



UNITED STATES WELDING CORPORATION

USW ALLOY DESIGNATION AND DESCRIPTION	TURBALOY® 685 MC-GRADE GTAW SOLID BARE WELDING WIRE NICKEL BASE		ISSUED JANUARY 2007		DATA SHEET 5828 (8)																																																
			REVISION NO. A																																																		
CROSS-REFERENCE CONFORMANCE SPECIFICATIONS	MSRR 9500/202 AMS 5828 Waspaloy UNS N07001 57Ni 19.5Cr 13.5Co 4.2Mo 3.1Ti 1.4Al 0.006B USW 5828 (V) AISI 685 OMAT 3/99A Available in HQ-GRADE																																																				
METALLURGICAL BACKGROUND INFORMATION	<p>TURBALOY® 685 is produced by vacuum induction melting and remelting techniques. The final wire is produced by special lubricant-free, roller-die forming followed by surface abrasion and cleaning processes.</p> <p>These manufacturing processes ensure consistent metallurgical integrity of the alloy with regard to control of trace elements and physical purity of the welding wire surface.</p> <p>TURBALOY® 685 is a Ni-Cr-Co-Mo precipitation hardening, high temperature alloy used for welding similar composition base alloys.</p>																																																				
MATERIALS TO BE WELDED AND APPLICATIONS	AMS 5708, 5709, 5706, 5707, 5704, 5544, 5586. PWA 1005, 1007, 1016, 1027. ASTM B637. TURBALOY® 685 is used for rotary seal manufacture and repair, manufacture of blades and discs. Acceptable welds can only be obtained by using premium quality weld metal for this alloy. Base metal should be in the softened condition before welding. Pure argon gas shielding and ultra clean conditions must be used, to obtain optimum quality welds.																																																				
WIRE CHEMISTRY WT%	<table border="0"> <tr> <td>Carbon</td> <td>0.02</td> <td>0.10</td> <td>Molybdenum</td> <td>3.50</td> <td>5.00</td> </tr> <tr> <td>Manganese</td> <td>-</td> <td>0.10</td> <td>Titanium</td> <td>2.75</td> <td>3.50</td> </tr> <tr> <td>Silicon</td> <td>-</td> <td>0.10</td> <td>Aluminum</td> <td>1.20</td> <td>1.60</td> </tr> <tr> <td>Sulfur</td> <td>-</td> <td>0.010</td> <td>Boron</td> <td>0.003</td> <td>0.010</td> </tr> <tr> <td>Phosphorus</td> <td>-</td> <td>0.010</td> <td>Iron</td> <td>-</td> <td>2.00</td> </tr> <tr> <td>Chromium</td> <td>18.00</td> <td>21.00</td> <td>Copper</td> <td>-</td> <td>0.10</td> </tr> <tr> <td>Cobalt</td> <td>12.00</td> <td>15.00</td> <td>Zirconium</td> <td>-</td> <td>0.04</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Nickel</td> <td></td> <td>Balance</td> </tr> </table>					Carbon	0.02	0.10	Molybdenum	3.50	5.00	Manganese	-	0.10	Titanium	2.75	3.50	Silicon	-	0.10	Aluminum	1.20	1.60	Sulfur	-	0.010	Boron	0.003	0.010	Phosphorus	-	0.010	Iron	-	2.00	Chromium	18.00	21.00	Copper	-	0.10	Cobalt	12.00	15.00	Zirconium	-	0.04				Nickel		Balance
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WELD PROPERTIES	Soft condition: 95 HRB Aged condition: 34-44 HRC Density: 8.19 gm/ cc																																																				
SIZES AND FORMS AVAILABLE	<table border="0"> <tr> <td style="text-align: center;">STRAIGHT LENGTHS</td> <td style="text-align: center;">SPOOLED WIRE</td> </tr> <tr> <td>5 lb. (2.2kg) packs 36" (914mm) lengths Flag tagged for traceability. (Double tagging and other lengths on request) Wide range of diameters.</td> <td>Precision layer wound, with controlled cast and helix 12" (300mm) diameter spools standard 8" (200mm), 4" (100mm) and proprietary spool sizes on request. Wide range of diameters and spool weights.</td> </tr> </table>					STRAIGHT LENGTHS	SPOOLED WIRE	5 lb. (2.2kg) packs 36" (914mm) lengths Flag tagged for traceability. (Double tagging and other lengths on request) Wide range of diameters.	Precision layer wound, with controlled cast and helix 12" (300mm) diameter spools standard 8" (200mm), 4" (100mm) and proprietary spool sizes on request. Wide range of diameters and spool weights.																																												
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PACKAGING	Sealed polyethylene envelopes. (Desiccants optional)																																																				
DISTRIBUTED BY:																																																					