



MATERIAL APPLICATION & SAFETY DATASHEET

High Purity™ SOLDER ALLOYS



Product Name:

High Purity Soldering Products
Incorporating: Bar, Tinnans, Blowpipe, Ingot Solder, Pellets,
Chunks and Chips (all alloys).

Manufactured By:

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Description

High Purity Soldering Products are manufactured from a grade of solder alloy with purity levels far exceeding the requirements of all national and international standards. Warton Metals Ltd manufacture all high purity solder alloys using the finest raw materials available world-wide.

High Purity Solder Alloy

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In 1994 a single European standard, EN 29453 (ISO 9453), superseded all other European national standards, BS 219, DIN 1707, NFC 90-550.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.

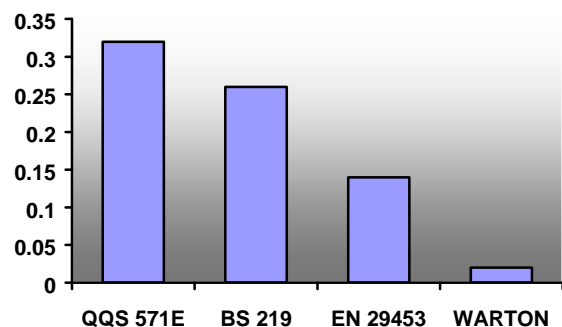
Warton Part No:	EN 29453	QQS 571E	BS 219 *DIN 1707
63/37	1a	Sn63Pb37	AP
60/40	2a	Sn60Pb40	KP
60/40 DIS*	-	-	-
50/50	3a	Sn50Pb50	F
45/55	4	-	R
40/60	5	Sn40Pb60	G
35/65	6	Sn35Pb65	H
30/70	7	Sn30Pb70	J
20/80	-	Sn20Pb80	V
15/85	-	-	W
99C	23	-	99C
97C	24	-	-
Alloy No.1	26	-	*Sn50PbCu
Alloy No. 2	25	-	*Sn60PbCu2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

*DIS dross inhibiting solder

The table above illustrates the equivalent Warton High Purity solder alloy in relationship to EN 29453, QQS 571E, BS-219 and DIN-1707.

Purity of solder alloy

The chart below compares the impurity levels permitted by Warton in relation to BS EN 29543, BS 219 and U.S. QQS 571E.



Warton High Purity Solder Alloys are manufactured using only the 'Highest purity raw materials' available world-wide.

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: Warton 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

Solder Alloys Containing Lead

Warton 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	-	-	-
60/40 DIS*	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	-	-	-
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	-

*DIS Dross Inhibiting Solder

Lead Free Solder Alloys

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

Warton 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	-
95A	Rem	-	-	4.5-5.5
TIN	100	-	-	-
TSC	95.5-96	0.5-1	3.3-4	-
SAC3	Rem	0.5-0.7	2.8-3.2	-
SAC2	Rem	0.5-0.7	1.8-2.2	-
SAC1	Rem	0.5-0.7	0.3-0.7	-

Working temperatures & strengths

The following table shows both working temperatures and ultimate tensile strength of Warton material. The table indicates that a maximum in tensile strength exists in the eutectic composition. The ultimate tensile strengths listed below 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.

Warton Part No	Melting range °C	Min junction temp °C	N/mm²	Tons/In ²
63/37	183	245	67	4.3
60/40	183-188	248	48	3.1
60/40 DIS*	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
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	-	-
95A	236-243	303	31	2.0
TIN	232	-	-	-
TSC	217	-	-	-
SAC3	217-219	-	-	-
SAC2	217-219	-	-	-
SAC1	217-219	-	-	-

*DIS dross inhibiting solder

Analytical Service

Warton Metals Ltd. offer customers the opportunity of regularly monitoring the quality of the solder in use, with Wartons skilled technical personnel advising on the analytical results if required. For customer assays **Warton Metals Ltd** use an independent, Namas approved test facility (Testing No: 0012/0963). This provides accurate unbiased results traceable to international standards.

Waste Removal

Agitation of solder by wave soldering or dipping will cause oxidation (known as 'dross'). Dross must be regularly removed and placed carefully into metal containers supplied free from Warton Metals on request. Contact Customer Services for more information.

Duty Of Care

Under the Environmental Protection Act 1990, it is necessary to complete a Duty Of Care Transfer Note with all waste solder from your company. Rather than complete a transfer note every time we collect your waste, you can save administration costs by simply signing one transfer note. We then hold all relevant details on our central database, which is open to inspection by the regulatory authorities to help you meet your legal obligations. This service is free to all customers.

Packaging

High Purity Bar Solder is supplied in nominal weights of 60 grams (Blowpipe), 0.25 kilo (Tinman sticks), 0.5 kilo bar, 1 kilo bar and 5 kilo Ingots.