2400 HV10g Max. service temperature 500 °C Product density 5.2 kg/dm
MetaCeram® 28020 25020	Al2O3 TiO2(2.2%)	On RotoTec 51000 bonding layer. Seam ring joint seatings, cable gland seatings, shaft protector sleeves, electrical isolation of machine parts, press rings for making radial tyres, sifting plate.Good electrical insulation (dependent on deposit thickness). High hardness, excellent resistance to corrosion.	Microhardness ~1950 HV10g Max. service temperature 1000 °C Product density 4.0 kg/dm
MetaCeram® 28030 25030	Al2O3 TiO2(13%)	On RotoTec 51000 bonding layer. Printer cylinders, paper transport rollers, thread guide, wear and sliding plates, induction oven parts. Good resistance to corrosion and good friction properties.	Microhardness ~1600 HV10g Max. service temperature 1000 °C Product density 4.0 kg/dm
MetaCeram® 25040	TiO2	Titanium dioxide coatings offer the best finish capability and provide excellent resistance to mild cavitation. Do not use when resistance to abrasion is critical. Applications: pump sleeves, impellers, prop shafts, thread guides.	Typical hardness HRc 57 Max service Temp. 540°C
MetaCeram® 28095	Mo	Used without bonding layer. Sliders, bearings, spindle guide, cable gland seatings, pistons for high-pressure pumps. Good resistance to abrasion and excellent coefficient of friction. Non-magnetic deposit.	Microhardness ~900 HV10g Max. service temperature 400 °C Product density 10.2 kg/dm
MetaCeram® 25088	ZrO2 + 32% Al2O3, SiO2, TiO2	Eutectic 25088 is suitable for use as a thermal barrier coating, to resist wetting by molten metals or to resist hard particle abrasion. Applications: Heat treat fixtures, Pouring troughs, Ingot Moulds, Tuyeres.	Typical hardness HRc 55 Max service Temp. 980°C

Many more powder alloys are available upon request. Please ask your local Representative.

CastoDyn® DS8000 & SF Lance Auto Feed System



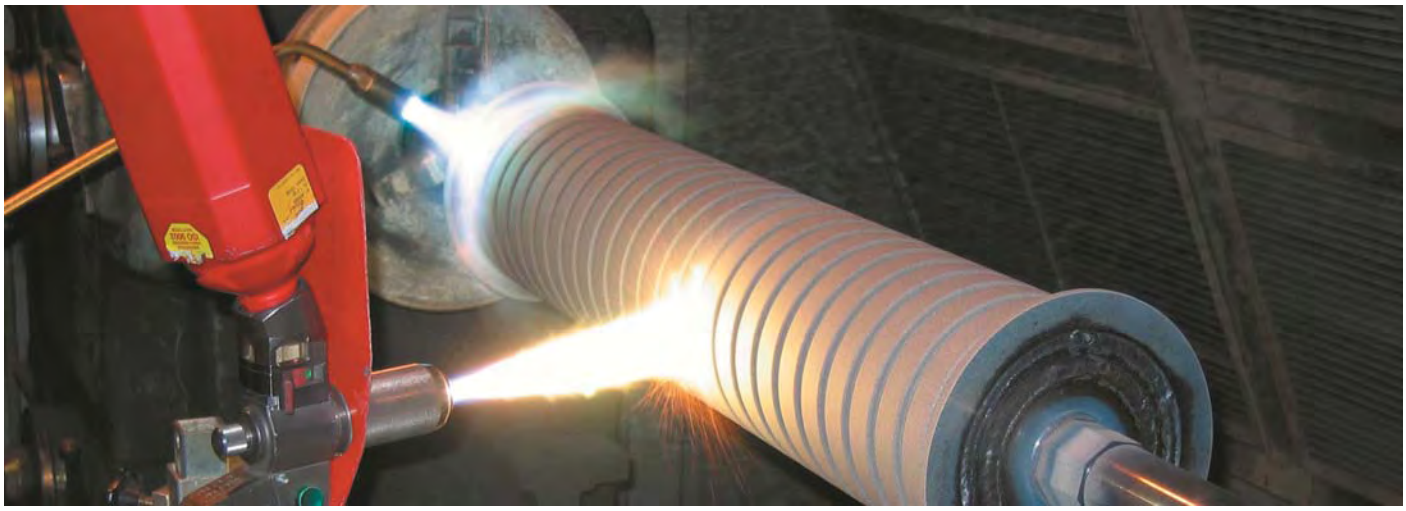
Optional set up for Automated powder feed.

- **CastoDyn EP Controller**
- **Individual powder injectors to suit each product group.**
- **Fine Carrier Gas control**
- **Less operator fatigue**
- **Higher production rates**

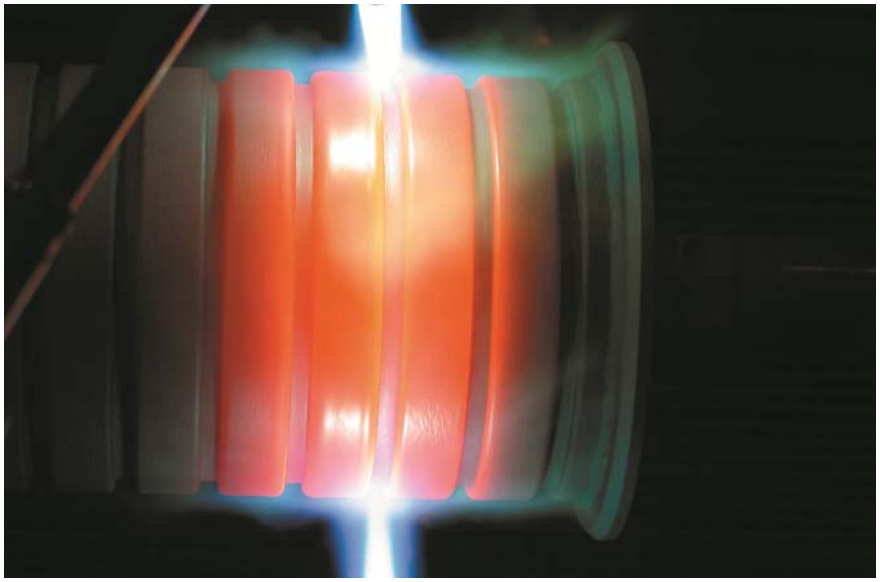
Powder Hot Flame Spraying

Function

Eutalloy® RW is a 2-step hot flame spraying process.
The first step is to «cold» spray a thin, regular layer of «RW» self-fluxing quality powder onto a pre-cleaned, preheated steel substrate using a oxy-acetylene powder spray system such as the CastoDyn DS® 8000.



The second step is then to heat the "RW" powder deposit "red hot" using a flame torch, such as the CastoFuse torch, until a reflective fused surface finish is visible locally. An induction system or an oven can also be used. Strong metallurgical diffusion bonding of the resultant wear resistant coating is thus achieved without melting or dilution with the substrate. The coating thickness may then be further increased by continuing to spray & fuse the powder simultaneously followed by controlled slow cooling to ambient temperatures.



Second step: *red hot fusion using the CastoFuse® flame torch*

Applications

The Eutalloy® RW process is designed to hot flame spray a range of wear resistant powder coatings onto fast rotating or stationary even surfaces. Final «RW» pure precision coatings are characterised by smooth surface finish requiring little or no post machining operations for optimum service performance.

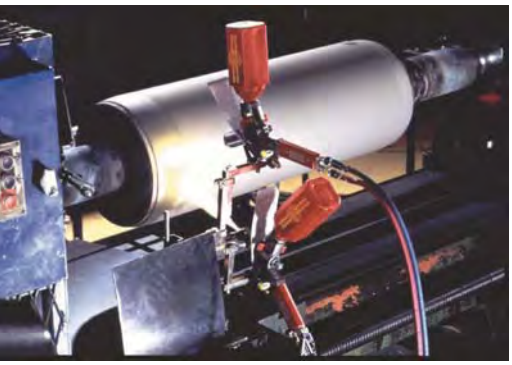
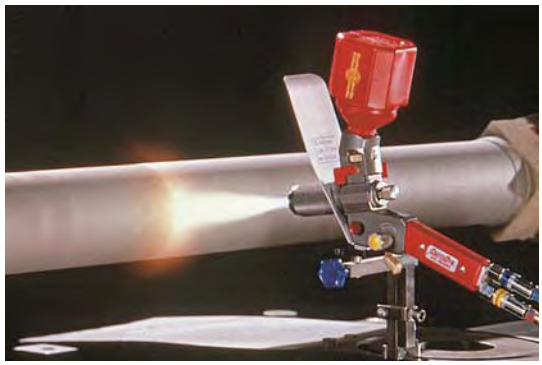
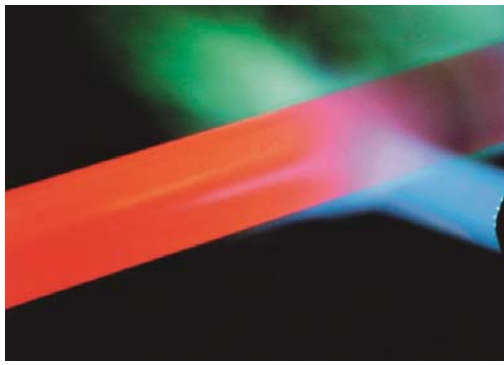
Microstructure of a 2-step sprayed & fused coating

Advantages

- Smooth surface for low or no post machining.
- No dilution of the base material.
- Best purity and performance of the coating alloy.
- Homogeneous and pore free coatings.
- High bond strength.
- Good shock resistance.

Powder Hot Flame Spraying

Eutolloy® RW Powders

Product	Product Type	Applications / Features	Properties
Eutalloy® RW 12112 RW 13112	Ni-Cr-B-Si-Fe alloy and tungsten carbide	Recoating wear pieces of agricultural machines, mixer blades, ceramic press feeder plungers. Resurfacing pump wear sleeves, steel industry transport rollers.	~710 HV30 35% tungsten carbides. Excellent resistance to erosion and abrasion.
Eutalloy® RW 12494 RW 13494	Alloy Ni-Cr-B-Si-Fe	Coating incineration boiler tubes. Machine elements in food and chemistry industry. Machinable with cutting tool.	~310 HV30 Very good resistance to corrosion. Suitable for friction under light loads.
Eutalloy® RW 12495 RW 13495	Alloy Ni-Cr-B-Si-Fe	Coating of wear sleeves for pumps, glassworks feed plunger, valve parts: seats, flaps, etc.	~390 HV30 Suited for impact and friction. Machinable with cutting tool.
Eutalloy® RW 12496 RW 13496	Alloy Ni-Cr-B-Si-Fe	Coating cylinder rods, wear sleeves, pump pistons and faucet parts. Resurfacing coal dust separators, etc. Excellent resistance to corrosion and especially to seawater.	~680 HV30 Very low coefficient of friction and good abrasion resistance.
Eutalloy® RW 12497 RW 13497	Alloy Ni-Cr-B-Si-Fe-Mo-Cu	Coating protective couplings, cylinder rods, wear and seal sleeves, Pelton turbine, injection needle valves, etc. Coating stainless steel pieces.	~740 HV30 Excellent frictional and corrosion resistance. Excellent corrosion resistance.
Eutalloy® RW 12999 RW 13999	Ni-Cr-B-Si-Fe alloy and tungsten carbide	Coating fan blades, mixers, transport screws, tensioning pulleys, guides. Wear parts for agricultural equipment, etc.	~760 HV30 40% tungsten carbides. Excellent resistance to abrasion.
Eutalloy® RW 17535	Alloy Ni-Cr-B-Si	Coating paper mill and household waste boiler tubes. Resurfacing machine parts operating in corrosive environments. Excellent resistance to oxidation while hot. Good resistance to cracking. Machinable with cutting tool.	~480 HV30 High Cr alloy. Well suited for metal-to-metal friction.
Eutalloy® RW 53606	Alloy Ni-Cr-Mo-Si-B-Cu	Boiler tubes, shafts and sleeves in waste incineration, chemical, pulp and paper industries. Excellent wear and corrosion resistance to both reducing and oxidizing environments.	~600 HV30

CastoFuse® Kit

Kit with optional lances

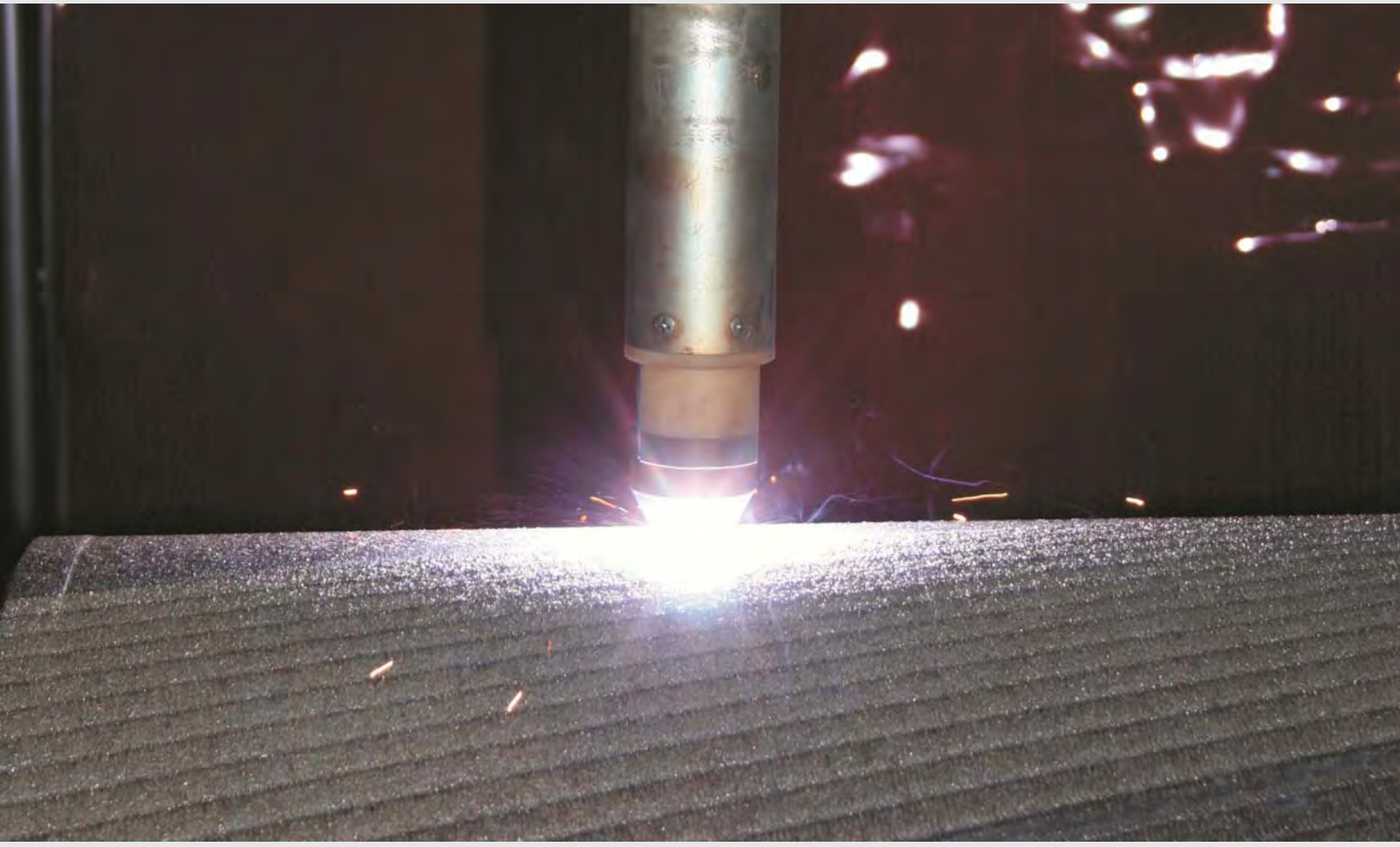
Technical data

The advantage of local heating using the CastoFuse® torch is obvious compared with an oven. Local preheating and fusing prevents the dispersion of heat in the rest of the workpiece, to the surrounding area and into the oven walls. CastoFuse® offers the heat where needed. Furthermore, only a small investment is required.

Advantages

- Performance: nozzles designed specifically to fuse self-fluxing.
- powder coatings.
- Safety and ease-of-use: unique rapid shut-off lever.
- Full line: assortment of lances to ensure optimum flame power.

Plasma Transferred Arc (PTA) Welding



Simplified overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment investment
EuTroLoy	Powder or wire. Metals	Steels, cast iron, (aluminium bronze)*	Medium to high	2 (20)®	Large	Homoge-neous	Negligible	Excellent Fusion	Medium to high	High	Electricity & shielding gas	Medium

Best **Second choice**

(...) * request special precaution or spray powder

Plasma Transferred Arc (PTA) Welding

EuTroLoy® Plasma Transferred Arc Process

Plasma Transferred Arc (PTA)

Function

In the PTA process, the plasma is focused while forced through the heat resistant anode, causing a considerable increase of the arc density, energy and temperature. The filler alloy in powder form is conveyed into the plasma arc column where a shielding gas protects the weld pool from the atmosphere. The plasma arc and the heat input can be far better controlled than a conventional electric arc and the energy is almost completely spent to melt the filler metal, reducing the heat input and dilution to the minimum.

Advantages

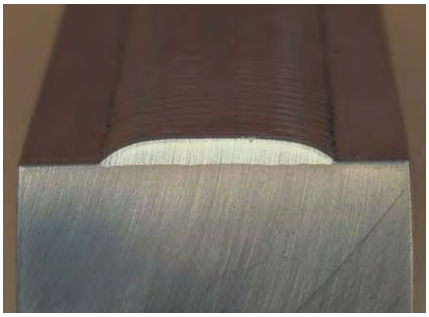
PTA technology provides a wide range of benefits compared with conventional arc welding processes:

- Lowest dilution, heat input, distortions and HAZ less than any other arc welding process.
- Maximum purity and performance of the coating alloy.
- Extra smooth surface for least post-weld machining.
- Higher bond strength.
- Pore free coating.
- Thicker coatings capabilities.

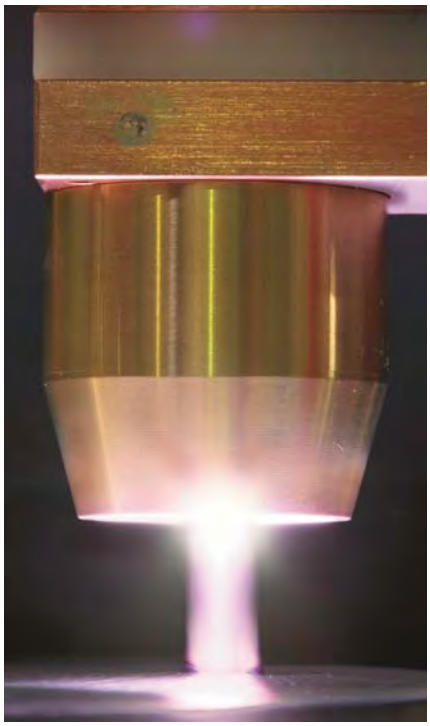
Applications

The EuTronic® GAP is the Castolin Eutectic Plasma Transferred Arc (PTA) equipment. GAP is ideal for coating and joining operations. Castolin Eutectic has developed special EuTroLoy powders for applications done with the EuTronic ® GAP.

Smooth surface and spatter free Coating.

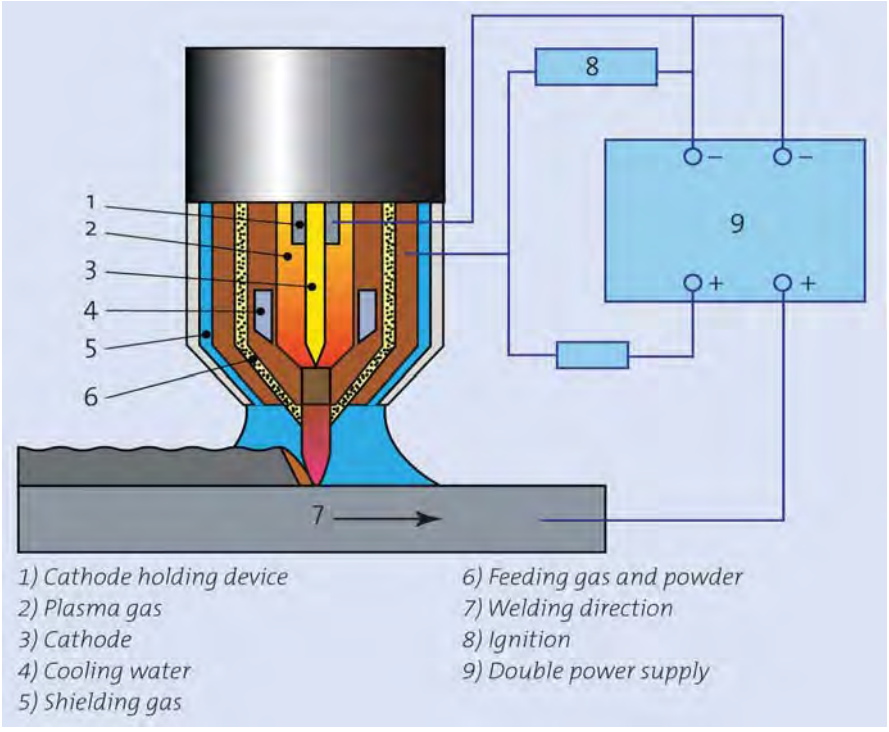


Wear resistant coating with metallurgical bonding and minimum dilution.



Technical data

- Plasma arc temperature: up to 20 000 °C
- Particle velocity: not relevant.
- Deposition rate: 2 to 20 kg/h.
- Coating material: Metals in powder or wire form.
- Coating thickness: 0.1 - 20 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)



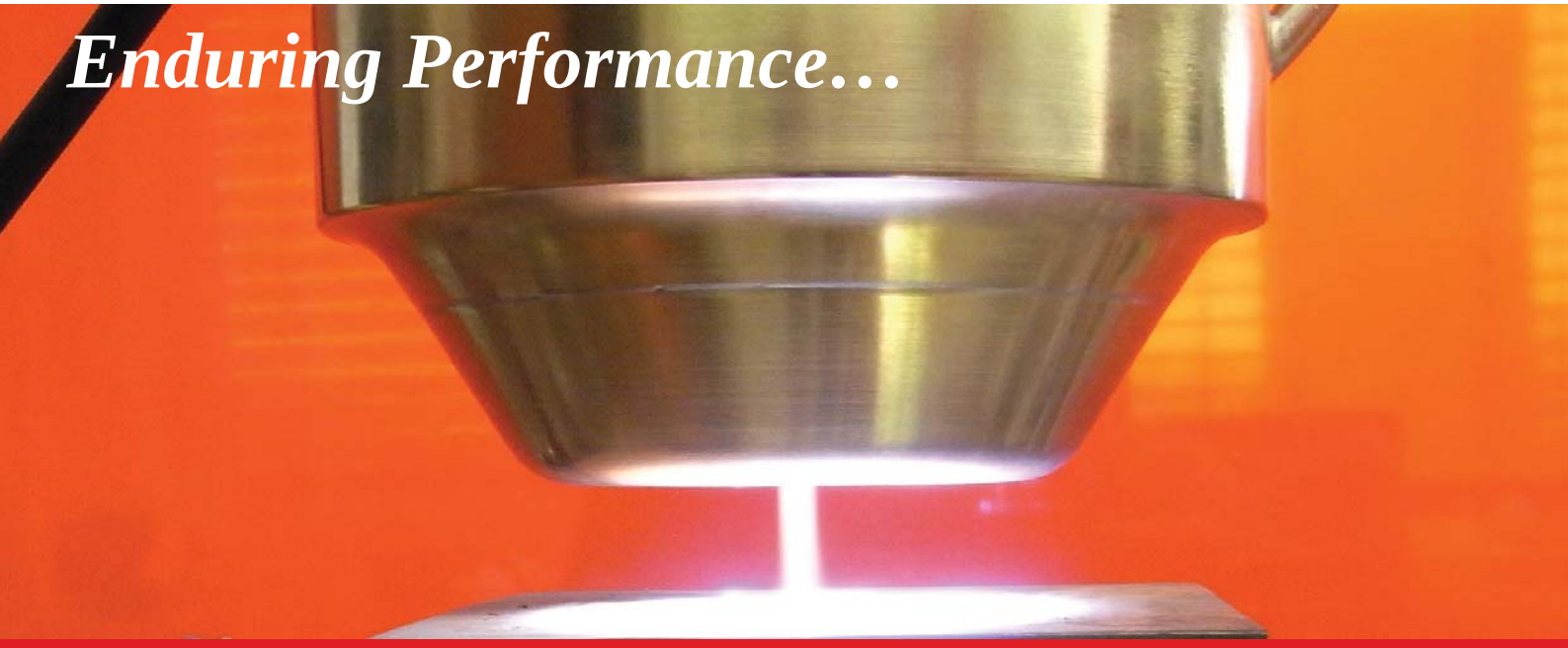
1) Cathode holding device
2) Plasma gas
3) Cathode
4) Cooling water
5) Shielding gas
6) Feeding gas and powder
7) Welding direction
8) Ignition
9) Double power supply

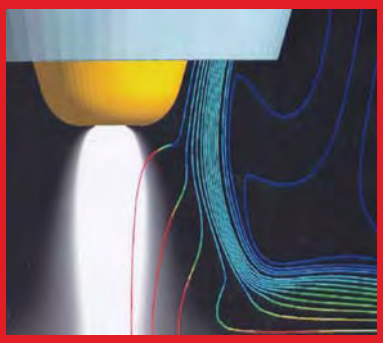
Plasma Transferred Arc (PTA) Welding

EuTronic GAP® PTA Equipment

EuTronic GAP® 4501 DC IMPA

For Heavy industrial applications





PTA process with Highest deposition rate in the World!

Easily transportable unit
Lowest dilution
Up to 20 Kg/hr* deposition rate
Modern, fully automated, friendly user

- Automation interface with analogue and digital inputs and outputs.
- Powerful PLC 72 pin harting plug automated interfaces
- DC power source with HF-ignition
- Plasma welding with 100 memory cells for parameter storage
- Powder coating using powder feeder EP3
- Optional GAP control software package for enhanced control and display of parameters
- Special chiller cooling

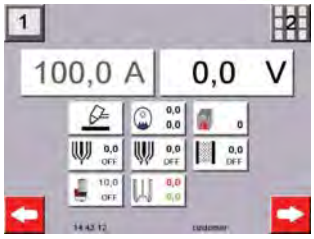
Deposition rates of up to 20Kg per hour

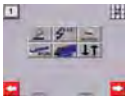
Description	Touch Screen
Voltage supply	3x460V, 60Hz
Power supply	Cable 4x16mm², open end
Max power consumption	34kVA
Max. preliminary fuse	63A
Supply frequency	50/60 Hz
Welding current (35%ED / 100%ED)	450A / 300A
Adjustment range	6-450A
Open circuit V main inverter	70V DC
Open circuit V pilot inverter	85V DC
Pilot current (100%ED)	100A
Adjustment range pilot current	3 - 160A
Protection index	IP21S
Dimensions L x W x H (mm)	815x445x785mm
Weight	105 Kg

Plasma Transferred Arc (PTA) Welding

EuTronic GAP® PTA Equipment

EuTronic GAP® 2501 DC Touch Screen





Description GAP 2501	Touch Screen
Voltage supply	3x400 + N ± 10%
Power supply	5X16A CEE plug
Maximum welding current	250 Amps
Welding current (100%ED)	160 Amps
Adjustment range	2—250 Amps
Max power consumption	18 KVA
Open circuit V main inverter	90 V
Open circuit V pilot inverter	100 V
Pilot current (100%ED)	10A
Adjustment range pilot current	Up to 30 A
Protection index	IP 23 S
Dimensions L x W x H (mm)	815 x 445 x 635
Weight	70 Kg

- Plasma welding with powder or wire feed options
- Programmable and Manual settings
- Joining or overlay, plus Keyhole welding
- Many hand held torches or machine torches available
- TIG welding & Cold wire TIG and MMA welding
- Trolley mounting facility
- GAP® 2501DC touch screen
- GAP® 2501DC automation interface suitable for many types of robotic applications
- High deposition (up to 10kg/hr)

EuTronic GAP® 3501 DC

Specialist equipment designed to suit your application

Description GAP 3501	Touch Screen
Voltage supply	3x400 + N ± 10%
Power supply	5x32A CEE plug 6mm2
Supply frequency	50/60 Hz
Welding current (35% / 60%ED)	350 / 320A
Welding current (100%ED)	250A
Adjustment range	6 - 350A
Max power consumption	20 KVA
Open circuit V main inverter	80 V DC
Open circuit V pilot inverter	110 V DC
Pilot current (100%ED)	30A
Adjustment range pilot current	0.5 - 50A
Protection index	IP 21 S
Dimensions L x W x H (mm)	815 x 445 x 635
Weight	75 Kg

- For full automation or manual operations
- Plasma welding
- Powerful PLC 72 pin harting plug automated interfaces (on request)
- 100 memory cells for parameter storage
- Powder coating using powder feeder EP2
- Optional GAP control software package for enhanced control & display of parameters
- Works with cold wire feeder WF
- Hand held and machine torches for both welding and powder coatings
- Easy Touchscreen controls
- PTAW, GTAW and MMAW

Plasma Transferred Arc (PTA) Welding

EuTronic GAP® Accessories

EP 2 Powder feeder

Powder Feeder EP2

The powder feeder EP2 is suitable for GAP 2001, GAP 3001 / 2, Castodyn DS8000 and CastoDyn SF Lance.

Description	Characteristics
Carrier gas	Ar, Ar-H2
Carrier gas flow rate	0 - 4 l/min
Powder reservoir	2 l capacity
Degree of protection	IP 23
Weight (without powder)	7.5 kg
Dimensions L x W x H (mm)	200 x 170 x 470

- Stepless feeding rate control via feeding wheel speed directly from inverter PLC.
- Powder feed rate 3-120 g/min, depending on feeding wheel configuration, torch, anode and powder density.
- Larger powder feeders and additional options are available for EuTronic GAP systems, eg: twin feeders, twin motors for blending options.

Cold Wire feeder

Cold Wire Feeder

Suitable for the GAP 2001, GAP 3001 and 3002 series

Description	Characteristics
Degree of protection	IP23
Weight	25 Kg
Dimensions L x W x H (mm)	725 x 230 x 450

- Drive: efficient four roll drive with 30mm wire feeder rolls, fit in wire feeder for 16 Kg wire coils.
- Special designed pressure arms care for a smooth and reproducible pressure of the wire onto the feeder rolls within the drive.

GAP Cooling unit

Cooling GAP and Cooling GAP Twin

Suitable for the GAP 2001, GAP 3001 and 3002 series

Description	Characteristics
Cooling GAP Weight	40kg
Dimensions L x W x H (mm)	900 x 445 x 360
Cooling GAP Twin Weight	45 kg
Dimensions L x W x H (mm)	900 x 445 x 360

- Single or twin circuit heat exchangers additional water-water heat exchanger available.
- Additional water-water heat exchanger available on request.

OU and VU Units (Assembled)

TT200 Table

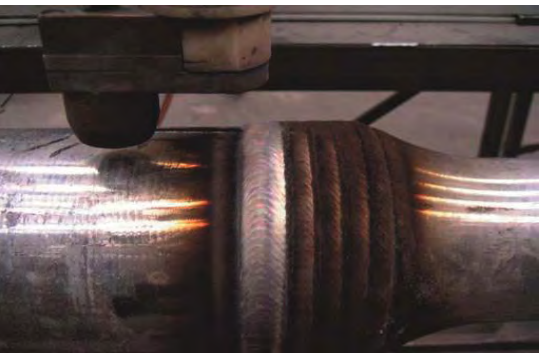
GAP Automation and Manipulation accessories.

Suitable for the GAP 2001, GAP 3001 and 3002 series

Description	Characteristics
Oscillation Unit (OU)	Left Right oscillation
Oscillation width	Max 100 to 500 mm
Oscillation speed	0.1 - 60 mm/s
Dwell time	0 - unlimited
Max load	5 Kg
Vertical Unit (VU)	
Max transverse path	100 mm
Oscillation speed	0,1 - 20 mm/s
Max load	10 Kg
Turning Tilting Table TTT200	
Max. load	200 kg
Diameter turntable	400 mm
Continuously tilting range	-110°/+110°
Manual adjustable by hand wheel	Encoder for position feedback

Plasma Transferred Arc (PTA) Welding

EuTroLoy® Plasma Transferred Arc Powders



Product	Product Type	Applications / Features	Properties
EuTroLoy® 16006	Alloy Co-Cr-W-Ni-Fe (Gr. 6 Type)	Valve seats, protective shaft sleeves, shaft seal surfaces, tools in the wood and plastic processing industry, stirrer components, valve parts, extruder screws, buffer layer for EuTroLoy® 16001 alloy powders.	~40 HRC High abrasion resistance under pressure and impact stress (cavitation). Heat and corrosion resistant. Low coefficient of sliding metal friction, insensitive to adhesive wear. For operating temperatures up to 750°C.
EuTroLoy® 16008	Alloy Co-Cr-Mo-Ni (Gr. 21 Type)	Calibration matrices for steel forming, hot working tools such as dies and shearing blades, valve seats, seal surfaces of shafts and spindles, pump and turbine parts. Buffer layers for EuTroLoy® 16001, 16006, 16012 alloy powders.	~30 HRC Corrosion, oxidation, heat, cavitation, thermal shock and creep-resistant weld metal. Work hardening. Low coefficient of sliding metal friction, insensitive to adhesive wear. Nonmagnetic, easily machined and polished coatings.
EuTroLoy® 16012	Alloy Co-Cr-W-Ni-Fe (Gr. 12 Type)	Slide valve seats, extruder screws for plastic masses, feed screws for sawdust and hydropulpers in the paper industry, tools in the timber industry, segments of nose rings and clinker cooling plates, tools for the paper, plastics and timber processing industries.	~46 HRC High abrasion resistance under pressure and impact stress (cavitation). Heat and corrosion-resistant. Low coefficient of sliding metal friction, insensitive to adhesive wear. For operating temperatures up to 750°C.
EuTroLoy® 16221	Alloy Ni-Cr-B-Si-Al	Highly suitable for use with molten glass. Mould bottoms, tailstocks, blowheads in cast iron and Cu-Al. Drawing matrices in cast iron, coke oven door. Bonding layer on flake and spheroidal graphite cast iron parts.	~30 HRC Excellent bonding with lamellar and spheroidal graphite grey cast iron, as well as steel. Excellent resistance to heat and thermal shock.
EuTroLoy® 16223	Alloy Ni-Cr-B-Si-Al	Gray cast iron forming tools, gray cast iron and bronze glass moulds, valve and slide valve parts, dies, anti-corrosion hardfacings on gray cast iron workpieces, buffer layers on gray and nodular cast iron.	~34 HRC Good wetting of the base metals. Creep resistant, thermal fatigue resistant and cavitation resistant hardfacings. Low coefficient of sliding metal friction. Good adhesive strength and corrosion resistance. Polishable.
EuTroLoy® 16316	Alloy Fe-Cr-Ni-Mo	Workpieces in the chemical industry and food processing industry and buffer layers for hard-facing.	~170 HV30 Austenitic weld metal with ~9 % -ferrite and low carbon content. Resistant to pitting and intercrystalline corrosion up to temperatures of 400 °C, also scale resistant up to 800 °C. May be polished to a mirror finish.
EuTroLoy® 16454	Self-fluxing Ni base alloy	Hardfacing of seal surfaces in valves, sliding seals and slideways, forming tools, valves, valve flaps, pump rotors, cams and worm screw parts.	~53 HRC Highly creep resistant, heat and corrosion resistant weld metal. Low coefficient of sliding metal friction. High adhesive strength.

Many more powder alloys are available upon request. Please ask your local Representative.

Plasma Transferred Arc (PTA) Welding

EuTroLoy® Plasma Transferred Arc Powders




Product	Product Type	Applications / Features	Properties
EuTroLoy® 16494	Self-fluxing Ni base alloy	GAP welding process, oxidation resistant up to 800°C. Corrosion resistant and has low coefficient of sliding metal friction. High adhesive strength. Typical applications: slide valves for oil and steam, glass making tools, foundry tools,	~39 to 42 HRC 0.4 C, 10 Cr, 1.8 B, 2.7 Si, max 0.2 Fe, Bal Ni. Good resistance to high temperature (800° C) Good metal to metal friction properties
EuTroLoy® 16495	Self-fluxing Ni base alloy	GAP welding process, high temperature oxidation and corrosion resistance. Typical applications: Steam and oil/gas valve shutters, slide valves, pump impellers, wear rings, glass making components.	~50 HRC 0.5 C, 12 Cr, 2.2 B, 3.2 Si, max 0.2 Fe, Bal Ni Good resistance to high temperature oxidation and corrosion, (750°C). Good metal to metal friction properties.
EuTroLoy® 16496	Self-fluxing Ni base alloy	Hardfacing of seal surfaces in valves, sliding seals and slide ways, forming tools, valves, valve flaps, pump rotors, cams and worm screw parts.	~60 HRC 0.7 C, 16 Cr, 3.3 B, 4.2 Si, max 0.3 Fe, Bal Ni Good resistance to high temperature oxidation and abrasion, (700°C). Good friction properties.
EuTroLoy® 16604	Alloy Fe-Co-Cr-Mo	Tools for hot and cold metal shaping: clipping bed, rolling mills, bending machines, sealing joints. Excellent buttering layer before coating with cobalt based alloys.	~45 HRC Work-hardening deposit with very fine martensitic structure. Excellent resistance to heat, thermal shock and corrosion. Good resistance to cracking.
EuTroLoy® 16606	Alloy Fe-W-Cr-Mo-V	Temperature-stressed dies and mandrels, cutting tools, also for natural fibres, punching, compression moulding and drawing dies, forging inserts, worm screw parts, valves, barrel extruders.	~58 HRC Martensitic weld metal based on cold work tool steel. Wear-resistant to abrasion and fatigue stress as well as when subjected to a combination of abrasion and fatigue stress. Hot wear resistant. Good tempering properties. Heat treatable.
EuTroLoy® 16625	Alloy Ni-Cr-Mo-Nb-Fe	Marine engine components, power plant components, installations on drilling rigs, valve components for mineral oil, tools for underwater work and low-temperature equipment.	~210 HV30 High ductility. Very good corrosion resistance (e.g. seawater). Tough at subzero temperatures, suitable for cryogenic use.
EuTroLoy® 16800	Alloy Ni-Mo-Cr-W	Mixer arms, components in the paper industry, hot shears, hot trimming dies, extrusion dies, valve seats, pump components in the chemical industry.	~260 HV30 Very high resistance to inter crystalline corrosion, interfacial corrosion and stress corrosion cracking. Excellent corrosion resistance to oxidising media such as nitric, phosphoric, sulphuric and sulphurous acid. Also resistant to ethanoic, lactic, citric and fatty acids, caustic soda as well as media containing chloride.
EuTroLoy® PG 6503	Ni-B-Si-Fe alloy and tungsten carbide	Dragline bucket wear components, ground engaging tool protection. Decanting and transport screw. Mixer pieces. Drilling tools. Brick or tile dies. Protective sleeves. Wood-working tools.	~60 HRC 60% tungsten carbides. Excellent resistance to abrasion.

Many more powder alloys are available upon request. Please ask your local Representative.

Plasma Transferred Arc (PTA) Welding

EuTronic GAP® Accessories

GAP® E12N manual torch

GAP E12N

Hand held (manual) torch without powder. Used for accurate fusion welding via PTA

Description	Characteristics
Max current at 100%	100A
Weight with hose pack	1.9 kg (4m)

- Liquid cooled manual torch, available also with 70° and 180° neck
- Hose pack: 4 metres; longer hose packs on request. Cold wire holder available as option.

GAP® E15N manual torch

GAP E15N

Hand held (manual) torch without powder. Used for accurate fusion welding via PTA

Description	Characteristics
Max current at 100%	150A
Weight with hose pack	2.5 kg (4m)

- Liquid cooled manual torch, available also with 70° and 180° neck
- Hose pack: 4 metres; longer hose packs on request Cold wire holder available as option.

GAP® E150P manual powder torch

GAP E150P

Hand held (manual) with powder. Used for manual powder welding via PTA

Description	Characteristics
Max current at 100%	150A
Weight with hose pack	2.0 kg (3m)

- Liquid cooled manual torch, 3mt and 4mt available.
- Powder flow rate 5-20 g/min. Ideal for small jobs or repairing automated deposits

GAP® E54 ID torch (>80mm)

GAP E54S—M—D—DL

Internal Diameter Torch

Description	Characteristics
Max current at 100%	200A
Powder flow rate	10-40 g/min

- Powder machine torch for inner coatings of parts with diameter > 80mm
- Hose pack: 4 metres; longer hose packs on request (6mt, 8mt, 10mt all built to order)
- Available in four different lengths (models): 330(S), 550(M), 920(D) and 1770(DL)mm

GAP® E52 Auto torch

GAP E52

Standard torch designed for Automated applications

Description	Characteristics
Max current at 100%	200A
Powder flow rate	3-80 g/min

- Liquid cooled powder machine torch for general applications Cold wire holder available
- Hose pack: 4 metres; longer hose packs on request (6mt, 8mt, 10mt all built to order)

GAP® E42 Auto torch

GAP E42

Medium deposition torch designed for Automated applications

Description	Characteristics
Max current at 100%	200A
Powder flow rate	3-140 g/min

- Liquid cooled powder machine torch for general applications Cold wire holder available
- Hose pack: 4 metres; longer hose packs on request (6mt, 8mt, 10mt all built to order)

GAP® IMPA 100 heavy duty torch

GAP IMPA 100

High deposition torch designed for large Automated applications

Description	Characteristics
Max current at 100%	400A
Powder flow rate	Approx max 370 g/min

- Liquid cooled powder machine torch for heavy duty applications
- Built on request: Please ask your local Castolin Representative, Smenco Pty Ltd

EuTronic® Arc Wire spraying

Simplified overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment investment
EuTronic Arc	Wire. Metals	All metals	Low	1 (20)*	Very large	Lamelar	3 to 10%	Good. Mechanical & micro-diffusion	Very high	Medium	Electricity & compressed air	Medium

Best **Second choice**

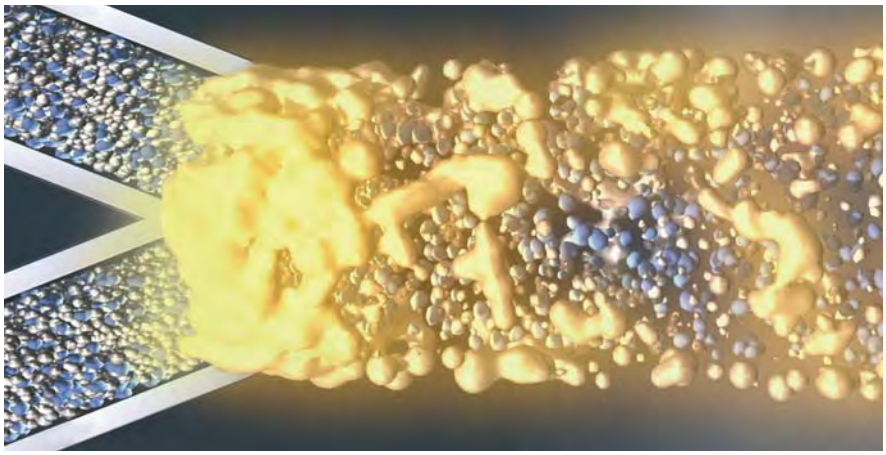
(...) * request special precaution or coating material

Powder Cold Flame Spraying

EuTronic® Arc Process

Function

EuTronic® Arc is the highest productivity thermal spraying process. EuTronic® Arc is an Arc Spray Process using a pair of wires which are melted by an electric arc. The arc has a temperature of 5 000 - 6 000°C that melts the wires continuously. Compressed gas - most often air - is used to atomise the molten wire tips and to propel the droplets towards the substrate at velocities exceeding 100 meters per second. This molten material is atomised by compressed gas and propelled towards the workpiece to form a coating. This combination of high temperature and high particle velocities gives arc sprayed coatings very good coating properties with high bond strengths and low porosity.
Arc spraying often produces large amounts of fume and high noise levels.
Arc spraying is a cold thermal spraying process where the temperature of the substrate is held below 150°C. Because of the low temperature, the work piece is not exposed to any metallurgical changes or distortion.



Arc Spraying

Structure of cold arc sprayed coating

Advantages

The arc spraying process is the thermal spraying process that has the highest spray rates and lowest running costs.

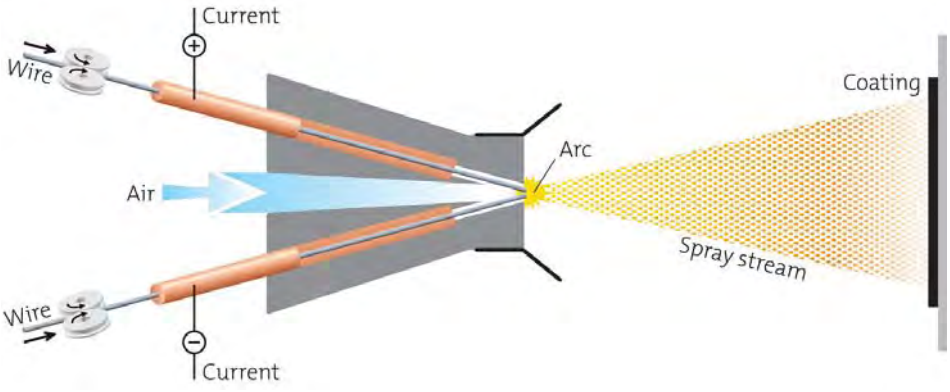
- Safe process
- No flammable gases used
- Cold spray process
- Not requiring the use of oxygen, kerosene or a combustible gas which means more economic coatings
- Operator can use two different wires during spraying to produce new suitable coatings.

Applications

The main applications of the arc spray process are anti-corrosion coatings of zinc and aluminium and spraying work on large components. The material to be sprayed must be electrically conductive. The most common materials are metallic material or cored wires. Low running costs, high spray rates and efficiency make it a good tool for spraying extensive areas or a large number of parts.

Technical data

- Arc temperature: up to 6000°C
- Particle velocity: 150 - 300 m/s
- Deposition rate: 2.5 to 40 kg/h
- Coating material: Metals or metal alloys in solid and cored wires form
- Coating thickness: 0.1 to 20mm
- Coating density: 90 - 97%
- Noise level: 100 - 120 dB(A)



Schematic of Arc Spray process

Powder Cold Flame Spraying

EuTronic® Arc Spray Wires





Product	Product Type	Applications / Features	Properties
EuTronic® Arc 502	Alloy Fe-Cr-Ti-Si-Mn	Cement cooler plates, boiler water wall protection, pulp production digesters, steam turbine casings, cracking installations, high temperature cyclone, fume extractors etc.	Hardness ~860 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat erosion, thermal shock up to 650°C.
EuTronic® Arc 509	Alloy Fe-Cr-Al-Mo	Corrosion and erosion resistant protective coatings in boiler equipment up to 900°C.Self bonding alloy with enhanced surface wear resistance properties to combat corrosion, erosion up to 900°C and oxidation.	Hardness ~260 HV0.3
EuTronic® Arc 532	Alloy Fe-Ni-Cr-Si-Mn	Worn general engineering components, undersize external or internal diameters, bearing seats and faces, housings, shrink or force fit areas, flat surfaces etc. Hot gas corrosion protective coatings in heat exchangers, process piping, etc.	Hardness ~230 HV0.3 Self bonding alloy for thick or thin coatings with good corrosion resistance. Easy machinabillity, like machining solid mild steel.
EuTronic® Arc 595	Alloy Fe-Cr-B-Si-Mn-C	Exhaust fans, pump components, coal-fired boilers, super-heaters, economiser waterwalls, boiler tubes, boiler installations, lamella seals and «Füller» cooler plates in cement works etc. Self bonding alloy with enhanced surface wear resistance properties to slurry erosion, corrosion and low stress abrasion.	Hardness ~965 HV0.3 Withstands service environment up to 925°C.
Eutectic Arc 563	Alloy Fe-Ni-Al-Mo-Mn	Iron-nickel-aluminium cored wire, self bonding with exceptionally good machinability with standard tips. Good resistance to broad range of moderately corrosive environments. Diesel engine firedecks.	Macro Hardness ~90 HRb Micro hardness ~ 200 Vickers Service temp 649°C
Eutectic 10X	Aluminium Bronze	General metalizing work, bearing surfaces in contact with salt water corrosion.	Hardness ~55-60 HRb 7% Al, 0.5% Fe, Cu Bal
Eutectic 55X	18/5 Stainless steel	Low shrink, excellent resistance to corrosion with better machinability.	Hardness ~92-94 HRb 8 Mg, 5 Ni, 18 Cr, .08 Si, Fe Bal
Eutectic 60X	420 Stainless steel	General applications, 13% Chrome Steel, fair hardness	Hardness ~40-43 HRc 1 Mg, 1 Ni, 12/14 Cr, .08 Si, Fe Bal
Eutectic 75X	Ni, 5% Al Bond	Specialist Bond Wire with 9100-9750 psi bond strength.	Hardness ~55-80 HRb 95 Ni, 5 Al
Eutectic 95X	Iron Chrome Boron	Very hard abrasive and corrosion resistant coating with service temperature of up to 925°C	Hardness ~55 HRc (after load 29 Cr, 1.6 Mg, 3.7 B, Fe Bal
Alcro	Iron Chrome Aluminium	High resistance to corrosive gases in boilers, also prevents oxidation and scaling of low alloy steels.	Hardness ~88 HRb 4-5.3 Al, 0.65 Si, <23.5 Cr, Fe Bal

Many more wire alloys are available upon request. Please ask your local Representative.

Wire Spraying

EuTronic® Arc Spray Equipment

EuTronic® Arc Spray 4 System

The EuTronic® Arc Spray 4 is robust, reliable and easy to use. The Arc Gun and the drive system are coupled to a 350 amp, switched voltage power source. This power source features sealed electronics for excellent reliability in the harshest spray environments. The wire feeder unit is neatly mounted on the power source, leaving it free to swivel and follow the operator whilst spraying. Other options include either floor or trolley mounting. There is no motor in the gun. Instead, the Gun 4 uses a patented 'Synchrodrive' system, where a single sealed motor with a flexible drive arrangement, powers a reliable, positive drive push / pull up to a distance of 20 m. This results in a long reach and lightweight flexibility of the gun and supplies. For the operator, working conditions are more comfortable and productive.

- Sealed 350 amp power source for reliability.
- 1.6 mm wires standard. From 1.6 mm to 2.5 mm optional.
- Air cooled cables for low weight
- Excellent gun manoeuvrability
- 5m supplies packages standard
- Steel reinforced, PTFE lined wire conduits
- Easy to maintain for lower downtime costs
- Wire spool, coil and drum feeder option capabilities
- Soft start for smooth start ups

EuTronic® Arc Spray Supplies Setup

Standard Configuration (Push / Pull)

- Power source, push / pull drive & wire feeder.
- Arc Spray Gun.
- Drive unit position : On power source or floor.
- 5 m Push / Pull from Wire.
- Supplies package includes power and control cables, air hose, wire conduits and flexible drive.

Liquid Fuelled HVOF Technology

CastoJet® CJK5

COATING

- **Easy to use and intuitive to operate**
- **Kerosene fuelled high pressure HVOF for high quality coatings**
- **Unlimited recipes and parameter recording for repeatable coatings**
- **Safe and rapid start up which saves fuel and time**
- **Simplified maintenance**
- **Thick, low stressed coatings that are in compression**

CastoJet® CJK5 HVOF Technology

CastoJet® CJK5

Castolin Eutectic
Eutectic Castolin

Intuitive to operate

The CastoJet® Kerosene 5 - CJK5 - is the latest Castolin Eutectic development of kerosene fuelled high pressure HVOF (High-Velocity Oxy-Fuel) systems. Using mass flow control for repeatable coating quality. The system produces the densest metallic and carbide coatings of all. The coatings can be compressively stressed, allowing thick layers to be applied without fear of spalling.

The latest developments are to the gun, powder feeder and operator interface. The operator interface is simple to follow using a touch screen interface. The powder feeder has mass flow controlled carrier gas and closed loop motor control for reliability and repeatability of powder feed rates.

The value is in the technology to make it intuitive to operate, to reduce operator errors, to simplify the maintenance and to obtain repeatable high quality coatings.

Advantages

- High-pressure of the combustion chamber is typically at least double that of gas fuelled HVOF, what improves the gas speed of 20% over gas fuelled HVOF.
- Mass flow control of oxygen and carrier gas = repeatability.
- PC control with touch screen operator interface.
- Optional keyboard control or operator interface unit.
- Unlimited recipes and parameter recording.
- Low running costs compared with hydrogen fuel HVOF systems.
- High Bond strength and low porosity coatings.
- Manual or fully sequenced start-up, operation and shut-down.
- Hydrogen, Propylene, Propane or Kerosene start-up.
- Liquid fuel = thick, low stressed coatings.
- High hardness, low oxide level coatings

Technical data:

Typical Material	GPM (grams)	Deposit Efficiency (%)
Stellite 6	70	44
Cr3C2 /25 NiCr	70	50
Wc/10Co/4Cr	70	49
Wc/Co17%	70	45
Wc/Co12%	70	45
625	70	47
Copper	70	63
NiCrBSi	70	48

All figures are approximate

Typical applications:

- Hard chrome plating alternative
- CGL mill rolls
- Gas ball and gate valves
- Down hole tools used in the oil and gas industry
- Paper rolls
- Hydraulic rams
- Aircraft Landing gear
- Suspension components
- Hydro-electric turbines
- Automotive valves
- Wire drawing blocks

Your resource for protection, repair and joining solutions

CastoDur® Diamond Plates

CDP® 4666 - Premium Quality

Weld cladded wear plate for extreme abrasion and erosion resistance. This is the real High Load resistant wearplate with a unique overlay and a complex carbide structure with high density of hard particles. The extremely hard boron and niobium hard particles finely dispersed in between the chromium carbides reduce their spacing and ensure the best protection from abrasive and erosive media of finer size.

Alloying elements: C, Cr, Nb, B

Hardness: 62-65HRC

Carbide content: >50%

Dimension

Base material: mild steel
Plate dimensions: 1500 x 3000 mm
Surface coating: 1220 x2740 mm (3.34 m2)
Thickness of metal base + protective layer:

Product	Size	Size	Size	Size
CDP 4666	3 on 5	4 on 6	5 on 8	5 on 10

Many more plates and sizes are available upon request.
Please ask your local Representative.

XuperWave

Our wearplates are available with straight beads (standard) or with the exclusive XuperWave bead pattern.

Linear wear resistance is increased by 30% with XuperWave geometry. XuperWave, whose beads and crack morphology provide non parallel geometry to wear flow direction.

Strips Weld Geometry

Strips and cut plate can be supplied to your exact dimensions saving you space and costs.

CastoDur® Powder Plate Range

Advantages

CDP® Powder Plates are produced by overlaying an easy-to-weld steel plate with a metal powder alloy fused in a furnace under protected atmosphere. The main advantage of these products is the 100% dilution free overlay obtained, that ensures maximum protection even with just a few millimetres of deposit thickness.
Lightweight and therefore easy to handle Easily formed, and therefore also suitable to tight bending radius.

CDP® 112

Powder Coated wear plate for extreme abrasion and erosion. The deposit consists of a wear resistant Ni Cr B Si matrix and additions of fine dispersed tungsten carbides (WC), designed for resistance to wear by erosion and low stress abrasion both in wet and dry forms.

Wearfacing alloy: Ni Cr B Si + W carbides

Matrix hardness: 60 HRC

Carbide hardness: > 1,700 HV0.03

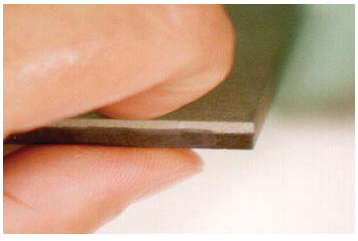
Carbide content: 35%

Max. service Temp: 700°C

Product	1 on 2	2 on 4	2 on 6	4 on 6	2 on 8	2 on 10
CDP® 112	X	X	X	X	X	X
CDP® 496	X	X	X			

Product	Abrasion	Errosion	Corrosion	Metal/Metal	Friction
CDP® 112	XXXX	XXXX	XX	X	
CDP® 496	XX	XXX	XXXX	XXXXX	

Plate dimensions 850 x 1250
Coated surface 800 x 1200



CDP® 496

Powder Coated wear plate to combat erosion. The Ni Cr B Si alloy deposit offers excellent resistance to wear by metal-to-metal friction, erosion and a wide range of corrosive conditions.

Wearfacing alloy: Ni Cr B Si

Hardness: 57 HRC

Max. service Temp: 700°C

CastoTube®

Wearface-welded small diameter tubes
Preventive protection against severe abrasion and erosion

CastoTubes

Small diameter, seamless CastoTubes for superior industrial performance:

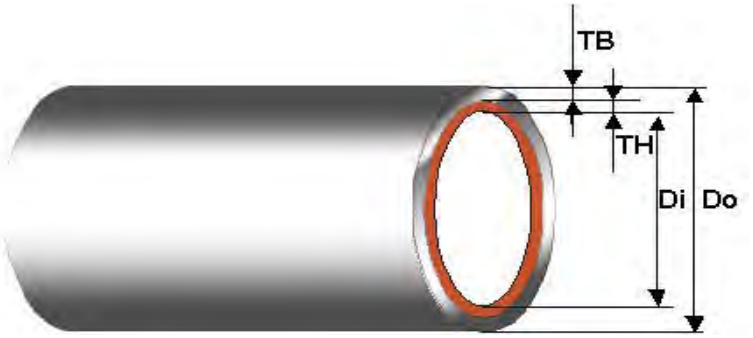
- Extremely wear resistant, lightweight and easy-to-join
- Highly cost effective for rapid replacement of worn tubes
- Increase service life, plant availability and process productivity

Castolin Eutectic®
Eutectic Castolin

CastoTube®

CastoTubes - the latest addition to our expanding range of semi-finished, anti-wear solutions for industry.
Basically it consists of easy-to-weld mild steel tubes which have been internally wearface-welded with TeroMaTec 4666 alloy thus maintaining the exceptional wear resistance of our well known 4666 CastoDur Diamond Plates. Furthermore, by avoiding expensive forming operations of flat plates into tubes, seamless small diameter CastoTubes offer many advantages:

- Highly cost effective
- Absence of harmful linear weld joints
- Exceptional wear resistance
- Perfectly round cross section
- Spiral welding minimises distortion
- Lightweight for handling
- Easy-to-join by welding or mechanical means

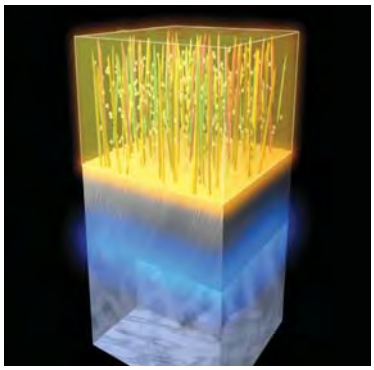


Item No	Inner Dia Di mm	Basic Tube Do mm	Basic Tube Wall TB mm	Wear Facing TH mm
0082CT0640	82	101.6	5.6	4.0
0100CT0735	100	121.0	7.1	3.5
0125CT0435	125	139.7	4.0	3.5
0150CT0635	150	168.0	5.6	3.5
0175CT630	175	193.7	6.3	3.0
0200CT0635	200	219.1	6.3	3.5
0250CT0835	250	273.0	8.0	3.5

Many more sizes are available upon request. Please ask your local Representative.

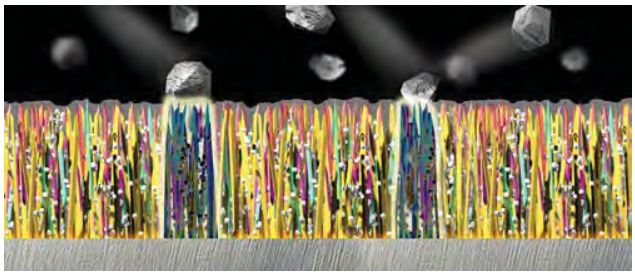
CastoTubes coating

Applied internal coating thicknesses are typically 3 - 4.5 mm. The TeroMaTec 4666 wearfacing alloy contains multiple hard phases with hardnesses reaching 1500 - 2700 HV which resist abrasion and erosion up to 500°C. Alternative alloys and different base tube compositions for extreme service conditions (eg high temperature erosion), are available on request.



CastoTubes are engineered for exceptional wear resistance as illustrated by the laboratory abrasion wear test data above. This performance results from:

1. Ultra-hard phases anchored in a tough matrix. Their hardness is typically 2-3 times higher than the most abrasive media used in industrial processes.



2. Unique geometry of hard phases achieved by controlled cooling of weld solidification kinetics. These tend to nucleate as a dispersion between other needle shaped phases which are strongly oriented and firmly anchored within the matrix. This prevents premature “washing out” of the hard phases from the “softer” matrix by wear mechanisms.

Standard CastoTubes Range

Tubes with a minimum diameter of 82 mm are available, with a maximum length of 3 m.
CastoTubes can be fitted with standard flanges so that the replacement of worn out tubes can be done quickly and easily.
Virtually any inner diameter from the 82 - 300mm range can be produced by applying a different wearfacing thickness inside the standard base tube.
This allows a close mating joint to the existing installation thus avoiding turbulent media flow.

Flanged joints CastoTubes are available with slip-on or integral flanges in accordance with DIN standards. Other types of flange joints are also available upon request.

Elbows Elbows are fabricated by cutting CastoTubes into wedges and reassembling them according to customer specifications for the pipe bend geometry.

Additional Products

Solution R104

Protective shielding/masking compound. Shields metal surfaces during powder metal spraying.

Description	Characteristics
Brush on liquid compound for masking metal parts during metal spraying. Suitable for Superjet and RotoTec applications.	Non stick solution 400gram Pack

Cover all areas of part which may be exposed to powder metal overspray. After spraying is completed, wash or wire brush the protective compound. Unwanted metal particles adhering to the compound areas are removed when washed or wire brushed off, leaving clean, unsprayed surfaces.

Extra Hands

Heat resistant material for insulating and positioning parts when welding/brazing.

Description	Characteristics
Easy to use, adheres to most surfaces	Reusable
Withstands elevated temperatures	1650°C (3000°F)
Packaging	2.27kg Pail

Easily holds or positions small and difficult-to-align parts for welding, brazing or soldering. Can be used as a heat sink to absorb heat and avoid surface discolouration on heat sensitive parts. Can also be used as a heat dam to prevent heat from travelling to areas that can be damaged by heat, such as seals, gaskets, glass and wiring. Prevents discolouration on metals such as stainless steel.

Eutectic Instant Hardener 75

Case hardening compound

Description	Characteristics
Case hardening powder compound	
Easy to use and safe.	Cyanide free
Packaging	2.27 kg

Eutectic Instant Hardener #75 is a cyanide-free hardening compound for case hardening tools, harrowing & furrowing farm implements, and case hardening soft materials such as mild steel for improved wear performance.

Eutectic SealTec

Low Temperature Wax sealer for cold spray coatings

Description	Characteristics
Easy to use and safe.	
Packaging	0.45 kg

A deeply penetrating, non-toxic wax sealer. Recommended for sealing thermal coatings when the service temperature is below 190ºF.

Bloc-It

Heat absorbing paste

Description	Characteristics
Easy to use and safe.	Non toxic
Packaging	0.283 kg (10 Oz)

Effectively absorbs surface heat and protects adjoining surfaces that may be damaged by excessive heat.
Safe to use: non-toxic, no asbestos, harmless to skin, and odourless.
Easy to clean: wipe off with cloth or wash with water. Leaves no stains.

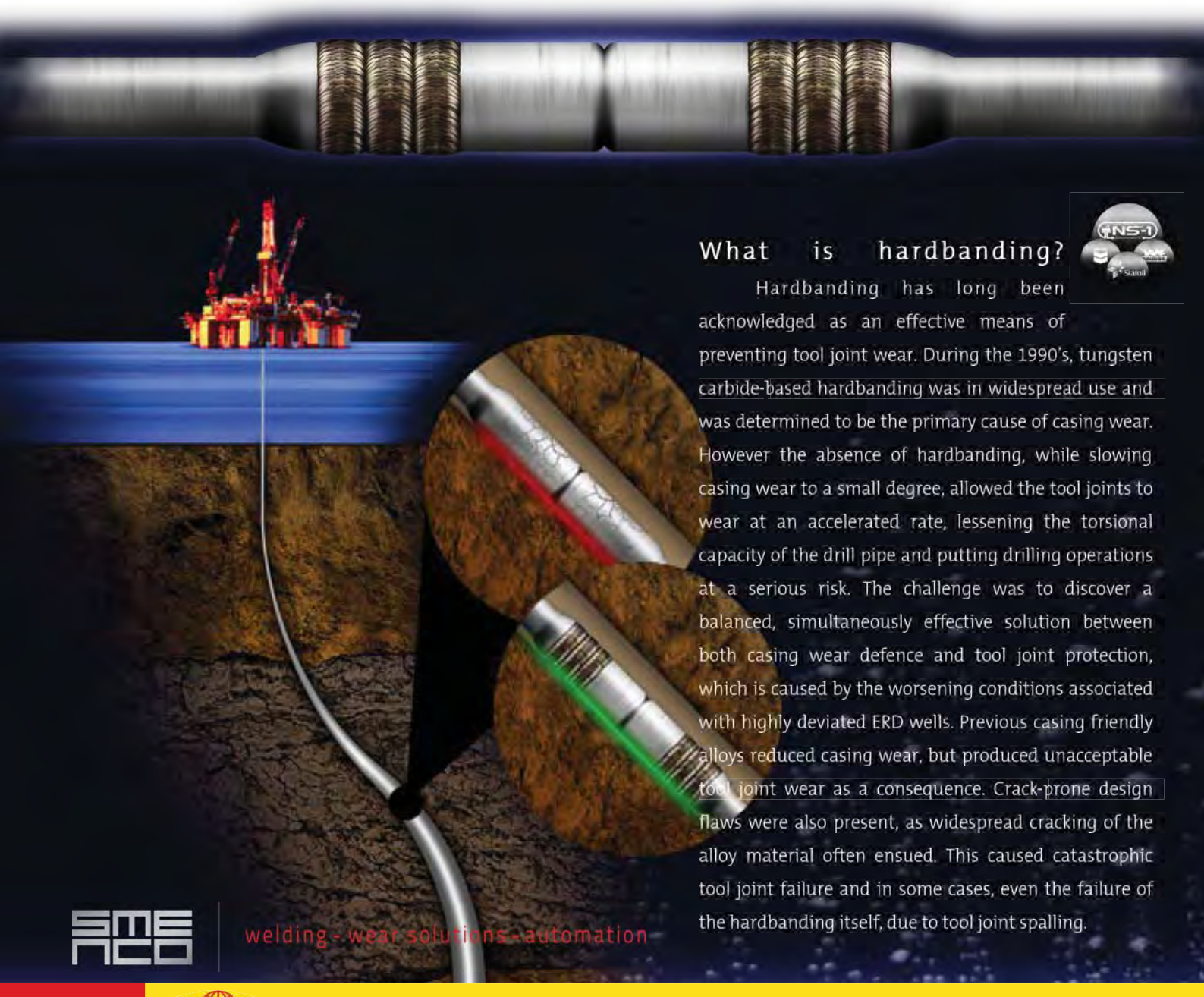
Key applications: protects rubber, plastic, distortion, painted, and finished surfaces during soldering, brazing or welding.

Hardbanding

For Oil and Gas drilling

10SS 16XS OTW 12Ti 13CF

Optimized Performance
Crack Free Design
Casing Friendly
Optimized Tool Wear Resistance
Flexible Rebuild Design



What is hardbanding?

Hardbanding has long been acknowledged as an effective means of preventing tool joint wear. During the 1990's, tungsten carbide-based hardbanding was in widespread use and was determined to be the primary cause of casing wear. However the absence of hardbanding, while slowing casing wear to a small degree, allowed the tool joints to wear at an accelerated rate, lessening the torsional capacity of the drill pipe and putting drilling operations at a serious risk. The challenge was to discover a balanced, simultaneously effective solution between both casing wear defence and tool joint protection, which is caused by the worsening conditions associated with highly deviated ERD wells. Previous casing friendly alloys reduced casing wear, but produced unacceptable tool joint wear as a consequence. Crack-prone design flaws were also present, as widespread cracking of the alloy material often ensued. This caused catastrophic tool joint failure and in some cases, even the failure of the hardbanding itself, due to tool joint spalling.

welding - wear solutions - automation

Hardbanding for Oil and Gas drilling

10SS 16XS OTW 12Ti 13CF

Product	Applications / Features	Mechanical Properties
OTW 10SS Hardbanding 	**The new standard for Sour Gas, casing friendly wire, that's easy to weld.** OTW-10SS is an exclusive, gas shielded, metal cored alloy wire, specifically designed for us in severe sour (SS) environments and fully compatible with all Sour Service Grades of drill pipes. Sour service grades of drill pipe (VM 105 DP SS™, TSS 105™, CYX 105™) and HWDP differ greatly from normal API grades and use a modified form of steel on the pipe body and tool joints. This alloy is formulated to be Non-cracking, easy to apply and repair, with low dilution and minimal preheat temperatures. The reduced overall hardness is designed to optimize performance in even the most severe sour environments. OTW-10SS is formulated to produce a unique hard tool steel microstructure with numerous, very fine, ultra hard phases dispersed in a tough, tempered martensitic matrix. This ensures immunity to cracking and excellent casing wear resistance. OTW-10SS has excellent bead appearance, no spatter, high arc stability and great flexibility in operation between 100-400 Amps. Plus an exceptional all positional weld ability and high deposition rate for reduced labour costs. A real cost effective solution for multipurpose hardbanding applications, including Drill Pipe Tool joints and HWDP Tool Joints and Centre Wear Pads.	Typical Hardness: 53-58 HRc G65 test data: 1 layer, loss 0.969g Casing Wear: CW %, Mohr 6.17 CW Factor 1.07 Friction factor 0.41
OTW 16XS Hardbanding 	**The Casing Friendly Leader of "all purpose" Non Cracking Design wires. Ideal in advanced drilling operations.** OTW-16XS "Extreme Service" is a product ideally suited for drilling in even the most demanding ERD and Ultra ERD wells. The unique nature of these wells puts severe stresses on the drill string and the industry has responded with high performance Tool Joint connections (XT™, VX™, TT™). These connections have higher torque values with lower wall thickness. This increases the necessity to provide a solution that will minimize dilution and still provide for effective overall durability. Due to the nature of these wells the need for the highest levels of casing friendly designs are necessary and OTW-16XS has best in class performance. OTW-16XS is The Casing Friendly Leader of „all purpose" Non Cracking Design wires ideal in advanced drilling operations. OTW-16XS demonstrates wear resistance in both open hole and cased hole environments. OTW-16XS achieves these optimized wear-resistant properties with a uniquely modified micro-structure supported by an ultra-dispersed network of wear resistant carbides (Cr, Ti, Mo, and W) providing a uniform & tempered martensitic microstructure with optimized deposit through-thickness properties for maximum wear resistance.	Typical Hardness: 57-62 HRc G65 test data: 1 layer, loss 0.312g Casing Wear: CW %, Mohr 5.72 CW Factor 0.96 Friction factor 0.33
OTW 12Ti Hardbanding 	**Hard but tough all-rounder. Best in class when combined open and case hole wear performance counts.** OTW-12Ti was designed for use in today's challenging drilling environment and ideal for use in highly deviated wells. In order to maximize the life of the drill pipe, it needs to have good wear resistance to withstand even the most demanding open hole environments but also exhibit the casing friendly properties required by most oil companies. OTW-12Ti has been designed to produce a unique microstructure which is super hard and abrasion resistant for open hole performance, yet fine, smooth and tough to stay extremely casing friendly, and it is also easy to weld. The structure contains very fine, ultra-hard Titanium-cermet phases dispersed in a tough, tempered martensitic matrix. Having up to 61,5 HRC, OTW-12Ti is Non-Cracking Designed (NCD) and also Flexible Application Designed (FAD) like all OTW alloys. FAD means cost effectively reapplied over itself and also most other Titanium based Hardbanding to refurbish worn drill pipes after drilling operations. The low heat formulation is designed to have low dilution. OTW-12Ti is a flux filled cored wire alloy, designed and manufactured by Castolin Eutectic on state of the art equipment under the strictest quality control, and is certified by NS-1 for new application and re-application on tool joints.	Typical Hardness: 59-64 HRc G65 test data: 1 layer, loss 0.279g Casing Wear: CW %, Mohr 7.33 CW Factor 01.39 Friction factor 0.32
OTW 13CF Hardbanding 	**Outstanding Casing wear resistance against current industry standard solutions with good tool performance.** OTW-13CF has a Crack-Free Design, smooth surface with low friction properties and a microstructure designed to achieve a good balance between casing friendly and tool wear, whilst remaining a cost-effective solution. OTW-13CF has a casing wear resistance that is superior to currently established Non-Cracking wires, whilst retaining a competitive level of all round tool wear resistance. It achieves this with a slag-free deposit that precipitates a dense dispersion of hard, primary niobium and complex CrMo carbide phases finely distributed in a martensitic/residual austenitic matrix. The good resistance to high stress abrasion and erosion even when combined with heavy impact or pressure, are typical conditions that can be expected in an open hole or cased hole environment. OTW-13CF is ideally suited to intermediate to advanced hardbanding applications. OTW-13CF is an exclusive, gas shielded, metal cored alloy wire may be reapplied over itself to refurbish worn drill pipes after drilling operations and also any of the OTW range. The Flexible Application Designed (FAD) feature implies greater flexibility for the hardbander and significant cost savings in old hardbanding removal and pipe preparation.	

Welding Equipment MMAW

PowerMax MMAW and GTAW

Description	PowerMax
150 amp DC Manual MMA and Tig welding with a single unit connected to 240V mains power. Advantages: • Minimum size and weight, low power consumption with high efficiency and generator compatibility • Variable characteristics allow welding of most electrode types • Low-spatter manual electric welding with outstanding arc stability thanks to the resonance control system • Easy ignition of all types of electrodes • Ideal for TIG welding offering contact ignition (lift arc) • Suitable for site welding and has easy change fan filters	
Welding amperage range	10A - 150A
35% Duty Cycle amperage	140 A
100% Duty Cycle amperage	80 A (@ 40°C
Open circuit voltage	92 V
Power supply	230 V 50/60 hz
Power at primary (100%)	3.6 kVA
Fuse rating	16 A slow blow
Protection rating	IP23
Dimensions (L x W x H)	315 x 110 x 200
Weight	4.7 kg
Standard PowerMax Part number	304307
Restricted 10amp input Powermax part number	30430710
Tig welding torch AL17 type 4mt	AL17S
Tig welding torch accessory kit AL17 type	AL17AC

MineSpec Powermax MMAW and GTAW

Specifications:	MineSpec
Eutectic PowerMax VRD Mine-Spec	
Mains Voltage +/- 15%	50-60 Hz 230V
Welding Current Range	10-125A
Welding Current @ 230V 10 min/ 40 Degrees C	50% @ DC 125A 100 % @ DC 80A
Open Circuit Voltage	92 Volts
Open Circuit Voltage VRD	12 Volts
Operating Voltage	20.4-25.6 Volts
Dimensions L /W/H	315/110/200mm
Protection Class	IP23
Weight	4.7 kg
Part Number	4.075.108-MS

The small MMA welder that's big on safety.
Eutectic PowerMax VRD Mine-Spec (Voltage Reduction Device) has been designed in direct response to 'world's best practice' Australian mining sector OH&S safety demands-and then some. With safety in mind the Eutectic PowerMax software places the machine into fault mode if the VRD is disconnected (or fails) therefore the PowerMax VRD Mine-Spec is deemed to be 'Fail to safe'.

Key features include.

- Powerful 125Amp output max 10amp draw, HiVis cables, 10Amp 240V moulded plug top with braided connection to earth.
- VRD as standard, Generator compatable (Min 8 Kva), IP23 rated, Thermostatically controlled fan, CE and C-tick approved.
- Anti-stick electrode function, Meets AS60974/AS1674.2, Arc force dynamic functions.

Welding Equipment GTAW

CastoTig 2202 AC/DC

Description	CastoTig
Digital Inverter for TIG and MMA welding Advantages: • Powerful 220 A from 230V single phase outlet • Flexible: suitable for DC and AC welding • AC balance control • Low noise, high speed ignition • Micro-processor controlled, providing stable and consistent arc performance • Clear user friendly control panel • Also available in 170 A and DC only models	
Welding amperage range	3A—220A
Open circuit voltage	83V
Mains voltage	1x240V 50/60Hz
Mains fuse	16A, delay
Protection Class	IP23
Duty Cycle (10 min @ 40°C)	100% @ 130A
Duty Cycle (10 min @ 40°C)	30% @ 220A
Dimensions	500x410x175 mm
Weight	17.3 kg

Options:

Cooling unit, Remote controls for current and foot control, 4 or 8 mt torch length, Trolley and custom options upon request.

CastoTig 3011DC & 3012 AC/DC GTAW

Description:	CastoTig	
Powerful 300 Amp Digital Inverter for TIG and MMA welding Advantages: • Powerful 300A Tig equipment for only 23/27 Kg • Flexible: suitable for DC and AC welding • New technology with highest precision and efficiency = Low noise, high speed ignition • Micro-processor controlled, providing stable and consistent arc performance • Clear user friendly control panel		
Technical Data CastoTig	3011 DC	3012 AC/DC
Welding amperage range Tig	3-300 A	3-300 A
Welding amperage range MMA	10-300 A	10-300 A
Open circuit voltage	85 Volts	89 Volts
Mains voltage +/- 15%	3x400 V	3x 400
Mains fuse	16A, delay	16A, delay
Protection Class	IP23	IP23
Duty Cycle (10 min @ 40°C)	100% @ 230A	100% @ 190A
Duty Cycle (10 min @ 40°C)	60% @ 270 A	60% @ 230 A
Dimensions	590 x 245 x 450 mm	
Weight	23 kg	27 kg

Options:
Cooling unit, Remote controls for current and foot control, 4 or 8 mt torch length, torches water or gas cooled, Trolley and custom options upon request.

Training packages available to suit your needs. Contact us for further details.

Welding Equipment GMAW Mig

TotalArc 271 Digital Pulse

Description	TotalArc 271
The flexible welding system for professional welders Advantages: • Programmable, 80 welding programs pre-configured for optimum adaptation to the material. • Many Castolin Eutectic wire programs preloaded to make the job easy • Microprocessor controlled pulsed and standard mig • Compact design with wire spool inside • Reliable 4WD wire feed system • User friendly front panel controls	
Welding amperage range	3-270 Amps
Duty Cycle (25°C/10min) 60/100%	270/210 Amps
Duty Cycle (40°C/10min) 60/100%	210/170 Amps
On load voltage	14.2—27.5 V
Off load voltage	50 V
Mains supply	3 x 400 V
Fuse	16 A slow blow
Dimensions	700x410x525 mm
Weight	37 kg
Degree of protection	IP 23

Options:
Water cooling, tool cabinet under power source, trolley, Dual Pulse program, 3.5 or 4.5 mt Mig torch with or without up/down controls, 6,8 or 10 mt push pull torch, wire feed rollers to suit 0.6—1.6mm wires plus many more special options. 400 and 500 Amp models available as well.

iD Weld 2501 Bore welding unit

Description:	Id Weld 2501
GMA Welding system for applying internal & external coatings. Advantages: • Ideal for “on site” maintenance and repair work • Internal coatings of bores 30mm diameter or larger • Longitudinal stroke up to 170mm in one run • Suitable for most Mig welding machines • Duty cycle 200 Amps / 100% allows for the largest of jobs • Packed in sturdy transport case with foam inserts •	
Technical data	Id Weld 2501
Mains supply voltage	204 Volts 50 Hz
Diameter range	30-800 mm
Axial capacity	170 mm max
Axial feed pitch	3 mm / Rev
Min rotation speed	0.3 rpm
Max rotational speed	12 rpm
Weight (feed unit)	18.6 kg
Weight (control unit)	9.2 kg
Filler alloy solid wire	Ø 0.8—1.0 mm
Filler alloy cored wire	Ø 1.0—1.2 mm

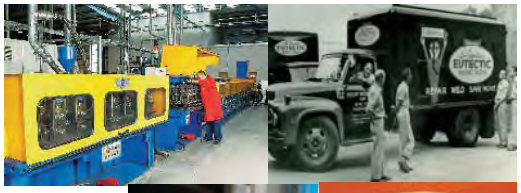
Applications:
Refurbishing internal bores on earthmoving machinery plant and equipment, bronze bush replacement within hydraulic cylinders, cast iron hub repairs using specialist Castolin DO 23 wire, hydraulic ram eye rebuilding, etc....

Castolin Eutectic and Smenco

Training and ongoing support

At Smenco we offer a wide range of welding, brazing and thermal spray training courses. These courses can be designed according to the needs of each customer, plus we have training sessions for managers, engineers and technicians.
Specific Castolin Eutectic equipment or consumable training constructed to include an optimum balance of both theoretical as well as practical training. Castolin Eutectic and Smenco can offer these courses in every state, in our own in-house facilities or in your workshop environment. Dedicated and qualified Smenco staff willing to provide that extra service required in today's demanding work environment. For more information about training please contact your local Smenco office or Representative.

History of Castolin Eutectic



1906 Foundation of Castolin in Lausanne, Switzerland by Jean-Pierre Wasserman. His stroke of genius: to discover a way of welding cast iron at low temperature. In the following years, this innovation was further developed for all industrial metals including aluminium alloys.

1940 Foundation of Eutectic Welding Alloys Corporation in New York.

1952 Foundation of Castolin France.

1959 Foundation of Eutectic Japan Ltd.

1962 Foundation of Eutectic India Ltd.

1960's International consolidation under Castolin Eutectic. Formation of Eutectic Australia.

1970's Creation of training centers for Maintenance & Repair technologies.

1978 Establishment of World Head Quarters in St- Sulpice, Switzerland.

2000 Merger with Messer Cutting & Welding and creation of the MEC Group Messer Eutectic Castolin.

2005 Part of the Messer World.

2006 100 years.

2008 Smenco Pty Ltd purchased Australian rights to Castolin Eutectic Products. Smenco Pty Ltd is an Australian company importing high quality equipment associated with the welding and metal industry. These include Fronius, Messer Cutting & Welding, Bugo, Kemper Fume Extraction, Bohler Welding consumables, TAFA Thermal Spray, ProArc, Huntingdon Fusion Technologies, Hypertherm, DWT Babcock, Bore Repair Systems, Steel tailor CNC cutting systems, Melt View thermal cameras.

Castolin Eutectic®
Eutectic Castolin

Smenco Pty Ltd,
100% Australian company proudly promoting ***Castolin Eutectic***.
World wide solutions with local support through our many regional offices and Distributor network.

Your local distributor is:

ABN 21 060 672 979

TOOWOOMBA WELDING SUPPLIES

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E: sales@tweld.com.au I www.tweld.com.au

We deliver on time ... EVERYTIME
We are an Australian locally owned family business

welding - wear solutions - automation