Press release

Eltville, 17.04.2026

Special flux for nitinol and nickel in high-performance military applications

Miniaturization, robustness, adaptive functions, and maximum reliability are crucial factors in the performance of defense and aerospace technologies today. In this context, Nitinol—a nickel-titanium alloy with shape memory and superelasticity—is becoming increasingly important as a key component in innovative systems. With EO-M-026, Emil Otto offers a specifically developed high-performance flux that is precisely tailored to the processing of Nitinol and nickel alloys.

Soldering nitinol is one of the greatest challenges in assembly and connection technology. It is caused by the extremely stable titanium oxide layer that forms immediately upon contact with air and almost completely prevents reliable wetting. Conventional fluxes reach their limits in this case, as they do not sufficiently remove the oxide layer or leave behind critical residues. The flux EO-M-026 addresses precisely this problem by selectively removing the titanium oxide layer, activating surfaces that are difficult to wet, minimizing corrosive residues, and ensuring maximum process stability.

EO-M-026 was particularly developed to meet these requirements. The combination of highly active inorganic activators and complex organic additives enables reliable wetting even on oxidized surfaces, clean, low-residue processes, and high process reliability in automated manufacturing environments. The flux is zinc- and halide-free, non-flammable, and VOC-free, making it suitable for modern, safety-critical production environments. By supporting common application methods, from manual processes to selective or laser-based soldering, EO-M-026 can be flexibly integrated into existing production lines.

EO-M-026 is a specialized flux that, for the first time, enables the reliable and industrially scalable processing of nitinol. This makes it a crucial enabler for modern military technologies, ranging from UAV systems and adaptive structures to highly sensitive electronic assemblies. The flux thus becomes a crucial process component, not merely supportive, but functionally indispensable for the production of durable solder joints. Especially in the defense industry, the quality of joining technology determines the operational capability of entire systems. Nitinol is used wherever conventional materials reach their limits. Typical military applications therefore include the following areas:

- Adaptive structures and morphing systems: self-adjusting wings or air ducts in UAVs and missiles
- Thermally controlled actuators and valves: autonomous control mechanisms in fuel or hydraulic systems
- Vibration and shock damping: protection of sensitive electronics in communication and targeting systems
- Miniaturized microactuators: applications in sensor technology, optics, and portable equipment
- Space and satellite technology: reliable separation mechanisms without explosive components

These applications are based directly on the unique material properties of Nitinol, particularly its shape memory effect and superelasticity, which enable mechanical functions without conventional drive systems.

As powerful as Nitinol is, its processing is equally demanding. Even minor deviations in the soldering process can permanently impair its functional properties, such as the shape memory effect. Precise, controlled thermal processes, tailored solder alloys, and precisely matched fluxes are therefore crucial. Only through this synergy it is possible to ensure that the material's mechanical and functional properties are preserved. This is a fundamental requirement for military systems with long service lives and extreme loads. In an era where performance, reliability, and

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miniaturization determine technological superiority, joining technology thus plays a key role. EO-M-026 provides the necessary foundation for this.

About Emil Otto

Since 1901 "Emil Otto" stands for top quality. As owner-managed company, Emil Otto is committed to the development and manufacturing of high-quality fluxing agents. In particular the fluxing agents for electronics production, strip tinning, cooler construction as well as for galvanizing are used by market leaders at home and abroad.

Over the years, reliable products and a high level of customer care have become the signature. The manufacturing takes place in accordance with the latest standards, the quality- and environmental management system has been certified for many years. Emil Otto responds with high flexibility to customer requests. Special products or product adaptations are developed and implemented in collaboration with system manufacturers and institutes.

More information: www.emilotto.com

Picture:

Picture caption:
Modern UAV technologies are playing an increasingly important role in defense and ISR applications

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