2-component coating made easy
Cost effective and quick repairs

Until now, there has been no recognized standard for the automated application of 2-component coating materials frequently required for maintenanceand repair work on ships, pipelines and steel constructions. This results in time- and cost-intensive manual labour. With its 2K coating systems, Sulzer Mixpac is setting a completely new, professional standard in this field.

Both new application systems, MixCoat™ Spray and MixCoat™ Flex, combined with the tried and true 2K cartridge technology matched with a newly developed spray mixer, form these revolutionary new systems; MixCoat™ Spray and MixCoat™ Flex not only simplify difficult repair jobs, but also create value-added, real cost/savings advantages.

"Life to him seemed hollow, and existence but a burden. Sighing, he dipped his brush and passed it along the topmost plank."* So it was for Mark Twain's titular hero, Tom Sawyer, when he was made to paint a fence as a punishment for fighting. In Mark Twain's day, painting with a brush was the only way to paint large objects. While the technology in this area has made huge progress since then, two-component (2K) coating materials are still often, to this very day, mixed by hand and applied with a brush. These functional coatings serve as corrosion protection or as sealants, and are used in ship and bridge building and repair, on pipelines and wind turbines.

Existing systems present many challenges, including air entrapment in the cartridges, product leakage and contamination during storage. If there is air in the cartridges during the filling process, this leads to off-ratio mixing problems during use. Customers have asked for lighter weight, easier to use dispensing tools that ensure consistent application with fewer complications.

Manual mixing and application presents numerous disadvantages and risks. Both the mixing and the application are very time-consuming, especially when working on large areas. With manual applications, coating materials must be manually mixed in the proper ratio, allowed to dwell (or „sweat-in") for a given period of time, and then the mixed coating must be applied before the open time („pot life") of the product expires. Moreover, there can be considerable material loss through residues in opened packaging and also through uneven application with the brush.

Figure 1: „Applications for 2-K coatings: shipbuilding, steel constructions, trains & railways and wind power plants.

Both components of a 2K coating are non-reactive by themselves. They only cure properly when they are brought together in the correct mix ratio. Due to short pot life, they can only be mixed immediately before they are to be used. Previously, there was no appropriate technology to automate this process.

In addition, the consistent quality of the manual mixing is often difficult to consistently reproduce. Last but not least, working with such hazardous materials requires careful handling to minimize any health risks for workers.

* From the book, Tom Sawyer

Cartridge systems offer convincing advantages

Given their experience with automated dispensing systems, especially with large package sizes such as those used in the building trade, Sulzer Mixpac was constantly receiving requests from the coatings market. The developers at Sulzer held intensive talks with end-users in order to understand the problems they faced and to find out what they needed. As it proved impossible to meet all the requirements with a single system, two variations were developed: The light, portable MixCoat™ Spray system, and for difficult to access areas, the flexible MixCoat™ Flex. Both are easy to use and are very low-maintenance. The advantages of the cartridge systems are obvious:

- **Cost savings** – Higher material costs incurred by filling into cartridges are far outweighed by the lower labor costs, resulting in significantly shorter working time being required for mixing and applying coatings.
- **Automated mixing** – This yields a much more precise mix ratio which can be reproduced every time.
- **Precise metering** – Coatings are applied evenly for consistent film thickness, with minimal over spray.
- **Safe storage** – The cartridges are extremely stable and also able to be resealed easily.
- **Protection of resources** – With each application, only the amount of material that is actually required is used.
- **Portability** – The systems can be used without difficulty wherever they are needed, for example, on board ships.

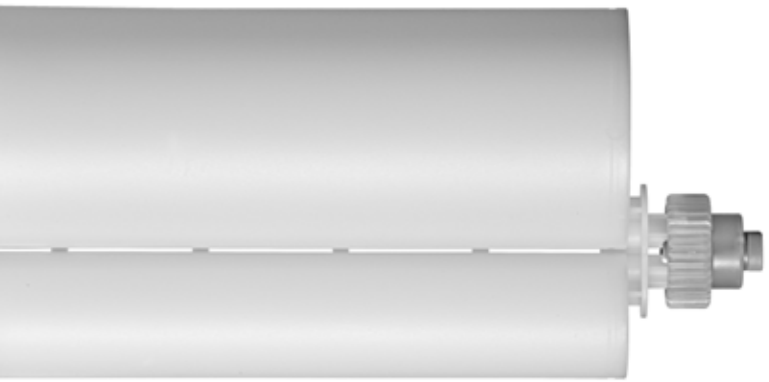

Figure 2: MIXPAC™ cartridge with patented seal to avoid premature mixing of the two components and the incorrect attachment of the mixer.

A complete system is comprised of three different parts: the cartridge, the mixer and the dispenser. Both components of the coatings material are stored separately in the side-by-side cartridges. As the material is sometimes hazardous, the leak tightness of the cartridge is of paramount importance. In addition, cartridges must be filled without incorporating air so that uniform metering and dispensing is consistently achieved. For this, Sulzer was able to call on its own patented technologies. The cartridges are back-filled, while a valve plunger seals the cartridge and prevents air entrapment. At the front, a special outlet system (F-System) ensures that neither component comes into contact with the other before entering the mixer. The cartridges are coded so that they cannot be accidentally connected incorrectly to the mixer, and because the cartridges are easily resealed, opened cartridges can be reused until they are completely empty. There are two advantages of these features: Firstly, the material is used as needed, and secondly, completely empty cartridges are not considered hazardous waste, making them much more economical to dispose of than partially empty containers.

Figure 3: Spray mixer based on the tried and true QUADRO™ mixing technology.

The spray mixer is attached to the cartridge at the front and has two functions. Firstly, it ensures that both components bind into a homogenous mixture. To this end, Sulzer uses its tried and true QUADRO™ mixing technology. Secondly, the compressed air in the Air Assist process enables the spray function. There are two options available for the compressed air connections: A standard connection and a “quick lock” connection for faster and more convenient mixer exchange. Sulzer offers 0° and 90° angled spray tip versions as well. In the latter, the point is designed at a right angle. This facilitates easy spray coating of angled surfaces.

The right dispenser for every application

The cartridges and mixers are completed by the addition of the new dispensers, MixCoat™ Spray and MixCoat™ Flex. Typical applications for both systems include 2K coating repair work in shipbuilding, on pipelines, steel constructions and wind power plants as well as on automotive loading spaces or railway cars.

MixCoat™ Spray Spray is a straightforward spray dispenser. It is suitable for smaller, quick 2K coating and repair jobs. The independent system requires only a compressed air connection to operate. The integrated air line makes it possible to reach all areas to be coated easily and without being hindered by air tubes and other lines. The lightweight design of MixCoat™ Spray enables precise spraying for a prolonged period minimizing operator fatigue. The system can also be used with just one hand thanks to the dual-stage trigger. If this trigger is pressed only halfway, it activates the compressed air that is required for spraying. When pushed all the way, the compressed air required to dispense the materials from the cartridge is also started, thereby initiating the mixing process of the two components. As a result, there is no longer any need for laborious and time-consuming settings on the devices.

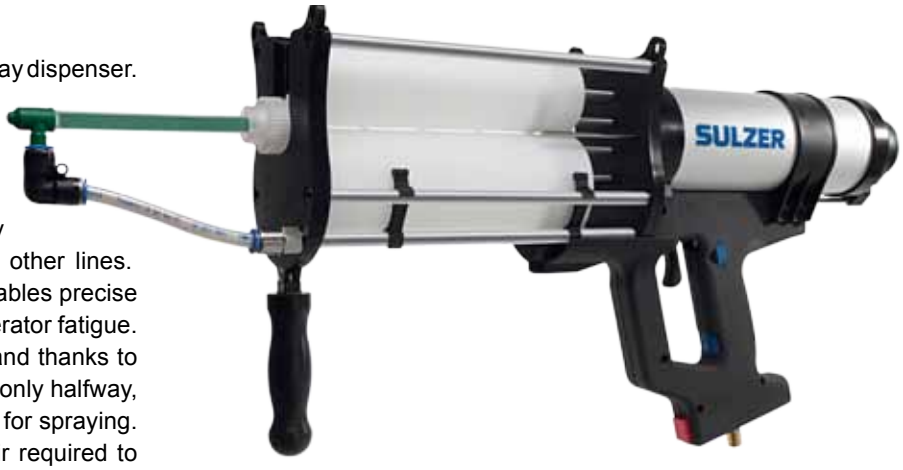

Figure 4: MixCoat™ Spray system

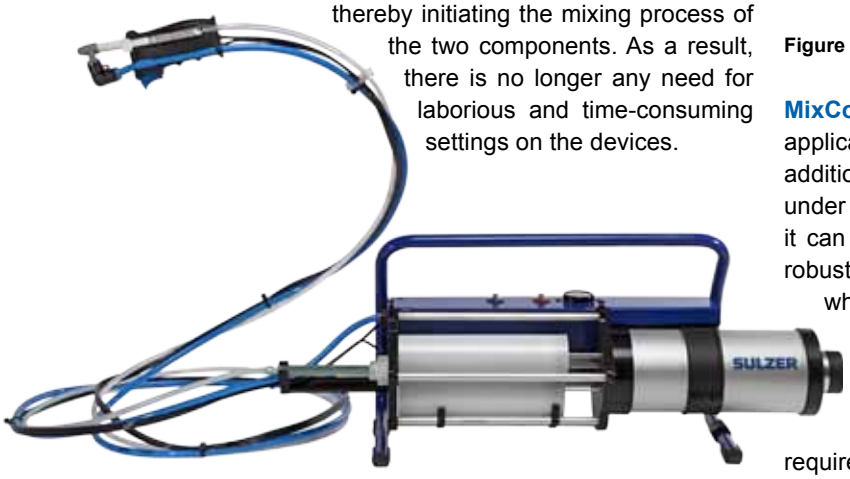

Figure 5: MixCoat™ Flex system

MixCoat™ Flex is is a universal device for coating applications, offering different application methods. In addition to spraying, which is not permitted in every situation under Occupational Health and Safety regulations (OSHA), it can also be used with an attached brush or roller. The robust device is attached to the wall or placed on the ground when in use. It is typically used in hard to reach areas or where complex geometry exists. The spray head, brush or roller is attached to the device via tubing, which makes handling MixCoat™ Flex particularly easy. This system, like MixCoat™ Spray, only requires one air connection in order to operate.

Conclusion: With these versatile and cost-effective automated dispensing devices, 2K coating technology has entered the 21st century. The cartridge-based systems offer reduced overall costs and enhance the quality of coatings work at the push of a button.

More Information about
MIXPAC MixCoat™
faster, safer, cleaner