

Innovative Solder Wires

Heading for the Future at High Speed

Contributed by Almit GmbH

Faster, higher, further: the electronics manufacturing industry is in a constant state of change. Manufacturing requirements are changing rapidly, new priorities are being set, and new markets need to be tapped. In order to keep pace, manufacturers must meet the highest quality standards and strive to meet customer needs with innovative solutions that not only meet current requirements, but also open up entirely new possibilities and opportunities for the future. Almit's elaborate research work lays the foundation for the unique quality of its solder wire portfolio. This is complemented by individual development work to offer tailor-made products for every requirement.

100% Continuous Flux Core

Conventional solder wires often have the problem that the flux core is interrupted by air inclusions due to poor production technology and the core has a high variance in flux content. This leads to inferior solder joint quality in the application. Almit solder wires, on the other hand, have a 100% continuous flux core without any kind of air inclusions and only a minimal variance in flux content (**Figure 1**). Almit can guarantee this quality promise for all solder wires, even for its extremely thin high-performance wires with a diameter of up to 0.08 mm. These are used primarily in the fields of electronics, medical technology, the automotive industry and aerospace, and open up completely new possibilities in miniaturization thanks to their small diameter while maintaining the highest quality.

Almit is not only focused on current market

requirements, but also wants to anticipate potential challenges that may arise in the future. For this reason, Almit repeatedly sets its own standards in product development, which exceed industry standards. This is also the case in flux development: Almit's flux content varies only minimally and exceeds the industry standard: For a P3 wire, the flux content may range between 2.7% and 3.9% according to the industry standard. Almit sets itself considerably higher standards than the industry: P3 wires from Almit achieve a much lower variance with a flux content between 3.1% and 3.5%, which is reflected in **Figure 2**.

Longer Solder Tip Life

When it comes to costs in electronics manufacturing, the issue of solder tip wear is a critical factor. Almit offers forward-looking solutions to keep costs under control. For example, Almit's S-Line solder wires use an innovative additive in the alloy to reduce

oxidation and thus minimize iron removal at the soldering tip (**Figure 3**). Compared to a conventional alloy, the soldering tip life is increased by up to 5 times and thus helps to reduce costs in production.

The Best of Two Worlds: The Halogen-Free Solder Wire SRS-ZL

A new innovative product in Almit's high-performance portfolio is the SRS-ZL solder wire. As a halogen-free wire, it is assigned to IPC classification Lo and yet impresses with many of the properties of an L1 wire, such as exceptionally fast wetting behavior and very good flow properties. This combination makes it particularly suitable for automotive applications. The excellent properties of the SRS-ZL also prove themselves in through-hole drag soldering. In through-hole techniques, the minimum filling of the piercer is 75% in order to achieve the highest classifica-

tion in IPC's 3-class product system and thus to be approved for the manufacture of high-performance electronics. In this context, high-performance electronics refers to products whose continuous functionality and high performance are essential, such as life-support or other critical systems. Almit's SRS-ZL solder wire not only achieves the required 75%, but also features 100% fill of the piercer — a unique performance, especially for a halogen-free solder wire (Figure 4).

Flux Spatter

A major challenge in soldering is flux spatter. The binder and activator used in the flux is rosin, a resin that is left over when the volatile turpentine oil is separated from the turpentine secreted by softwood logs by distillation. The resin used contains residual moisture, the main reason for flux spattering. Almit operates its own flux development to provide the appropriate flux for each application, depending on the thermal heating conditions.

A complex manufacturing process is used to reduce the natural residual moisture in the flux to a minimum. The quality advantage achieved in this way is also reflected in the characteristics of the SRS-ZL, as it convinces with particularly few flux spatter, as the graphic in Figure 5 shows.

Do you wish for a technical consultation? We look forward to hearing from you at technicalsupport@almit.de !

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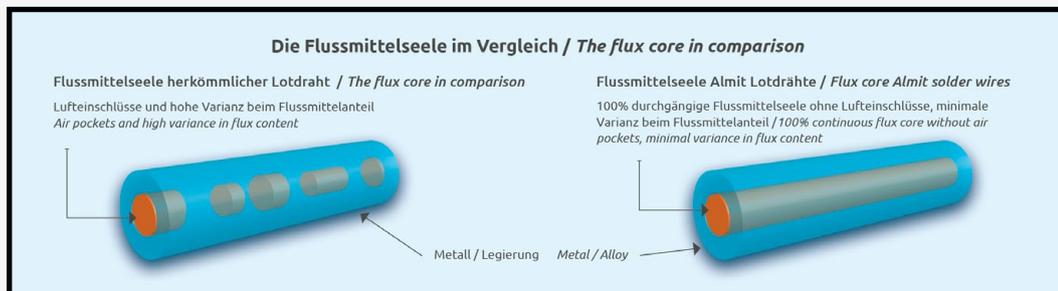


Figure 1: Almit solder wires have a 100% continuous flux core without any kind of air inclusions.



Figure 2: On the left side: Soldering points of conventional solder wire with flux core containing air pockets. Right side: Solder points of Almit solder wire with 100% continuous flux core without air pockets.

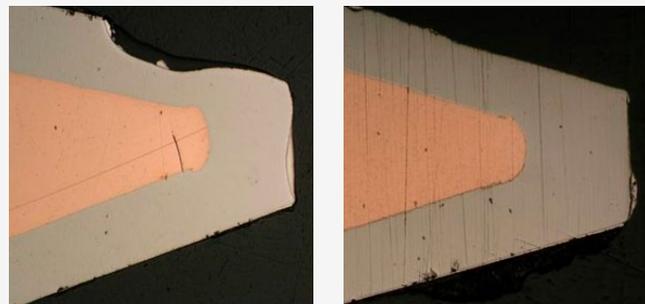


Figure 3: Result after 20,000 times soldering: On the left side, the soldering tip wear conventional solder wire. Right: The soldering tip wear Almit solder wire LFM-23 S.

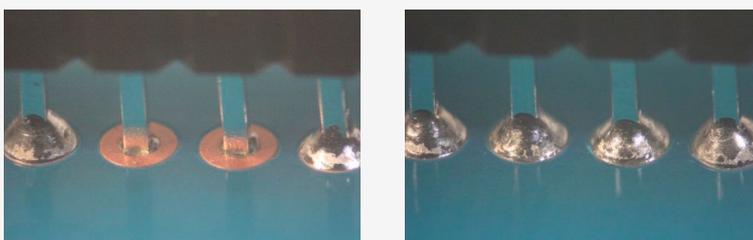


Figure 4: Left side: Result of Through-Hole-Soldering with conventional solder wire. On the right, the result of Through-Hole-Soldering with Almit solder wire SRS-ZL.

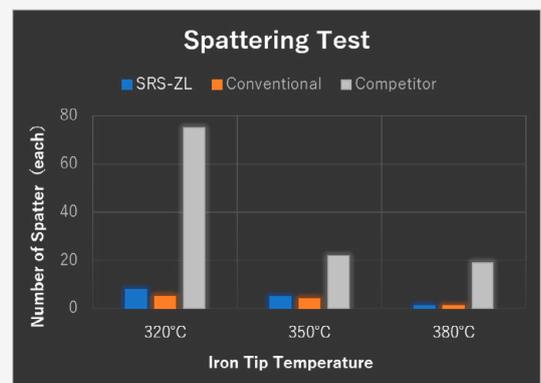


Figure 5: The solder wire SRS-ZL convinces with particularly few flux spatter.