

Informally speaking

A formaldehyde magazine from Johnson Matthey

- Another memorable conference in Europe
- Expanding R&D lab to house 'micropilots'
- America's changing regulatory landscape
- How good is your methanol flow?
- A flooding incident calls for vigilance



Wind of change

This familiar song title from 1990 seems to apply now more than ever. We have seen a lot of change since the beginning of 2025 which has affected the whole world in trade, logistical chains, national defence and many systems that are meant to provide security. The most recent development in the Middle East between Israel and Iran is yet another. All creating a lot of uncertainty, which is also something we have seen signs of when comparing our sales trends historically. From our perspective we can only hope that efforts to resolve these difficult conflicts will soon ease tensions, which in turn may spur optimism in investments and a better outlook for the future.

In the meantime, we are happy to report that the expansion of our catalyst plant was finalised at the beginning of this year. Although this work did cause some undesired delays in the recovery of spent catalysts, as the market leader, we have seen the need to future-proof our capacity to meet the market needs. For those of you who may have been impacted by delays, we apologize for any inconvenience this may have caused during that time.

While we're on the subject of change, you may already have heard the exciting news that JM is selling its Catalyst Technologies (CT) business to Honeywell. The announcement (opposite page) was made amid our Formaldehyde Europe conference in Helsingborg (page 10), so we had the pleasure to share the news in person with our customers who were there. Expect to hear more about this in the months ahead.

Also noteworthy is that another 1.2 million tonnes of capacity have been started up by our Projects department since December 2024! That's quite an accomplishment following last year's record-setting achievements. But aside from this, the Projects team plays another very important role for revamps and upgrades, which we know are important topics for many of you – see page 12.

Other news includes the expansion of our R&D lab (page 6), and that we now have the Automated Data Ingestion solution in place to support our **JM-LEVO™** Portal customers! With the required set-up, there is no need to upload the file manually to our Portal. This is creating value for both you and us, since it allows our Technical Service team to support you and provide feedback much faster, be it regular performance optimisation or troubleshooting – see page 8.

And speaking of feedback, our comprehensive, biannual survey will be conducted this autumn. We strongly encourage you to participate as it helps us in our continuous improvement work and also in putting our focus on the areas which we need to prioritise, which in the end will also benefit you.

Finally, we look forward to continuing to serve you and we also hope to connect either in person somewhere in the world, at our upcoming conferences, or in the personal meetings between our teams, and we hope for an exciting future for all of us during 2025.



Lars Andersson and Ronnie Ljungbäck
Global Market Managers Formaldehyde

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Honeywell to acquire JM's Catalyst Technologies

As announced May 22, 2025, Johnson Matthey has signed an agreement to sell the Catalyst Technologies (CT) business to Honeywell, which includes the Formaldehyde business. The terms of the deal create a great opportunity for our CT business to benefit from Honeywell's scale and investment capabilities and to help accelerate growth. While we are eager to start this new journey, we want to emphasise that our CT business will continue to operate as a standalone business until the transaction completes, expected by H1 2026.

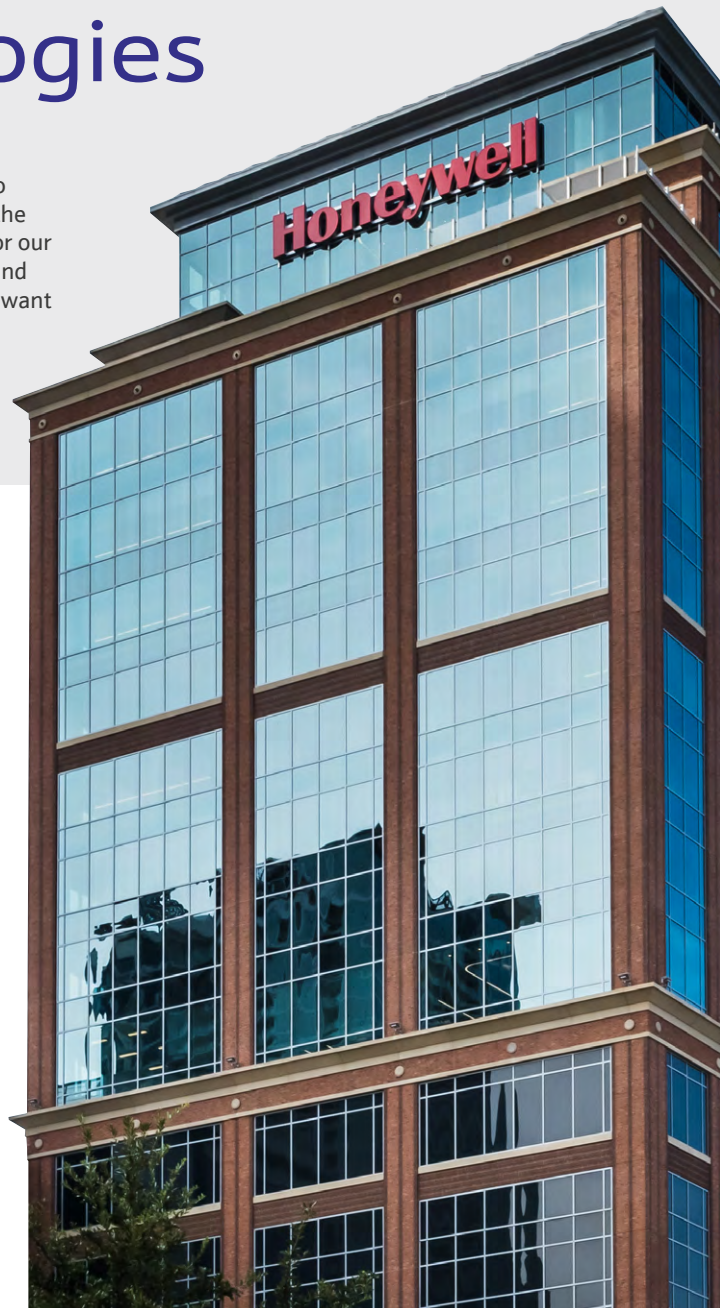
What this change means to you

Honeywell is a US Fortune 500 integrated operating company headquartered in Charlotte, North Carolina, that operates in aerospace, building automation, industrial automation, and energy and sustainability solutions. Honeywell is a 100-year-old established and trusted US brand with \$38bn sales revenue and 102,000 employees.

Honeywell believes that CT is a brilliant business with high growth potential - both CT's technology and people are extremely important to them. For CT, the move is a great fit; it is highly complementary with Honeywell's existing businesses and provides a platform to scale CT's technologies and drive future growth.

The acquisition will result in all of CT's employees and leadership team moving to Honeywell. As a valued customer/partner, we do not anticipate any immediate impact, although over the course of the coming months our teams will be assessing and making the necessary steps for the successful completion of the deal.

Throughout, we will endeavour to work through all necessary details, considerations and practicalities as quickly as possible, liaising with yourselves. Should you have any queries between now and then, please approach your designated JM contact.



On the front page:

Jingzhou, China: One of many new startups in 2025

Upcoming conferences...

Formaldehyde Americas,
29th September - 2nd October 2025,
Atlanta, Georgia.



Celebrating Earth Day

It starts with small actions -
but every action counts.

“it was a brilliant opportunity to connect with nature and contribute to ongoing environmental protection efforts. Small actions add up - and we were proud to have played our part this Earth Month”

Tara Taylor, Community Ambassador, UK.

While Johnson Matthey's global mission is integral to driving net zero, we recognise that our individual responsibility has the power to drive a large impact – and team JM certainly rose to this challenge during Earth Week 2025. Team members across 31 of our global sites committed to implementing a sustainable habit for the week to help demonstrate how small changes in our day-to-day habits can make a tangible difference. Many of these small pledges included:

- ★ no using single-use plastic, reusable items only
- ★ to have homemade lunches only
- ★ taking showers for no longer than 4 minutes
- ★ following a plant-based diet
- ★ walking, running or cycling to work
- ★ turning appliances off, rather than leaving on standby

Alongside these individual pledges, we also saw ourselves wrapping up 275 days of environmental volunteering during Earth Month, by partnering with local causes to support their communities. These activities included:

- ★ Planting 100 trees with local schools in Bawal and Manesar, India
- ★ Monitoring local river health in Clitheroe, UK
- ★ Sustainability session given in local primary school, Riyadh, Saudi Arabia
- ★ Clearing debris from a two-mile stretch of road in Devon, USA



Proud to have played our part this Earth month,
doing our bit for the planet and its people.



BY



Nicole Watson
Marketing Communications Representative



New regulatory landscape takes form in the US

As the new US administration under President Trump took shape earlier this year, including the appointment of Lee Zeldin as new EPA Administrator, environmental regulations in the US faced a significant shift. With its new, forceful emphasis on deregulation, the EPA has since announced and begun implementing 'historic' actions aimed at rolling back policies deemed burdensome to industries. Among the areas likely to see changes are formaldehyde regulations as well as emissions controls during Startup, Shutdown, and Malfunction (SSM) periods - two key issues that could impact the formaldehyde industry across the country.*

Formaldehyde regulations

In January 2025, the EPA finalised its risk evaluation for formaldehyde, determining that exposure poses an unreasonable risk to human health, particularly for workers and consumers. This evaluation was widely expected to pave the way for stricter regulations governing the production and use of formaldehyde in various industries.

However, the new administration's aggressive deregulatory approach has added doubt around these anticipated restrictions. With Zeldin in charge, the EPA has made economic growth a priority, working to ease regulatory burdens on manufacturers. This shift suggests that forthcoming formaldehyde regulations may be reconsidered, delayed, or significantly softened - a move that could bring relief to producers but spark concerns among environmental advocates.

For industry players, the message is clear: stay vigilant. As the EPA re-evaluates its regulatory stance, formaldehyde producers should monitor agency announcements closely to stay ahead of potential compliance changes.

SSM emission rules

The previous administration implemented strict emission standards during Startup, Shutdown, and Malfunction (SSM) periods, eliminating exemptions that previously allowed for higher emissions during these operational phases. These regulations required industries - including formaldehyde producers - to adopt rigorous work practice standards to control emissions at all times.

Now, with the EPA's deregulatory agenda in motion, there is a possibility that these SSM-related requirements could be relaxed or revoked entirely. Administrator Zeldin has hinted at revisiting a range of environmental regulations, with potentially SSM emission standards among those to come under scrutiny.

What formaldehyde producers should do now

While the regulatory landscape remains uncertain, formaldehyde producers should take a proactive approach to prepare for potential shifts. Here are four key steps to consider:

1. Stay informed

Regularly track EPA announcements, proposed rule changes, and industry reports to understand how policy developments may affect compliance requirements.

2. Engage with industry associations

Collaborate with organisations such as the American Chemistry Council and other trade groups that advocate for chemical producers. These groups can provide early insights into regulatory trends and offer support in shaping industry-friendly policies.

3. Evaluate compliance strategies

Even if regulations are relaxed, companies should assess their current compliance strategies carefully. Consider the risks of scaling back environmental controls, especially in terms of long-term sustainability, potential policy reversals, and public perception.

4. Prepare for regulatory uncertainty

While a rollback of formaldehyde and SSM regulations seems likely, policy shifts can be unpredictable. Companies should weigh the pros and cons of adjusting compliance measures now versus maintaining current best practices to future-proof operations.

Looking ahead

With deregulation as a core priority of the new EPA leadership, formaldehyde producers may soon find themselves with more operational flexibility. However, navigating the changing regulatory framework requires a careful balance - taking advantage of relaxed rules while ensuring long-term environmental responsibility.

As the situation evolves, one thing remains clear: adapting to regulatory shifts will be key to staying ahead in the formaldehyde industry.

BY



Lucas Freitas
Regional Technical
Service Engineer

*Reservation for changes in EPA policy made between the writing and the publishing of this article.

Expanding R&D lab to house new 'micropilots'

Developing our offering is an integral part of JM's business model. The development of formaldehyde technology and catalysts is led from Perstorp, but usually it is a collaborative effort involving other JM sites and competencies. Readers may recall that David J Martin, Principal Scientist in the Catalyst R&D group, detailed the extensive development process in the 2023 Spring/Summer issue of *Informally speaking* in which he spoke of the various pilot reactors involved. In this issue, we want to share with you some news about improvements we're making in that area.

The heart of R&D

The pilot hall in Perstorp is the very heart of formaldehyde catalyst R&D. As customers who participated in our Refresher Training in late 2023 could see during their visit, the hall contains our full-scale pilots, which are in fact mini-plants, less an absorber system, designed to mimic the real formaldehyde plants.

These pilots not only make it possible for us to simulate different operating conditions, but they also enable us to do both short term and catalyst lifetime tests. It is in the pilot hall that all new catalysts and loading plans undergo extensive testing before being brought to market, to ensure the high quality our customers expect.

Earlier in the development

Long before a new catalyst can be tested in any of these pilots, however, its components are first looked at in small 'micropilots'. A micropilot is a miniature pilot used for studying the catalytic properties of individual materials in powder form, not pellets, thus avoiding the mass transfer limitations that can arise with pelleted material.

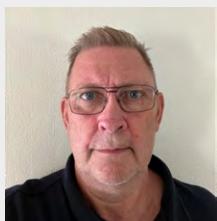
Micropilots are typically used in early phases of product development as they require only a small amount of material to reveal the intrinsic catalytic properties. Once good performance in the micropilot is ensured, we can then form the powder into pellets and begin testing real loading plans in our full-scale pilots.

BY



Kaisa Kisko
Manager Catalyst R&D

A few moments with Lars Schüler



Lars is the Pilot and Engineering Manager at the JM R&D lab in Perstorp and is overseeing the new lab expansion. His 25 years of working with catalysts in Perstorp began as a catalyst technician in charge of testing environmental catalysts. He has been an R&D engineer for many years and enjoys the challenges associated with designing and building pilots from scratch. He is also responsible for the staff who run the pilots.

So, what can you tell our readers about the new lab?

This is something we're really happy about for a couple of reasons. For one, it is an important improvement in terms of safety. Secondly, it will increase our capacity.

Safety?

Yes. At JM we regularly perform Process Hazard Reviews to see where we can make improvements for our people. By creating a new dedicated space where all our micropilots are set up in a more secure environment, we will have taken safety to a higher level by reducing potential risks to any of our R&D staff.

And besides an increased capacity, any other upgrades for the new lab?

We're upgrading the micropilot control unit, which means it will be integrated into the same system as the large pilots. And we will continue to invest in our comprehensive lab for better efficiency and safety.



Lars replacing two of the specially built microreactors in one of the micropilots

Could you explain why the micropilots are so important?

With the micropilots we can do really close studies of the catalytic properties of a material without any unwanted effects. That's because the material is in powder form, giving a more homogenous blend where all particles are the same size. This enables us to truly observe the catalytic properties with nothing else that might otherwise distract. It's actually the very first thing we do when developing new catalysts. And of course they are also a key part of the quality control. So the micropilots play a very important role for us and, in the end, for our customers.

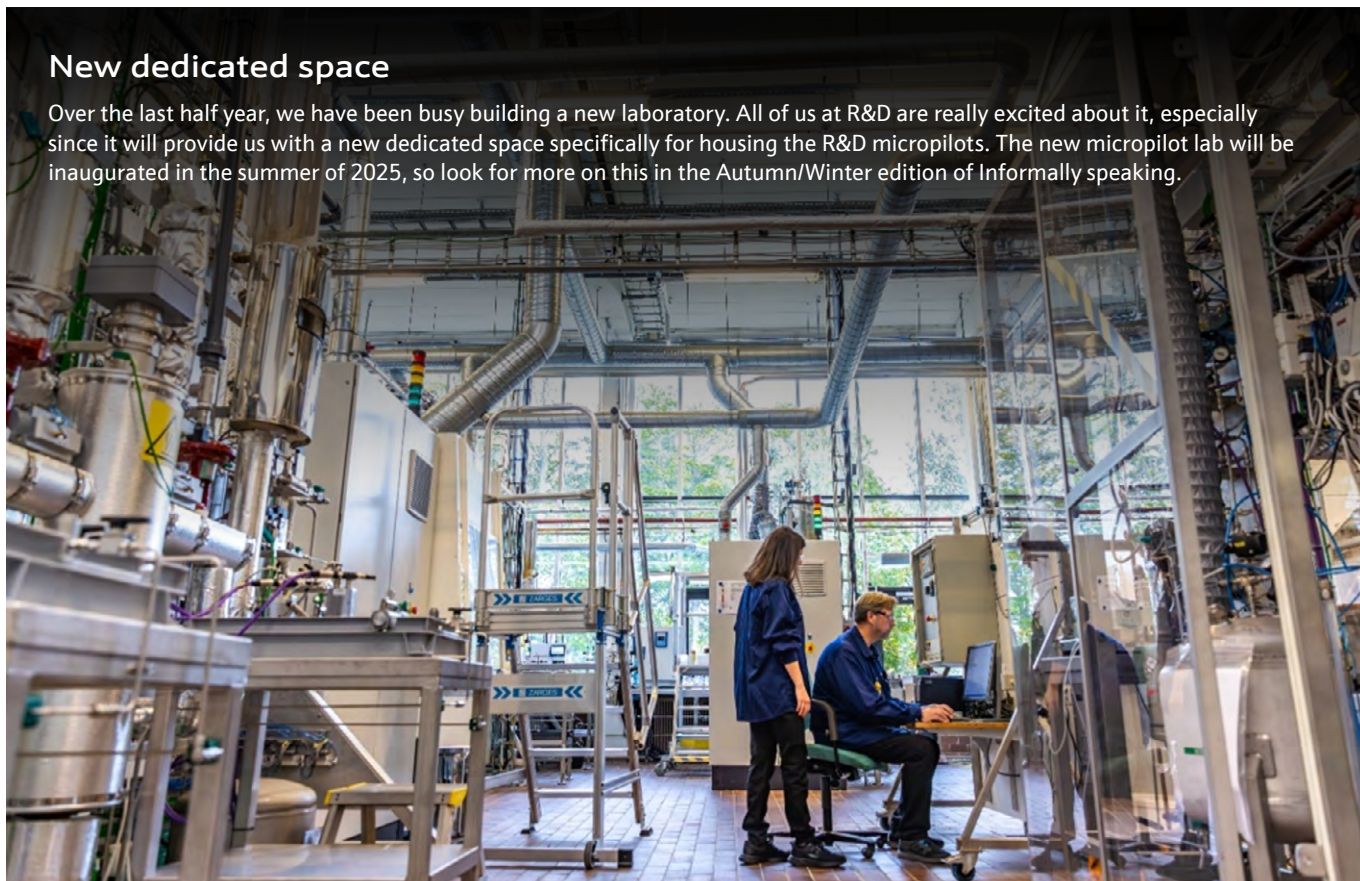
BY



Charles Hodgdon
Editor

New dedicated space

Over the last half year, we have been busy building a new laboratory. All of us at R&D are really excited about it, especially since it will provide us with a new dedicated space specifically for housing the R&D micropilots. The new micropilot lab will be inaugurated in the summer of 2025, so look for more on this in the Autumn/Winter edition of Informally speaking.



JM-LEVO tips and reminders

How to get the most out of the JM-LEVO Formaldehyde Portal

Operating your plant at sub-optimal levels may be costing you more than it should. Fortunately, there is a way to help you prevent undesired and unnecessarily costly experiences – by sharing data with JM, which is now easier than ever.

As an example, let's consider a plant that was running at an average of 300 metric tons of 37 wt% formaldehyde per day. For some reason, performance began to drop, and the yield kept decreasing over a period of about three months before the issue was finally resolved and performance was restored to the same level as before.

Assuming a yield drop of 1.5% at the lowest point and a methanol price of 350 EUR per metric ton, the economic loss would be around 34,000 EUR, or about 0.2% of the overall methanol cost for one year of operation.

If data had been shared on a more regular basis, the drop in performance would have been shorter, timewise. The increase in methanol consumption would also have been more moderate.

Financially, the added cost caused would have been significantly reduced and limited to approximately 1,100 EUR, which is less than 0.01% of the cost of methanol.

Understandably problematic

For many, the process of sharing data may feel too burdensome. First collecting data from the DCS system, then populating the JM-LEVO template spreadsheet with the collected data, and finally uploading the file to the JM-LEVO Formaldehyde Portal. Unfortunately, these tasks are too easily deprioritised, and data is not shared with JM, eventually jeopardising the performance of the plant. As a result, it would also affect the speed of troubleshooting any operating problems. Besides the direct budgetary impact caused by a higher consumption of methanol, it may also affect the capability of production at the rate required by the business.



Figure 1: Intermittent data sharing may lead to an unnecessarily lengthy and costly path for restoring performance

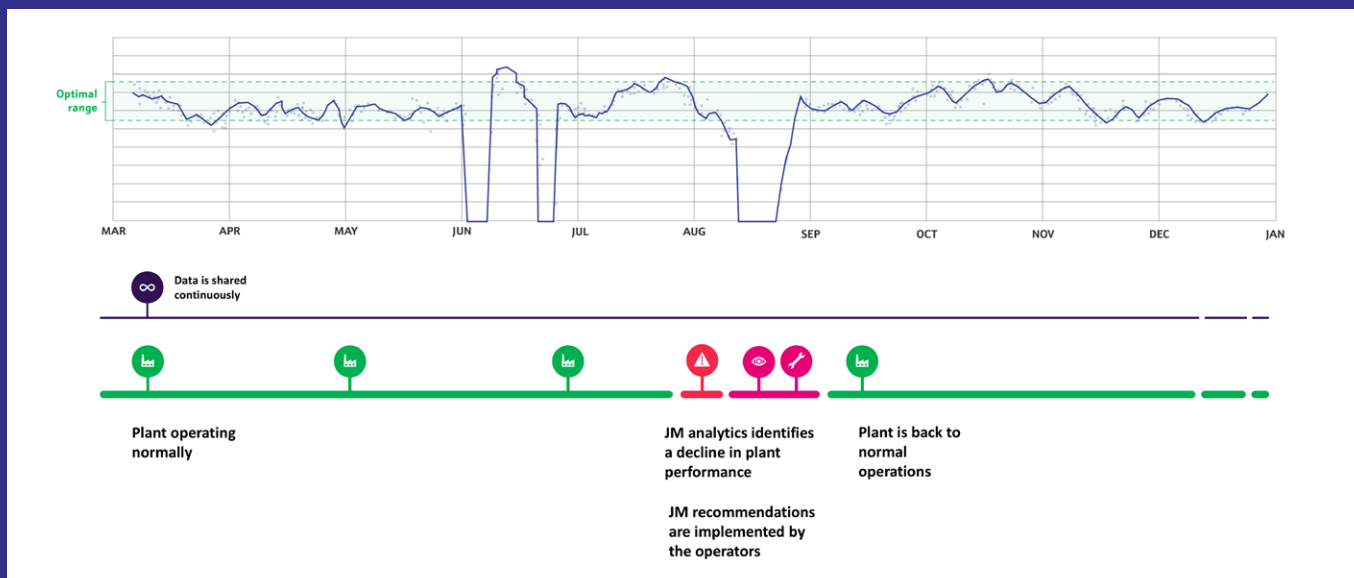


Figure 2: Continuous data sharing helps to drastically reduce the path to restored performance

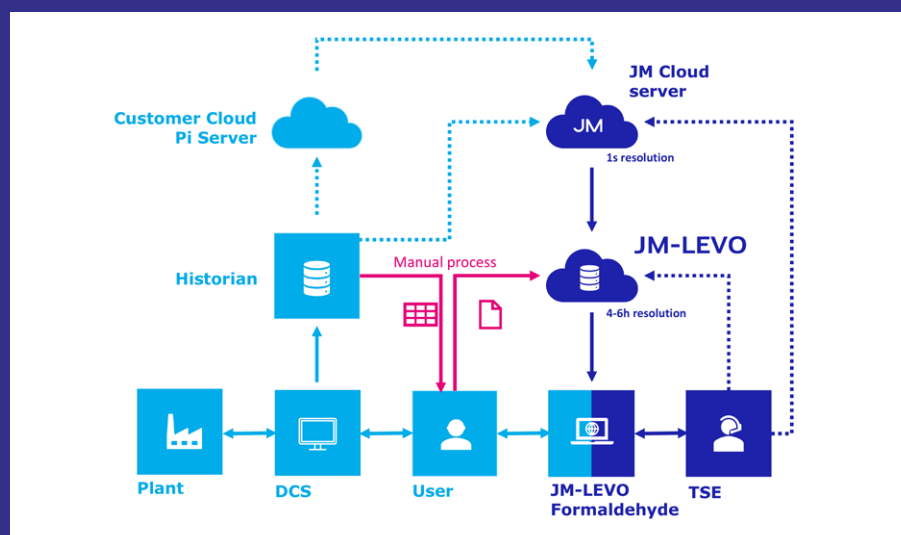


Figure 3: New, fully automated ADI solution with secure, mono-directional flow of data extracted from DCS to JM-LEVO Formaldehyde Portal eliminates the burden of manually sharing data

Now there's an easier way

To better support our customers we have therefore developed an Automatic Data Ingestion (ADI) process that is continuously feeding data from the customer system to a JM data collection system. This allows the sharing of data at a high resolution, up to one measurement point per second, which is stored on the JM Cloud server. It is then processed and one point per six hours is pushed to the JM-LEVO database to be used for generating the different visuals, charts and KPI calculations on the Portal itself.

What about the other data?

While the one-point-per-second data are not currently processed for displaying on the Portal, they are available to the Technical Service Engineer in case of specific troubleshooting. In the future, they will also make the development of other data analysis possible, supporting not only performance optimisation but also preventing incidents or production issues.

Contact your JM representative to find out how you can get started with our ADI solution to avoid unnecessarily costly experiences in the future.

BY



Dr Philippe Thevenin
Global Technical Services
Leader – Formaldehyde



Formaldehyde Europe 2025

19th – 22nd May 2025, Helsingborg, Sweden

Formaldehyde Europe 2025 got underway at The Elite Hotel Marina Plaza in Helsingborg on the 19th with a welcome **barbeque buffet for delegates**. The evening was well attended and both JM staff and delegates spent a few hours together settling into Helsingborg, meeting old friends and making new introductions.

Day 1

The main event began at 9 am the following day and the agenda covered general presentations. Delegates heard a JM update, the FORMOX offer: Plants, Catalysts and Technical Support, as well as from external presenters Håkan Kihlberg from Perstorp about sustainable methanol, Paul Girard from Cefic/Formacare about the EU's ongoing regulatory work regarding formaldehyde and Formacare's response, and Simon Maddren from Energex about the global methanol market.

After that followed a Formaldehyde market update from Ronnie Ljungbäck, Sales & Market Manager Catalysts, as well as an update on the future development of formaldehyde technology presented by Lars Andersson, Market Manager Formaldehyde Plants, Ronnie, as well as Senior Process Specialist Ola Erlandsson.

The evening was spent at the stunning Sofiero Castle. The weather was very kind and the group were able to enjoy a guided tour around the beautiful castle gardens, learning about the flowers, hearing about the history of the building and the previous owners (the Swedish King and Queen!) before being seated for dinner which, for the lucky group, was inside the castle.

Day 2

The second day covered technical presentations, and the delegates received updates on both our catalyst development and ECS catalysts, critical plant and process equipment, a look at unlikely events – 3 uncommon problems in formaldehyde plants, and the **JM-LEVO Formaldehyde Portal**.

The afternoon was a chance for delegates to hear from some different vendors and each vendor delivered a short presentation – Ragnar Olafsson from MAN spoke about the sustainable turbocharger technology which can save 30% of the power consumption; Stephen Griffin from Heliex about how to use excess steam from the formaldehyde plant to generate power with a compact screw compressor; and Fredrik Klingström from Aerzen about their product portfolio with a focus on positive displacement blowers. After that the delegates were able to grab a coffee and work their way around the vendor stations to ask questions and get more information.

The day ended with a great presentation on automation from Jimmy Karlsson at Emerson entitled "Together in control – keeping automation future-proof through collaboration."

In the evening the group took a short walk to a nearby restaurant called KOL & Cocktails, known for its great atmosphere and delicious grilled dishes, for dinner.

ELITE HOTEL MARINA PLAZA



Day 3

The final day was reserved for customers and is the training day of the event. The agenda covered turbochargers vs blowers for pressurisation, catalyst loading plans – design considerations, ECS catalysts – fundamentals, aging and poisoning, optimum plant operation, absorber design and operation, deflagration example and theory, and finally, seven operational problems in the formaldehyde plant.

The conference ran smoothly and was attended by 17 different companies. The JM team received lots of great feedback about the conference content and offsite dinners. Big thank you to our customers and vendors! We look forward to doing it all again in Atlanta in September.

Words from some of the delegates:

"It was truly a pleasure and privilege to attend. I deeply appreciated the opportunity to connect with you and I must commend your contributions to such a well-organized and impactful event."

"Top organisation! Compliments to the JM team."

BY



Polly Murray,
Marketing Communications
Representative

A smarter path to growth and sustainability with JM's Projects department



Highly tailored upgrade services for:

- Increasing methanol or air flow
- Boosting operating pressure (>0.5 bar g)
- Enhancing absorption performance
- Adding UFC towers for greater product flexibility
- Installing new instrumentation and automation
- Treating off-gas with ECS units to meet environmental regulations

In today's competitive industrial landscape, upgrading isn't just a technical decision – it's a strategic move. And thanks to our highly experienced and knowledgeable Projects department, JM is ideally and uniquely suited to help customers turn older existing plants into high-performing, future-ready assets that support both sustainability and profitability.

Despite all the new capacity that has been built over the past few years, there are still many formaldehyde production plants that were built decades ago. And although they may still operate reliably, today's demands require more. Plant upgrades offer a smart, future-focused solution.

Claes Lundström, Senior Consultant Plant & Revamp Sales, says there are many different reasons for considering an upgrade, like improving product quality, reducing energy usage, or complying with new environmental regulations.

"In many cases upgrades also support better automation, safer operations, and smarter energy recovery. The most common reason customers approach us about an upgrade," he says, "is to increase production capacity to meet rising demand."

Important questions

"These are really important topics," he says, "which are often first discussed in the regular interactions between customers and Technical Support."

Tomas Nelander, Global Formaldehyde Technical Services Manager, agrees, saying that TS reps often get these types of questions in the regular dialogue with customers:

"Questions such as what adjustments a customer can make to help them meet stricter emissions regulations are handled by TS," says Tomas, "but what customers may not always be aware of is just how involved the Projects department is in instances such as these."

"In most cases," he says, "the solutions to the customer's needs are process related, and that's where Simon's team and their in-depth knowledge comes in."

Behind the scenes

The team Tomas is referring to is the Process Engineering team, headed up by Simon Smrtnik. Asked about their involvement in supporting upgrades, Simon brings up one example from last year when a customer in Europe wanted to begin producing UFC:

"The absorber needed to be modified in order to achieve what the customer wanted. That's a difficult task for our competitors," he says. "We have all the necessary expertise in-house, so we were able to quickly carry out the HAZOP study before doing the actual engineering."

"As part of the FORMOX family, you get access to not only Technical Service and support, but also to a deeply knowledgeable Projects department."

Stefan Wedman, head of the Detailed Engineering team adds that one way in which Projects supports with upgrades is by performing feasibility studies.

"We'll learn through either Claes or Tomas what the customer wants to do," says Stefan, "and when needed, we have a process for carrying out the study, which sometimes may involve a large part of our Projects team."

Claes adds: "Projects has a truly central role in making sure we get it right when setting the scope and the budget for these upgrades and revamps. And it is of huge importance to customers as well."

Recent upgrades with dramatic results

- Capacity increases of over 60-65% from original design
- Steam production boosts of more than 150%
- Revival of mothballed plants with cutting-edge automation and emissions control

Recent examples

He brings up a few cases where a customer in South America needs to retrofit its 30-year-old plant with an ECS. Another in Western Europe needs an upgrade of its energy recovery steam system, and a third in Africa has to replace various equipment in order to be able to increase plant capacity by up to 20%.

"In all of these examples, not only would our Projects team be carrying out the engineering," says Claes, "but also supplying equipment."

"Some of these journeys are quite risky for our customers to embark on by themselves. Our Projects teams know the territory well, so working with us takes a lot of the pressure off our customers and gives them greater peace of mind."

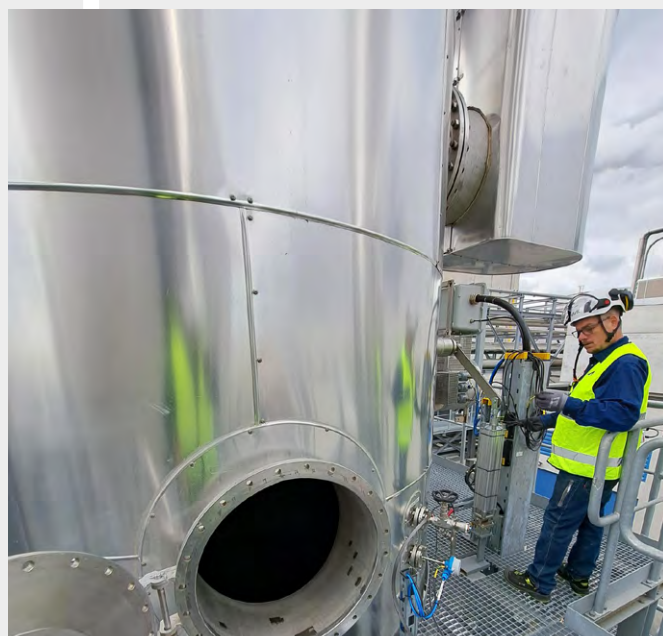
Circular economy

Another example is bringing an existing plant back into service after years of inactivity, which contributes to the circular economy by putting idle assets to productive use. Such was the case with a plant in Slovenia that was dismantled and moved to Egypt (see Spring/Summer 2024 issue page 18) where the Projects department provided support for the customer including start-up assistance.

Of course, not every upgrade or revamp is as dramatic as relocating and reviving an entire plant. However, as Tomas Nelandar points out, "Virtually every upgrade is unique, which is why our customers have a big advantage. As part of the FORMOX family, you get access to not only Technical Service and support, but also to a deeply knowledgeable Projects department."

Planning an Upgrade?

If you're considering ways to improve your plant's performance, let's explore the potential together. With decades of experience, a proven track record, Technical Service and an unrivalled Projects department, JM is your trusted partner in formaldehyde plant upgrades.



BY



Charles Hodgdon
Editor

Reactor flooding incident is a reminder to be extra vigilant

A recent incident at a customer's formaldehyde plant led to the main reactor being filled with water just after reloading. A small mistake with an open bypass valve resulted in 120 m³ of water entering the process and rendering the catalyst useless. During catalyst reloading many maintenance activities often happen simultaneously in the formaldehyde plant. This is a critical period during which there is an increased urgency to meet the maintenance schedule and avoid delays. However, this time-sensitive period can often lead to hectic conditions, and in some cases, mistakes are made.

It is equally important to remain vigilant to plant conditions and alarms during this period, as many things may go wrong, and plant operators are normally not focusing on information and alarms displayed in the control system. This condition can lead to varying degrees of damage, ranging from minor to significant.

Case in point

In a recent incident at one of our customer's formaldehyde plants, process water fed to the top of the absorber accidentally filled the reactor (see Figure 1). The cause of the flooding was determined to be a bypass over the control valve that had been left open during maintenance work. Why it had been left open remains unknown, but as a result, about 120 m³ of water was introduced into the process over the course of a few days.

Such an occurrence could potentially be prevented by monitoring and adequate response to process alarms. During shutdown, however, many alarms are often muted in the DCS. In this case, the newly loaded catalyst became soaked in water that was boiling due to hot HTF in the reactor and was ultimately completely damaged.

New catalyst needed

Johnson Matthey and the customer worked hard together to speed up the process of getting a new load of catalyst into the reactor. To everyone's credit, the replacement load arrived at the customer site less than two weeks after the incident despite the plant being on the other side of the world from Sweden. The soaked catalyst could easily be removed from the reactor by standard unloading techniques.

Lessons learned

Water may enter the reactor through several pathways, including leaking plate heat exchangers or cooling coils, unauthorized hose connections, process water entering the absorber (either from the top or bottom), via a urea feeding line, from cleaning activities, or through other unforeseen causes. Furthermore, catalyst inside the reactor can also be damaged in other ways, e.g. through contamination from methanol or oil leakage from rotating equipment.

While Johnson Matthey was able to quickly provide all available products for the catalyst loading plan, the incident underscores the benefit of maintaining a spare catalyst load on site. Having a spare catalyst load available can significantly reduce downtime, lower costs, and most importantly safeguard production without the need for emergency delivery. This risk-benefit must of course be balanced considering the cost of storing the catalyst, and is probably easier to accommodate for customers with several reactors and/or plants.

This is a valuable reminder of the importance of process alarms and plant control at all stages of operations, especially during non-routine maintenance work.

If you would like to know more about how you can minimise the risk of similar incidents at your plant and protect your assets during shutdown, reach out to your Technical Service Representative.

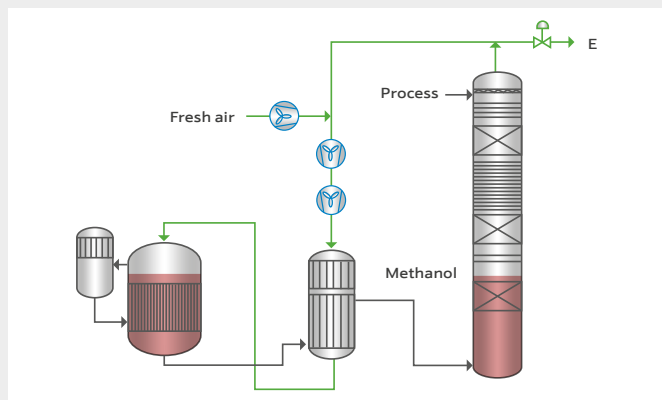


Figure 1: Water was introduced to the top of the absorber resulting in water entering both the vaporizer (shell side) and the tube side of the reactor



Figure 2: Water could be seen pouring out from the reactor through the temporarily closed manhole above the tube sheet



Figure 3: A look inside the reactor after all the water had been drained

BY



Tomas Nelander
Global Technical Services
Leader - Formaldehyde

Enhancing safety through effective methanol flow control

Methanol flow control is vital to the safe and efficient operation of formaldehyde plants. It ensures proper reaction startup and stable ongoing production. Improper control can lead to operational instability, equipment damage, or even serious safety risks. This article outlines key considerations in methanol flow management, highlights common issues and their solutions, and emphasises best practices for system evaluation and improvement.

About the controller

The methanol flow control is an important part of the safety design in a formaldehyde plant. The controller can be started in manual mode and will allow the opening of the control valve. This is to make it possible to quickly add a couple hundred kg/h of methanol to get the reaction started in the catalyst. Once the set flow is reached, the controller will automatically switch to auto mode. After that, any increase in the methanol flow can only be achieved by increasing the set point.

Purposely slow

The controller has a rate limiter to ensure that flow increases take effect slowly. It is important that the methanol flow changes are done carefully to avoid high inlet concentration during start up and to prevent disturbance of the oxygen control during normal operation. Mistakes will not only trip the methanol valve, but also increase the risk of a deflagration.

Pressure considerations

The pressure distribution in the methanol system is mainly set by the methanol pump discharge pressure, the control valve pressure drop, the spray nozzle pressure drop and the process gas pressure in the vaporizer tube side. The design tries to maximise the nozzle pressure drop to get the smallest possible droplets and the best possible evaporation of the methanol. It is also good to prevent erosion of the control valve by not running it with a small opening. A good system design will have a nozzle pressure drop of 0.5-1.0 bar at minimum operation flow and a control valve opening of 80-90 % at maximum flow.

Control valve erosion problem

Erosion of the control valve is typically caused by a small opening and high velocity. High pump discharge pressure or excessively large spray nozzles may be causing this. The best solution is to install smaller spray nozzles. Installing a smaller pump or a smaller control valve are (less good) alternatives. Not running the plant for an extended time at very low capacity can also help.

Low pressure drop over the spray nozzles

Occurs when nozzles are either too large or worn. Replace the nozzles to solve the problem.

Low methanol flow capacity

Can be caused by small methanol pump, small control valve, small / plugged nozzles or dirty strainers. All the pressure drops in the system must be measured to determine the best action to correct the problem.

Controller wind up

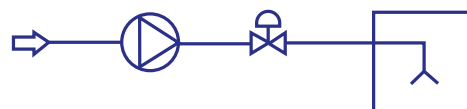
There is a risk of overfeeding methanol if the methanol feed pressure first goes low and then goes back to normal. This is caused by the controller which will open the control valve when the methanol flow goes down but not manage to close the valve fast enough when the methanol pressure comes back. A typical example is when the methanol pump stops and is then restarted. The best restart procedure is to always close the methanol valve before bringing the methanol pressure back. Some plants activate the methanol trip if the methanol pump stops.

Evaluating the system

To assess what improvements might be possible, begin by noting the methanol pump discharge pressure, the control valve pressure drop, the control valve opening, the spray nozzle pressure drop and the recycle fan discharge pressure for both maximum and minimum normal production methanol flows. An evaluation of the data will then show if there are any improvements to be made. JM Technical Service specialists are always available for support.

Conclusion

Effective methanol flow control enhances safety and reliability in formaldehyde production. Understanding system dynamics and addressing issues proactively helps avoid risks and maintain performance. Regular evaluations and expert support are key to ongoing improvement.



'The methanol system' – pump, control valve and spray nozzle

BY



Ola Erlandsson
Senior Process Specialist

Projects and start-ups



In Fuqing City, a new plant was started up for Wanhua. They have several other FORMOX plants in operation, the first one was started in 2002.



In April, this plant was started for Hualu Hengsheng in Jingzhou, China. In June a second plant was started at the same site!



In March, this large plant was started for Markor in Korla, China. The customer has had several **FORMOX** plants before.



Wanhua started this plant in Meizhan City, Sichuan Province China in October 2024.



In Nantong City, China, this plant is built for Nantong Jiangtian, the planned start-up is later this summer.



Two plants were started in January and June respectively, for Sichuan Yongying in Nanchong, Sichuan Province China.

New projects

Agreements have been signed with customers in:

- Chile for a new emission control system (ECS) for an Existing Formaldehyde Production Plant.
- Shandong Province, China for one FS3 plant and one FT3 plant.
- Fujian Province, China for one FS3 plant.
- Singapore for a new ECS start-up heater.

Ongoing projects

In the design phase:

- One FT3 plant for a customer in Inner Mongolia, China.
- An upgrade and equipment replacement of an FS2 plant for a customer in Germany.
- One FS1 UFC plant for a customer in Turkmenistan.
- Three FT3 plants for a customer in Yumen, Gansu, China.

- Two FT3 plants for a customer in Qingtongxia, China.

In the shipping or construction phase:

- An upgrade of an FT3 plant in Changshou, Chongqing, China.
- One FS3 plant to Australia.
- One FS2 UFC plant to Egypt with Suez Methanol Derivatives Co as the end user.
- Two FT3 plants to Shanxi Province, China with planned start-up in September 2025.
- Three FT3 plants to Xinjiang, China, with planned start-up in 2025.

Start-ups

- One FT3 plant to Chuzhou City, Anhui Province, China successfully went on stream in December 2024.
- One FT3 plant to Korla, China was successfully started in March 2025.
- The FS1 High Pressure plant to Synthite Ltd., United Kingdom went on stream in April 2025.

- The FT3 plant to Fujian Province, China, the second on this site, went on stream in April 2025.
- Two FT3 plants to Jingzhou City, Hubei Province, China went on stream in April 2025.
- The FS3 plant for a customer in Europe was successfully started in June 2025.
- The FT3 plant to Tangshan City, Hebei, China has a scheduled start-up in summer 2025.
- The two FT3 plants to Nanchong, China had first plant successfully on stream in January 2025, and the second plant started up in July 2025.
- The FT3 plant to Nantong City, Jiangsu province, China is scheduled for start-up in July 2025.
- The replacement of an ECS Steam Generator to Thailand is scheduled for start-up in July 2025.

Training



In November 2024 JM conducted operator training for Anhui Hwasu, in the city of Chuzhou, Anhui province, China, where a large plant is constructed. The training took place in connection with the startup of the plant, it went on stream in December.



In December 2024 JM conducted operator training for Sichuan Yongying, in the city of Nanchong, Sichuan province, China, where two plants are constructed. The training took place in connection with the startup of one of the plants in January.



In December 2024 JM conducted operator training for Tangshan Zhonghao, in the city of Tangshan, Hubei province, China, where a twin plant is under construction.



In December 2024 JM conducted operator training for Hualu Hengsheng, in the city of Jingzhou, Hubei province, China, where two large twin plants are constructed. The first plant was started in April.



In March 2025 JM conducted operator training for Nantong Jiangtian, in the city of Nantong, Jiangsu province, China, where a twin plant is under construction.

New faces



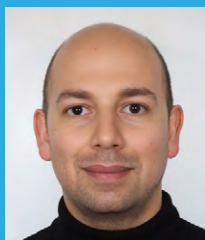
Anton Erös
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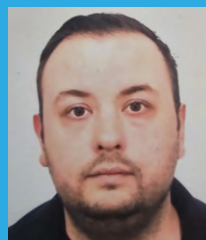
Mette Buchberg
Supply Chain Manager



Maria Österlin Rietz
Site Administrator



Babak Hamidian
Senior Mechanical &
Piping Engineer



Norman Juhls
R&D Technician



A formaldehyde magazine from Johnson Matthey

The newsletter *Informally speaking* aims to provide information about formaldehyde in an informal forum and is published twice annually by Johnson Matthey for its customers and contacts in the formaldehyde business. The information included herein is part of our customer service and in no way entails or implies any undertakings, legal responsibilities or liabilities.

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Empower Your Team Optimise Your Operations

Investing in comprehensive training for your plant operators and engineers is a strategic move that directly enhances both operational efficiency and plant safety — particularly in the complex environment of formaldehyde production. Skilled and knowledgeable personnel are key to optimising processes, reducing unplanned downtime, minimising operational risks, and ensuring regulatory compliance. The result? Improved productivity, fewer incidents, and stronger profitability.

At Johnson Matthey, we understand the critical role that well-trained teams play in your plant's success. That's why we offer a specialised and flexible training portfolio designed specifically for formaldehyde producers. Our offerings include:

- **Recurring refresher training** to keep your teams up to date with the latest operational best practices and safety protocols
- **Tailored training programmes** customised to meet the unique requirements of your facility and workforce
- **Specialised training support** during the commissioning and start-up phases of new plant projects

Whether you're upgrading your existing workforce or onboarding a new team, Johnson Matthey's training solutions help ensure your plant runs safer, smoother, and more efficiently—from day one and beyond.

Contact your Johnson Matthey representative to discuss how we can find the best training for your needs.

