MATERIAL APPLICATION & SAFETY DATASHEET

High Purity Solid Solder Wire

Product Name:
High Purity Solid Solder Wire

Manufactured By:
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Description
High Purity Solid Solder Wire is manufactured from a grade of solder alloy with purity levels far exceeding the requirements of all national and international standards. The Solder Connection Ltd manufacture all high purity solder alloys using the finest virgin materials available worldwide.

Selection Criteria
1. High Purity Solder Alloy: Purity of solder alloy, and working temperatures.
2. Wire gauge (diameter).
3. Health & Safety

High Purity Solder Alloys
Standardisation is important to reduce variety and to promote the quality of products by defining features and characteristics governing their fitness for purpose. The standards promote clear unambiguous communication between purchasers and suppliers for quotation ordering and supply purposes. In 1994 a single European standard EN 29453 (ISO 9453), superseded all other European national standards, BS 219, DIN 1707, NFC 90-550. Other equivalent international standards include QQS 571E, ASTM B32 and JIS-Z-3382.

The following table illustrates the equivalent **High Purity Solder Alloy** relationship to EN 29453, WWS-571E, BS-219 and DIN-1707. **Autosol** is available in all **High Purity Solder Alloys as well** including: Improved quality 63/37, Non toxic (lead free), low melting alloys, high melting alloys and all alloys to EN 29453, BS 219, DIN 1707 & QQS 571E.

Part No:	EN 29453	QQS 571E	BS 219 *DIN 1707
63/37	1a	Sn63Pb37	AP
60/40	2a	Sn60Pb40	KP
50/50	3a	Sn50Pb50	F
45/55	4	-	R
40/60	5	Sn40Pb60	G
35/65	6	Sn35Pb65	H
30/70	7	Sn30Pb70	J
20/80	-	Sn20Pb80	V
10/90	8	-	-
15/85	-	-	W
99C	23	-	99C
97C	24	-	-
Alloy No 1	26	-	*Sn50PbCu
Alloy No 2	25	-	*Sn60PbCu2
HMP 5S	34	-	5S
LMP 62S	30	Sn62Pb36Ag2	62S
96S	28	Sn96Ag04	96S
95A	18	Sn95Sb5	95A
TLS/5	-	-	-
TSC	-	-	-
Sn10Pb88Ag2	-	-	-
SAC3	-	-	-
SAC2	-	-	-
SAC1	-	-	
Sc100e	-	-	

Typical batch analysis: High Purity Virgin Tin.

Sn	Sb	Pb	Cu	Zn
99.95	0.009	0.002	0.0002	0.0001
Fe	As	Ag	Bi	In
0.002	0.002	0.0001	0.0001	0.0003

Typical batch analysis: High Purity Virgin Lead.

Sn	Sb	Pb	Cu	Zn
0.001	0.002	99.99	0.003	0.0001
Fe	As	Ag	Bi	In
0.002	0.0005	0.002	0.005	0.0003

Typical batch analysis: High Purity 63/37

Sn	Sb	Pb	Cu	Zn
63.0	0.0095	rem	0.0007	0.0002
Fe	As	Ag	Bi	In
0.002	0.001	0.0005	0.0003	0.0003

These consistent high standards apply to all of our **High Purity Solder Alloys.**

Solder Alloys Containing Lead

Part No	Sn % Tin	Pb % Lead	Cu % Copper	Ag % Silver	Sb % Antimony
63/37	62.5-63.5	Rem	-	-	-
60/40	59.5-60.5	Rem	-	-	-
50/50	49.5-50.5	Rem	-	-	-
45/55	44.5-45.5	Rem	-	-	-
40/60	39.5-40.5	Rem	-	-	-
35/65	34.5-35.5	Rem	-	-	-
30/70	29.5-30.5	Rem	-	-	-
20/80	19.0-20.0	Rem	-	-	-
10/90	10	90	-	-	-
15/85	14.0-15.0	Rem	-	-	-
Alloy No 1	49.5-50.5	Rem	1.2-1.6	-	-
Alloy No 2	59.5-60.5	Rem	1.6-2.0	-	-
HMP 5S	4.8 - 5.2	Rem	-	1.2-1.8	-
LMP 62S	61.5-62.5	Rem	-	1.8-2.2	-
TLS/5	4.8-5.2	Rem	-	0.8-1.2	-
1/99	1	99	-	-	-
5/95	1	95	-	-	-

Lead Free Solder Alloys

In response to increasing environmental awareness and the drive for new legislation (forcing greater end of product life responsibility), Solder Connection offer a complete range of 'lead free' alloys to suit all applications. See table below.

Part No	Sn % Tin	Cu % Copper	Ag% Silver	Sb % Antimony
99C	Rem	.45 - .9	-	-
97C	Rem	2.5-3.5	-	-
96S	Rem	-	3.5-4.0	-
95S	95	-	5	-
95A	Rem	-	-	4.5-5.5
TIN	100	-	-	-
TSC	95.5-96	0.5-1	3.3-4	-
98S	Remainder	-	1.8-2.2	-
SAC405	95.5	0.7	4	-
SAC305	96.5	0.5	3	-
SAC300	97	-	3	-
SAC3	96.7	0.5	2.8	-
SAC2	97.5	0.5	2	-
SAC1	99.2	0.5	0.3	-

Key: - no element present

Working temperatures & Strengths

Apart from the purity of the solder alloy, other important properties when selecting the correct alloy are the working temperatures and the ultimate strength of the soldered joint.

The following table shows both working temperatures and the ultimate tensile strength of material. The table indicates that a maximum in tensile strength exists in the eutectic composition. The ultimate tensile strengths listed refer to the bulk solder. The values are only a guide to the relative strength of identical joints made with the solder alloys at room temperature. The table should not be used to calculate exact joint strengths, which depend on a number of factors The solder alloys were tested at 20°C at 1/16 inch per minute strain rate.

Part No	Melting range °C	Min junction temp °C	N/mm²	Tons/In²
63/37	183	245	67	4.3
60/40	183-188	248	48	3.1
50/50	183-212	272	47	3.1
45/55	183-224	284	47	3.1
40/60	183-234	294	47	3.1
35/65	183-244	304	-	-
30/70	183-255	315	49	3.2
20/80	183-275	335	51	3.3
10/90	268-302	-	-	-
15/85	227-288	348	49	3.2
99C	227	287	-	-
97C	230-250	310	-	-
Alloy No. 1	183-215	275	55	3.5
Alloy No.2	183-190	250	-	-
HMP 5S	296-301	361	36	2.3
LMP 62S	179	239	92	5.9
96S	221	281	54	3.5
TLS/5	296-301	361	-	-
TSC	217	-	-	-
98S	221	-	-	-
1/99	-	-	-	-
SAC405	217-219	-	-	-
SAC305	217-219	-	-	-
SAC300	217-219	-	-	-
SAC3	217-219	-	-	-
SAC2	217-219	-	-	-
SAC1	217-219	-	-	-
5/95	300-315	-	-	-

Wire Gauge (Diameter)

The wire gauge (diameter) for High Purity Solid Solder wire is represented as swg (standard wire gauge). The equivalent imperial and metric values are shown below.

Swg	10	11	12	13	14	16	18	19
mm	3.25	2.95	2.64	2.34	2.03	1.63	1.22	1.02
Inch	0.128	0.116	0.104	0.092	0.080	0.064	0.04	0.040

Swg	20	21	22	24	26	28	30	32
mm	0.914	0.813	0.711	0.599	0.457	0.376	0.315	0.274
Inch	0.036	0.032	0.028	0.022	0.018	0.014	0.012	0.010

The optimum thickness of solder wire will depend on the size of soldering iron being used.

Packaging

High Purity Solid Solder Wire is supplied on 0.25kg, 0.5kg, 1kg, 2.5kg, 3kg, 5kg, 10kg, 15kg and 25kg reels.