Sn42Bi58 Lead-Free Solid Solder Wire

Eutectic Low-Temperature Tin-Bismuth Solid Solder Wire

PRODUCT DESCRIPTION

JUFENG Sn42Bi58 is a low-temperature, lead-free eutectic tin-bismuth solder alloy available in solid wire form. The eutectic composition melts at **138°C**, providing a single melting temperature rather than a solidus-liquidus melting range. The alloy is intended for applications where reduced thermal input is beneficial, including heat-sensitive electronic components and secondary soldering operations.

This datasheet relates specifically to **solid solder wire with no internal flux core**. A suitable external flux may be required according to the materials, process and application.

PRODUCT AT A GLANCE

- Sn42Bi58 eutectic alloy
- Lead-free
- Solid wire construction
- No internal flux core
- Melting point: 138°C
- Single melting temperature
- Low-temperature soldering
- Minimum published wire diameter: 0.5 mm

TYPICAL PRODUCT PROPERTIES

Property	Typical / Published Information
Product form	Solid solder wire
Alloy designation	Sn42Bi58
Alloy type	Eutectic tin-bismuth alloy
Nominal composition	42% Tin (Sn) / 58% Bismuth (Bi)
Lead-free	Yes
Internal flux core	None – solid wire
Melting point	138°C
Melting behaviour	Eutectic – single melting temperature
Minimum published wire diameter	0.5 mm

KEY FEATURES

- Eutectic Sn42Bi58 composition with a defined melting point of 138°C.
- Single melting temperature with no pasty range for the nominal eutectic composition.
- Low melting temperature helps reduce thermal exposure during soldering.
- Tin-bismuth alloy suited to applications involving heat-sensitive components.
- Solid wire format allows selection and control of a separate external flux system where required.
- Lead-free alloy for applications requiring a non-intentionally leaded solder composition.

TYPICAL APPLICATION AREAS

Electronics manufacturing	Heat-sensitive components, LED products, sensors and integrated circuit applications.
Secondary PCB soldering	Multi-stage soldering operations where lower thermal input may help reduce thermal stress.
Semiconductor packaging	Low-temperature bonding between chips and substrates.
Circuit protection	Thermal cut-offs, thermal protectors, surge protection and precision control modules.
Industrial / specialist electronics	Applications where a low-temperature solder alloy is technically appropriate.

PROCESS GUIDANCE

Sn42Bi58 is a eutectic low-temperature solder alloy with a melting point of 138°C. Soldering parameters should be established and validated for the specific assembly, substrate, component finish and external flux system. Avoid applying unnecessary thermal energy once satisfactory solder flow and wetting have been achieved.

External flux	Because this product is solid wire and contains no internal flux core, an appropriate external flux may be required. Flux selection should be based on substrate finish, cleanliness, process requirements and residue / cleaning requirements.
Temperature	The eutectic alloy melts at 138°C. Actual tool or process set-point will be higher than the alloy melting point and must be validated for the application.
Joint design	The mechanical characteristics of tin-bismuth alloys differ from conventional tin-lead and SAC alloys. Suitability should be assessed for the intended service environment and joint design.
Mixed alloy considerations	Where Sn42Bi58 is used for secondary soldering or rework, consider the effect of mixing with solder already present on the assembly.
Qualification	For critical, high-reliability, automotive, medical, aerospace or safety-related applications, the complete soldering process should be independently qualified against applicable requirements.

PACKAGING & AVAILABILITY

JUFENG publishes solder wire packaging options of 100 g, 200 g, 250 g, 500 g, 800 g and 1 kg per roll for this product family. Specific solid-wire diameter, reel weight, tolerances and minimum order quantity should be confirmed at the time of quotation.

STORAGE & HANDLING

Store in original packaging in a clean, dry environment and protect from contamination, moisture and physical damage. Maintain product identification and batch traceability. Before use, inspect the wire for contamination or damage. Storage life and specific storage limits should be confirmed against the supplied JUFENG product documentation for the ordered batch.

TECHNICAL NOTES & LIMITATIONS

IMPORTANT

This datasheet has been prepared for the **Sn42Bi58 eutectic solid solder wire variant**. It intentionally excludes terminology and performance claims relating to an internal flux core. Published JUFENG product information also describes rosin-cored wire within the wider Sn42Bi58 product family; those flux-content details do not apply to the solid-wire product described here.

The 138°C melting point stated relates to the nominal eutectic Sn42Bi58 composition. Batch-specific alloy composition, impurity limits, wire diameter tolerance, standards compliance, shelf life and application-specific approvals should be confirmed with the manufacturer for the exact product supplied.

Manufacturer	**Product**
Shenzhen Jufeng Solder Co., Ltd. JUFENG Solder	Sn42Bi58 Lead-Free Eutectic Solid Solder Wire Low-Temperature Tin-Bismuth Alloy