



**MANUFACTURERS OF A DIVERSE RANGE OF  
ADVANCED WELDING CONSUMABLES**

**SECTION  
5**

WI-0304 DS55 RD-16B9 Rev. 5, Date 01.01.2013

<b>RD-16B9</b>	<b>BASIC LOW HYDROGEN ELECTRODE FOR WELDING MODIFIED 9Cr-1Mo STEELS OPERATING AT ELEVATED TEMPERATURES UP TO 650°C</b>				<b>DATA SHEET NO. 55</b>																																																					
SPECIFICATION	AWS A5.5		BS EN 1599																																																							
CLASSIFICATION	E9016-B9		E CrMo91 B																																																							
PRODUCT DESCRIPTION	<p>The design emphasis of the chemically basic flux is engineered to ensure the optimum weld metal properties demanded by the specification are fully met.</p> <p>The basic flux containing the appropriate alloying elements but minimal iron powder, is extruded onto a high purity ferritic core wire and bound with a blend of silicates that ensure both coating strength and a coating resistant to subsequent moisture absorption.</p> <p align="center"><b>UNCONTROLLED</b></p>																																																									
WELDING FEATURES OF THE ELECTRODE	<p>The chemical nature of the flux together with its controlled coating factor allows the electrode to be used at relatively low amps. This factor together with the fairly fluid but quick freezing slag facilitate vertical up welding including controlled penetration root runs.</p> <p>Overall the arc is very stable, slag detachability is good, fillet welds are slightly convex and metal recovery is some 98% with respect to weight of the core wire.</p>																																																									
APPLICATIONS AND MATERIALS TO BE WELDED	<p>PLATE           ASTM A387 Grade 91, TUBES/PIPES   ASTM A335 Grade 91, A234 Grade WP91, A199 Grade T91,                           A213 Grade T91.                           BS 3604 Grades CFS &amp; HFS 629-470 CFS/HFS 629-590. FORGINGS       A182 Grade F91, A336 Grade F91 CAST             ASTM A217 Grade C12A, BS1503 Grade 91</p> <p>PWHT recommended range is 745 - 775°C (2 hours), pre-heat 200 - 300°C. Cool to 150°C before PWHT.</p>																																																									
WELD METAL ANALYSIS COMPOSITION % BY Wt.	<table border="1"> <thead> <tr> <th></th> <th>C</th> <th>Mn</th> <th>Si</th> <th>S*</th> <th>P*</th> <th>Cr</th> <th>Ni</th> <th>Mo</th> <th>Nb</th> <th>V</th> <th>Al</th> <th>N</th> </tr> </thead> <tbody> <tr> <td>MIN</td> <td>0.08</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>8.0</td> <td>-</td> <td>0.85</td> <td>0.02</td> <td>0.15</td> <td>-</td> <td>0.02</td> </tr> <tr> <td>MAX</td> <td>0.13</td> <td>1.2</td> <td>0.30</td> <td>0.015</td> <td>0.015</td> <td>10.5</td> <td>0.8</td> <td>1.2</td> <td>0.10</td> <td>0.30</td> <td>0.04</td> <td>0.07</td> </tr> <tr> <td>TYPICAL</td> <td>0.10</td> <td>0.9</td> <td>0.28</td> <td>0.01</td> <td>0.01</td> <td>9.0</td> <td>0.4</td> <td>1.0</td> <td>0.03</td> <td>0.22</td> <td>0.01</td> <td>0.03</td> </tr> </tbody> </table> <p>* AWS A5.5 specifies S = 0.01% max. and P = 0.01% max.</p>							C	Mn	Si	S*	P*	Cr	Ni	Mo	Nb	V	Al	N	MIN	0.08	-	-	-	-	8.0	-	0.85	0.02	0.15	-	0.02	MAX	0.13	1.2	0.30	0.015	0.015	10.5	0.8	1.2	0.10	0.30	0.04	0.07	TYPICAL	0.10	0.9	0.28	0.01	0.01	9.0	0.4	1.0	0.03	0.22	0.01	0.03
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ALL WELD METAL PROPERTIES (AFTER PWHT)	<u>PROPERTY</u>		<u>UNITS</u>	<u>MINIMUM</u>	<u>TYPICAL</u>	<u>OTHERS</u>																																																				
	Tensile strength		N/mm <sup>2</sup>	620	750 – 880	Results relate to PWHT 765°C furnace cooled																																																				
	0.2% Proof stress		N/mm <sup>2</sup>	530	620 – 780																																																					
	Elongation on 4d		%	17	21																																																					
	Reduction of Area (RA)		%	-	60																																																					
	Impact energy 20 °C		J	-	65																																																					
WELDING AMPERAGE AC or DC+	Ø (mm)	2.6	3.2	4.0	5.0																																																					
	MIN	50	75	130	180																																																					
	MAX	85	125	170	220																																																					
OTHER DATA	Electrodes that have become damp should be re-dried at 150°C for 1 hour.																																																									
RELATED PRODUCTS	Please contact our Technical Department for detail.																																																									