

## Aluminium

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## Aluminium **AL**

### SIFMIG 1050

A pure aluminium (99.5% min) shaved wire which produces a ductile weld equal in strength to that of the base metal.

EN ISO 18273 - S Al 1070 (AI99.7),  
BS: 2901 1050A, (GIB) (NG3)



Dia mm	Art #	6.5kg Spl
0.8	WO140865	<b>119.25</b>
1.0	WO141065	<b>99.65</b>
1.2	WO141265	<b>97.35</b>
1.6	WO141665	<b>94.90</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
99.5 Min Al	650	90	15	118

### SIFMIG 4043

An Aluminium alloy with 5% silicon giving excellent flow characteristics and penetration. Suitable for welding duralumin, cast and wrought alloys 6063 (H9), 6061 (H20) and 6082 (H30). Weld will discolour if anodised.

EN ISO 18273 S Al 4043A (AISi5),  
BS: 2901 4043A, (NG21)

Dia mm	Art #	0.5kg Spl	Art #	2.0kg Spl	Art #	6.5kg Spl
0.8	WO150805	★ <b>10.80</b>	WO150820	<b>54.85</b>	WO150865	★ <b>86.80</b>
1.0	WO151005	★ <b>10.45</b>	WO151020	<b>48.80</b>	WO151065	★ <b>78.00</b>
1.2	WO151205	★ <b>10.15</b>	WO151220	<b>46.45</b>	WO151265	★ <b>73.45</b>
1.6					WO151665	★ <b>70.90</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Si Bal Al	635	120	40	118

### SIFMIG 4047

Aluminium alloy containing 12% Silicon, for high silicon alloys and automotive work.

EN ISO 18273 S Al 4047A (AISi12),  
BS: 2901 4047A, (NG2)

Dia mm	Art #	2.0kg Spl	Art #	6.5kg Spl
1.0	WO161020	<b>52.50</b>	WO161065	★ <b>95.30</b>
1.2			WO161265	★ <b>88.45</b>
1.6			WO161665	★ <b>86.20</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
12 Si, Bal Al	585	130	50	118

### SIFMIG 5356

A general purpose aluminium wire with 5% magnesium that has excellent corrosion resistance and high strength. Suitable for welding magnesium bearing aluminium alloys such as 5251 (N4), 5154 (N5), 5454 (N51) and also heat treatable alloys 6063 (H9), 6061 (H20) and 6082 (H30)

EN ISO 18273 S Al 5356 (AlMg5),  
BS: 2901 5356, (NG6)

Dia mm	Art #	0.5kg Spl	Art #	2.0kg Spl	Art #	6.5kg Spl
0.8	WO270805	★ <b>11.00</b>	WO270820	<b>55.80</b>	WO270865	★ <b>88.20</b>
1.0	WO271005	★ <b>10.55</b>	WO271020	<b>49.95</b>	WO271065	★ <b>79.45</b>
1.2	WO271205	★ <b>10.30</b>	WO271220	<b>47.20</b>	WO271265	★ <b>74.55</b>
1.6					WO271665	★ <b>72.85</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Mg Bal Al	640	250	60	118

### SIFMIG 5183

Special aluminium alloy containing 5% Magnesium and 0.75% Manganese, for improved weld strength.

EN ISO 18273 S Al 5183  
(AlMg4.5Mn0.7), BS: 2901 5183

Dia mm	Art #	6.5kg Spl
1.0	WO281065	<b>113.75</b>
1.2	WO281265	<b>105.55</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Mg, 0.75 Mn, Bal Al	640	275	65	118

### SIFMIG 5556

Aluminium alloy containing 5.3% Magnesium: all elements are closely controlled for optimum weld strength. Normally used on 5083 (N8) and for military applications

EN ISO 18273 S Al 5556A  
(AlMg5Mn), BS: 2901 5556

Dia mm	Art #	0.5kg Spl	Art #	2.0kg Spl	Art #	6.5kg Spl
1.0					WO371065	★ <b>99.45</b>
1.2	WO371205	<b>13.40</b>	WO371220	<b>50.05</b>	WO371265	★ <b>93.35</b>
1.6					WO371665	★ <b>92.20</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5.3 Mg, 0.8 Mn, 0.1Cr, 0.1Ti, Bal Al	640	300	70	118

## Copper & MIG Brazing **CU**

### SIFMIG 8

This phosphor bronze wire contains 7% tin and is suitable for fusion welding of phosphor bronze castings and copper alloys (brass). It is also used for MIG brazing on ferrous and dissimilar metals or for applying a bearing surface.

ISO 24373 Cu 5180A (CuSn6P),  
BS: 2901 C11

Dia mm	Art #	0.7kg Spl	Art #	4.0kg Spl	Art #	12.5kg Spl
0.8	WO080807	<b>50.80</b>	WO080840	<b>240.55</b>	WO080812	<b>557.35</b>
1.0	WO081007	<b>47.90</b>	WO081040	<b>223.50</b>	WO081012	<b>518.65</b>
1.2	WO081207	<b>45.60</b>	WO081240	<b>216.75</b>	WO081212	<b>501.80</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
7 Sn, Bal Cu	900-1050	260	80	124 & 125

### SIFMIG 328

This is a 92/8 aluminium bronze wire suitable for welding materials of a similar composition and copper alloys. It is ideal for MIG Brazing, dissimilar metal joints and maintenance applications.

ISO 24373 Cu 6100 (CuAl7),  
BS: 2901 C28

Dia mm	Art #	4.0kg Spl	Art #	12.5kg Spl
0.8	WO320840A	<b>267.25</b>	WO320812A	<b>608.15</b>
1.0	WO321040A	<b>260.05</b>	WO321012A	<b>592.30</b>
1.2	WO321240A	<b>247.60</b>	WO321212A	<b>563.25</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
8 Al, Bal Cu	1030	430	85	

### SIFMIG 44

Nickel aluminium bronze for AB2 material and marine/corrosive applications.

ISO 24373 Cu 6328 (CuAl9Ni5Fe3Mn2),  
BS: 2901 C20/C26

Dia mm	Art #	4.0kg Spl	Art #	12.5kg Spl
0.8			WO440812	<b>1,390.10</b>
1.2	WO441240	<b>515.45</b>	WO441212	<b>1,263.35</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
83 Cu, 9 Al, 3 Fe, 4 Ni, 1 Mn	1050	700	290	

### SIFMIG 967

A copper wire containing 2% silicon and 1% manganese. Has optimised flow characteristics and suitable for variable root gaps. Reduces weld spatter and offers increased corrosion resistance.

ISO 24373 Cu 6511 (CuSi2Mn1),

Dia mm	Art #	4.0kg Spl	Art #	12.5kg Spl	Art #	200kg Spl
0.8	WO970840	<b>196.80</b>	WO970812	<b>504.30</b>	WO9708200	<b>7,612.20</b>
1.0	WO971040	<b>160.60</b>	WO971012	<b>417.40</b>	WO9710200	<b>7,069.10</b>
1.2	WO971240	<b>160.60</b>	WO971212	<b>409.10</b>	WO9712200	<b>6,964.20</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1 Mn, 2 Si, Bal Cu	1030-1050	285	62	120

### SIFMIG 968

A copper wire containing 3% silicon and 1% manganese used for fusion welding materials of similar composition, copper alloys (brass) and for MIG brazing steels. It is also suitable for surfacing steel and dissimilar metal applications.

ISO 24373 Cu 6560 (CuSi3Mn1),  
BS: 2901 C9

Dia mm	Art #	0.7kg Spl	Art #	4.0kg Spl	Art #	12.5kg Spl	Art #	200kg Spl
0.8	WO960807	<b>43.80</b>	WO960840	<b>185.50</b>	WO960812	<b>417.90</b>		
1.0	WO961007	<b>41.50</b>	WO961040	<b>176.55</b>	WO961012	<b>392.32</b>	WO9610200	<b>4,676.70</b>
1.2			WO961240	<b>172.10</b>	WO961212	<b>386.75</b>		

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1 Mn, 3 Si, Bal Cu	980-1020	350	90	120

### SIFMIG 985

High quality wire containing a minimum of 98.5% copper with deoxidizing elements. It is ideal for MIG welding of copper.

ISO 24373 Cu 1898 (CuSn1)  
BS: 2901 C7

Dia mm	Art #	4.0kg Spl	Art #	12.5kg Spl
0.8	WO980840	<b>247.15</b>	WO980812	<b>531.10</b>
1.0	WO981040	<b>220.00</b>	WO981012	<b>515.45</b>
1.2	WO981240	<b>213.50</b>	WO981212	<b>497.95</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.25 Mn, 0.25 Si, Bal Cu	1025	220	70	124

## Surcharge Info



Due to metal market volatility, it may be necessary to add a surcharge to the detailed prices from time to time. Please note that we have indicated appropriate icons for each product sector i.e.



## Test Certificates

Test Certificates are available for each product, and can be supplied - on request - with your orders. Test Certificates can also be re-produced for up to 3 months following your order. Test Certificate requests beyond 3 months will incur a charge of £25.00 to cover administration costs.

Distributors can obtain Test Certificates from our website eCommerce system 24/7.

## Steels and Self Shielding Cored Wire **STL**

### SIFMIG SG2

Copper coated mild steel MIG wire for welding mild and medium tensile steels, for impact toughness down to -20C

EN ISO 14341-A G3Si1  
EN 440 G3Si1, (BS 2901: A18)  
(Din SG2)

Dia mm	Art #	0.7kg Spl	Art #	5.0kg Spl	Art #	15kg Spl	Art #	250kg Spl
0.6	WA180607	5.25	WA180650	22.45	WA180615	73.65		
0.8	WA180807	4.45	WA180850	21.00	WA180815	48.85	WA1808250	769.35
1.0			WA181050	18.45	WA181015	45.85	WA1810250	742.60
1.2					WA181215	45.15	WA1812250	736.20
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1 C, 0.8 Si, 1.3 Mn		1450		400		120		126

### SIFMIG SG3

Copper coated steel MIG wire with increased silicon and manganese for improved UTS.

EN ISO 14341-A G4Si1  
EN 440: G4Si1, (Din SG3)

Dia mm	Art #	15kg Spl	Art #	250kg Spl				
0.8	WG030815	55.90	WG030815	55.90				
1.0	WG031015	53.20	WG031015	53.20				
1.2	WG031215	51.20	WG031215	51.20				
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1C, 1.0Si, 1.75Mn		1450		600		120		136

### SIFMIG ZERO SG3

Copper free steel MIG wire providing a low spatter arc with low noise and visible fume for high productivity applications. Increased silicon and manganese for improved UTS.

EN ISO 14341-A G4Si1  
EN 440: G4Si1, (Din SG3)

Dia mm	Art #	15/18kg Spl	Art #	250kg Spl				
0.8 - 15kg spool	WA190815	63.80						
1.0 - 18kg spool	WA191018	71.55	WA1910250	646.75				
1.2 - 18kg spool	WA191218	70.40	WA1912250	802.45				
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1C, 1.0Si, 1.75Mn		1450		600		120		136

### SIFMIG A15

Triple deoxidised mild steel MIG wire.

EN ISO 636-A W2Ti  
BS: 2901 A15



Dia mm	Art #	15kg Spl						
0.8	WA150815	116.45						
1.0	WA151015	110.95						
1.2	WA151215	103.85						
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1 C, 0.6 Si, 1.3 Mn, 0.2 Al		1450		440		120		136

### SIFMIG A31

A copper-coated alloy steel rod containing 0.5% molybdenum. Suitable for use on low temperature pressure vessel and pipe work applications.

EN ISO 14341-A G4Mo  
BS: 2901 A31, AWS: ER 80S-D2

Dia mm	Art #	15kg Spl						
0.8	WA310815	214.10						
1.0	WA311015	193.70						
1.2	WA311215	183.70						
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1 C, 0.7 Si, 1.8 Mn, 0.5 Mo		1450		460		180		126

### SIFMIG A32

A copper coated, alloy steel wire containing 1.0% chromium and 0.5% molybdenum. It is ideal for low alloy and creep resistant steels.

EN ISO 21952-A G CrMo1Si (1CM)  
BS: 2901 A32

Dia mm	Art #	15kg Spl						
0.8	WA320815	174.10						
1.0	WA321015	157.50						
1.2	WA321215	145.80						
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN		SIF TIPS Page
0.1 C, 0.5 Si, 1 Mn, 1.3 Cr, 0.5 Mo		1450		500		180		136

### SIFMIG GASLESS

Self shielding steel MIG wire; ideal for DIY use

AWS: E71T-GS

Dia mm	Art #	0.45kg Spl	Art #	0.9kg Spl	Art #	4.55kg Spl	
0.8	WG180805	★ 11.60	WG180809	19.30	WG180845	104.50	
% Metal Composition		Melting°C		U.T.S. N/mm <sup>2</sup>		Hardness BHN	SIF TIPS Page
0.25 C, 0.4 Si, 0.7Mn, 2.4 Al		1450		400		120	

## Steel Flux and Metal Cored Wire **STL**

### SIFCORED E71T-1

Rutile flux cored wire for welding thin sheet steels or low alloyed structural steels in all positions. Argon/CO2 shielding gas.

AWS: E71T-1M  
EN ISO 17632-A-T 42 2 P M 1 H 5

Dia mm	Art #	5kg Spl	Art #	15kg Spl
1.2	WO711250	<b>39.65</b>	WO711215	★ <b>108.10</b>
1.6			WO711615	★ <b>105.40</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.05 C, 0.48 Si, 1.22 Mn 0.013 P, 0.009 S	1450	570	105	

### SIFCORED E81T1-Ni

Rutile flux cored wire for welding low temperature applications which require post-weld heat treatment (PWHT).

AWS: E81T1-Ni 1M-J  
EN ISO 17632-A-T 46 6 1Ni P M 2 H 5

Dia mm	Art #	15kg Spl
1.2	WO811215	<b>162.15</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.05 C, 0.32 Si, 1.26 Mn, 0.95 Ni, 0.006 P, 0.006 S	1450	582	135	

### SIFCORED E70C-6M

Metal cord wire for mild steel and 490MPa high tensile steels.

AWS: E70C-6M  
EN ISO 17632-A-T 42 4 M M 3 H 5

Dia mm	Art #	5kg Spl	Art #	15kg Spl
1.2	WO701250	<b>40.55</b>	WO701215	★ <b>110.80</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.08 C, 0.52 Si, 1.39 Mn 0.009 P, 0.009 S	1450	600	105	

### SIFCORED E110C-G

Metal cored wire for welding 110ksi class high strength steels and can provide excellent mechanical properties and crack resistance.

AWS: E110C-G H4  
EN ISO 18276-A-T 69 6 Mn2.5Ni M M 3 H 5

Dia mm	Art #	12.5kg Spl
1.2	WO111212	<b>202.70</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.06 C, 0.48 Si, 1.87 Mn, 2.37 Ni, 0.008 P, 0.010 S	1450	791	115	

## Stainless **SS**

### SIFMIG 347

Stainless steel wire, niobium stabilised to prevent weld decay, giving excellent corrosion resistance. Suitable for use on 18/8 type stainless steel, Nb and Ti stabilised, such as 304, 321 and where the weld is subjected to temperatures above 400°C.

EN ISO 14343: 19 9 NbSi,  
BS: 2901 347 S96

Dia mm	Art #	12.5/15kg Spl
0.8	WO200815	<b>196.20</b>
1.0	WO201015	<b>175.50</b>
1.2	WO201215	<b>164.00</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.04 C, 0.8 Si, 1.5 Mn, 10 Ni, 20 Cr, 0.6 Nb	1440	650	180	125

### SIFMIG 316LSI

A molybdenum bearing, stainless steel with low carbon content. It is corrosion resistant for welding molybdenum bearing austenitic stainless steels.

EN ISO 14343: 19 9 LSi,  
BS: 2901 316 S93,  
AWS A5.9 : ER316LSi (0.7kg)

Dia mm	Art #	0.7kg Spl	Art #	3.75kg Spl	Art #	12.5/15kg Spl
0.6	WO210607	<b>19.20</b>	WO210640	<b>83.00</b>	WO210612	<b>186.00</b>
0.8	WO210807	<b>15.95</b>	WO210840	<b>64.55</b>	WO210815	★ <b>122.50</b>
1.0	WO211007	<b>14.70</b>	WO211040	<b>58.45</b>	WO211015	★ <b>116.90</b>
1.2	WO211207	<b>14.60</b>	WO211240	<b>55.00</b>	WO211215	★ <b>115.85</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.02 C, 0.8 Si, 1.5 Mn, 12 Ni, 19 Cr, 2 Mo	1440	650	180	125

### SIFMIG 308LSI

Stainless steel filler wire suitable for welding 18/8 (304) austenitic stainless steels, providing good corrosion and wear resistance.

EN ISO 14343: 19 9 LSi,  
BS: 2901 308 S93

Dia mm	Art #	0.7kg Spl	Art #	3.75kg Spl	Art #	12.5/15kg Spl
0.8	WO330807	<b>15.75</b>	WO330840	<b>62.30</b>	WO330815	★ <b>127.90</b>
1.0	WO331007	<b>14.70</b>	WO331040	<b>60.85</b>	WO331015	★ <b>119.65</b>
1.2	WO331207	<b>14.60</b>	WO331240	<b>60.00</b>	WO331215	★ <b>118.05</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.02 C, 0.8 Si, 1.5 Mn, 10 Ni, 21 Cr	1440	650	180	125

### SIFMIG 309LSI

This stainless steel wire contains higher chromium and Nickel. It can be used for joining material of similar composition and also dissimilar stainless steels.

EN ISO 14343: 23 12 LSi,  
BS: 2901 309 S93

Dia mm	Art #	3.75kg Spl	Art #	12kg Spl	Art #	15kg Spl
0.8	WO340840	<b>100.15</b>	WO340812	<b>174.85</b>	WO340815	<b>209.85</b>
1.0	WO341040	<b>90.65</b>			WO341015	<b>197.00</b>
1.2	WO341240	<b>86.85</b>			WO341215	<b>194.60</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.4 Si, 1.5 Mn, 13 Ni, 26 Cr	1440	650	180	125

## Stainless SS

### SIFMIG 310

Corrosion resistant, chrome-nickel wire for welding heat-resistant austenitic stainless steels.

EN ISO 14343:A 25 20  
BS 2901 310 594

Dia mm	Art #	15kg Spl
0.8	WO360815	<b>443.10</b>
1.0	WO361015	<b>425.70</b>
1.2	WO361215	<b>419.90</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.4 Si, 1.7 Mn, 9 Ni, 30 Cr, 0.1 Mo	1440	750	200	125

### SIFMIG 312

This is a 29.9 stainless MIG wire, suitable for difficult-to-weld steels (Mn steels, tool and spring steels), also dissimilar materials. High resistance to weld metal cracking.

EN ISO 14343: 29 9  
BS: 2901 312S94

Dia mm	Art #	3.75kg Spl	Art #	15kg Spl
0.8	WO350840	<b>99.10</b>	WO350815	<b>311.35</b>
1.0	WO351040	<b>93.85</b>	WO351015	<b>292.65</b>
1.2			WO351215	<b>283.90</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.4 Si, 1.7 Mn, 9 Ni, 30 Cr, 0.1 Mo	1440	750	200	125

### SIFMIG DUPLEX

A 2209 duplex wire for welding austenitic-ferritic stainless alloys providing intergranular, pitting and stress corrosion resistance.

EN 12072 W 22 9 3 N L  
AWS A5.9 ER2209

Dia mm	Art #	15kg Spl
0.8	WO220815	<b>345.75</b>
1.0	WO221015	<b>324.65</b>
1.2	WO221215	<b>315.20</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.7Mn, 22.5Cr, 8.5Ni, 3.3Mo		765	240	

## Stainless Steel Flux Cored Wires SS

### SIFCORED E308LT1-1/4

Rutile flux cored wire for welding 18-8 stainless steel. Suitable for butt and fillet welding in all positions including verticle down.

EN ISO 17633-A-T 19 9 L P C/M 1  
AWS: E308LT1-1/4

Dia mm	Art #	15kg Bkt
1.2	WF331215	<b>648.50</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
10.4 Ni, 18.7 Cr, 1.3Mn, 0.03 C 0.6 Si, 0.018 P, 0.004 S	1450	400	120	

### SIFCORED E309LT1-1/-4

Rutile flux cored wire for welding dissimilar metals. Suitable for butt and fillet welding in all positions including verticle down.

EN ISO 17633-A-T 23 12 L P C/M 1  
AWS: E309LT1-1/-4

Dia mm	Art #	15kg Bkt
1.2	WF341215	<b>675.00</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
12.6 Ni, 23.3 Cr, 1.3 Mn, 0.03C 0.7 Si, 0.018 P, 0.005 S	1450	400	120	

### SIFCORED E316LT1-1/-4

Rutile flux cored wire for welding 18-12-2 stainless steel. Suitable for butt and fillet welding in all positions including verticle down.

EN ISO 17633-A-T 19 12 3 L P C/M 1  
AWS: E316LT1-1/-4

Dia mm	Art #	15kg Bkt
1.2	WF211215	<b>221.60</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
12.3 Ni, 18.4 Cr, 2.9 Mo, 0.03C 0.7 Si, 1.4 Mn, 0.019 P, 0.006 S	1450	400	120	

## Hardfacing STL

### SIFCORED 600

Metal cored wire for wear resistant surfacing parts of steel, cast steel and high Mn steel, subject to abrasion, metal to metal wear, impact and/or compression stresses.

EN 14700 S Fe8  
Din 8555: MSG6-4Z-60

Dia mm	Art #	5.0kg Spl	Art #	15kg Spl
1.0			WO601015	<b>499.65</b>
1.2	WO601250	<b>157.00</b>	WO601215	<b>362.35</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.5C, 0.6Si, 1.5Mn, 5.5Cr, 0.6Mo	n/a	n/a	600	

### SIFMIG HF600

Solid hard facing MIG wire, for high wear resistance.

EN 14700 T Fe8  
Din 8555: MSG6-GZ-60

Dia mm	Art #	5.0kg Spl	Art #	15kg Spl
1.0	WF601050	<b>229.20</b>	WF601015	<b>528.70</b>
1.2	WF601250	<b>166.15</b>	WF601215	<b>383.50</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.45 C, 3 Si, 0.4 Mn, 9 Cr	1450	n/a	570-650	

## Low-Alloy MIG STL

### SIFMIG 120S-G

A low-alloy MIG wire with Cr, Mo and Ni for high-strength steel applications such as earth-moving equipment and crane manufacture.

EN ISO 16834-A: G 89 4 M (Mn4Ni2CrMo),

AWS A5.28 ER120S-G

Dia mm	Art #	15kg Spl	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.8	WG120815	186.20	1.9Mn, 2.1Ni, 0.5Mo, 0.4Cr	690			
1.0	WG121015	176.45					
1.2	WG121215	171.20					

### SIFMIG Ni2

A fine-gained low-alloy steel with 2% nickel for low-temperature applications requiring good toughness, such as offshore platform and pipeline construction.

EN ISO 14341-D G50 6M G2 Ni2

AWS A5.28 ER80S-Ni2

Dia mm	Art #	15kg Spl	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.0	WG721015	158.40	0.1C, 2.1Ni, 1.0Mn	620			
1.2	WG721215	146.95					

## TIG Special Alloys STL AL NI CU SS

### SIFALLOY No73

A copper-nickel-ferrous rod with 30% nickel particularly suitable for highly-stressed corrosion-resistant weld surfacing on cast iron and on unalloyed and low-alloyed steel in applications such as plant engineering.

ISO 24373 Cu7158 (CuNi30)

Dia mm	Art #	5.0kg Ctn	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.6	RT731650	367.75	30.7Ni, 0.5Fe, Cu Bal	1180	420	115	
2.4	RT732450	324.60					
3.2	RT733250	310.30					

### SIFALLOY No79

A copper-nickel-ferrous rod with 10% nickel particularly suitable for highly-stressed corrosion-resistant weld surfacing on cast iron and on unalloyed and low-alloyed steel in applications such as plant engineering.

ISO 24373 Cu7061 (CuNi10)

Dia mm	Art #	5.0kg Ctn	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.6	RT791650	323.15	10.2Ni, 0.5Fe, Cu Bal	1120	300	80	
2.4	RT792450	295.80					
3.2	RT793250	288.65					

### SIFALLOY No75

One of the most widely used titanium alloys. Its high strength, ability to be heat treated, weldability, excellent fatigue strength and hardness make this alloy excellent for a wide range of applications.

AMS 4954, AWS A5.16 ERTI-5

Dia mm	Art #	2.5kg Ctn	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.6	RT751625	1,038.45	0.5C, 5.8Al, Ti Bal			35	
2.4	RT752425	975.80					

### SIFSTEEL HF6

Hard surfacing rod for metal to metal wear, such as wire guides, high speed steel, die and tool steel.

Dia mm	Art #	12 rod/Pkt	Art #	1.0kg Pkt	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.6	ROHF61612	53.15	ROHF61601	194.65	1 C, 0.5 Si, 0.3Mn, 4Cr, 8Mo, 2V, 1.5W	n/a	n/a	60 HRC	
2.4	ROHF62412	99.65	ROHF62401	172.65					

## Aluminium AL

### SIFALUMIN No 14

A pure aluminium (99.5% min) shaved rod which produces a ductile weld equal in strength to that of the base metal. The weld is capable of being hammered, stretched and drawn into shape without fracture.

EN ISO 18273 - S Al 1070 (Al99.7), BS: 2901 1050A, (GIB) (NG3)

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton	% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.6	RO141601	23.50	RO141625	39.15	99.5 Min Al	650	90	15	118
2.4	RO142401	19.80	RO142425	33.00					
3.2	RO143201	19.00	RO143225	31.60					

**SIFALUMIN No 15**

An Aluminium alloy with 5% silicon giving excellent flow characteristics and penetration. Suitable for welding duralumin, cast (LM25) and wrought alloys 6063 (H9), 6061 (H20) and 6082 (H30). Weld will discolour if anodised.

EN ISO 18273 S AI 4043A (AISI5), BS: 2901 4043A, (NG21)

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton
1.6	RO151601	17.75	RO151625	★28.75
2.4	RO152401	16.65	RO152425	★26.10
3.2	RO153201	15.75	RO153225	★25.65
5.0			RO155025	32.00

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Si, Bal Al	635	120	40	118

**SIFALUMIN No 16**

Aluminium rod containing 12% silicon. It has good mechanical properties, excellent corrosion resistance. Suitable for silicon bearing cast aluminium alloys and wrought alloys. Do not use if fabrication is to be anodised.

EN ISO 18273 S AI 4047A (AISI12), BS: 2901 4047A, (NG2)

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton
1.6	RO161601	28.90	RO161625	★48.15
2.4	RO162401	24.60	RO162425	★40.90
3.2	RO163201	23.55	RO163225	★39.20
5.0			RO165025	45.55

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
12 Si, Bal Al	585	150	50	118

**SIFALUMIN No 27**

A general purpose aluminium rod containing 5% magnesium that has excellent corrosion resistance and high strength. Suitable for welding magnesium bearing aluminium alloys such as 5251 (N4), 5154 (N5), 5454 (N51) and also heat treatable alloys 6063 (H9), 6061 (H20) and 6082 (H30).

EN ISO 18273 S AI 5356 (AlMg5), BS: 2901 5356, (NG6)

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton
1.6	RO271601	18.40	RO271625	★29.75
2.4	RO272401	16.30	RO272425	★26.45
3.2	RO273201	15.20	RO273225	★26.05

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Mg, Bal Al	640	250	60	118

**SIFALUMIN No 28**

Special aluminium alloy containing 5% Magnesium and 0.75% Manganese, for improved weld strength.

EN ISO 18273 S AI 5183 (AlMg4.5Mn0.7), BS: 2901 5183

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton
1.6	RO281601	28.15	RO281625	46.85
2.4	RO282401	23.80	RO282425	39.65
3.2	RO283201	22.75	RO283225	37.90

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Mg, 0.75 Mn, Bal Al	640	275	65	118

**SIFALUMIN No 37**

Aluminium alloy containing 5.3% Magnesium: all elements are closely controlled for optimum weld strength. Normally used on 5083 (N8) and for military applications.

EN ISO 18273 S AI 5556A (AlMg5Mn), BS: 2901 5556

Dia mm	Art #	1kg Pkt	Art #	2.5kg Carton
1.6	RO371601	28.15	RO371625	★46.85
2.4	RO372401	23.80	RO372425	★39.65
3.2	RO373201	22.75	RO373225	★37.90

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5.3Mg, 0.8Mn, 0.1Cr, 0.1Ti, Bal Al	640	300	70	118

**SIF MAGNESIUM No 23**

Magnesium rod with 6% Aluminium suitable for welding magnesium aluminium alloy castings of similar composition, crankcases, gearboxes, sumps, wheels etc.

AZ61A

Dia mm	Art #	12 rod/packet	Art #	1kg Pkt
3.0	RO233212	73.95	RO233201	291.55

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
6 Al, 0.6 Zn, 0.3Mn, Bal Mg	610	280	N/A	

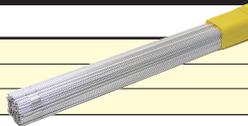
**Copper & Tig Brazing** CU**SIFSILCOPPER No 7 HQ**

Refined especially for TIG applications, with an improved surface finish, No7 HQ is an easy-flowing, porosity-free rod for deoxidised copper. Suitable for copper tanks, pipe, sheet and bar. For copper No7 (for oxy/fuel) see page 120.

EN ISO 24373 Cu 1897 (CuAg1), BS 1453 C1

Dia mm	Art #	5.0kg Ctn
1.6	RO071650HQ	312.90
2.4	RO072450HQ	282.80
3.2	RO073250HQ	263.55

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1 Ag, Bal Cu	1060	200	75	124



## SIFPHOSPHOR BRONZE No 8

The phosphor bronze rod contains 7% tin and is suitable for fusion welding of phosphor bronze castings and copper alloys (brass). It is also used for TIG brazing on ferrous and dissimilar metals.

ISO 24373 Cu 5180A (CuSn6P),  
BS: 2901 C11

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.2	RO081201	80.55	RO081225	148.40	RO081250	268.25
1.6	RO081601	76.55	RO081625	137.20	RO081650	255.15
2.4	RO082401	64.85	RO082425	116.10	RO082450	215.90
3.2	RO083201	62.90	RO083225	112.55	RO083250	209.55
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
7 Sn, Bal Cu		900-1050	260	80	121	

## SIFPHOSPHOR BRONZE No 82

Phosphor bronze rod with 12% Tin, for improved colour match on brass and bronze.

ISO 24373 Cu 5410 (CuSn12P),  
BS: 2901 C27

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO821601	117.10	RO821625	210.00	RO821650	390.10
2.4	RO822401	93.60	RO822425	164.85	RO822450	311.80
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
12 Sn, 0.2 P, Bal Cu		850-1000	320	120	124	

## SIFALBRONZE No 32

This is a 90/10 aluminium bronze rod suitable for welding materials of a similar composition. It is used for surfacing and dissimilar metal joints, also TIG brazing on ferrous and dissimilar metals.

ISO 24373 Cu 6180 (CuAl110Fe),  
BS: 2901 C.13

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO321601	92.10	RO321625	165.40	RO321650	306.90
2.4	RO322401	84.75	RO322425	151.70	RO322450	282.40
3.2	RO323201	80.00	RO323225	143.65	RO323250	266.55
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
10 Al, 1 Fe, Bal Cu		1030	500	95	121	

## SIFALBRONZE No 44

Nickel aluminium bronze for AB2 material and marine/corrosive applications.

ISO 24373 Cu 6328 (CuAl9Ni5Fe3Mn2),  
BS: 2901 C20/C26

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
2.4	RO442401	115.20	RO442425	206.95	RO442450	383.85
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
83 Cu, 9 Al, 3 Fe, 4 Ni, 1 Mn		1050	700	290		

## SIFSILCOPPER No 968

A copper rod, containing 3% silicon and 1% manganese used for fusion welding materials of similar composition, copper alloys (brass) and for TIG brazing steels. It is also suitable for surfacing steel and dissimilar metal applications.

ISO 24373 Cu 6560 (CuSi3Mn1),  
BS: 2901 C9

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.2	RO961201	59.25	RO961225	106.80	RO961250	★197.30
1.6	RO961601	55.10	RO961625	102.20	RO961650	★184.70
2.4	RO962401	48.05	RO962425	86.30	RO962450	★156.45
3.2	RO963201	45.00	RO963225	80.60	RO963250	146.65
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
1 Mn, 3 Si, Bal Cu		980-120	350	90	121	

## SIFSILCOPPER No 985

High quality rod containing a minimum of 98.5% copper with deoxidizing elements. It is ideal for TIG welding of copper.

ISO 24373 Cu 1898 (CuSn1)  
BS: 2901 C7

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.2	RO981201	75.85	RO981225	130.80	RO981250	252.65
1.6	RO981601	72.85	RO981625	127.20	RO981650	242.55
2.4	RO982401	62.05	RO982425	111.40	RO982450	206.40
3.2	RO983201	60.20	RO983225	107.10	RO983250	199.10
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.25 Mn, 0.25 Si, Bal Cu		1025	220	70	124	

## Stainless SS

### SIFSTEEL STAINLESS 347

Stainless steel filler rod, niobium stabilised to prevent weld decay, giving excellent corrosion resistance. Suitable for use on 18/8 type stainless steel, Nb and Ti stabilised, such as 304, 321 and where the weld is subjected to temperatures above 400°C

EN ISO 14343: 19 9 Nb,  
BS: 2901 347S96

Dia mm	Art #	1kg Pkt	Art #	2.5kg Ctn	Art #	5.0kg Ctn
1.0	RO201001	28.95	RO201025	51.40	RO201050	99.70
1.2	RO201201	25.40	RO201225	45.50	RO201250	88.20
1.6	RO201601	22.40	RO201625	36.75	RO201650	71.20
2.4	RO202401	22.05	RO202425	34.05	RO202450	66.00
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.04 C, 0.4 Si, 1.5 Mn, 10 Ni, 20 Cr 0.6 Nb		1440	650	180	125	

**SIFSTEEL STAINLESS 308L**

Stainless steel filler rod suitable for welding 18/8 (304) austenitic stainless steels, providing good corrosion and wear resistance.

EN ISO 14343: 19 9 L,  
BS: 2901 308S92

Dia mm	Art #	1kg Pkt	Art #	2.5kg Ctn	Art #	5.0kg Ctn
1.6	RO331601	20.40	RO331625	33.05	RO331650	★ 58.30
2.4	RO332401	19.85	RO332425	32.20	RO332450	★ 56.85
3.2	RO333201	19.10	RO333225	30.75	RO333250	★ 54.25
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.02 C, 0.4 Si, 1.5 Mn, 10 Ni, 21 Cr		1440	650	180	125	

**SIFSTEEL STAINLESS 316L**

A molybdenum bearing, stainless steel filler rod with low carbon content. It is corrosion resistant for welding molybdenum bearing austenitic stainless steels.

EN ISO 14343: 19 12 3 L,  
BS: 2901 316S92

Dia mm	Art #	1kg Pkt	Art #	2.5kg Ctn	Art #	5.0kg Ctn
0.8	RO210801	35.80	RO210825	57.25		
1.0	RO211001	30.45	RO211025	48.45	RO211050	★ 85.60
1.2	RO211201	28.30	RO211225	42.55	RO211250	★ 73.45
1.6	RO211601	21.35	RO211625	31.15	RO211650	★ 44.60
2.4	RO212401	21.00	RO212425	30.60	RO212450	★ 43.80
3.2	RO213201	20.30	RO213225	29.40	RO213250	★ 42.25
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.02 C, 0.4 Si, 1.5 Mn, 12 Ni, 19 Cr, 2 Mo		1440	650	180	125	

**SIFSTEEL STAINLESS 310**

A solid corrosion-resistant, chromium-nickel rod for TIG welding heat-resistant austenitic steels with high 25% Cr / 20% Ni contents. Offers good general oxidation resistance - especially at high temperatures - and is therefore common in industrial furnaces and heat exchangers. Fully austenitic therefore sensitive to hot cracking.

EN ISO 14343 G 25 20,  
AWS A5.9 ER310

Dia mm	Art #	2.5kg Ctn			
1.2	RT701225	87.10			
1.6	RT701625	82.60			
2.4	RT702425	79.10			
3.2	RT703225	78.40			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 1.8Mn, 26Cr, 21Ni		1440	590	200	

**SIFSTEEL STAINLESS 309LSI**

This stainless rod contains higher chromium and nickel. It can be used for joining material of similar composition and also dissimilar stainless steels.

EN ISO 14343: 23 12 LSi,  
BS: 2901 309S93

Dia mm	Art #	1kg Pkt	Art #	2.5kg Ctn	Art #	5.0kg Ctn
1.6	RO341601	23.15	RO341625	38.05	RO341650	★ 65.90
2.4	RO342401	20.80	RO342425	34.20	RO342450	★ 59.70
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.02 C, 0.7 Si, 1.8 Mn, 13 Ni, 23 Cr		1440	650	180	125	

**SIFSTEEL STAINLESS 312**

This is a 29.9 stainless TIG filler rod, suitable for difficult-to-weld steels (Mn steels, tool and spring steels), also dissimilar materials. High resistance to weld metal cracking.

EN ISO 14343: 29 9,  
BS: 2901 312S94

Dia mm	Art #	1kg Pkt	Art #	2.5kg Ctn	Art #	5.0kg Ctn
1.0	RO351001	37.65	RO351025	77.25	RO351050	149.70
1.2	RO351201	34.90	RO351225	71.50	RO351250	138.70
1.6	RO351601	28.90	RO351625	58.45	RO351650	113.45
2.4	RO352401	27.90	RO352425	56.45	RO352450	109.40
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.1 C, 0.4 Si, 1.7 Mn, 9 Ni, 30 Cr, 0.1 Mo		1440	750	200	125	

**SIFSTEEL STAINLESS DUPLEX**

A 2209 duplex wire for welding austenitic-ferritic stainless alloys providing intergranular, pitting and stress corrosion resistance.

EN 12072 W 22 9 3 N L  
AWS A5.9 ER2209

Dia mm	Art #	5.0kg Ctn			
1.6	RT741650	133.60			
2.4	RT742450	128.20			
3.2	RT743250	126.40			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.7Mn, 22.5Cr, 8.5Ni, 3.3Mo			765	240	

**SIFSTEEL STAINLESS SUPER DUPLEX**

A 2594 super duplex rod for welding austenitic-ferritic stainless alloys where a high corrosion resistance is required.

EN 12072 W 25 9 4 N L  
AWS A5.9 ER2594

Dia mm	Art #	5.0kg Ctn			
1.6	RT781650	296.10			
2.4	RT782450	282.50			
3.2	RT783250	280.60			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.4Mn, 25.0Cr, 9.8Ni, 4.0Mo			850	250	

## Steel **STL**

### SIFSTEEL A15

A copper-coated triple deoxidised mild steel rod. Used with the TIG process it enables sound porosity free welds to be made on mild and low-alloy steels. Typical applications include pipe welding and root runs on heavy vessels.

EN ISO 636-A : 2008 W2Ti  
BS: 2901 A15, AWS ER70S-2,  
EN 1668: W2Ti

Dia mm	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.0	RA151025	<b>47.35</b>	RA151050	<b>75.80</b>
1.2	RA151225	<b>37.80</b>	RA151250	<b>60.25</b>
1.6	RA151625	<b>27.60</b>	RA151650	<b>★43.40</b>
2.4	RA152425	<b>25.40</b>	RA152450	<b>★39.65</b>
3.2	RA153225	<b>23.60</b>	RA153250	<b>★38.45</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 0.6Si, 1.3Mn, 0.2Al	1450	440	120	126

### SIFSTEEL A17

Low carbon, double deoxidised rod for TIG welding mild steel.

BS: 2901 A17

Dia mm	Art #	5.0kg Ctn
1.6	RA171650	<b>72.35</b>
2.4	RA172450	<b>67.35</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 0.3 Si, 1 Mn	1450	400	120	126

### SIFSTEEL A18

Copper coated deoxidised steel rod for TIG welding of mild steel.

EN ISO 636-A  
W3Si1  
BS: 2901 A18,  
AWS ER70S-6



Dia mm	Art #	5.0kg Ctn
1.0	RA181050	<b>68.95</b>
1.2	RA181250	<b>60.80</b>
1.6	RA181650	<b>55.50</b>
2.4	RA182450	<b>51.05</b>
3.2	RA183250	<b>47.45</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 1 Si, 1.3 Mn	1450	400	120	126

### SIFSTEEL A31

A copper-coated alloy steel rod containing 0.5% molybdenum. Suitable for use on low temperature pressure vessel and pipe work applications.

EN ISO 14341-A G4Mo  
BS: 2901 A31, AWS: ER 80S-D2

Dia mm	Art #	5.0kg Ctn
1.6	RA311650	<b>74.00</b>
2.4	RA312450	<b>63.65</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.7 Si, 1.8 Mn, 0.5 Mo	1450	460	180	126

### SIFSTEEL A32

A copper coated alloy steel rod containing 1.0% chromium, 0.5% molybdenum. Ideal for creep resistant steels of a similar composition.

EN ISO 21952-A W CrMo1Si (1C1M)  
BS: 2901 A32, AWS ER80S-B2

Dia mm	Art #	5.0kg Ctn
1.0	RA321050	<b>136.95</b>
1.2	RA321250	<b>113.55</b>
1.6	RA321650	<b>107.35</b>
2.4	RA322450	<b>99.75</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.5 Si, 1 Mn, 1.3 Cr, 0.5 Mo	1450	500	180	126

### SIFSTEEL A33

A copper-coated alloy steel rod containing 2.5% chromium, 1.0% Molybdenum. It is suitable for high temperature and pressure applications on materials of similar composition.

EN ISO 21952-A W CrMo2Si (2C1M)  
BS: 2901 A33, AWS ER90S-B3

Dia mm	Art #	5.0kg Ctn
1.6	RA331650	<b>133.85</b>
2.4	RA332450	<b>122.70</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.5 Si, 1 Mn, 2.4 Cr, 1 Mo	1450	525	200	126

### SIFSTEEL Ni2

A fine-grained low-alloy TIG rod with 2% Nickel for applications such as pipeline and offshore platform construction, where good fracture-toughness is required at low temperatures (eg -60°C).

EN ISO 636-A W2Ni2,  
AWS A5.28 ER80S-Ni2

Dia mm	Art #	5.0kg Ctn
1.6	RT721650	<b>52.80</b>
2.4	RT722450	<b>49.65</b>
3.2	RT723250	<b>48.05</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 2.1Ni, 1.0Mn		620		

## Copper/Phosphorous & Silver Solder **CU**

### SIFCUPRON No 17

This copper phosphorus alloy rod is self-fluxing on copper. Its good electrical conductivity and corrosion resistance make it ideal for copper tubing, switchgear, motors etc.

EN ISO 17672 CuP 180  
EN 1044: CP201, BS: 1845 CP3

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.5	RO171501	52.20	RO171525	★92.75	RO171550	★173.85
2.4	RO172401	50.55	RO172425	★90.45	RO172450	★168.15
3.2	RO173201	49.10	RO173225	★89.60	RO173250	★163.45
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
7 P, Bal Cu		705-800	500	200	122	

### SIFCUPRON No 17-2Ag

A copper phosphorus alloy with the addition of 2% silver to improve ductility and flowing characteristics. Highly resistant to corrosion and not subject to dezincification. It is ideal for hot water cylinders, electric motors and also general maintenance work.

EN ISO 17672 CuP 280  
EN 1044: CP105, BS: 1845 CP2

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO181601	96.55	RO181625	★186.10	RO181650	★344.75
2.4	RO182401	89.80	RO182425	★172.45	RO182450	★320.65
3.2	RO183201	86.85	RO183225	★167.50	RO183250	★310.05
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
2 Ag, 6 P, Bal Cu		645-740	430	195	122	

### SIFCUPRON No 17-5Ag

Copper/Phosphorus alloy with 5% silver, having ductility and capillary flow characteristics between 17-2 Ag and 17-15 Ag.

EN ISO 17672 CuP 282  
EN 1044: CP104, BS: 1845 CP4

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.5	RO1815015Ag	183.25	RO1815255Ag	347.80	RO1815505Ag	654.15
2.5	RO1825015Ag	181.50	RO1825255Ag	345.60	RO1825505Ag	648.20
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
5 Ag, 6 P, Bal Cu		645-730	600	190	122	

### SIFCUPRON No 17-15Ag

Copper/Phosphorus alloy with 15% silver for stressed applications. Ideal for poor fitting joints.

EN ISO 17672 CuP 284  
EN 1044: CP102, BS: 1845 CP1

Dia mm	Art #	4 rod/Pkt	Art #	6 rod/Pkt		
1.5			RO181506	37.75		
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
15 Ag, 5 P, Bal Cu		645-700	640	185	122	

### SIF SILVER SOLDER No 39

CADMIUM FREE silver solder suitable for use on all ferrous and non-ferrous metals, except aluminium. It can be used with a range of heat sources. Use SIF SILVER SOLDER flux.

EN ISO 17672 Ag 138

Dia mm	Art #	4 rod/Pkt	Art #	6 rod/Pkt	Art #	1kg Pkt
1.5			RO391506	63.60	RX391500	896.40
2.0					RX392000	628.60
2.5	RO392504	96.85			RX392500	887.20
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
38 Ag, 32 Cu, 28 Zn, 2 Sn		650-725	460	140	122	

### SIF SILVER SOLDER No 40

A popular grade of Silver Solder offering good capillary action and ductility in many ferrous and non-ferrous applications. Use with SIF SILVER SOLDER flux.

EN ISO 17672 Ag 140

Dia mm	Art #	4 rod/Pkt	Art #	6 rod/Pkt	Art #	1kg Pkt
1.5					RX401500	939.75
2.0					RX402000	930.50
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
40 Ag, 30 Cu, 28 Zn, 2 Sn		670-710	440	130	122	

### SIF SILVER SOLDER No 43

CADMIUM FREE 55% Silver Solder, which is free flowing and ideal for close fitting capillary joints and for colour match on stainless. Use SIF SILVER SOLDER flux.

EN ISO 17672 Ag 155  
EN 1044: AG 103, BS: 1845 AG14

Dia mm	Art #	6 rod/Pkt	Art #	1kg Pkt		
1.5	RO431506	84.25	RX431500	1,264.45		
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
55 Ag, 21 Cu, 22 Zn, 2Sn		630-660	415	145	122	

### SIF SILVERCOTE No 43

CADMIUM FREE Silver Solder No.43 with full flux coating.

EN ISO 17672 Ag 155  
EN 1044: AG 103, BS: 1845 AG14

Dia mm	Art #	4 rod/Pkt	Art #	6 rod/Pkt	Art #	1kg Pkt
1.5	RR431506	107.25	RR431501	1,106.90		
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
55 Ag, 21 Cu, 22 Zn, 2Sn		630-660	415	145	122	

For SIF Silver Solder bulk 1kg; nett prices available on application.

## General Brazing (Silicon Bronze), Nickel Bronze **CU**

### SIFBRONZE No 1

Original multi-purpose Sifbronze low temperature rod for brazing and bronze welding of steels, cast iron, copper and its alloys. Ideally suited for general mild steel work, galvanised steel and dissimilar metal applications. Use SIFBRONZE flux.

EN 1044: CU 302,  
BS: 1845 CZ6A, 1453 C2

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO011601	34.45	RO011625	★ 66.00	RO011650	★ 123.15
2.4	RO012401	31.00	RO012425	★ 59.60	RO012450	★ 110.70
3.2	RO013201	28.55	RO013225	★ 54.80	RO013250	★ 101.80
4.8					RO014850	101.80
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
60 Cu, 0.3 Sn, 0.3 Si, Bal Zn		875-895	430	120	122 & 123	

### SIFREDICOTE No 1

This rod is Sifbronze No.1 with a full flux coating providing the added benefit of faster, continuous brazing through not having to flux-dip. It is ideally suited for general mild steel work, galvanised steel and dissimilar metal applications.

EN 1044: CU 302,  
BS: 1845 CZ6A, 1453 C2

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RR011601	60.40	RR011625	★ 114.30		
2.4	RR012401	41.70	RR012425	★ 79.35	RR012450	★ 147.75
3.2	RR013201	34.50	RR013225	★ 67.05	RR013250	★ 124.20
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
60 Cu, 0.3 Sn, 0.3 Si, Bal Zn		875-895	430	120	122	

### SIF AUTOBRONZE

Free flowing flux impregnated brazing rod, ideal for brazing clean mild steel.

EN 1044: CU 302,  
BS: 1845 CZ6A, 1453 C2



Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
2.4	RS412401	46.30	RS412425	89.50	RS412450	173.90
3.2	RS413201	42.95	RS413225	84.50	RS413250	161.40
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
60 Cu, 0.3 Sn, 0.3 Si, Bal Zn		875-895	430	120	122	

### SIFBRONZE No 101

A special brazing rod containing specific additions of Manganese and Tin, giving it free flowing characteristics. It is particularly suitable for use with 'gas flux'.

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.5	RO101501	39.05	RO101525	75.60	RO101550	141.15
2.0	RO102001	36.00	RO102025	69.65	RO102050	128.55
2.5	RO102501	34.05	RO102525	65.30	RO102550	121.45
3.0	RO103001	32.20	RO103025	61.25	RO103050	115.10
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
60 Cu, 0.2 Mn, 0.1 Si, 0.1 Sn, Bal Zn		870-890	460	130	122 & 123	

### SIFBRONZE No 2

Brazing rod containing 9% nickel, for use on cast iron, copper alloys, stainless and alloy steels. It has excellent wearing properties and high strength making it ideal for tubular structures, brazing cutting tips and as a general maintenance alloy. Use SIFBRONZE or SIF TOOL TIP/BRAZE STAINLESS flux.

EN ISO 17672 Cu773  
EN 1044: CU305,  
BS: 1845 CZ8, 1453 C5

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO021601	82.50	RO021625	158.25	RO021650	294.45
2.4	RO022401	71.85	RO022425	137.75	RO022450	256.30
3.2	RO023201	66.45	RO023225	127.25	RO023250	237.10
4.8					RO024850	237.10
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
48 Cu, 10 Ni, 0.3 Si, Bal Zn		920-980	540	200	122 & 123	

### SIFREDICOTE No 2

This rod is Sifbronze No.2 with a full flux coating and with similar characteristics. The UTS is approximately 25% greater than Sifredicote No.1 and is ideal for high strength production and maintenance applications.

EN ISO 17672 Cu773  
EN 1044: CU305,  
BS: 1845 CZ8, 1453 C5

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
2.4	RR022401	91.65	RR022425	176.00	RR022450	327.25
3.2	RR023201	76.50	RR023225	146.40	RR023250	272.50
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
48 Cu, 10 Ni, 0.3 Si, Bal Zn		920-980	540	200	122	

## Aluminium, Cast Iron, Copper, Stainless AL NI CU SS

### SIF FLUXCORE ALUMINIUM

Flux cored 5% Silicon Aluminium rod: ideal for oxy/acetylene general repair work.

Dia mm	Art #	1kg Pkt			
3.0	RO153001F	78.70			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
5 Si, Bal Al		635	120	40	118

### SIF 555 AL SOLDER

Self fluxing solder for use on Aluminium and its alloys. Separate instruction sheet available.

Dia mm	Art #	12 rod/Pkt	Art #	1kg Pkt	Art #	2.5kgCtn
3.0	RO553212	24.30	RO553201	70.50	RO553225	144.65
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
93 Zn, 4 Al, 3 Cu		380	200	100	119	

### AUTOTIN SOLDER

Ideal for use as a fitting solder for copper pipe installations and plumbing works or for finishing/repair on metal goods. Suitable for use in the food stuffs industry.

Dia mm	Art #		1kg Pkt			
5.0	FXS0928501		129.10			
10.0	FXS09281001		133.10			
12.0	FXS09281201		135.40			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
92 Zn, 8Cu		227-418				

EN ISO 9453: 2006 S-Sn92Cu8

### SIFALUMIN No 16

A rod for brazing aluminium that enables strong, neat joints to be easily produced. Difficulties can occur on alloys containing magnesium in excess of 2% and high silicon alloys. Use SIF ALUMINIUM flux.

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn		
1.6	RO161601	28.90	RO161625	★ 48.15		
2.4	RO162401	24.60	RO162425	★ 40.90		
3.2	RO163201	23.55	RO163225	★ 39.20		
5.0			RO165025	45.55		
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
12 Si, Bal Al		585	150	50	119	

EN ISO 17672 Al 112

EN ISO 18273 S Al 4047A (AISi12), BS: 2901 4047A, (NG2)

### SIFSILCOPPER No 7

An easy flowing, high quality copper rod for full fusion welding of deoxidised copper. Suitable for fabrication and repairs to copper pipes, tanks etc. Use SIFSILCOPPER flux.

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO071601	81.75	RO071625	146.70	RO071650	272.10
2.4	RO072401	73.80	RO072425	132.15	RO072450	245.95
3.2	RO073201	68.80	RO073225	124.50	RO073250	229.20
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
1 Ag, Bal Cu		1060	200	75	124	

EN 14640 Cu 1897 (CuAg1), BS:1453 C1

### SUPER SILICON No 9

The rod is suitable for full fusion welding of cast iron, providing a high strength weld metal which is easily machinable. It gives an excellent colour match and has the same structure as grey cast iron. Use SIF CAST IRON flux.

Dia mm	Art #	1kg Pkt	Art #			5.0kg Ctn
4.0	RO094001	33.75	RO094050			136.10
5.0			RO095050			126.05
6.0			RO096050			106.65
10.0			RO091050			83.00
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
3.3 C, 3.0 Si, 0.7 Mn, 0.1 S, 0.5 P		1250	200	180	126	

### SIF SUPER SG CAST IRON

This rod is suitable for full fusion oxy-acetylene welding of Spheroidal Graphite cast iron, providing a machinable weld.

Use SIF CAST IRON flux.

Dia mm	Art #	1kg Pkt	Art #			5.0kg Ctn
6.0	RO296001	28.35	RO296050			119.85
10.0			RO291050			91.10
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
3.7 C, 2.5 Si, 0.1 Mn		1250	400	190	126	

### SIFSTEEL STAINLESS 308L

Stainless steel filler rod suitable for welding 18/8 (304) austenitic stainless steels. For gas welding use SIF STAINLESS flux.

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO331601	20.40	RO331625	33.05	RO331650	★ 58.30
2.4	RO332401	19.85	RO332425	32.20	RO332450	★ 56.85
3.2	RO333201	19.10	RO333225	30.75	RO333250	★ 54.25
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.02 C, 0.4 Si, 1.5 Mn, 10 Ni, 21 Cr		1440	650	180	125	

EN ISO 14343: 19 9 L, BS: 2901 308S92

## Steel

### SIFSTEEL No 11

A low-carbon mild steel rod ideal for all types of mild steel and wrought iron welding. It is free-flowing and produces a high strength ductile weld. It is copper coated to ensure long shelf life. Particularly suitable for sheet metal panels, plates, tubes and fittings.

EN 12536 01  
BS: 1453 A1, EN 12536: 01

Dia mm	Art #	1kg Pkt	Art #	2.5kgCtn	Art #	5.0kg Ctn
1.6	RO111601	7.80	RO111625	17.00	RO111650	★ 27.30
2.4	RO112401	7.25	RO112425	15.95	RO112450	★ 25.05
3.2	RO113201	6.80	RO113225	14.80	RO113250	★ 23.95
4.8					RO114850	27.00
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page	
0.06 C, 0.4 Mn		1450	350	120	126	

### SIFSTEEL No 22

A special alloy steel rod containing manganese for toughness. It provides a weld deposit of high strength and ductility. Recommended for oxy/acetylene welding of pipelines and pressure vessels.

EN 12536: 011, BS: 1453 A2

Dia mm	Art #	5.0kg Ctn			
1.6	RO221650	51.45			
2.5	RO222550	48.70			
3.0	RO223050	47.25			
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1 C, 0.1 Si, 1.1 Mn		1450	450	140	126

## Flux powder & GasFlux

### ALUMINIUM

Powder fluxes for gas welding and brazing aluminium and its alloys.

EN 1045 - FL10

Art #	500g Jar
FO120050	28.60 For brazing and low-melting point alloys
FO140050	27.80 For brazing and low-melting point alloys
FO360050	27.40 For welding and higher-melting-point alloys

### CAST IRON

Powder flux for fusion welding cast iron.

EN 1045 - FH20

Art #	500g Jar
FO090050	19.55

### SIFBRONZE

Powder flux for general brazing work.

EN 1045 - FH10

Art #	225g Jar	Art #	500g Jar
FO010022	11.45	FO010050	★ 17.55

### ECO FLUX PASTE

A pre-mixed paste at optimal liquidity free of boric acid and suitable for brazing of mild steel and copper alloys.

EN 1045 - FH10

Art #	350g Jar
FO050035	20.85

### SIFSILCOPPER

Powder flux for brazing and welding copper alloys.

EN 1045 - FH11

Art #	500g Jar
FO070050	22.85

### SILVER SOLDER

Powder flux for silver solder operations.

EN 1045 - FH10

Art #	500g Jar
FO380050	★ 46.80

### TOOL TIP/BRAZE STAINLESS

Powder flux for Tool Tipping or brazing stainless with Sifbronze No 1 or No 2. Also for oxy/fuel welding of stainless.

EN 1045 - FH12

Art #	500g Jar
FO020050	28.95

### SIF GASFLUX LIQUID

Specially formulated liquid of Methanol and trimethylborate, which allows fuel gas (acetylene) to absorb flux into the torch flame. It is a flammable liquid UN No 1993 and is supplied in 3 litre plastic containers.

EN 1045 - FH10 £35 hazardous goods freight surcharge applies to all shipments.

Art #	3L container	Qty	SIF TIPS page
FXGF3L	239.35	4 containers per ctn	123

### GASFLUXER - MODEL 69-D

Gas fluxer unit with removeable filling tank.

Art #	Qty	SIF TIPS page
FXGF69D	1,352.10	123



ROD LENGTH	Diameter mm	1.0	1.2	1.6	2.4	3.2	4.8
1000mm	Aluminium			200	90	48	20
	Brazing & Copper		105	60	28	15	7
	Flux Coated			42	25	14	
	Stainless & Steel	170	115	65	30	16	7
	Average Qty Rods Per Kilo						
ROD LENGTH	Diameter mm	1.5	2.5	4.0	6.0	10.0	
500mm	Cast Iron			16	7	3	
	Silver Solder (bare)	119	44				
	Sil Sol flux coated	80					
Average Qty Rods Per Kilo							

**SIFTRODE** **STL****SIFTRODE 6013-M**

General purpose multi-positional rutile-coated mild steel electrode with stable arc and easy-lifting slag.

Dia mm	Art #	2.5kg Pkt	Art #	5.0kg Ctn	Pcs/Pkt
2.5	RE652525 ★	10.15	RE652550 ★	18.00	265
3.2	RE653225	10.15	RE653250 ★	18.00	170
4.0	RE654025	10.15	RE654050 ★	18.00	115

AWS A5.1: E 6013  
EN ISO 2560 E 42 0 11

**SIFTRODE 7018-M**

Basic-coated low-hydrogen electrode with high efficiency and good mechanical properties.

Dia mm	Art #	2.5kg Pkt	Art #	5.0kg Ctn	Pcs/Pkt
2.5	RE752525	11.30	RE752550 ★	19.90	220
3.2	RE753225	11.30	RE753250 ★	19.90	140
4.0	RE754025	11.30	RE754050 ★	19.90	90

AWS A5.1: E 7018  
EN ISO 2560 E 42 4 B 42

**SIFTRODE 6013**

General purpose multi-positional rutile-coated mild steel electrode with stable arc and easy-lifting slag.

Dia mm	Art #	2.0kg Pkt	Art #	5.0kg Ctn	Pcs/Pkt
1.6	RE601602 ★	42.45			285
2.5			RE602550 ★	20.15	265
3.2			RE603250 ★	19.05	170
4.0			RE604050 ★	19.05	115

CE EN13479

AWS A5.1: E 6013  
EN ISO 2560 E 42 0 RC 11

**SIFTRODE 7018**

Basic-coated low-hydrogen electrode with high efficiency and good mechanical properties.



Dia mm	Art #	5.0kg Ctn	Pcs/Pkt
2.5	RE702550 ★	28.05	220
3.2	RE703250 ★	26.50	140
4.0	RE704050 ★	26.50	90

AWS A5.1: E 7018  
EN ISO 2560 E 42 4 B 42 H5

CE EN13479

**SIFTRODE 7016 SPEZIAL**

A vac-packed rutile-basic-coated spezial low-hydrogen electrode for all positions. Suitable for mild, medium/high-tensile and low-alloy steels and as a buffer layer.

Dia mm	Art #	5.0kg Vac
2.5	RE712550V	66.70
3.2	RE713250V	65.20
4.0	RE714050V	63.90

EN 499 E 38 3 B 42 H10,  
AWS A5.1 E 7016

**SIFTRODE 7024**

An iron-powder rutile-coated electrode with about 150% efficiency. For butt & fillet welds on medium to thick plates in shipbuilding and structural steel.

Dia mm	Art #	5.0kg Ctn
2.5	RE723250	44.00
3.2	RE724050	39.70
4.0	RE725050	37.35

EN ISO 2560-A: E 42 0 RR 54,  
AWS A 5.1: E7024

**SIFTRODE 6010**

A vac-packed cellulosic electrode for pipe welding, performing well in all positions, especially vertical down.

Dia mm	Art #	5.0kg Tin
2.5	RE612550V	100.05
3.2	RE613250V	97.30
4.0	RE614050V	92.05

EN 499 E 42 3 C 25,  
AWS A5.1 E 6010

**SIFTRODE 225**

A stable, low-spatter electrode with 2.25% Cr and 1.0% Mo for creep- and heat-resistance (<600°C). Suited to pressure-vessel, power-plant and refinery applications.

Dia mm	Art #	5.0kg Vac
2.5	RC222550V	140.30
3.2	RC223250V	139.10
4.0	RC224050V	136.25

EN 1599 E CrMo2 B  
AWS A5.5 E 9018-B3

## Stainless SS

### SIFCHROME 308L

Rutile coated electrode for welding austenitic stainless steel (304). Suitable for dairy and cold storage applications. Self-releasing slag and an excellent weld appearance.

EN 1600:E 19 9 LR 32

AWS: E308L-17

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	RC3082540	4.0kg	225 ★	103.15	
3.2	RC3083240	4.0kg	120 ★	98.55	
4.0	RC3084040	4.0kg	80 ★	96.20	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.03C, 0.8 Si, 0.8Mn, 19.8 Cr, 10.2 Ni		n/a	>550	n/a	125

### SIFCHROME 316L

Rutile coated electrode for welding molybdenum alloyed 18/12 and similar Cr/Ni/Mo steels. High resistance against general and intergranular corrosion. Self-releasing slag and an excellent weld appearance.

EN 1600:E 19 12 3 LR 12

AWS: E316L-17

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
1.5	RC3161540	4.0kg	705 ★	268.10	
2.0	RC3162040	4.0kg	350 ★	144.55	
2.5	RC3162540	4.0kg	225 ★	107.85	
3.2	RC3163240	4.0kg	110 ★	103.15	
4.0	RC3164040	4.0kg	80 ★	109.05	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.03C, 0.8Si, 0.8Mn, 18.8Cr, 11.7Ni, 2.7Mo		n/a	>550	n/a	125

### SIFCHROME 316L CRYO

A 316L grade low carbon stainless steel electrode suitable for use in applications where the mechanical requirements are tough. It provides good impact toughness at low temperatures and 100% recovery. Re-dry at 200°C for 2 hours.

EN 1600:E 19 12 3 LB 22

AWS: A5.4 E316L-15

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	RC3162540CRYO	4.0kg	225 ★	135.30	
3.2	RC3163240CRYO	4.0kg	110 ★	129.45	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.03C, 0.8Si, 0.8Mn, 18.8Cr, 11.7Ni, 2.7Mo		n/a	>550	n/a	125

### SIFCHROME 312

Rutile coated high Cr/Ni electrode for welding of difficult-to-weld steels like armour plate, austenitic Mn steel, high carbon steel and Cr/Ni steels. Self-releasing slag and an excellent weld appearance.

EN 1600:E 29 9 R 32

AWS: E312-17

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	RC3122540	4.0kg	225	145.80	
3.2	RC3123240	4.0kg	120	139.35	
4.0	RC3124040	4.0kg	80	139.85	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 1.2Si, 0.7Mn, 28.5Cr, 9.5Ni		n/a	>800	n/a	125

### HILCHROME 309 R

Rutile coated electrode for welding corrosion resistant and heat resistant Cr/Ni steels, joining dissimilar metals and buffering. Self-releasing slag and an excellent weld appearance.

EN 1600:E 23 12 LR 32

AWS: E309L-17

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	H023093025T	3.6kg	200	168.55	
3.2	H023093532T	4.4kg	130	193.25	
4.0	H023093540T	4.6kg	90	200.30	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.02C, 0.7Si, 0.7Mn, 22.7Cr, 12.5Ni		n/a	>550	n/a	125

### HILCHROME 309Mo R

Rutile coated electrode for joining similar and dissimilar stainless steels, buffering, joining hardenable and difficult-to-weld steels. Self-releasing slag and an excellent weld appearance.

EN 1600:E 23 12 2 LR 32

AWS: E309 MoL-17

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	H023093025MT	3.7kg	200	199.40	
3.2	H023093532MT	4.6kg	125	232.60	
4.0	H023093540MT	4.7kg	90	231.45	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.02C, 0.7Si, 0.8Mn, 23Cr, 12.5Ni, 2.7Mo		n/a	>750	n/a	125

**Hilco - Steel STL****HILCO RED EXTRA**

Universal electrode for welding in all positions, including vertical downwards. Especially suitable for construction work where the use of one single type of electrode is permissible. Very attractive weld appearance. Suitable for both AC and DC current and will operate with low OCV, min 42v.

**AWS: E6013,**  
**EN ISO 2560: E 42 0 RC 11**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
2.0	H01013020H	4.1kg	390 ★	<b>47.50</b>
2.5	H01013525H	5.0kg	275 ★	<b>27.75</b>
3.2	H01013532H	5.0kg	173 ★	<b>25.75</b>
4.0	H01013540H	5.0kg	112 ★	<b>26.80</b>
5.0	H01013550H	5.0kg	71 ★	<b>33.30</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.12C, 0.4Si, 0.6Mn	n/a	>500	n/a	126

**HILCO VELVETA**

Electrode for welding in all positions, especially vertical upwards. The quiet and easily controllable molten pool makes it suitable for pipe welding. Easy striking and restriking. Suitable for AC and DC current; will operate on low OCV, min 42v.

**AWS: E6013,**  
**EN ISO 2560: E 42 0 RR 32**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
2.5	H01033525P	4.8kg	250 ★	<b>48.15</b>
3.2	H01033532P	5.0kg	160 ★	<b>46.75</b>
4.0	H01033540P	4.6kg	100 ★	<b>39.25</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 0.4Si, 0.6Mn	n/a	>510	n/a	126

**HILCO VELORA**

'Slow freezing' electrode for welding in all positions, except vertical down. The stable and easily controllable molten pool makes it suitable for thin sheet or pipe welding. Easy striking and restriking. Suitable for AC and DC current; will operate on low OCV, min 42v.

**AWS: E6013,**  
**EN ISO 2560: E 42 0 RR 12**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
2.5	H01053525P	4.1kg	200 ★	<b>40.60</b>
3.2	H01053532P	4.3kg	125 ★	<b>40.30</b>
4.0	H01054540P	5.6kg	80 ★	<b>49.70</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.08C, 0.4Si, 0.6Mn	n/a	>500	n/a	126

**HILCO BASIC SUPER**

Universal basic coated low hydrogen electrode suitable where high demands on impact value (even at low temperatures) are required. Excellent welding characteristics in all positions (except vertically downwards) on both AC/DC current. Suitable for pipe welding. Excellent X-ray quality. Smooth welding characteristics and an easy slag release.

**AWS: E7018-1,**  
**EN ISO 2560: E 46 4 B 32 H5**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
2.5	H01193525P	4.1kg	200 ★	<b>41.85</b>
3.2	H01193532P	4.1kg	110 ★	<b>36.00</b>
4.0	H01194540P	5.8kg	90 ★	<b>49.10</b>
5.0	H01194550P	5.9kg	60 ★	<b>49.00</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.05C, 0.5Si, 1.0Mn	n/a	> 550	n/a	126

**HILCO BASIC 55**

Double coated basic electrode for welding in all positions (except vertically downwards) of unalloyed steels. Electrode has excellent weldability, good slag release and smooth weld appearance.

**AWS: E7016,**  
**EN ISO 2560: E42 2 RB 12 H10**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
2.5	H01353525P	3.9kg	200 ★	<b>57.20</b>
3.2	H01354532P	5.3kg	125 ★	<b>64.00</b>
4.0	H01354540P	5.2kg	80 ★	<b>58.05</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.06C, 0.7Si, 0.9Mn	n/a	>510	n/a	126

**HILCO REGINA 160**

Rutile electrode with a recovery of 160%. Especially suitable for fillet welding and the filling of V-butts. Excellent welding characteristics, self releasing slag. Due to the high recovery and excellent weldability Regina 160 is very economical in usage.

**AWS: E7024,**  
**EN ISO 2560: E 42 0 RR 53**

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt
3.2	H01124532P	5.9kg	90 ★	<b>62.20</b>
4.0	H01124540P	5.7kg	55 ★	<b>55.25</b>
5.0	H01124550P	5.4kg	35 ★	<b>56.20</b>

% Metal Composition	Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.1C, 0.4Si, 0.6Mn	n/a	>510	n/a	126

## Hilco - Hard Face, Cast Iron, Copper, Aluminium STL NI CU AL

### HILCO HARDMELT 600

Basic coated electrode for wear resistant surfacing of steel, cast steel, and high Mn-steel, which are subjected to abrasion, metal to metal wear, impact and/or compression stresses.

EN 14700 E Fe6

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
3.2	H01423532P	4.5kg	130	66.70	
4.0	H01424540P	5.9kg	90	85.95	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.5C, 2.3Si, 0.4Mn, 9Cr		n/a	n/a	600	

### HILCO CUTIL CUTTING

An electrode for cutting, gouging and piercing of all metals, including stainless, cast, and non-ferrous alloys, at a high cutting speed.

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
3.2	H07498132	4.0kg	80	71.15	
4.0	H07498340	4.0kg	72	70.70	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
		n/a	n/a	n/a	

### HILCO PURE NICKEL

Electrode with a pure nickel core for welding grey cast iron, for joining cast irons to other ferrous or non-ferrous metals. Heat affected zone and weld metal easily machinable. Especially suitable for welding contaminated cast iron and repair work.

AWS: E Ni C1, DIN: E Ni BG 22

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	H0290350125P	1.0kg	58	166.50	
3.2	H0290350132P	1.0kg	31	165.60	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.5C, 0.1Si, 0.2Mn, 2.3Fe, bal Ni		n/a	n/a		

### HILCO NICKEL IRON

Electrode with a nickel iron core for repair welding and joining all types of cast iron. Weld metal and heat affected zone are both easily machinable. Especially recommended for joints in which severe demands are made on the strength of the weld.

AWS: E NiFeC1, DIN: E NiFe BG 22

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	H0291350125P	1.0kg	54	77.25	
3.2	H0291350132P	1.0kg	32	74.50	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
0.9C, 0.7Si, 0.8Mn, 53Ni, bal Fe		n/a	n/a	n/a	

### HILCO BRONSIL

Tin-bronze electrode for use on copper, copper alloy, phosphor and tin-bronzes. Also, minor repair work on cast iron and C/Mn steels. Preheat workpiece to approx. 250°C. Maintain workpiece temperature during welding.

AWS: E CuSn-C, DIN 1733: EL -CuSn7

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
3.2	H02013532P	2.0kg	58	220.20	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
1.5Mn, 0.5Si, 7.5Sn, 0.2Fe, 0.1P, bal Cu		n/a	>280	n/a	124

### HILCO ALUMINIL SI12

Silicon alloyed aluminium electrode for welding of all types of aluminium castings and applications, where good colour matching with base materials is important.

AWS: E 4047, DIN 1732: EL-AISI 12

Dia mm	Art #	Pkt Wt	Pcs/Pkt	£/ Pkt	
2.5	H02023525T	2.0kg	227	145.70	
3.2	H02023532T	2.0kg	152	138.75	
% Metal Composition		Melting°C	U.T.S. N/mm <sup>2</sup>	Hardness BHN	SIF TIPS Page
12Si, 0.1Mn, bal Al		n/a	>180	n/a	118



To assist with the selection of the correct Sif consumable product for your application we have produced the Weldability Sif selector chart. The chart covers all common processes and base materials with a recommendation for your combination. Call our team on 0845 130 7757 to order your copy. Art No: WBPOSTERCOMS

## Aluminium

Years ago 'aluminium' was considered a difficult material to weld, since when using oxy-acetylene there was no change in colour to indicate the metal's temperature and suddenly it could melt and collapse! With the introduction of TIG and MIG welding processes, these 'welder fears' have been put to one side, providing that the properties of aluminium are understood. This article is intended to give a general overview.

Aluminium and its alloys have special properties of lightness, strength, conductivity, malleability etc, which make it a particularly useful material in a variety of industries. The metal can be either in 'cast' form or extruded (wrought), which then divides into non-heat treatable and heat treatable. Generally, it is readily weldable, but it is important to understand some of its characteristics:

**Oxidation:** in air aluminium immediately forms an oxide layer on its surface, which will increase in thickness with time. This oxide layer must be controlled during the welding process, by chemically and mechanically cleaning the metal, using an

aggressive flux or ensure the arc has reverse polarity (electrode positive). Correct gas shielding (argon) will prevent oxides reforming in the weld.

**Thermal:** as aluminium is a very good thermal conductor, it will rapidly disperse heat. Care must be taken to avoid distortion and possibly cracking.

**Colour:** unlike steel, there is no change in colour as it is being heated. Look out for a 'wet' appearance. For gas brazing, melting of flux powder is a temperature indicator.

**Preparation:** smooth all edges of workpiece to minimise trapped dirt. Use a commercial degreaser and stainless steel brush to remove dirt, oil, paint. Dry surface thoroughly. If TIG welding, wipe filler rod clean of any surface oil.

**Application:** support the joint to be welded, preferably with a jig, but spot tacking can be used. Keep the arc travelling at the right speed to build up a bead of the right proportions. Do not stop/start on one weld, as this can lead to oxidation/porosity. Carry out the weld quickly to minimise distortion.

### Typical welding consumables:

Arc welding electrodes - HILCO Aluminil Si5 & Si12 (important for welder to get into a comfortable position, as weld run must be deposited very quickly)

Brazing - Sifalumin No 16 and Aluminium Flux

Soldering - SIF 555 Aluminium Solder (separate data sheet available)

Gas welding - Sifalumin No 14 or No 15 and Aluminium Flux.

### MIG & TIG welding -

SIFMIG 1050	Sifalumin No 14	for pure aluminium
SIFMIG 4043	Sifalumin No 15	contains 5% silicon, for castings and heat treatable alloys 6063, 6061 & 6083. Weld will discolour if anodised.
SIFMIG 4047	Sifalumin No 16	contains 12% silicon, for castings and automotive applications.
SIFMIG 5356	Sifalumin No 27	contains 5% magnesium, for similar 5xxx alloys and heat treatable alloys 6063, 6061 & 6083.
SIFMIG 5183	Sifalumin No 28	contains 5% magnesium with 0.75% manganese for improved weld strength.
SIFMIG 5556	Sifalumin No 37	contains 5.3% magnesium and other closely controlled elements for 5083 military and aerospace applications.

**Conclusion:** it is hoped that these comments will lead to sound welds being produced. However, provided the right filler wire has been used, defects are usually due to inadequate cleaning/preparation or poor technique (shielding gas not effective, too long an arc, incorrect torch angle).

## Aluminium Soldering and Brazing

### Soldering – SIF 555 Aluminium Solder

Historically, engineers have considered that welding aluminium presents a range of problems, due to its surface oxide and that it does not change colour when heated. With the advent of MIG and TIG welding, it is now regularly welded with great success. Certain alloys can be gas welded or brazed, but the removal of flux residue is most important, as its corrosive action will continue after the joint has been completed.

There is another 'low temperature' process, which is called soldering, although the workpiece is melted. The parts to be joined are heated (even by a small propane burner) and the rod rubbed on the work surface. At the correct temperature (370°C), the rod is seen to melt and creates an exothermic reaction generating sufficient heat to locally melt the aluminium. An advantage of this process is that flux is NOT required. We refer to the material as SIF 555 Aluminium Solder. The product gives high strength deposits that do not have the problem of galvanic corrosion between base metal and solder. The low working temperature keeps distortion and discoloration of the work to a minimum.

This process is commonly used by manufacturers of aluminium windows and doors. It is ideal for repairing and sealing defects in aluminium boats, gutters, engine parts, castings and sheets, being especially recommended for applications where flux residue removal is a problem.

The correct procedure is as follows; cracks and joints should be bevelled to a 60° to 90° Vee. Remove all dirt, grease and foreign material from the surface to be bonded. For a higher strength bond, roughen the surface before applying the alloy. Using a carburizing flame, heat the part broadly. As the temperature approaches 370°C, rub the rod on the surface to be soldered. Continue heating base metal until enough heat is present to cause the rod to melt off when it is rubbed on the joint. Do not overheat, but be sure the entire joint surface is tinned before adding additional alloy to make a build-up. Tinning action may be improved by using a clean, stainless steel wire brush to brush through the molten metal to the base metal surface. Allow part to cool slowly.

### Brazing – Sifalumin No16 & Aluminium Flux

Traditionally Sifbronze referred to the technique as "Process 36", but recently Sifalumin No 36 and Aluminium No 36 flux have been replaced by Sifalumin No 16 which melts approx. 80°C lower than pure aluminium and Aluminium Flux.

The process is applicable to pure aluminium and alloys with up to 2% magnesium. Other alloys will prove difficult, especially if containing high % of silicon. The joint design should be lap type with a good mechanical fit. Parts must be thoroughly cleaned and if magnesium bearing wire brushing is essential. The brazing operation should be carried out as soon as possible after cleaning .

The SIF Aluminium flux is used as a temperature indicator and can be applied via the rod or applied direct to the workpiece as a paste, made by mixing the flux with water. The whole workpiece should be pre-heated with the blowpipe moving backwards and forwards along the joint line. As the flux melts, the rod is applied to flow freely along and through the joint. It is important to avoid overheating which can destroy the properties of Sifalumin No 16.

Aluminium flux is highly corrosive and the residue must be removed within 30 minutes of the brazing operation. Where joints are accessible, wire brush with very hot water or even a steam jet, alternatively treatment with 5% nitric acid solution may be required.

## MIG Brazing 'Manganese Boron Steel'

(in the automotive / vehicle production & repair industries)

### Why 'Manganese Boron Steel'

In the automotive industry the need to save weight, while at the same time meeting increasingly severe crash test standards, has led to the use of high strength steels that conserve good ductility and formability. The high yield strength makes this material particularly suited for anti-intrusion functions i.e. fender beams, door reinforcements, middle posts etc. This sheet steel is pre-aluminised to protect the metal from oxidation and decarburisation, during heat treatment; this also enhances the corrosion resistance after painting, avoiding the need for any subsequent corrosion protection treatment.

### MIG Brazing of pre-aluminised (galvanised) sheet

Zinc, in the galvanised coating, melts at temperatures of around 420°C and vaporises at 906°C. This causes unfavourable effects on the welding process as unalloyed SG2 MIG welding wire melts around 1450°C. The zinc starts to vaporise as soon as the arc is struck; zinc vapours and oxides can lead to pores and inadequate fusion. An alternative is to use MIG Braze process, using a copper silicon alloy wire SIFMIG 968 (CuSi3). SIFMIG 968 has a relatively low melting point approx 980°C.

The reduced heat input results in the following advantages:

- low coating burn off
- no corrosion to the joint seam
- low distortion
- dissimilar joints (any combination of material, except aluminium)
- easy after joint machining
- fast deposition saving labour costs
- minimal spatter

Since there is no fusion of the base metal, it therefore has more in common with a brazed joint than a welded one.

### The Product - SIFMIG 968

SIFMIG 968 is produced to conform to BS2901 C9 and also Din CuSi3, having a typical composition of 3% Silicon, 1% Manganese and balance Copper.

Diameters available:	0.8mm, 1.0mm and 1.2mm
Spool sizes:	D100 - 0.7kg (in 0.8 and 1.0mm) D200 - 4.0kg (spool bore is 50mm, so fits standard MIG set spindle) D300 - 12.5kg

### General Hints

Copper alloy MIG wires require 'soft' or formed wire feed drive rollers and a soft or Teflon type wire liner in the torch cable. If the welding machine has been used with steel MIG wire, ensure any steel particles are removed from the wire feed system. This is to avoid carbon contamination on the copper alloy wire.

### Procedure Tips

On thin sheet steel and galvanised sheet use 0.8mm / 1.0mm SIFMIG 968, keeping heat input to a minimum (approx 45-65 amps). Select a shielding gas, which will maintain a stable arc, such as pure Argon or Argon 2% CO2 mix. Pushing MIG torch (as conventional MIG welding) will ensure not too deep penetration, avoiding burn through on thin sheet. If galvanised coating is thick, use dip transfer with a short arc.

For best results, use a programmable synergic MIG machine. This type of system will produce a neat, clean brazed joint, requiring a minimal amount of joint dressing and preparation prior to painting. low coating burn off no corrosion to the joint seam low distortion dissimilar joints (any combination of material, except aluminium) easy after joint machining fast deposition saving labour costs minimal spatter

## TIG Brazing

(Comments and a few Applications)

'TIG Brazing' can cover a wide range of applications, from the point of view of materials to be joined, joint design, one off special repair job to quantity production. Perhaps the title is a confusion of terms. Initial reaction is that TIG is a fusion welding process and brazing gets obscured by the thought of oxy-acetylene torches, flux powder etc. In practice, the heat source is the TIG arc but run on a low current so as not to melt the material with a suitable filler rod fed into the arc. This filler rod is quite different from conventional oxy-acetylene 'silicon bronze' brazing rod. As the TIG torch provides a protective gas shroud, there is no need for the addition of flux, as with the long established brazing process.

There are typically three different copper alloys filler rods to be considered for TIG Brazing:

### Sifsilcopper No 968 (C9)

Sifsilcopper No 968 conforms to BS2901 C9 and Din CuSi3, having a typical composition of 3% Silicon, 1% Manganese and balance Copper. It is available in diameters: 1.2, 1.6, 2.4 & 3.2mm and pack sizes 1.0, 2.5 & 7.5 kgs.

A customer was using Sifsteel A15 to complete TIG welds on sheet steel ducting, which was being joined to a square section frame. The initial problem was distortion due to heat build up and subsequent costs for heat treatment to remove stresses and dress the weld. TIG brazing with Sifsilcopper No 968 was suggested. The speed of operation is nearly twice as fast as welding, as the TIG arc has a temperature of approx 1400°C and Sifsilcopper No 968 melting point is around 1000°C, some 450°C lower than Sifsteel A15. The speed of operation is very rapid.

Not only did the customer nearly halve his 'joining' time, but found there was only minimal 'after brazing' work to bring the components into an acceptable final condition for painting.

### Procedure tips

TIG brazing is relatively straightforward. The TIG torch needs a thoriated tungsten and dc current (torch +). Whereas TIG welding with say 1.6mm Sifsteel A15 would require 80-95 amps, TIG brazing will only require less than half that current, more in the order of 35-45 amps. As you can imagine, it is important for the welder to be comfortably positioned with regards to the parts being joined, so that the whole procedure can flow at a relatively fast rate. Maintaining torch and filler rod angles with respect to the workpiece is key, to prevent breakdown of the inert gas envelope to avoid atmospheric contamination of the joint.

### Sifphosphor Bronze No 8 (C11)

Sifphosphor Bronze No 8 conforms to BS 2901 C11 and Din CuSn6, having a typical composition of 7% Tin, balance Copper. It is available in diameters: 1.2, 1.6, 2.4 & 3.2mm and pack sizes 1.0, 2.5 & 7.5 kgs.

This filler rod is particularly useful where copper alloys are involved, if the joint is between dissimilar metals (e.g. copper/stainless), if the metal cannot be completely identified or if it is known to be difficult to weld but can be brazed.

As an example, a welder was required to repair an old exhaust manifold, which had been previously welded on a number of occasions where cracks had developed in and around the heat affected zone. Further efforts to TIG weld the material only led to burn through and further cracks. The exact composition of the metal was not known.

The solution was for the welder to try Sifphosphor Bronze No 8, working on ground out cracks and suitably reducing the current. The job was successful and the manifold went back into service.

### Sifalbronze No 32

Sifalbronze No 32 conforms to BS 2901 C13 and Din CuAl9Fe, having a typical composition of 10% Aluminium, 1% Iron, balance Copper. It is available in diameters: 1.6, 2.4 and 3.2mm and in 1.0, 2.5 and 7.5 kg packs.

This filler rod alloy has free flowing characteristics making it ideal for close fitting joints which one would expect to find in brazing operations.

An example here would be the fabrication of special bicycle frames from T45 (0.2% C, 0.2% Si, 1.5% Mn) Steel material. If the joints are of the type where tube fits into sockets or lugs, Sifalbronze No 32 is particularly ideal, as it has excellent 'wetting out' characteristics compared with the other alloys.

As Sifalbronze No 32 contains 10% aluminium, ac current is recommended with zirconiated tungsten.

### General Hints

Irrespective of the filler rod used, argon is the recommended shielding gas. Always remember that cleanliness of the workpiece is a priority for first class results: remove any oxide or grease from the joint area.

## Bronze Welding and Brazing

### Sifbronzing

For successful 'bronze welding' or 'sifbronzing', parts must be clean and for optimum strength a 60° - 90° vee preparation is required. Using leftward welding technique, the parts should be heated with an oxidising flame to a 'dull red', before introducing the Sifbronze rod and flux. Overheating must be avoided, as this will lead to porosity and inferior work.

It is essential that the joint faces are tinned. A drop of Sifbronze appears to collapse and spread across the metal face. If the drop stays as a globule, the metal is either too hot, too cold or dirty. The gap between the tinned faces is now filled with a weave action. It may be necessary to carry out further 'weld runs', building up the joint.

Sifbronze flux plays an important role not just cleaning the metal, but it covers the weld pool surface, preventing further oxidation of the molten bronze.

### Bronze welding cast iron

Prior to 'welded fabrications', engineers would use cast iron to produce a whole range of products from small domestic items (mangles, mincers, mowers) to large industrial parts (agricultural equipment, civil engineering brackets and fixings, cylinder blocks, machine tool frames etc). Cast iron is a very hard, but brittle material, which can be easily machined.

Since it is brittle, there is a tendency for it to fracture, especially if a part is subjected to a sudden impact, such as a casting being dropped on a protruding fixing lug or bracket. A repair of this nature does not require a colour match, so oxy-acetylene sifbronzing (or bronze welding) will be considered. The joint must be prepared by grinding back the surface and producing a 'vee' preparation if the material is thick.

The first task is to seal the carbon into the cast iron, by 'buttering' both faces of the joint. This is done by using brazing rod (Sifbronze No 1) and standard Sifbronze flux, to cover each face with a layer of brazing material. Next, the two parts are positioned so that the joint can be completed by bronze welding between the two 'battered' faces.

This produces a strong joint, which is very visible, unless dressed and painted. The process does not require the parts to be pre-heated, as necessary when full fusion welding cast iron.

### Brazing copper to copper

Copper to copper joints produced with SIFCUPRON, do not require the addition of flux, as the phosphorus provides a self-fluxing action. It is necessary for the parts to overlap with a joint gap of 0.05 to 0.12mm. The gap should not exceed 0.4mm

As copper is a very good thermal conductor, the heat must be applied quickly, taking great care not to overheat and cause embrittlement. If joint strength and ductility are important, Sifcupron No 17-2Ag or 17-5Ag should be used in preference to No 17. Sifcupron No 17-15Ag is more tolerant if joints are not close fitting.

On occasions, there is the need to braze copper to brass (perhaps a brass flange to a copper pipe). Provided it is a suitably designed joint, a copper/phos alloy with an inclusion of silver (such as Sifcupron No 17-2Ag) will be ideal. However in order to get the alloy to bond with the brass, it is necessary to use a flux, such as Sifsilcopper or Sifbronze.

Sifcupron is not suitable for brazing nickel alloys, ferrous metals or where the joint is subject to hot sulphurous gases or oxidising atmosphere above 200°C.

### Silver Soldering

As with all brazed joints, preparation and cleaning of the workpiece is essential to produce a successful joint. When silver soldering, lap type joints (rather than butt) are preferred and the recommended clearance is 0.04 to 0.15mm.

Apply SIF Silver Solder flux to both joint faces before assembling the parts. Using a neutral flame, heat assembly quickly and evenly, avoiding overheating the silver solder (wipe rod on joint rather than melting it directly in the flame). Use in a well ventilated area and be aware of health and safety procedures.

To silver solder stainless, a high silver content alloy is required (such as SIF Silver Solder No 43 — 55% Ag Cd free) and a suitable flux (SIF Flux - Silver Solder). Alternatively, a 'nickel bronze' brazing rod such as Sifbronze No 2 together with 'Tool Tipping/Brazing Stainless' flux (note: do NOT use Stainless flux as it is for gas welding of stainless).

## GasFlux Process

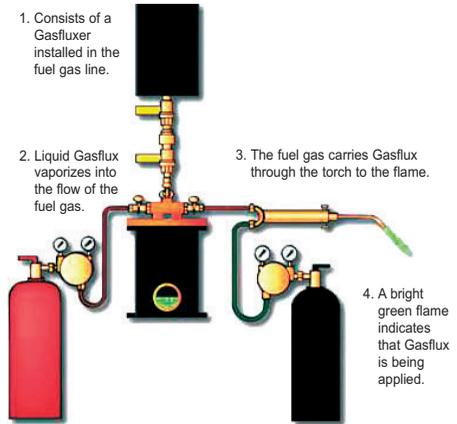
With changing technology, the 'old' established methods of joining metals by gas welding or brazing are being converted to TIG or MIG processes. However, there is still a place for the 'old' processes for either production of parts designed for brazing and also for repair and maintenance work, which is dependent on welder skill and technique.

### The Process

The 'GasFlux' process is a very attractive alternative to using powder flux or flux coated rods. It literally puts flux into the fuel gas and it is delivered to wherever the flame is directed, resulting in superior fluxing and wetting action, which encourages the brazing alloy to flow evenly and follow the flame smoothly giving optimum strength and outstanding appearance.

As shown in the diagram, a GasFluxer unit is installed in the fuel gas line (usually acetylene). The Reserve Tank is detachable, so that it can be removed from the welding area and any possible source of ignition, when it is topped up with GasFlux Liquid, which is flammable; an important health and safety point.

The Gasfluxer unit can control the gas flow rate and also the amount of liquid flux being collected, thereby ensuring that just the right amount of flux is delivered to the joint, ensuring a sound braze with a minimum of flux residue removal work. The flame with Gasflux burns with a green hue and ideally blue goggle lenses should be used to clearly view the joint area during the brazing process.



### Applications

Immediate thoughts turn to tubular applications, where a smooth fillet joint is required, which is then possibly painted or plated to look attractive. Such items might be bicycles, wheelchairs, hospital furniture, go-karts, automotive assemblies. The list could go on and on. These are all predominantly produced from steel, but GasFluxers are also used on copper and brass components to aid the brazing process and reduce subsequent cleaning operations. Many assemblies are suitable for automatic brazing and the GasFlux system is an ideal method for delivering flux to the joint area.

For steel applications, the ideal rods to use are Sifbronze No 1 (EN 1044 CU 302) and also our Special bronze 'Sifbronze No 101', which is ideal for production work with the GasFlux process. For work on copper and brass, filler rods such as Sifcupron No 17 (EN 1044 CP201) and No 17-2Ag (EN 1044 CP105) and a range of silver solders would be considered.

### Benefits

- The GasFlux process improves brazing quality and reduces costs by:
- Optimum joint strength
- Reduced filler rod consumption
- Minimising post joint cleaning operations
- Quicker brazing times.

### General

The flux is only delivered where the flame is directed. With a complicated design where the flame cannot access a blind side or where deep penetration is required, it may be necessary to mix a powder flux to paste and add to the 'blind' areas prior or during assembly.

## Welding Copper and Brass

### Copper

Pure copper has characteristics of high thermal and electrical conductivity and, because the metal requires about six times more heat (melting point is 1,083°C) for fusion welding than steel, particular care must be taken during welding and brazing.

Tough pitch copper, which includes most varieties of high conductivity copper, contains up to 0.5% oxygen (cuprous oxide) and is not suitable for fusion welding since it has a tendency to embrittlement and cracking, though it can be brazed.

Deoxidised copper, where the oxygen has been removed during manufacture by the use of deoxidising agents, can be fusion welded.

For MIG and TIG welding, It will be necessary to preheat workpiece if it is over 6mm thick. The usual shielding gas is argon, but with thicker material an argon/helium mixture can beneficially increase the arc temperature. Consumables to be used are SIFMIG 985 and Sifsilcopper No 985, although Sifsilcopper No 7 can be used for TIG welding sheet up to 3mm thick.

Gas welding of copper, such as whiskey stills, tanks etc, requires the parts to be preheated to 600°C and slowly cooled on completion of the joint. Sifsilcopper No 7 together with Sifsilcopper flux will produce a joint with excellent colour match.

Copper is not generally joined using arc welding electrodes. But in circumstances where there is no other welding equipment other than a transformer, Hilco Bronsil proves ideal.

### Brass

Brass is a generic term covering a wide range of copper alloys containing additions of zinc. All brasses, which includes Gilding Metal, can be silver soldered, MIG and TIG welded successfully. However, the addition of lead for free cutting brass and in gunmetal (LG1 & LG2) causes porosity and fume problems with gas shielded arc welding. Phosphor Bronze, copper/tin alloys such as PB2, can be readily brazed or welded.

Gas welding of brass is not recommended as the zinc will tend to vaporise causing fumes (zinc oxide) and porosity. However, PB2 phosphor bronze can be joined with oxy-acetylene and Sifphosphor Bronze No 8, as sometimes used by sculptors.

For MIG and TIG welding a shielding gas of argon or argon/carbon dioxide mixture is used. If it is felt necessary to use preheat, this must be limited to less than 80°C, otherwise the structure of the brass may become altered.

The choice of filler wire or rod will depend on the composition of the alloy being joined. As a general comment, SIFMIG 8 or Sifphosphor Bronze No8 is recommended as first consideration. However, SIFMIG 328 and 968 or Sifalbronze No 32 and Sifsilcopper No 968 may also be suitable. If colour match with brass is important, Sifphosphor Bronze No 82 is recommended.

## Stainless

Stainless steel is a generic term for a range of steels that contain a minimum of 12% chromium, although other elements such as nickel and molybdenum are added to improve corrosion resistance, which is their primary feature and use. They sub-divide into five groups, but our main interest is with austenitic, which is the most popular and weldable range of stainless used in chemical plants, food processing equipment etc.

TIG welding is ideal for high quality work or root runs, prior to filling with an alternative process. Whereas the main advantage of MIG is speed. Shielding gas is typically argon or a mix of argon, helium and CO<sub>2</sub>. There is a range of matching consumables in 2. SIFMIG and Sifsteel Stainless, covering 347, 308, 316, 309 and 312 grades. Whilst talking MIG and TIG process, stainless can be TIG or MIG brazed using say Sifphosphor Bronze No 8 or SIFMIG 8, which can be very useful if the material needs to be joined to copper or steel.

It is possible to gas welding the common grades of stainless (18/8), but it is important to use Stainless flux and also apply the flux in paste form (mix powder with water) to the reverse side of the joint. Also, stainless can be silver soldered or brazed, which is again a benefit for dissimilar metal applications. To silver solder stainless, a high silver content alloy is required (such as SIF Silver Solder No 43 55% Ag Cd free) and a suitable flux (SIF Flux Silver Solder). Alternatively, a 'nickel bronze' brazing rod such as Sifbronze No 2 together with 'Tool Tipping/Brazing Stainless' flux (note: do NOT use Stainless flux as it is for gas welding of stainless).

A widely used process is arc welding. Our range of Hilchrome electrodes are ideal in the flat and vertical up positions and produce a concave bead from which the slag will easily lift.

### Procedure Tips:

Cleanliness of the workpiece and working area is most important. Only use stainless wire brushes for cleaning. As stainless is considered a poor thermal conductor, preheat is not normally required and a high heat input should be avoided. Avoid striking the arc outside the joint, as this can lead to pitting and cracks.

With TIG, use a thoriated tungsten and do not allow it to contact the workpiece, which can lead to contamination. After welding, clean thoroughly using a stainless brush. Use SIF Pickling Paste to clean discoloration from surface and restore chrome oxide layer on the stainless.

The weld can become contaminated and 'rust' spots appear on the stainless if ferrous particles have inadvertently been allowed to enter the weld area. This can be caused by poor housekeeping (stainless brush being used on steel) or other operations in the welding area which produce air borne metal particles, such as grinding.

## Steel

As a general statement, steel is readily weldable by the majority of welding processes. With alloy steels, it is necessary to select an appropriate filler metal for the material and service situation that the weld will be subjected to. As a guide, carbon content is the first consideration, followed by silicon and manganese. If there are other elements such as chromium, molybdenum etc, then these will usually take priority over carbon.

In today's world, the first thought for welding steel is to use the MIG process and SIFMIG SG2 wire, or perhaps if a higher UTS is required SIFMIG SG3. In fact, welding is symbolised by a MIG welder and a 'shower of sparks'!

Having touched on the MIG process, if deposition rate is important, then Sifcored E71T-1 flux cored wire should be considered. It should also be borne in mind that steel can be MIG brazed, as in the automotive industry on manganese boron steel with SIFMIG 968. Our other copper alloy wires SIFMIG 8 and 328 are also suitable for MIG brazing.

TIG filler rods are available for a range of mild and alloy steels. A frequently asked question is 'what do we use on 4130 (0.3C, 0.3Si, 0.5Mn, 1.0Cr, 0.2Mo)'; the answer is Sifsteel A32. With spring and high carbon steels, Sifsteel Stainless 312 is often the answer. For joining steel to stainless, consider Sifsteel Stainless 309LSI.

It is also worth remembering that TIG brazing with Sifphosphor Bronze No 8, Sifalbronze No 32 or Sifsilcopper No 968 can be very useful with difficult steel applications, dissimilar joints or where heat must be kept to a minimum.

The Sifbronze business developed due to the ability of Sifbronze No 1, No 101 and No 2 to 'bronze weld' and braze steel, with minimum of distortion and producing a neat fillet joint, especially on tubular structures. Perhaps we should also add silver solder for those steel to brass/copper joints. From a gas welding point of view, the filler rod is Sifsteel No 11, which is also referred to as CCMS.

Now to arc welding electrodes, which come with three different types of coating. The most common and popular electrode, such as Hilco Red Extra, Velveta and Velora have a 'rutile' coating, which is predominantly titanium oxide to decrease spatter and improve slag removal. Cracking in steels is often due to the formation of minute quantities of steam from hydrogen in the electrode combining with oxygen from the air. This can be overcome by using 'basic' coated electrodes (Hilco Basic Super and Basic 55), also known as 'low hydrogen'. Finally, for high deposition rates, iron powder is added to the coating to substantially increase the amount of material deposited compared with a rutile type electrode. They are referred to as 'high recovery', such as Hilco Regina 160.

## Cast Iron and Super SG Cast Iron

### Oxy-Acetylene Welding with Super Silicon No. 9

Broken castings should be aligned and tack-welded into position before pre-heating. All castings must be carefully supported on firebricks with a space of at least three inches beneath and preheated in a muffle to between 600°C and 800°C.

An oxy-acetylene flame, of ample capacity for the thickness of metal to be welded, is adjusted to a neutral condition. The edges of the fracture, or the sides of the vee groove, are melted by flame application; a little SIF Cast Iron Flux sprinkled in the weld area assists in forming a fluid pool of metal.

It is recommended that, on completion of welding, the casting should be brought once again to a uniform temperature of 600°C-800°C and then allowed to cool very slowly inside the muffle. Cast iron welds correctly made by the oxy-acetylene process using Super Silicon No. 9 rods can be relied upon to provide a soft and easily machinable deposit with full physical properties similar to those of the parent metal.

For spheroidal graphite cast iron, follow the above procedure and ensure you are using Sif Super SG Cast Iron.

Sifbronzing is an almost universally recognised way of describing the low temperature bronze welding of sheet steel, cast iron and other metals. The reason behind this fact summarises why Sifbronze, the company which first developed and promoted the technique, is generally considered to be a supplier of top-quality welding rods, wires, fluxes and equipment.

In 1914 a young man called Louis Tibbenham took on part of a factory in Stowmarket which had gone bankrupt, and set up his own company, the Suffolk Iron Foundry, to make castings such as flywheels and ploughshares. Just as the business got going, the Great War started, the bank-rate went up and business ground to a halt. It looked as though the company was doomed.

However, Louis Tibbenham struggled on, picking up small contracts and learning, in many cases by bitter experience, about business. At one stage, having built up a good trade in ploughshares, he signed a contract which, he discovered later, forced him to stop making them. So he turned to making mangles; then, before the age of the tumble-drier, an essential part of every household's washing equipment.

By the end of the Great War the company was doing well. It had grown too big for its premises and so another site, some six acres of bog and rubbish tip by the River Gipping in Stowmarket, was bought for £500. The railway company provided a siding close by and work began on the site. The whole site was planned by Louis Tibbenham, and the buildings were designed by him, resulting in his winning a first prize in a competition run by the Foundry Trade Journal.

The new factory coincided with a major contract which took up nearly all the Foundry's capacity and then, in the form of having too many eggs in one basket, disaster struck and the contract was cancelled. Louis Tibbenham had to find something to fill the void and so he decided to turn to specialist castings. Prime amongst these was the lawn mower, soon to become recognised as the 'Suffolk' range.

Though casting and iron -founding was a major part of the business, Louis Tibbenham had always been interested in welding, and during the Great War he had met a young engineer in London who was experimenting with welding cast-iron using an oxy-acetylene flame. Suffolk Iron Foundries was asked to supply a few cast-iron rods containing extra silicon. They



*Louis Tibbenham, the founder, photographed in the early 1920's.*

performed so well that they became a production item in due course, under the brand name, 'Super-Silicon Rod'.

At around this time Mr Tibbenham learned of the techniques of low temperature bronze welding for cast-iron, so he developed a rod which, subsequently, was found to be suitable for welding virtually any metal except aluminium. Taking the initials SIF from Suffolk Iron Foundry, and adding 'bronze', he gave a name to the technique and formed a division to handle the products. The name Sifbronze has remained a fact in welding ever since, and has come to describe a technique which is universally accepted.

Over the years the nature of the company at Stowmarket has changed little beyond expanding to meet increased demand and keeping ahead of technology. During the Second World War most of the company's efforts were devoted to war work, largely for the Royal Air Force. This included the production of ground equipment such as the bomb-trolleys which were a prominent feature of so many air stations. Sifbronze was used for, amongst many other military applications, the fabrication of air frames.

In 1954 the first fully powered lawn mower, the 'Suffolk Colt', was introduced, heralding a whole new era of development in this field. The Sifbronze division extended its range to include welding equipment such as blowpipes and gas regulators.

Louis Tibbenham decided to retire in 1955, handing over to his son, Frank. In 1958 the company became apart of the Qualcast Group and then, in 1967 Qualcast merged with Birmid Industries. Subsequently, Louis' grandson, Paddy, became the Director responsible for Sifbronze.

Developments in welding in the 1960s were such that new techniques like semi-automatic MIG-welding were introduced and with them the requirement for new, high quality materials. At this point Sifbronze introduced the consumable electrode wire SIF-Mig, a shaved aluminium wire to ensure consistent, high-quality welds. When the QE2 was built, the aluminium welding of her superstructure was carried out using SIF-Mig. At the same time the traditional methods of supply, direct to the end-user, promoted through the magazine Siftips, began to change. This meant creating a whole new supply structure based on welding distributors and engineering merchants.



*'Will The Welder.'* A company magazine, Siftips, was produced in the early 1930's. The aim was to provide users with ideas and tips as to how to get the most out of their welding equipment. Will The Welder, a character in the magazine, was the vehicle for this and became one of the most readily identifiable personalities in welding.

## TODAY

In recent years, the company has taken positive steps to focus on its SIF brand and heritage in the welding industry. The product range of consumables continues to expand to meet the anticipated demands of our market place.



### Queen Elizabeth II takes the plunge

Down the slipway goes the Q-4—now the Queen Elizabeth II—Cunard's new 58,000-ton Atlantic liner, crowed by her aluminium superstructure welded with SIFMIG aluminium filler wire.

When the 2,000-passenger ship makes her maiden voyage next year 2,600 miles of SIFMIG will have gone into welding the 1,200 tons of aluminium used in her construction.

This is the first time that aluminium has been used to this extent in a passenger liner as a weight-bearing material—the decks are actually supported on aluminium alloy girders.

Use of aluminium has resulted in the near-exclusion of the rivet in favour of welding, and has also meant an even greater reliance on industrial X-ray techniques for examination of the welds.

By the time the ship's maiden voyage takes place the four radiographers at John Brown's shipyard will have taken more radiographs of the hull and power units than of any other passenger vessel.

Using portable X-ray equipment the radiography team are doing percentage spot checks at sites chosen by Lloyd's, the Board of Trade and Cunard, who, having approved SIFMIG after exhaustive tests, now have to be equally satisfied with the quality of the welds made with it.

The portable equipment is suitable for photographing through metal thickness from 1 in. to 2½ in., with Kodak Induray D film for steel and Crystalex film for aluminium.

This is an extract from a Siftips magazine circa 1967 where the QEII super structure was welded with SIFMIG 5356





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<b>P</b>		<b>P</b>		<b>P</b>	
Leather Trousers	93,94	Paint Markers	66-67	Safety Plates	83-84
Leather Welding Masks	85	Paint Sticks	66	Safety Specs	87
Lightweight Welding Nozzle	8	Palm Gloves	90	Safety Wear	78-95
Liners	16-25	Panel Plugs	31	Sanding Discs	71
Lugs	32	Panel Sockets	32	Scratch Brushes	35
<b>M</b>		PAPR Systems	82	Shaded Lenses	83,84
Machine Cutting Nozzles	11-12	Pedestal Spot Welders	50	Shaded Overspecs	87
Magnetic Earth Clamp	64	Personal Protection (PPE)	78-94	Shaded Visors	88
Magnetic Squares	64	PGNM Nozzles	10	Shanks	7
Magnetic Supports	19	Pickling Paste	76	Sheet Cutting Nozzles	10
Magnetic Torch Stand	26	Pipe Clamps	69	Shellers	90
Magnifying Lenses	83	Pipe Cutting Machine	9	Shielding Gas Economisers	15
Manual Spot Welders	48	Pipe Purging	69	Shroud Reamer	29
Markers	66-67	Pipe Stands	70	Shrouds	16-25
MIG Brazing Wire	28	Pipe Wrap-A-Rounds	68	Side Cutters	29
MIG Guns	17-22	Pistol Sparklighter	4	Side Entry Regulators	2,15
MIG Nozzles	16	Pivot Cutting Guide	9	Sifbronze Products	13
MIG Pliers	29	Plasma Cutters	51	Silicon Bronze Brazing Rod	13
MIG Side Cutters	29	Plasma Torch Parts	51-60	Silver Solder Rods	110
MIG Tips	17,19	Plasma Torches	51	Single Stage Regulators	2
MIG Torch Liners	17,19	Pliers	63	Ski-Type Goggles	78
MIG Torch Stand	29	Plugged Regulators	2,15	Skull Cap	93
MIG Torches	17-25	Plugs	31	Sleeves	93,94
MIG Welders	14	Pneumatic Spot Welders	50	Small Parts Brush	47,87
MIG Wire	28	PNM Nozzles	10	Smoked Safety Specs	78,87
MIG Wire Cleaner Pads	26	PNME Nozzles	10	Soapstone	35
Mild Steel Electrodes	114	Polycarbonate Lenses	83	Sockets	31
Mild Steel TIG Rods	109	Portable Drying Ovens	74	Solar Flux	76
Mini Gas Regulators	15	Portable Gas Packages	8	Solar-Powered Helmets	82
Mini MIG Torches	14	Proban Balaclavas	80	Solder-On Lugs	32
Mini-To-Euro Converter	16	Propane Heating Torches	12	Solvent Based Anti Spatter	75
Mixers	7	Propane Regulator	2	Spanners	3
Model O Kit	7	Propane Superheating	12	Sparklighters	4
Mole Grip Type Pliers	63	Protababy Headshields	80	Splats	93
Monkey Masks	85	Protashell Headshields	80	Splicers	6
Multi-C-Air Systems	82	Protection Spray	75	Spool Adaptor	16
Multi-Stage Regulators	2,3	Protective Blankets	92	Spot Welding Arms	48-50
Murex® MIG	25	Pulsafe Visor	88	Spot Welding Electrodes	49-50
Myking Style Earth Clamp	33	Purge Meter	69	Spot Welding Machines	48,50
Myking Style Holder	33	Purging Equipment	69	Spot Welding Tools	48-50
<b>N</b>		PVC Welding Cable	32	Stainless Steel Cleaner	76
NFF Nozzles	12	PVC Welding Curtains	91	Stainless Steel Electrodes	115
Nickel Bronze	13	<b>Q</b>		Stainless Steel MIG Wire	28
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NM Heating Nozzles	12	Red Leather Clothing	94	Straight Line Cutting Machine	9
Non-Return Valves	7	Reel Hub Assembly	16	Strip Curtain	91
Nozzle Cleaner Set	4	Regulator Nuts	3	Superheating Equipment	12
Nozzles - Gouging	10	Regulator Parts	2	Superstrike Tungstens	43
Nozzles - MIG Welding	16-25	Regulators	2,3,15	Supervisor Visor System	88
Nozzles - Oxy/Fuel Cutting	8-11	Resistance Spot Welders	48,50	Swaged Welding Nozzles	8
Nozzles - Oxy/Fuel Welding	8	Respirators	89	Swan Necks	16
Nuisance Dust Mask	89	Re-Usable Lugs	32	Sweatband	78
Nuts	6	Reversible Gloves	86	<b>T</b>	
<b>O</b>		Reversible Welders Caps	85	Tails	6
O Clip Pliers	63	Rigger Gloves	90	Tank Wrench	3
O Clips	6	Rivet Cutting Nozzles	10	Temperature Measurement	62
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		Round Lenses	84	TIG Adaptors	41
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				Welding Cable	32
				Welding Curtains	91
				Welding Fume Masks	89
				Welding Goggles	78
				Welding Lenses	83-84
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OXY/FUEL · MIG WELDING · STICK WELDING · TIG WELDING · CONSUMABLES · SAFETY

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