■錫鉛狀態圖及適用溫度

如下圖所示，錫鉛合金自Sn 19.5%起至97.5%，有均一不變的固相線即BCE線(183.3℃)。ABC及CDE階為半熔融狀域，而ACD曲線則表示液相線。固相線液相線兩線會合點，C點是為共晶點。其時，錫鉛含量為63/67。換言之，當錫鉛之錫鉛含量為錫63%鉛37%時，可自液體狀直接變為固體狀或自固體狀直接轉變液狀，而不經半熔融狀。其他成份之錫鉛，則均在183.3℃至ACD液相線中間形成半融熔狀。液相線熔點並非適當的錫鉛溫度，通常之適用溫度約高於該錫鉛之液相線溫度55° ～85℃。

■ 共晶點錫鉛：

既然大家都希望於最低溫度下完成錫鉛工作，那就得利用熔點最低之錫鉛，錫63%鉛37%之共晶點錫鉛可符合此項要求其理由有如下三點：

(1)因其不經過半熔融狀態而迅速的固化或液化，因此可以最快速度完成錫鉛工作。

(2)能在較低溫度下起始錫接作用，乃錫鉛合金中錫接性能最佳之一種。

(3)溶液之潛鑽力強，可札根般地滲透金屬上之極微細隙。

Application and soldering

As shown in figure below, there is a solidus temperature line from Sn 19.5% to 97.5%－BCE(183.3℃). ABC and CDE are plastic state. Curve ACD is the liquidus temperature line. Point C is the eutectic point where the solidus temperature line and the liquidus temperature line meet and the tin-lead contents will be 63-37. When the alloy contains 63% of tin and 37% of lead, it may change directly from liquid to solid or from solid to liquid without going plastic state between 183℃ to curve ACD. The melting point on the liquid temp. Line is not the right temperature from soldering. Usually, The applicable soldering temperature is 55℃ ～85℃ higher.

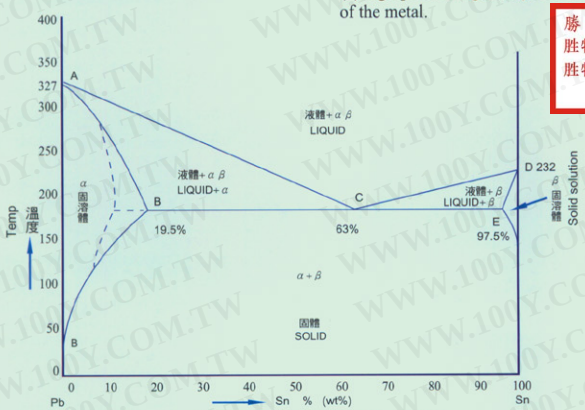
The eutectic solder

Since we want to solder at the lowest possible temperature, we want the solder with the lowest possible melting point. This would, of course, be the eutectic alloy of tin and lead which is 63% Tin and 37% Lead. There are three reasons for that:

(1)Soldering can be fast completed, owing to the direct liquidation or solidation without going through the plastic state.

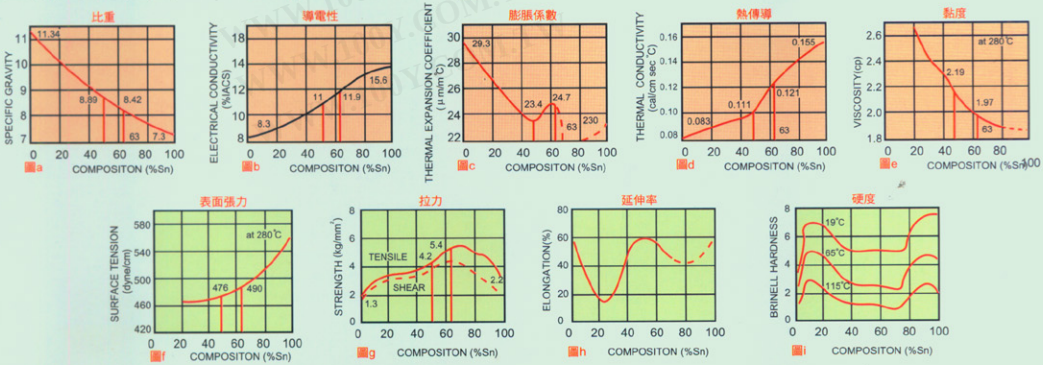
(2)Welding at low temperature, the best choice for tin-lead alloy.

(3)High penetrating ability to reach any small interstices of the metal.



■A simplified tin-lead phase diagram

■錫鉍特性圖 Soldering Features Diagram



Physical and mechanical properties of tin-lead solders versus composition.
All diagrams refer to ambient temperature except where otherwise stated.
以上係錫鉛錫鉍之物理與機械特性對其合金成份之變化，諸圖均以常溫為準除有指定的溫度之外如圖 e.f.i.

產品之種類規格及用途：
Table and Solder From Guide List

Available flux cored solder.可製成樹脂心之銲錫絲者

種類 Product's Item / 特性、形狀 Factor & temp		溶融溫度(℃) Melting temp. 固相 Solidus	溶融溫度(℃) Melting temp. 液相 Liquidus	比重 Specific gravity	棒狀 Bar	線狀 wire	用途 Uses	備考 Remarks
一般銲錫 Ordinary solder	20 Sn	183	279	10.2		◎	金屬之塗銲及銲接，車身接縫及凹位之補接 ・For metal coating and connecting for filling dents or seams in automobile bodies.	
	25 Sn	183	268	10.0		◎		
	30 Sn	183	258	9.7		◎	機械和燈泡之銲接 ・Soldering of machine and bulbs	
	35 Sn	183	248	9.5		◎	機械和燈泡之銲接 ・Soldering of machine and bulbs	
	40 Sn	183	238	9.3		◎	一般鉛工及燈泡之銲接 ・For wiping solder and common-purpose	
							鉛管或電纜用及汽車散熱器用，一般電器用品之銲接。 ・For lead pipes or cable sheaths soldering, also for car radiator cores and heating units, general electrical soldering	
	45 Sn	183	227	9.0		◎	汽車散熱器用及白鐵皮銲接用，一般電器用品之銲接。 ・Car radiator cores and roofing seams, general electrical appliances soldering	
	50 Sn	183	215	8.9		◎	用於電視機及一般電器用品之銲接，為最普遍之用途。 ・for TV and electrical appliances soldering which is most popular prupose	
	60 Sn	183	190	8.7		◎	一般銲接作業所使用特別對溫度要求嚴格者，通信器材收音機之銲接 ・for general soldering, specially for the place where the temperature must be required, communication equipment, radio receiver soldering	
共晶銲錫◎	63 Sn	183		8.4		◎	以浸泡式或手工用共晶點低溫銲接用 ・Eutectic solder with the lowest temperature for both by dipping or manual soldering	
	70 Sn	183	191	8.3		◎	塗裝用 ・for coating	
含銀銲錫 Silver bearing Solder	S-1/60/39	180	194	8.5		◎	銀電極，鍍銀零件，石英振盪器等。 Silver electrode, silver plated parts Quartz oscillator	
	S-1/54/45	180	203	8.7		◎		
	S-2/60/38	180	194	8.5		◎		
	S-2.5/60/37.5	180	194	8.5		◎		
	S-3/60/37	180	192	8.5		◎	厚膜積體電路用或鍍銀器皿用 Silverware Platinging etc.	(不含松香助銲劑) Containing no Flux
	S/4/96	180	200	8.5		◎		
低溫銲錫 Low temperature Solder	#72		72	8.5		○	用於對溫度敏感物質之銲接，有易分解之材質存在者，需銲數次之先銲部份，保險功能，如火警警報器等。 ・for the soldering of temperature sensitive material, or easily decomposed material, for materials which need to be soldered for several times on the same part and fuse function, eg fire alarm, etc.	
	#80		80			○		
	#90		90			○		
	#95		95			○		
	#102		102	9.9		○		共晶(EUTECTIC)
	#103.8		103.8			○		
	#124		24			○		
	#177		177	8.5		○		
高溫銲錫 High temperature Solder	#220		221	7.4	○	○	電視機，馬達銲接後須再經熱處理者。 ・TV, motor solderings which must be required post heat-treatment.	
	#240		240	7.3	○	○		
	#260		260	8.3	○	○		共晶(EUTECTIC)
	#280	183	280	10.2	○	○		
	#315	305	315	11.0	○	○		
特殊銲錫 Special solder	HARX-M					◎	電視或收音機之機座、鐵鎘、鎳鐵板(俗稱五彩板)不銹鋼之銲接。 ・for the soldering for chromed iron plate, iron-nickel alloy plate, etc.	成分依客戶之要求可訂製 Composition are available on your request.
	HARX 100					◎		
						○		
電鍍用陽板或棒、球 Tin anode / Solder anode	99.95up		232	○			P.C.B或電子零件之電鍍用。 P.C.B or electric parts.	
	63/37		183	○				
錫筆 Solder dispenser (pack)						◎	手工銲接，工藝用。 ・Manual soldering, technology.	
成型銲錫 solder preform							不易以手銲之精密零組件銲接用。 ・Precise parts which are hardly manually soldered	成分依客戶之要求可訂製 Composition are available on your request.
錫球 solder Ball							B.G.A 封裝用 For B.G.A Package	

※其他另有多種規格歡迎洽詢Other solder alloy are available on your request.

Solnet

產品之標示：
Indication System of Solder

產品之等級：Grade
(符合中國國家標準CNS 2475)

■ 銲錫S級之化學成分 CLASS S CHEMICAL COMPOSITION

記號 SYMBOL	化學成分 CHEMICAL COMPOSITION%							
	Sn	Pb	不純物 IMPURITY%					
			Sb	Cu	Bi	Zn	Fe	Al	As
Sn 65S	64～66	餘量 Remainder	0.10 以下 max	0.03 以下 max	0.03 以下 max	0.005 以下 max	0.02 以下 max	0.005 以下 max	0.03 以下 max
Sn 63S	62～64								
Sn 60S	59～61								
Sn 55S	54～56								
Sn 50S	49～51								
Sn 45S	44～46								
Sn 40S	39～41								

■ 銲錫A級化學成分 CLASS A CHEMICAL COMPOSITION

記號 SYMBOL	化學成分 CHEMICAL COMPOSITION%							
	Sn	Pb	不純物 IMPURITY%					
			Sb	Cu	Bi	Zn	Fe	Al	As
Sn 95A	94～96	餘量 Remainder	0.30 以下 max	0.05 以下 max	0.05 以下 max	0.005 以下 max	0.03 以下 max	0.005 以下 max	0.03 以下 max
Sn 63A	62～64								
Sn 60A	59～61								
Sn 55A	54～56								
Sn 50A	49～51								
Sn 45A	44～46								
Sn 40A	39～41								
Sn 38A	37～39								
Sn 30A	29～31								
Sn 20A	19～21								
Sn 10A	9～11								
Sn 5A	4～6								
Sn 2A	1.5～2.5								

■樹脂心錫絲：Rosin-core Solder Wire

・其顯著特點：

1.具有適度活性化，使任何形態的錫接均可適應。

2.不腐蝕，不起臭味。

3.錫接性能最佳。

4.可以迅速完成錫接作業而省時省力。

Significant Features

1.With appropriate activity, it adapts to any form of soldering.

2.Non-corrosive, no unpleasant odor.

3.Excellent Wetting.

4.Soldering can be completed rapidly, save time and laborer.

■三心樹脂錫絲：Tri-core Solder Wrie

◆以往國內生產的樹脂心錫絲只能做出單心的，原因不外乎技術上的困難和設備的簡陋，單心的樹脂心錫絲因為樹脂錫劑都集中在一處，以烙鐵頭等加熱時候很容易因突然受熱而使錫劑或錫粒到處噴，因此有人在錫絲上割V型溝，使錫劑露出空中，讓加熱時氣體能逸去空中以免噴散，更有人使用錫粉與錫劑粘合成型為線狀以達其目的，這工作方法雖好，但也有其缺點：

1.錫劑露出會粘手2.不能久放3.價格昂貴等....三心的錫絲使錫劑平均分散三處，受熱時錫劑之熱膨脹及產生之氣體壓力，亦因分散而大大的減少了噴散情形；更因三心錫絲絲作業性能之改良而縮短了作業時間。

樹脂心錫絲的最大課題是錫接性能、有無空心、可靠性及作業時臭味之發生和使用時之噴散。

新原新型三心樹脂錫絲係針對解決上述問題而新開發之產品，因為它的性能優良，尤其適用於精密配件之錫接或自動錫接。

Currently, the resin flux-cored solder manufactured in the country is mono-flux. This is mainly due to the lack ward of technology and equipment. The resin solder flux of the mono-flux is gathered at a point, when heat is applied, the flux spattered, As a result, a v-shaped slot is made on the surface of the solder wire, in order to expose the solder flux, thus the air may be released. Others maker use of solder powder and solders flux to form a wire solder. Although this is a good method, it still has its disadvantages as the below:

(1)the exposed solder flux will stick to hand,

(2)cannot be deep for a long period,

(3)expensive.

Tri-core solder wire distributes the flux uniformly, the gas evolved during heating is thus greatly reduced. Further, the working condition for the tri-core solder is greatly improved, thus the time for operation is also reduced. The most important characteristics of resin flux solder are on wetting, hollow flux, reliability in, the odor release at work and spattering when it has been soldered.

The aforementioned new product is developed in order to solve the problems. Due to its excellent properties, it is especially suitable for precision parts soldering or automatic soldering.

◆特點

・三心之錫絲

・不起臭味

・錫劑及錫粒之噴散殆無

・擴散性特佳，適用於大量生產，並減低不良率。

・錫劑之殘渣非常穩定，長期放置也不致有腐蝕或降低絕緣性。

FEATURES

・Tri-core solder wire.

・Generates little odor during soldering.

・No spattering to flux or solder particle.

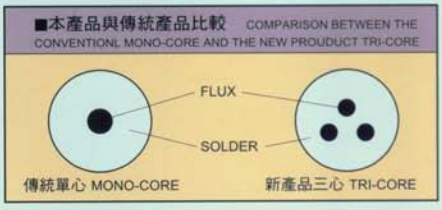
・Excellent spreadability, suitable for mass production which also decrease defect occurring ratio.

・Residue of flux is stable, no corrosion occurred for long period storage or decrease insulativity.

■種類及包裝 Kinds and Packing

成 份% composition%	熔 點 melting point℃	比 重 specific gravity	線 徑 diameter mm or inch	包 裝 package
Sn/Pb 63/37	183	8.4	3.0(.114") 2.5(.098") 2.0(.079") 1.6(.063") 1.2(.047") 1.0(.04") 0.8(0.32") 0.5(.02")	0.5kg 1kg 2kg
60/40	183~190	8.65		
50/50	183~215	8.85		
45/55	183~227	8.97		
40/60	183~238	9.3		
30/70	183~258	9.7		

Sn any composition, Dia 0.38 mm -3.0 mm can be manufactured.
錫可以任何比例成份，線徑0.38 mm -3.0 mm皆可生產



・沒有腐蝕性

錫錫絲經熔接後之殘渣，如有腐蝕性，對於電子電器產品之品質影響至大。SPARKLE SOLDER經過試驗後，證明不但毫無腐蝕性，相反地，可以保護被覆蓋的部份，不受外界之影響而致使錫接處發生氧化現象。

Non-Corrosive

If the residue after soldering possesses corrosivity, it will affects the quality of electrical appliances. The test carried out on SPARKLE SOLDER proves that there is no corrosion occurred. On the contrary, it protects the covered portion from oxidation (due to external influence) on the soldered area.

Sparkle Solder Typical Products & Specification

產品 Products	助焊劑種類 Flux Type	助焊劑含量 Flux Content(%)	絕緣阻抗 Insulation Resistance(Ω)	銅板腐蝕測試 corrsion test on copper plate	Application / 應用範圍
EX	RA	2.0	1×10^{12}	PASSED/合格	精密電子設備，點焊降低短路發生 For precise electronics, Prevention icicles by point soldering
115A-1	RA	2.3	1×10^{12}	PASSED/合格	精密電子設備，降低拉絲，飛散發生 For precision electronics equipment, spattering free and prevention of solder icicle
115B-1	RA	2.3	1×10^{11}	PASSED/合格	消費性電器，降低拉絲，飛散發生 Consumer electronics, spattering free and prevention of solder icicle
70U	RA	1.8	1×10^{11}	PASSED/合格	適消費性電器 Consumer electronics
WU-04	RA	1.5	1×10^{11}	PASSED/合格	適消費性電器，拉焊，點焊可降低拉絲，短路發生 Consumer electronics, prevention of solder icicle and bridging by slide and point soldering.

Specification Solder Alloy Sn40% to 100%, Dia 0.38mm to 3.0mm
錫可以任何比例成份，線徑0.38mm to 3.0mm 皆可製造

特殊焊錫絲 Special Resin-core Solder wire-〝好克〞

產品 Products	助焊劑種類 Flux Type	助焊劑含量 Flux Content(%)	絕緣阻抗 Insulation Resistance(Ω)	銅板腐蝕測試 corrsion test on copper plate	Application / 應用範圍
HARX-M	.....	2.2	1×10^{11}	PASSED/合格	適不易焊接材質，如不銹鋼等 For heavy soldering
HARX-100	.....	2.2	1×10^{11}	PASSED/合格	適不易焊接材質，如不銹鋼等 For heavy soldering