



UNITED STATES WELDING CORPORATION

USW ALLOY DESIGNATION AND DESCRIPTION	TURBALOY® 321 HQ-GRADE GTAW SOLID BARE WELDING WIRE IRON BASE	ISSUED JANUARY 2007	DATA SHEET 5689 (9)																																				
		REVISION NO. A																																					
CROSS-REFERENCE CONFORMANCE SPECIFICATIONS	AMS 5689 UNS S32100 321SS 18.Cr 10.5Ni 0.40Ti USWC 5689 Alloy 30321 AWS A5.9 ER321																																						
METALLURGICAL BACKGROUND INFORMATION	<p>TURBALOY® 321 undergoes a series of proprietary abrading and cleaning processes to remove all surface contaminants. These manufacturing processes ensure a consistent ultra-clean weld wire surface.</p> <p>TURBALOY® 321 is a Titanium stabilized, austenitic stainless engineering alloy used to fabricate base metal of similar composition. It is non-hardenable.</p>																																						
MATERIALS TO BE WELDED AND APPLICATION	AMS 5645, 5510, 5570, 5576, 5559, 5557. ASTM A167, A240, A213, A249, A 269, A276, A314, A479, A473. Aircraft collector rings, exhaust manifolds, expansion joints. <p><i>NOTE:</i> Up to 70% of Ti can be lost in welding. GTAW is best for preserving Ti. Often AMS 5680 can be substituted as a filler wire. Weld with minimum heat input and apply stringer beads.</p>																																						
WIRE CHEMISTRY WT%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Carbon</td><td style="text-align: center;">-</td><td style="text-align: center;">0.08</td><td>Nickel</td><td style="text-align: center;">9.00</td><td style="text-align: center;">12.00</td></tr> <tr> <td>Manganese</td><td style="text-align: center;">-</td><td style="text-align: center;">2.00</td><td>Titanium</td><td style="text-align: center;">5x(C+N)</td><td style="text-align: center;">0.70</td></tr> <tr> <td>Silicon</td><td style="text-align: center;">0.40</td><td style="text-align: center;">1.00</td><td>Molybdenum</td><td style="text-align: center;">-</td><td style="text-align: center;">0.75</td></tr> <tr> <td>Sulfur</td><td style="text-align: center;">-</td><td style="text-align: center;">0.030</td><td>Copper</td><td style="text-align: center;">-</td><td style="text-align: center;">0.75</td></tr> <tr> <td>Phosphorus</td><td style="text-align: center;">-</td><td style="text-align: center;">0.040</td><td>Nitrogen</td><td style="text-align: center;">-</td><td style="text-align: center;">0.10</td></tr> <tr> <td>Chromium</td><td style="text-align: center;">17.00</td><td style="text-align: center;">19.00</td><td>Iron</td><td></td><td style="text-align: center;">Balance</td></tr> </table>			Carbon	-	0.08	Nickel	9.00	12.00	Manganese	-	2.00	Titanium	5x(C+N)	0.70	Silicon	0.40	1.00	Molybdenum	-	0.75	Sulfur	-	0.030	Copper	-	0.75	Phosphorus	-	0.040	Nitrogen	-	0.10	Chromium	17.00	19.00	Iron		Balance
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WELD PROPERTIES	Melting point: 2600°F Hardness: annealed sheet 78HRB Density: 7.9 g m/cc																																						
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PACKAGING	Sealed polyethylene envelopes. (Desiccants optional)																																						

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