

# Stainless Steels

## DATA SHEET

## B-80

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## NUCLEAR 308L CONSUMABLES

### Alloy type

308L austenitic stainless steels conforming to RCC-M for joining 304L base materials used in nuclear applications.

### Materials to be welded

ASTM	BS EN & DIN
304L	1.4306
304	1.4301
304LN	1.4311
CF3	1.4308
CF8	

### UNS

S 30403  
 S 30400  
 S 30453

### Applications

Used to weld 304L (18/8) stainless steels for applications in the nuclear industry requiring conformance to the RCC-M code.

Standard 308L consumables for general purpose fabrication can be found in data sheet B-30. 308H consumables for elevated temperature service can be found in data sheets C-10 and C-12. Controlled ferrite 308L consumables for cryogenic applications can be found in data sheet B-37.

### Microstructure

Austenite with a controlled level of ferrite, 5-15FN.

### Welding guidelines

No preheat, maximum interpass temperature 250°C; no PWHT required.

### Additional information

Requirements are taken from the relevant consumable data sheets in the French RCC-M code.

For consumable qualification data sheets (B-93 and B-94) in accordance with RCC-M S 5142 please contact Metrode Technical Department.

### Related alloy groups


See data sheet B-81 for related 316L consumables conforming to the RCC-M requirements.

### Products available

Process	Product	Specification
MMA	<b>Ultramet 308L(N)</b>	AWS E308L-16
TIG	<b>308S92(N)</b>	AWS ER308L

# ULTRAMET 308L(N)

Rutile MMA electrode

<b>Product description</b>	<p>MMA electrode – special rutile flux coated 308L electrode on high purity 304L core wire. Versatile downhand and positional capability, <b>Ultramet 308L(N)</b> has a controlled composition and ferrite content designed to meet the requirements of the RCC-M data sheet S 2920.</p> <p>Recovery is about 110% with respect to core wire, 65% with respect to whole electrode.</p>																														
<b>Specifications</b>	<b>AWS A5.4</b>		E308L-16																												
	<b>BS EN 1600</b>		E 19 9 L R 3 2																												
	<b>RCC-M</b>		S 2920																												
<b>ASME IX Qualification</b>	<b>QW432</b> F-No 5, <b>QW442</b> A-No 8																														
<b>Composition (weld metal wt %)</b>		C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co	N	FN *																		
	min	--	0.5	--	--	--	18.00	9.00	--	--	--	--	5																		
	max	0.035	2.0	0.90	0.025	0.025	21.00	11.00	0.50	0.5	0.20	--	15																		
	typ	<0.025	0.7	0.6	0.01	0.02	19.5	9.5	0.1	<0.1	0.04	0.08	8																		
	* Ferrite calculated in accordance with DeLong diagram.																														
<b>All-weld mechanical properties</b>	As welded				min		typical		min +350°C		typical +350°C																				
	Tensile strength		MPa		520		600		--		410																				
	0.2% Proof stress		MPa		320		465		125		305																				
	Elongation on 4d		%		35		47		--		30																				
	Elongation on 5d		%		30		45		--		--																				
	Reduction of area		%		--		55		--		60																				
	Impact energy		+20°C		J		60 (42) *		--		--																				
	* Minimum average (minimum individual value).																														
<b>Operating parameters</b>	<p>DC +ve or AC (OCV: 50V min)</p> 																														
	∅ mm	2.5		3.2		4.0		5.0																							
	min A	60		75		100		130																							
	max A	90		120		155		210																							
<b>Packaging data</b>	∅ mm	2.5		3.2		4.0		5.0																							
	length mm	300		350		350		450																							
	kg/carton	11.4		13.5		13.5		15.5																							
	pieces/carton	627		411		261		159																							
<b>Storage</b>	<p><b>3 hermetically sealed ring-pull metal tins</b> per carton, with unlimited shelf life. Direct use from tin is satisfactory for longer than a working shift of 8h. Excessive exposure of electrodes to humid conditions will cause some moisture pick-up and increase the risk of porosity.</p> <p>For electrodes that have been exposed:</p> <p><b>Redry</b> 200 – 300°C/1-2h to restore to as-packed condition. Maximum 400° C, 3 cycles, 10h total.</p> <p><b>Storage</b> of redried electrodes at 50 – 200°C in holding oven or heated quiver: no limit, but maximum 6 weeks recommended. Recommended ambient storage conditions for opened tins (using plastic lid): &lt; 60% RH, &gt; 18°C.</p>																														
<b>Fume data</b>	<p>Fume composition, wt % typical:</p> <table border="1"> <tr> <td></td> <td>Fe</td> <td>Mn</td> <td>Cr</td> <td>Ni</td> <td>Mo</td> <td>Cu</td> <td>F *</td> <td>OES (mg/m<sup>3</sup>)</td> </tr> <tr> <td></td> <td>8</td> <td>5</td> <td>5</td> <td>0.8</td> <td>-</td> <td>&lt; 0.2</td> <td>16</td> <td>1</td> </tr> </table>														Fe	Mn	Cr	Ni	Mo	Cu	F *	OES (mg/m <sup>3</sup> )		8	5	5	0.8	-	< 0.2	16	1
	Fe	Mn	Cr	Ni	Mo	Cu	F *	OES (mg/m <sup>3</sup> )																							
	8	5	5	0.8	-	< 0.2	16	1																							

# 308S92(N)

308L solid wire

<b>Product description</b>	Solid wire for TIG welding that meets the requirements of RCC-M data sheet S 2910.												
<b>Specifications</b>	<b>AWS A5.9</b>		ER308L										
	<b>BS EN ISO 14343-A</b>		W 19 9 L										
	<b>BS EN ISO 14343-B</b>		SS308L										
	<b>RCC-M</b>		S 2910										
<b>ASME IX Qualification</b>	<b>QW432</b> F-No 6, <b>QW442</b> A-No 8												
<b>Composition (wire wt %)</b>		C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co	FN *	
	min	--	1.00	0.30	--	--	19.5	9.00	--	--	--	5	
	max	0.030	2.50	0.60	0.020	0.025	21.0	11.00	0.3	0.3	0.20	15	
	typ	0.01	1.7	0.4	0.01	0.015	20	10	0.1	0.15	0.04	8	
	* Ferrite calculated in accordance with DeLong diagram.												
<b>All-weld mechanical properties</b>	As welded				min +20°C		typical +20°C		min +350°C		typical +350°C		
	Tensile strength				MPa		520		605		--		400
	0.2% Proof stress				MPa		320		465		125		290
	Elongation on 4d				%		35		48		--		30
	Elongation on 5d				%		30		39		--		--
	Impact energy				+20°C		J		60 (42) *		160		--
	* Minimum average (minimum individual value).												
<b>Typical operating parameters</b>	TIG												
	Shielding Argon												
	Current DC-												
	Diameter 2.4mm												
	Parameters 100A, 12V												
<b>Packaging data</b>	TIG												
	ø mm												
	1.6												
	2.4												
	2.5kg tube												
	2.5kg tube												
<b>Fume data</b>	MIG fume composition (wt %) (TIG fume negligible)												
	Fe	Mn	Cr <sup>3</sup>	Ni	Mo	Cu	OES (mg/m <sup>3</sup> )						
	32	12	16	8	< 0.5	< 0.5	3.1						