Chemical collaboration


MST Chemicals' new headquarters

Rosario Patricelli, technical sales manager at CIE, and Paul Scott, business development director at MST Chemicals, discuss their working relationship in developing sustainable options for waste water and metal surface treatment.

All images courtesy of MST Chemicals

CIE was founded in 1981 in Italy, and since that time has been specialising in the design, development, manufacture and installation of water and waste water plants specifically dedicated to metal finishing lines, across Europe and the wider world.

CIE's technical sales manager Rosario Patricelli joined the company in 2001 and is passionate about the company's development over the years. "We employ a lot of skilled personnel. At CIE we have both mechanical engineers and chemists who use our lab in Italy for research and development, helping us to grow constantly."

The Italian business helps companies overcome water discharge limits, which are now becoming more and more stringent globally. CIE is able to treat water at the washer stage, from the upper press right to the body maker, removing chemical contaminants such as sulphuric acid and hydrofluoric acid.

The company expanded its expertise in this area when, in 1989, it installed its first Zero Liquid Discharge plant for stainless steel coiling cleaning in Arinox (Italy).

Zero Liquid Dischage (ZLD)

CIE's ZLD plants aim to eliminate the discharge of waste water, rather than just treating it in order to comply with discharge limits. Rosario explains that this means that "95-97 per cent of all water involved on the washer side can be treated and then re-used back on the washer again. A huge amount of water is saved with this process."

As Rosario explains, there are many reasons driving customers to seek this kind of solution. "For example, if a can maker sets up a factory in a developing country, often there is no infrastructure, no proper sewage systems, and a lack of water in the first place." Rosario uses the example here of Angola, where Nampak Group's beverage can factory had "no water inlet and no sewage connections," so the ZLD system acts as a game changer in these situations because "if you want to run the factory, you must be equipped with the system to recover the water. Otherwise you cannot run the factory."

However, the most significant push in the market now is impact on the environment and "for the biggest companies in the chemical field to be operating sustainably."

As technical sales manager, Rosario says his role now is mostly about pushing for ZLD systems for companies such as Nampak, Ball Corporation and Canpack. Back in 2018, CIE installed a full ZLD plant for Canpack India. Now, the design is complete for a full ZLD plant at Ball's Kettering site in the UK; 80 per cent of ZLD is already installed but discussions are still ongoing.

One of the biggest issues can manufacturers and other companies encounter is water cost. "The water cost in Europe seems to be doubling year on year," notes Rosario. "Imagine a company with factories all around the world. When they approach local authorities to discuss the possibility of water in and water out, they lose time. And authorities never give a fast answer, so the company risks a delay on its project while waiting, and while also risking losing more money because of the water costs."

Paul Scott, MST Chemicals' business development director, expands on this. "If we take the average usage of 50 cubic metres of water per million cans, globally roughly we're consuming 18 billion litres of water which equates to roughly 4.7 billion US gallons per annum.

"If we look at a typical example of water cost in a factory that is using 80 cubic metres of water, they're getting charged close to half a million dollars for water in and out for just one line."

"ZLD solves these issues, because you don't need water in, you don't need any connection to the sea; you can operate pretty much wherever you want. No discussion with the local authorities is needed and so the disputes and risk factors are eliminated. You're saving water and money," says Rosario.

Paul explains that other plants in the world have tried ZLD-type concepts but not with the same success as CIE. "Toyo Sekan in Japan tried this with its Tulc cans, to try to eliminate water out in a dry forming process where they covered their tinplate with PTFE coating, and used the PTFE coating as a lubricant, which was successful to a degree, but the cans still aren't recyclable because they're covered in plastic."

Combining skill sets

For CIE to continue its ZLD plant offering, it realised the treatment process needed reinforcement.

Rosario elaborates, "To run the plants and to achieve such high quality of water for these limits, we needed more help from chemists. So that's why we started up a new entity with MST Chemicals, with more or less the same shareholder of CIE, involved in the research and development of special chemicals for waste water.

"In my experience, going into the direction of saving water on the washer side, it starts to become more and more difficult to treat the water. More of the water is concentrated once you dump from the washer, so therefore the more difficult it is to treat.

"We said, look, if our problem starts on the washer – and we know the chemistry because we are chemistry-based – why don't we approach the problem from the beginning?"

MST's role within CIE operations is to provide full chemical management, from the front end to the waste water. Having started life in 2014, MST combines 75 years of managerial and technical experience in metal packaging, with Paul, and CEO and managing director Franco Falcone, having previously held leading positions at both Henkel and Chemetall.

"To complement the range that CIE has on the equipment side, we needed chemicals to control the pollutants that were in the water," says Paul Scott. ▷

The lab's workbench

The ICP-OES Plasma Spectrometer

MST's chemical range for waste water includes (but is not limited to) PuroSorb, to reduce COD levels; Pur-All, for taking out sulphates and fluorides that come from the chemicals within the washer; and PuroFloc, which involves flocculants to help separate the pollutants.

The natural progression for MST after developing this range, says Paul, was to look at all the other chemicals that were on the front end process.

"We now have licensed technology for lubricants, for both the cupping press and the body maker lubes. We also have a standalone cooling filter, so there's no need to empty the entire coolant system to do a trial. We could effectively put in a standalone coolant filter on one bodymaker and run the whole system."

All MST's products, Paul highlights, are 'COD harmonising' which "is all about selecting the right type of ingredients for the chemicals because we know that we must treat those chemicals later in the process." Paul notes that the distinction between MST and other chemical suppliers is that others seem to be "either focused commercially on the additives or qualitatively on the additives, whereas we are focused not only on a quality perspective but also in how to treat them at the end when they hit the waste water treatment plant."

MST is now also offering a range of washer chemicals. "There was only ever really one player in the market here and that was Henkel which had about 80-90% market share for both lubricants and washer chemicals. The technology is not that difficult and the formulations are well-known, but we've tweaked them and now have something alternative to Henkel, where globally that was never before available," says Paul.

"We also have a high end chemical controller to even out the consumption within the process itself."

CIE's partnership with MST helps reinforce the guarantee of quality and performance for customers. "We ask a supplier to use our chemicals for a temporary time and during this time, we share all the technical information related to the chemicals, so our customers are always free to compare the market," notes Rosario. However, with both companies' combined expertise, Rosario and Paul are confident that CIE and MST are uniquely positioned.

"With total front end chemical management we have cradle to grave responsibility, from the cupping lubricants to the body maker coolants, to the washer chemicals to the waste water treatment chemicals and ZLD process," says Paul.

"That allows us to control upstream compatibility, and improve site service to the customer, so the more out of the value chain that we have within a can plant, the better service that we can provide."

Paul concludes with the sentiment, "We don't think people will instantly cease working with their incumbent supplier and bring MST in immediately. Every factory needs a second supplier, and what we're really trying to do is encourage people to qualify us as an alternative supplier."

MST operates head offices in Italy and branches in South Africa and the UAE, with investigations underway to manufacture locally in the Middle East to meet growing customer demand. CT

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