

Royal 116-T

Gas Tungsten Arc Welding
(GTAW) TIG Alloy

Hard-Facing Alloy

Oxyacetylene Welding
(OAW)

All Position



Premium Cobalt Based Hard-Facing for TIG or Torch

Typical Applications

Royal 116-T is the most commonly used cobalt alloy. It is resistant to wear (abrasion), galling, erosion, cavitation, impact and corrosion AND it can retain these properties at high temperatures. Many surfacing alloys are softened permanently when heated to elevated temperatures. **Royal 116-T** is an exception since it retains its hardness and oxidation resistance up to 1100°F. In fact, **Royal 116-T** is typically used in the temperature range between 400°F – 1100°F. **Royal 116-T** can be fabricated to exceptional levels of surface finish with a low coefficient of friction to yield excellent sliding wear for metal-to-metal applications. **Royal 116-T** is the perfect choice for hot shear blades, extrusion screws, fluid flow valves, roll bushings, valve bearing surfaces, machine valves and seats, hot punches, saw guides, hot bed rack arm pads, scraper knives, hot trimming dies, agitators, digesters, valve trim in steam engines, pump shafts and bearings, and erosion shields. **Royal 116-T** bonds to all weldable steels, including stainless steels.

Specifications

AWS A5.21/A5.21M
ER CoCr-A

- Hardness 41 – 46 (Rockwell C)
- Machinability Good (using carbide tools)

Procedure

Clean area to be surfaced. In many cases, preheating or a postheating is not necessary. However, if the base alloy has a significant carbon content or is very thick, then it is imperative to preheat according to the following table:

Base Metal	Preheat	Postheat
Thin sections of low Carbon Steel (up to 0.40% C)	Not required	Air cool
Thick sections of low Carbon Steel (up to 0.40% C)	200°F - 600°F	Slow cool
Thin sections of high Carbon Steel (over 0.40% C)		
Thin sections of low Alloy Steel (up to 10% alloy)	300°F - 600°F	Slow cool
Thick sections of High Carbon Steel (over 0.40% C)		
Thick sections of Low Alloy Steel (up to 10% alloy)	1100°F - 1200°F	Slow cool
Air-Quench Steels		
Thin sections of High Chromium-Nickel (Austenitic) Stainless Steel	Not Required	Air cool
Thick sections of High Chromium-Nickel (Austenitic) Stainless Steel	200°F - 500°F	Slow cool
Thick sections of High Chromium (Martensitic) Stainless Steel (410, 416, 420, etc.)	400°F - 600°F	Maintain 400°F-600°F for 4 hrs. per inch thickness, then reduce heat 90°F/hr till cool
Thick sections of High Chromium (Ferritic) Stainless Steel (430, 442, 446, etc.)	200°F - 600°F	Maintain 200°F-600°F for 4 hrs. per inch thickness, then reduce heat 90°F/hr till cool
High Temperature Nickel Alloys (400, 600, 601, 625, 718, etc.)	200°F - 500°F	Stress relieve

Gas Tungsten Arc Welding (TIG): Use DC straight polarity (DCEN). Follow amp and gas settings in table below. The traditional tungsten choice is a 2% thoriated tungsten (Red Band). Try to run the **Royal 116-T** as cool as possible. Start welding at the low end of the amp range and increase amps until a smooth and stable arc is established. Cool according to the table above.

Oxyacetylene Welding (OAW): While TIG welding is the preferred process, it is sometimes useful to apply **Royal 116-T** with an oxyacetylene torch. Use a 3X feather-to-cone reducing flame to minimize oxidation, penetration and inter-alloying. Use a larger torch tip than is generally used for same diameter mild steel. Cool according to the table above.

Sizes, Amps and Part Numbers

Diameter	Amps DC- (DCEN)	Argon Gas Flow (cfh)	Part Numbers	
			1# Package	5# Package
1/8	95 – 135	25	RT116T/TO-BP	RT116T/TO
5/32	135 – 165	25 – 30	RT116T/TP-BP	RT116T/TP
3/16	160 – 195	25 – 30	RT116T/TQ-BP	RT116T/TQ
1/4	200 – 270	30 – 35	RT116T/TR-BP	RT116T/TR



!!!! WARNING !!!!



WELDING FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH.

BEFORE USING THIS PRODUCT THE WELDER (END-USER) MUST READ AND UNDERSTAND THE COMPLETE PRODUCT WARNING LABEL AND THE NEW 16 SECTION SAFETY DATA SHEET (SDS).

THE SAFETY DATA SHEET (SDS) WHICH OUTLINES THE POTENTIAL HEALTH HAZARDS AND SAFETY INFORMATION RELATED TO THIS PRODUCT CAN BE DOWNLOADED FROM THE SDS PORTION OF THIS WEBSITE. IT IS ALSO AVAILABLE FROM YOUR EMPLOYER AND WELDING SUPPLY DISTRIBUTOR.

DO NOT PROCEED WITH USE OF THIS PRODUCT UNTIL YOU READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) AND PRODUCT WARNING STATEMENT.

BE SURE TO CONSULT THE LATEST VERSION OF THE SDS.

SEE THE PRODUCT WARNING LABEL AND SDS FOR COMPLETE WARNING INFORMATION.

