

Informally speaking

A formaldehyde magazine from Johnson Matthey

- JM-Levo - new digital portal soon ready to launch
- Flexibility for running at reduced rates
- Special forum in Zhuhai marks 25 years in China
- Downstream – a look at one fantastic chemical
- Technical Support answers your questions



When the road ahead takes a sudden turn

Dear reader, If 2019 was about looking back on how far we've come over the past 60 years and looking forward at the exciting road ahead, 2020 has so far been about hitting a sudden and alarming bend in that road. Just weeks after celebrating with some of you at our much appreciated Formaldehyde Forum China in Zhuhai in December (see page 4) we began hearing about a novel Corona virus. Yet even as we began work on this issue of Informally Speaking in early February little did we imagine just how far reaching the effects of the virus would become, eventually bringing much of the world to a standstill. So many individuals, families, societies and business around the world have suffered greatly, and we will certainly see significant and lasting changes in our daily lives as a result.

When it comes to tackling changes, Johnson Matthey (JM) and those of us working in the formaldehyde business have always had a flexible approach in the way we work with customers, so we will continue to take the necessary steps to adapt to these new times. For example, as it is unlikely that we will be to hold our regular Formaldehyde conferences planned for this year, we will begin hosting webinars as an alternative means for interacting with customers and bringing you valuable news and tips. Another great channel is our new JM-Levo Formaldehyde portal, which some of you have already begun to use during the development phase. Launch of Version 1 is planned for late September, and it will significantly enhance how we communicate plant data and performance with customers, featuring improved visualisation of both data and recommendations (see page 8).

These of course are not the only developments aimed at enabling improved performance for our customers. We're currently working on a project for improved selectivity and yield, with the plan of launching one new product early next year. Another project is focused on extending catalyst lifetime and yet another on improved loading quality. And in this issue, you will find two helpful articles from our Technical Support team; one on page 12 with answers to your most often asked questions, and on page 10 for any customers thinking about running at reduced rates.

As always, we look forward to staying in touch with you through every twist and turn ahead. Whether it's webinars, conferences or personal encounters between members of our team and yours, these exchanges will always be the highlights of our continuing story.



Lars Andersson and Ronnie Ljungbäck
Global Market Managers Formaldehyde

Content

- | | |
|--|---|
| 2 Leader | 11 Training |
| 3 Johnson Matthey and COVID-19 | 12 Technical Tips – Four common questions |
| 4 JM-Levo Formaldehyde our new digital platform! | 14 New colleagues |
| 6 Formaldehyde Forum China 2019 | 14 New faces |
| 8 MMA – one of those fantastic chemicals | 15 Projects and start-ups |
| 10 Running at reduced rates | |

Editor: Charles Hodgdon,
Hodgdon Communications

Layout: House of Type, Teesside UK

Publication: twice a year

FORMOX is a trademark of the
Johnson Matthey group of companies.

Johnson Matthey and COVID-19

At JM, we have a clear vision – to make the world cleaner and healthier – and a set of strong values which are the principles we are using to ensure we successfully navigate COVID-19 in the interests of our customers, employees and society.

We have historically used our leading science to solve our customers' problems and our science is at the heart of countless products and services that the world relies on. Our teams are continuing to work hard to manufacture vital drug ingredients and medical devices for the healthcare industry and produce important catalysts and chemicals that enable the world's food and energy supply chains.

More broadly, our COVID-19 commitments are designed to ensure that our colleagues remain healthy and secure, our global teams can continue to serve the needs of our customers safely and that our company supports the local communities in which we operate.

Our colleagues

Our top priority is the safety, health and wellbeing of our 15,000 people. We are closely monitoring developments in the COVID-19 outbreak and are taking the appropriate steps to help maintain the ongoing health and safety of our employees.

Our customers and suppliers

JM is an important part of the value chains that are providing vital products and services to the healthcare industry, and that are maintaining food and energy supplies during COVID-19.



We have:

- Kept operations running for customers where it is safe to do so and where government measures allow, so we are there when they need us;
- Maintained our payment terms to support all of our suppliers; and
- Pledged to support any small supplier to our business that is suffering hardship and requests early payment terms as a result of the impact of COVID-19 during April - June 2020.

Our communities

Our communities are at the heart of the fight against COVID-19 and we are committed to playing our part in the local areas in which we operate. JM has:

- Started manufacturing goggles and visors across a number of our sites which are being offered to community medical staff and care organisations;
- Donated PPE equipment to medical and care organisations; and
- Pledged to match all donations made by our employees to fund local projects supporting communities through COVID-19.

We know that science will help provide the solution in winning the fight against COVID-19 long term, as well as many other major health and climate related challenges that we will face over the years to come. However, the impact of COVID-19 is likely to further increase the barriers to studying science for children and young people. To tackle this challenge, we are committing £1 million as a special fund to be donated to local and regional programmes in the areas in which we operate, to improve access to a quality

BY



Nicole Watson
Marketing Communications
Representative

On the front page:

Formaldehyde Forum China 2019 took place in Zhuhai, Guangdong in December.

Read more about this story on page 6.





JM-Levo Formaldehyde - our new digital platform!

In the previous issue of *Informally Speaking* we wrote about a high profile digitalisation project and the advantages it will bring to JM customers in the formaldehyde business. So let me now share with you an update of our progress and the benefits you will soon be able to enjoy through this new digital portal.

First, let me say that during the development phase a lot of time and consideration has also gone into finding the right name for the platform. After some internal workshops at JM we then asked some customers for their feedback. With their help it was finally decided that the global name would be 'JM-Levo', and that for each JM business to implement the platform the name would be appropriately adapted. This means that for all of you it will be known as the JM-Levo™ Formaldehyde portal.

What's in a name?

Various meanings of the name 'Levo' range from 'comfort' in Latin, to 'elevate' in Italian. It's a good match because customers should see the portal as a companion that offers you reliable advice and recommendations, as a means for enhancing your production. It has been specially developed to facilitate your

formaldehyde (or UFC) production management at different levels, from providing a high level overview down to very detailed operating recommendations supported by a brand-new machine learning model. It is a unique space where you will be able to quickly access all the key information you need to manage your operations.

Customer feedback is important

After reaching an exciting milestone in March when the first customer to begin trials of a scaled down prototype was brought aboard, several more customers later joined in and their feedback has been very positive. They could very quickly see the benefits and how this will make their work easier, allowing them to focus on other tasks. Such feedback is vital to our development activities to make sure the product will meet your needs as much as possible.

Big on data

Of the various features now being implemented for the release of the first fully commercial version, data analytics is top amongst them. Not only does this enable the computing of large amounts

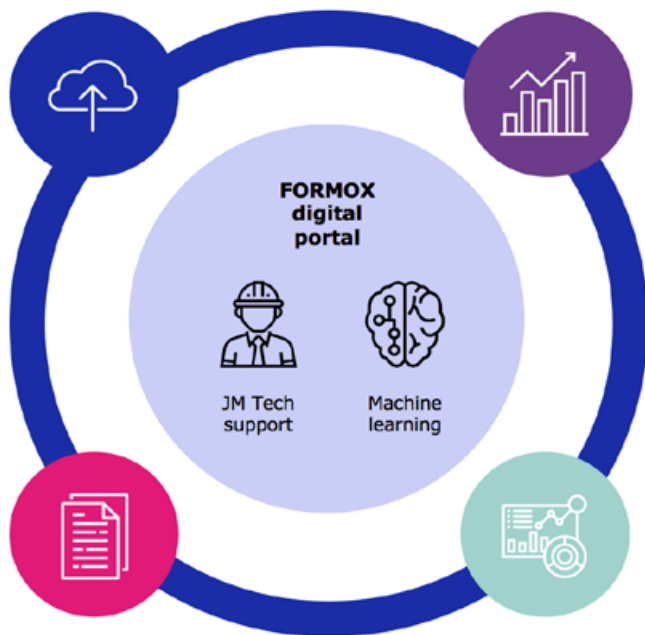
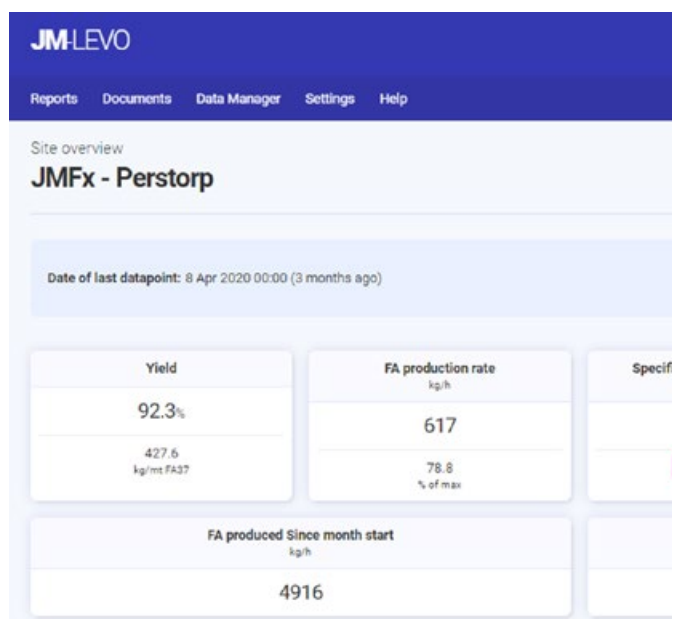


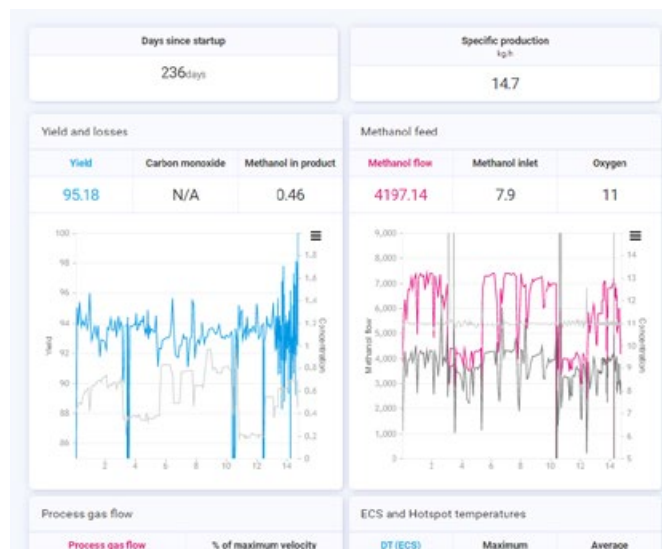
Figure 1: The new JM-Levo Formaldehyde portal will provide a more efficient way to communicate, making it easy to access technical documents, submit data, view reports and use planning tools to adapt production to customers' changing business needs.

of data, but it provides fast answers to key questions and will support several optimisation tools, e.g. for improving production economy and pinpointing the optimum time for reloading the catalyst.

As production economy is crucial to your business, the portal provides a model that will enable you to immediately access recommendations aimed at achieving an optimised yield, regardless of production rate. The model is based on a thorough analysis of more than 20 years of data collected from plants all over the world, combined with vast experience from catalyst and plant operation, loading plan design and plant design. Different models matching different types of plants exist, ensuring the most accurate recommendations for your specific plant.



In addition, the portal will incorporate the Time-to-Reload tool which up until now has been available as a spreadsheet. Not only will you be able to monitor the variations in your production cost as the catalyst ages, but the data analytics platform will provide you with a forecast of the optimum time to replace the catalyst based on overall production economy. As the Time-to-Reload will be clearly visualised through the portal, it will be easier for you to plan and schedule downtime in your FA production.



Enhanced communication

A third feature is a dedicated channel and space allocated for communication between you and your JM Technical Support representative. Initially it will focus mainly on topics related to a specific catalyst load. This domain will be used for asking questions and storing feedback from JM. Pictures, screenshots, reports or any other document you feel is relevant to the discussion can also be placed here. Other key features of the portal include management of your catalyst samples and a secured direct data connection system. Documents in the portal will initially be available in both English and Chinese, but we foresee additional languages being added in the future.

All of us at JM are looking forward to the release of this exciting new digital platform which is currently planned for the end of September. It will open up a new and efficient way for you to communicate with us and to more easily adapt your formaldehyde production to changing business needs. More information to come in the following months.



Follow JM on LinkedIn for further updates or contact Philippe or your Regional Sales or Technical Support Manager if you have any questions.

BY



Dr Philippe Thevenin
Global Catalyst Solutions
Specialist

Formaldehyde Forum China 2019

Zhuhai, Guangdong, China
18th – 20th December



A special JM event held at the end of last year in sunny Zhuhai covered many important topics and provided a final opportunity to celebrate our 60th anniversary as well as to pay tribute to our long relations with China. Formaldehyde Forum China 2019 was the latest in our long record of highly appreciated customer events which we first began organising back in the mid-1980s. Held at various venues around the world, these events are a way to present technical information and to enable vital exchanges with customers concerning safety, improvements and lessons learned when it comes to operational issues of formaldehyde plants and catalysts. The information and training on safety and operation that we provide on these occasions are especially important in China where many new customers are added each year. Below is a summary of some of the key topics covered during the 3-day event in presentations by the JM team.

Following the keynote address by Managing Director, Terry Qian, presentations on **FORMOX™** catalysts and formaldehyde technology were given by Sales Manager, Vivian Wang and Commercial License Manager, Jianguang Zhang. The presentations showed how **FORMOX** technology has been developed and re-invented over 60 years with the goal of obtaining higher capacity, better performance and longer lifetime, and how JM is moving forward towards green and high efficiency with new technology and product development.

In a presentation on **FORMOX** UFC technology, Sales Manager Bolin Qu cited extensive references of **FORMOX** UFC technology

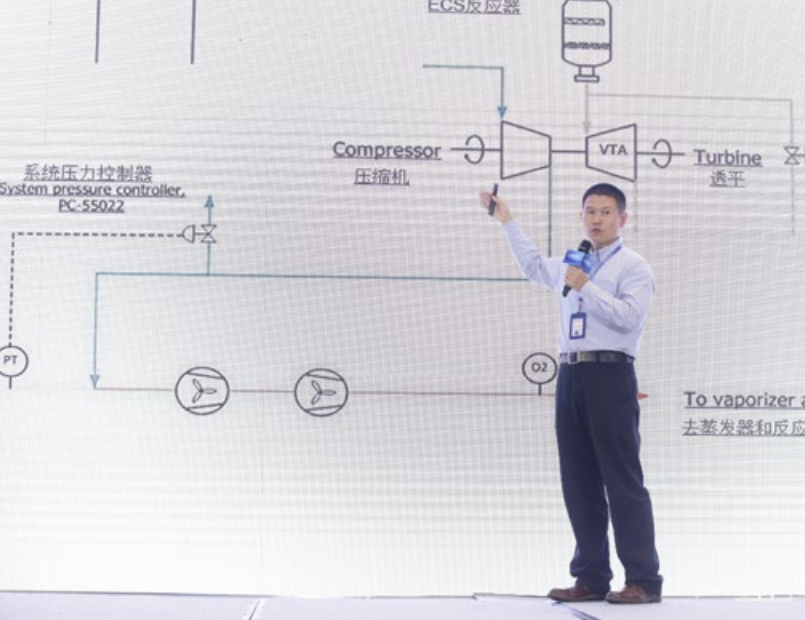


Terry Qian, Managing Director Efficient Natural Resources China, opened the conference and gave the keynote address

parameters calculation, case studies, experience and more. He also spoke of the value in how JM makes use of high volumes of collected data to get to the real root causes of issues and how different parameters influence performance.

Automation Design was another hot topic at the conference. Project Manager, Guofeng Sun, provided a brief look at the latest automation design by JM covering the running mode, the parking restart mode, and the parking mode, all designed to minimise human involvement. And Lipeng Zou, Mechanical/

and explained the benefits of using UFC in various stages from UFC production and storage, to resin and board production. Technical Support Manager 'Hans Han' gave a presentation highlighting the many ways that customers can benefit from our technical support, a process that encompasses equipment, instruments,



Celebrating 60 years of FORMOX

During the 2019 JM Formaldehyde Technology Forum all the delegates were invited to enjoy cake and champagne during a ceremony celebrating 60 years of FORMOX technology. Introduced in China over 25 years ago, the technology has since played a role in the country's economic growth with 45 plants sold to customers in China so far.



Raising a toast! From left to right: Mr. Deng Qi (Plant manager of Yanchang Petro), Lars-Olle Andersson (JM Formaldehyde Lead China), Terry Qian (JM Managing Director Efficient Natural Resources China), Vivian Wang (JM Sales Manager) and Mr. Deng Aihua (CEO of Henan Yongrun)

Site Engineer, explained how the Turbocharger, a major advancement and upgrade from the Roots blower, provides high efficiency of air compression and maximisation of the energy recovered from the ECS exhaust, and symbolises how JM will be creating value for customers for a long time to come.

In her presentation on Optimisation of Catalyst Performance, Sales Representative, Mei Zhu, spoke about how JM has been inventing and developing formaldehyde catalyst for over 60 years, always aimed at achieving improved performance and extended lifetime. She also said that, moving forward, JM's role as a qualified, trusted advisor and business partner will be of even greater importance to customers in China.

In a presentation on Safety and SIS System, Automation/Site Engineer, Ratly Li, described how EHS is a top priority and how JM never stops working on providing a safer operational environment for all customers. The presentation focused on safe operation and maintenance as the foundation for safe and stable production within a formaldehyde plant, and looked at JM's plant automation, site safety and SIS system. Zhankui Bu, Project Manager, talked about the growing demand and various drivers for Upgrading plants, as well as what solutions JM provides to increase value for customers.

Finally, in a presentation about Optimisation of Absorber Operation, Process Engineer, Dean Chu, explained how the concentration and distribution of FA and methanol in the absorber is the key to having a good operation. His presentation described why a good design of the absorber internals provides

the foundation for good absorption, and thus for good overall operation.

BY



Lars-Olle Andersson
Formaldehyde Expansion
Project Lead

UPCOMING CONFERENCES

In keeping with all relevant guidelines and recommendations during the ongoing COVID-19 situation, our regular Formaldehyde conferences are on hold for now. In the meantime, we are in the process of preparing a series of webinars as an alternative to these much appreciated gatherings.

More information to follow.



MMA – one of those fantastic chemicals

Though many think of Methyl methacrylate (MMA) as being fairly new, the fact is that it was first produced by ICI already back in the mid-1930s. The technology used then is still the base for the major production route in use today, but a more efficient route is important for manufacturers of formaldehyde.

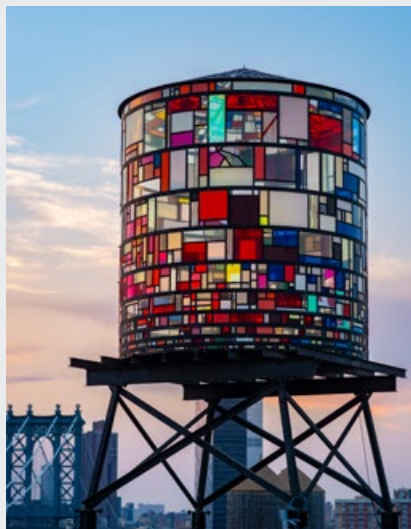


Oh! You mean PLEXI!

Methyl methacrylate is a colourless, volatile, flammable liquid and is regarded as the most important methacrylic acid ester. It can polymerise to **PMMA resins** which are used mainly in the form of cast and extruded sheets, or as pellets for extrusion and injection moulding. PMMA in the form of cast sheets was invented in the early 1930s by Otto Röhm, and most people know it by the original brand name Plexiglas®. Today it is known under many other brands as well, including Lucite®, Perspex®, Optix and Acrylite®, to name just a few. More than 60% of all MMA produced today is used for PMMA. Well-known end products include bathroom accessories, shower units, spas, sinks, furniture, signs, merchandising displays, windows/windshields, aquariums, bus stop enclosures, vehicle interiors, taillight lenses, tableware, knobs, etc. In other words, we find it all around us in our normal, everyday life.

The second largest use of MMA is for acrylic surface coatings. Good examples include architectural coatings, coatings for product finishes within the automotive sector, and other special purpose coatings such as floor polish, paper coating and protective coatings for fabric and leather. Acrylic latexes are waterborne emulsions that have increased a lot over recent years to replace the solvent borne emulsions that previously dominated the architectural coatings market.

How MMA is produced, and can formaldehyde be used?



From a process standpoint, MMA is interesting since it can be produced from several different starting materials such as ethylene (C2), acetone (C3), and isobutylene or butyl alcohol (C4), see Figure 1.

The acetone cyanohydrin (ACH) route originally developed in the 1930s was first out and is still the most

common production route worldwide. Over the years this route has been further developed and two good examples of this are Mitsubishi and Evonik, both having fairly new processes using acetone as feedstock.

Many manufacturing processes use C4 material as a starting point, all of which are 2 or 3-step processes. This route is predominantly used in Asia, specifically in Japan, and Mitsubishi, Sumitomo, Mitsui, LG, Kuraray and Asahi all have variations on this theme.

Finally, there are the ethylene (C2) based processes. These are the most efficient today, with lower production costs than those taking either the C3 or C4 route. There are mainly two commercial processes – the BASF process introduced in 1989, and the Lucite process which was first seen when their Alpha 1 plant in Singapore went on stream in 2008. Since then, Lucite has been acquired by Mitsubishi.

For us in the formaldehyde business, the C2 processes are the most interesting as formaldehyde is required for one of the process steps. The BASF process uses a 3-step route via propionaldehyde, whilst the Lucite process has a 1-step route going via methyl propionate (see Figure 3).

The market

The total amount of MMA produced worldwide is some 3.5 million of metric tons. The biggest markets are China, USA, South Korea and Japan. These countries alone stand for about 60% of the global consumption. The annual global growth over the next 5 years is expected to be about 3% (pre Covid-19). The strongest growth rate is seen in Middle East, China and India.

BY



Lars Andersson
Global Market Manager

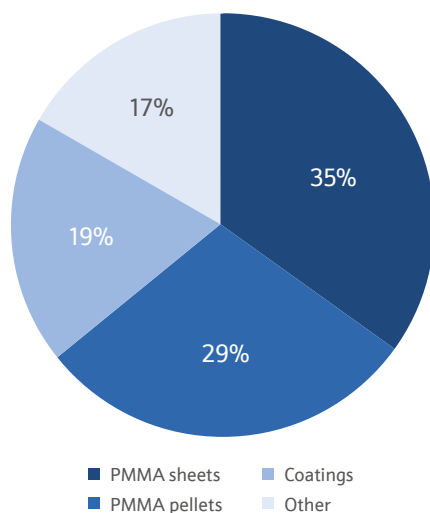


Figure 1: Main application areas

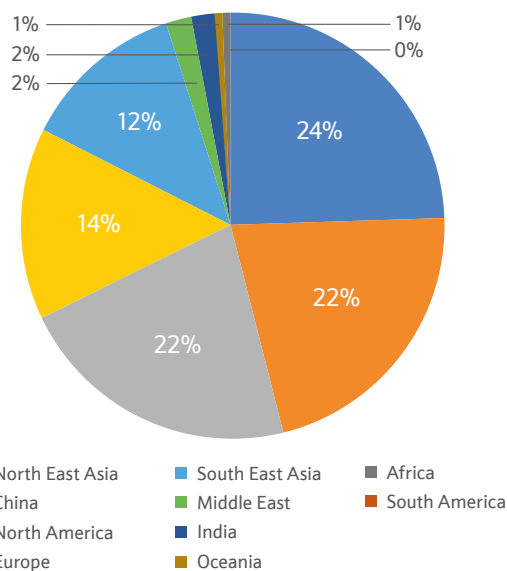


Figure 2: Global MMA consumption

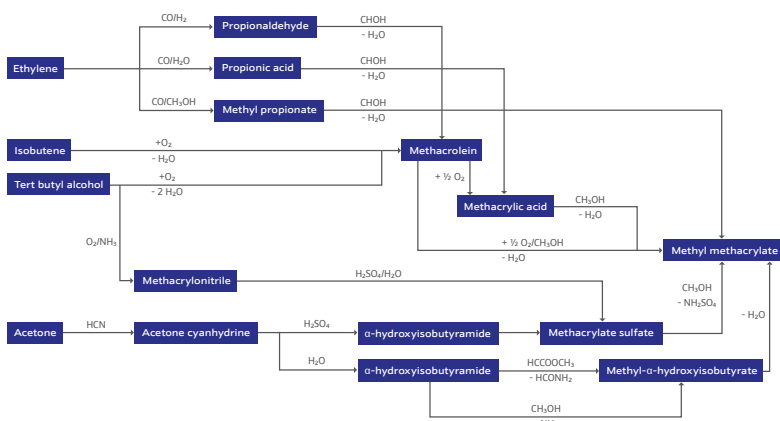


Figure 3: Graph showing the four major routes to MMA, as well as the role of formaldehyde in the ethylene-based processes.

Running at reduced rates

Strategies for adapting to today's challenges

If you are considering slowing down production in order to adapt to a decrease in demand, we recommend taking a good look at the alternatives in order to adopt the best strategy for your plant. In this article we take brief look at a few of them.

Fortunately, in times when global events have a noticeable impact on consumption and demand, it's good to know that not only is the **FORMOX** process very robust, flexible and considered by many as the most user-friendly formaldehyde process to operate, but also that catalysts and CAPs from JM efficiently enable changes in operation conditions.

What can we control and what should be considered?

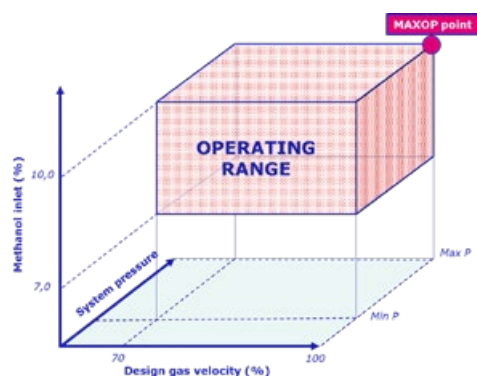


Figure 1: Visualisation of the operating region of a typical **FORMOX** plant

operations and must be taken into consideration when trying to establish your desired operating point, including installed equipment, variable operating costs, catalyst age and desired plant and product performance. Under the right circumstances, however, it is possible to achieve good results and cost benefits when lowering production rate by properly adjusting these parameters.

To illustrate a few of the effects, let us consider as a starting point a plant that needs to lower its production rate and is currently running with a CAP type of loading plan at 10 vol% methanol inlet and 0.5 bar (g) pressurisation pressure at full gas flow rate.

Methanol inlet

Reducing the methanol inlet is the quickest method for lowering capacity, e.g. from 10 to 8 vol%, and will in majority of cases improve yield (lower specific methanol consumption) whilst extending the catalyst lifetime (higher specific production). But this also requires correctly adjusting the HTF temperature. Other effects such as increased specific power consumption and lower specific steam production, need to be taken into consideration as well.

Gas velocity

Decreasing the capacity may, if the plant and loading plan allow, be achieved through lowering the process gas flow and keeping methanol inlet constant by reducing speed of recirculation blower(s). For example, reducing to 80% of max flow in this way can have a significant improvement on specific power consumption due to lower gas throughput and lower pressure drop in the system. It is a more cost (DVC) effective method for lowering production compared to lowering the methanol inlet, as methanol inlet is linked to the gas flow. But this also requires correctly adjusting the HTF temperature. The absorber may place additional limits on gas velocity. So these and other effects need to be carefully considered.

System pressure

Reducing system pressure, e.g. to 1.2 bar (a) from 1.5 bar (a), offers several benefits including improved yield (through lower specific methanol consumption) and longer catalyst lifetime (through higher specific production). It also reduces specific power consumption due to lower flow rates in pressurisation blower(s). Important considerations include a reduction in the mass flow while maintaining a fixed volumetric flow through the system, as well as a need to adjust the HTF temperature. In general, this method lowers the specific operating costs as most operating parameters are improved.

Find out more first!

As the most suitable procedure may not be the same for all and each change is governed by one or more important considerations, we recommend that you discuss with your JM Technical Support representative to explore your options. This is the best way to ensure that you get the most out of your plant and catalyst loading plan at times when it may be necessary to reduce rate of production. We are also happy to offer refresher trainings covering this specific topic.

Furthermore, if you intend to lower production rate for a longer period of time, e.g. past your next catalyst change, please bring it to the attention of your JM Sales representative. Provided with your input about the intended production capacity, a new loading plan could be designed to maximise the performance for your "new" production rate.

BY



Mike Brown
Regional Technical Support
Manager

Training



In October of last year, JM conducted an on-site training for Dynea at their plant in Ghent, Belgium, in connection with the commissioning and start-up of their new **FORMOX** plant; two different teams attended.



JM conducted an on-site training this January for GPC at their plant in Araucaria, Brazil, in connection with the commissioning and start-up of a relocated and revamped **FORMOX** plant; two different teams attended.



In February we welcomed a group from Perstorp, the former owners of JM Formox AB, for a refresher training on the **FORMOX** formaldehyde process.



In April, JM conducted an on-site training for Lunan at their plant in China, in connection with the commissioning and start-up of their new **FORMOX** plant.

TECHNICAL TIPS

Four common questions

Below are four of the most commonly asked questions received by our Technical Support team. For more information on these topics, please contact your Regional Technical Support Manager or refer to the related Technical Information (TI) documents available at our Customer Center (customercenter.formox.com).

① How do we determine the best time to reload the catalyst?

The key to ensuring the most economical operation of a formaldehyde plant is knowing the perfect time to reload the catalyst. The optimal time to reload is typically when the costs of methanol and power per ton produced formaldehyde have increased to a level where the continuously decreasing cost of the catalyst reloading per ton produced formaldehyde contributes less, as illustrated in Figure 1. Depending on how sharp the inflexion point is, the optimal time to change may range from within a week to within a month.

The running costs include the price of methanol and power consumption, as well as the returns from product and steam generation. This turning point occurs when specific costs reach a minimum, and is entirely dependent on the current operating conditions, be that high or low capacity. By consulting with your regional Technical Support manager, an expected end date can be predicted utilising a special calculation sheet. This calculation uses the most recent performance data and the relevant operating costs to determine when the ideal time will be to change the catalyst load. And in a near future, you will be able to utilise an even more developed version of this tool via our new JM-Levo Formaldehyde portal (see separate article about digitalisation).

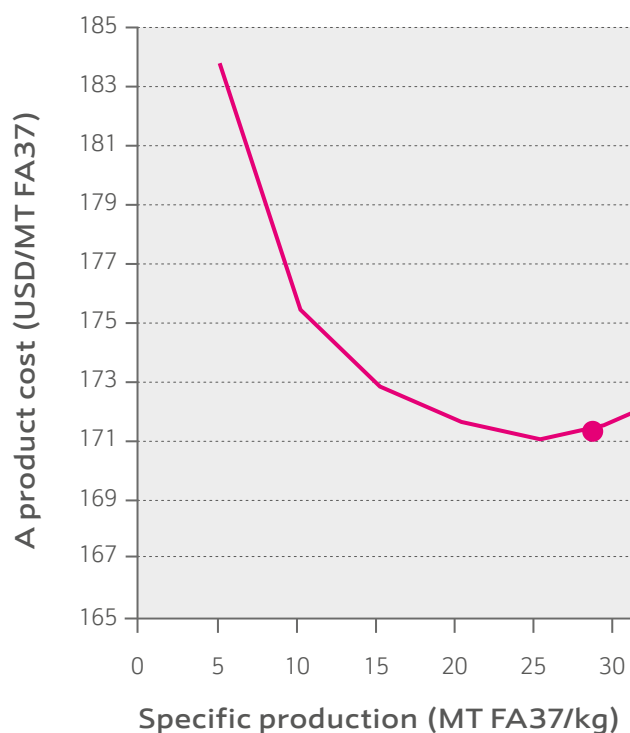


Figure 1: Pinpointing when to reload

TI document: *Formaldehyde Plant Economy*

2 What can we do to prevent urea solidification?

The single most common cause of solids formation inside a UFC absorber is a loss of caustic feed, and the resulting low pH. In a FORMOX designed plant, when producing UFC, the pH, as measured one or two trays below the urea solution feed point, should be kept between 8.5 and 9.5. The other critical factors that can impact formation of these solids are holdup time, molar ratio, temperature and solid content.



Figure 2: Inside of UFC absorber where solids have formed

The holdup time at design capacity is set by the design of the absorber – too long time in the column and solidification will have time to occur. The molar ratio is dependent on operating conditions and controlled by the correct feed inputs, such as urea. Solid content and temperature are connected, and under normal operating conditions these are set by other operating variables. High temperatures can concentrate the urea lower down in the column, causing solidification.

TI document: UFC Operation

3 How should we store the formaldehyde solution?

Due to the reactive nature of formaldehyde, storage for any length of time can be a difficult balancing act. Close temperature control is required, dependent on concentration of product; too high temperature and formic acid is formed, too low and paraformaldehyde accumulates. See the TI document for specific relationships.



Figure 3: Formaldehyde storage tank in Perstorp

To prevent too low a temperature we recommend insulating and heating using either hot water or steam. The heat can be supplied via an internal coil or via an external pump-around. Also, agitation is necessary to prevent any stagnation. It is best to contain the product in a vessel constructed of stainless steel 304 or 316. An alternative could be to use resin-coated walls. A SS316 bottom, extending to 1m up the sides, has been found to prevent corrosion from chlorides that accumulate in para.

TI document: Storage of Formaldehyde & Storage Temperature of Formaldehyde

4 How do we understand what the hotspot temperature matrix is showing?

The maximum and average hotspot positions provide only a snapshot of how a catalyst load is performing at a given moment. If you want to identify any issues or improvements and truly understand how the load is performing, the profile pattern throughout the reactor must be studied.

Void			
Inert	Pos.	1	2
Mix	1	277	279
	2	305	299
	3	345	341
	4	339	334
Pure	5	320	318
	6	323	330
	7	333	312
	8	315	301
	9	286	284
Inert	HS1	345	341
	HS2	333	330

Figure 4: Studying the temperature profile pattern

Each multitube throughout the reactor should display a similar temperature profile, with similar values. This pattern indicates whether changes are needed in order to move the reaction up or down the reactor tubes. Occasionally, one tube may show a unique profile, which can throw off the overall reactor maximum hotspot. Outliers such as these can occur from differing ageing rates, differing loading of the multitubes, or maldistribution. Therefore, adjustments to the reactor operation should not be made based on an individual value, but rather on the total reactor pattern. The outlier can however be used to identify if and where within the reactor maldistribution might be occurring.

TI document: Hotspot Temperature & Hotspot Trip Logic

BY



Mike Brown
Regional Technical Support
Manager

Virendra Rathore

New Regional Sales Manager for APAC-India/Bangladesh



Meet Virendra Rathore, a chemical engineer working out of Gurugram, whose special interest is mastering Yoga for mindfulness

"I graduated from Harcourt Butler Technological Institute (HBTI) Kanpur in 2003 and completed my Marketing Management education at the Indian Institute of Management (IIM) Kozhikode in 2010.

I started my career with BASF in 2003 working in R&D, followed by successfully handling multiple business roles and driving live customer projects with multicultural cross-functional teams.

I joined Johnson Matthey in 2010 to look after the Advanced Glass Technologies business for India whilst handling diverse product groups in a techno-commercial role. I am very excited to be currently working in my new role as Regional Sales Manager APAC-India/Bangladesh for the Formaldehyde, Syngas and Chemical catalysts businesses, which I



began in November of last year. I aspire to "add value" by maximising the winning opportunities for JM and our customers.

I enjoy reading Stephen Covey, listening to Blues, traveling to Lonavala hills, meeting people, and spending quality time with my kids playing Scrabble on the weekends.

New faces

Perstorp



Paul Zachrisson
Senior Process Engineer



Mette Buchberg
Supply Chain Manager



Mathias Lemórne
CI/EHS Coordinator



Larissa Cunico
Process Engineer



Johanna Nilsson
Process Engineer



Maitham Majeed
R&D Scientist



Gabriella Bicki
Business Controller

Projects and start-ups

New Projects

- An agreement has been signed for a **FORMOX** FT3 plant in Henan Province, China.
- An agreement for an Emission Control System has been signed with a customer in China.
- A customer in China has signed up for a revamp of a pressurisation unit.
- An agreement for an FS3 plant to a customer in Europe has been signed.

Ongoing projects

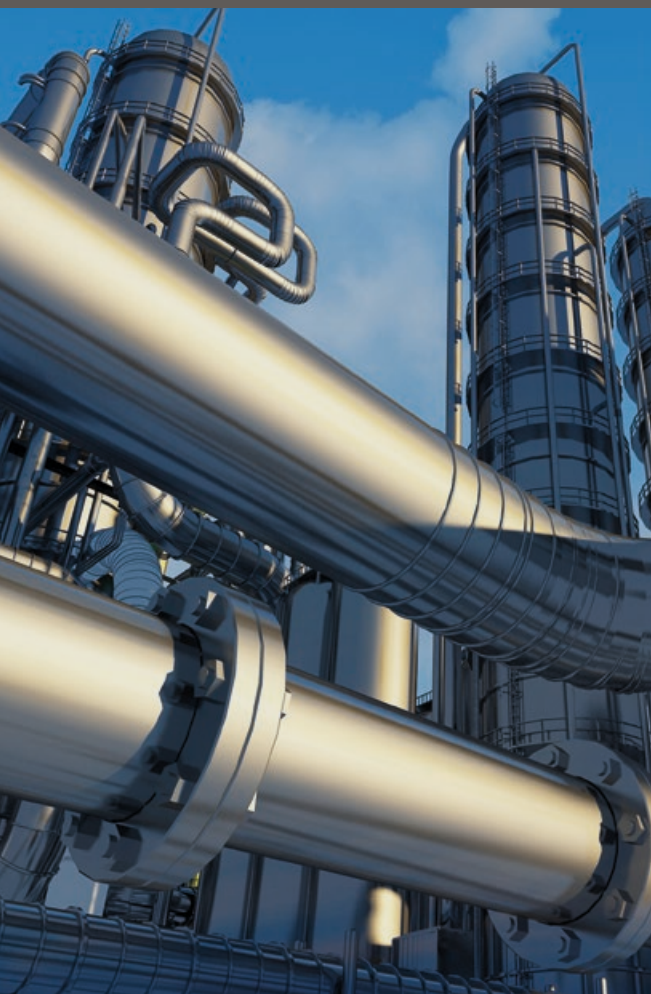
- The project with two plants, FS3 & FT3, to **Xuzhou Yuanfeng New Material Tech. Co., Ltd.**, China is approaching shipping phase.
- The FT3 plant to **Wanhua Chemicals Group Co. Ltd.** in Yantai China, their third **FORMOX** plant on this site, is in the design phase.
- The FT3 plant to Shangdong **Shengquan New Material Co., Ltd.**, China, is proceeding well with construction.

- The project for an FS3 plant for **Hubei Yihua New Material Co., Ltd.** is in the installation phase.
- The FT3 plant to **Wanhua Chemicals (Ningbo) Co. Ltd.** in Ningbo China, their third **FORMOX** plant on this site, is proceeding well.
- The project with **Inner Mongolia Jiutai New Material Co., Ltd.** in China is in the construction phase. The formaldehyde plant will have an annual capacity of 1,500,000 tonnes per annum and will be among the largest single site facilities for formaldehyde production in the world.
- The FT3 plant, built in **Qinyang Yongrun Technology Development Co., Ltd.**, Qinyang city, Henan province, China, signed with **China Chemical Sedin Ningbo Engineering Co., Ltd** is in the construction phase.
- Works on an FS1 plant to a customer in Southeast Asia is in the design phase.

Start-ups

- The project for a new **FORMOX** 2.0 plant with **Dynea N.V. Gent** went on stream in October.

- The project for a capacity upgrade of an existing formaldehyde production plant in Eastern Europe went on stream in November.
- A capacity upgrade and revamp project for **GPC Quimica S/A** in Brazil went on stream in January.
- The revamp of a pressurisation unit for a customer in Asia went on stream in January.
- The new plant to **Foresa, Industrias Químicas Del Noroeste, SA** was successfully started in June with some remote support from JM in Perstorp due to the Covid-19 situation. The plant is located in Caldas de Reis, Pontevedra, Spain.
- The FT3 plant to **Yankuang Lunan Chemicals Co., Ltd** in China, was successfully started in June.
- The FT3 plant for **Oilfield Gas Chemical Technology Co., Ltd** of **Shaanxi Yanchang Petroleum (Group) Co., Ltd** in Yan'an City, Shaanxi China is about to start up this year.



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.

Johnson Matthey Formox AB

SE-284 80 Perstorp, Sweden. Phone: +46 435 380 40
e-mail: formox@matthey.com www.matthey.com



JM



At Johnson Matthey our vision is for a world that's cleaner and healthier. Our scientists work every day developing innovative solutions to meet today's changing demands to enable us to build a cleaner and healthier future for generations to come.

Johnson Matthey
Inspiring science, enhancing life

www.matthey.com