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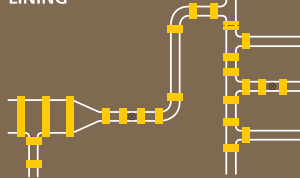
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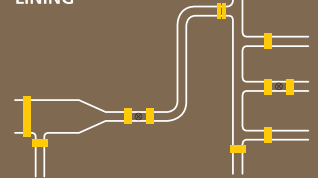
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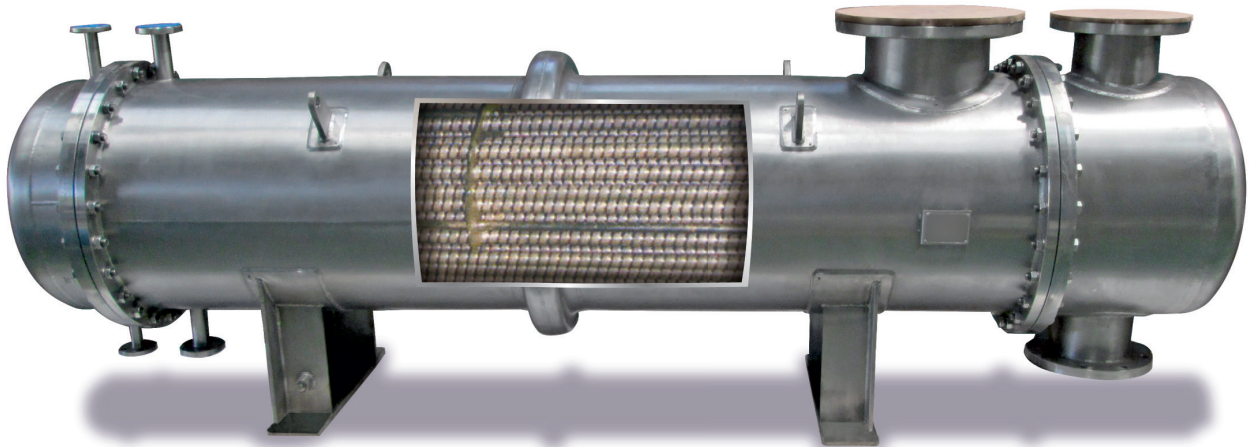
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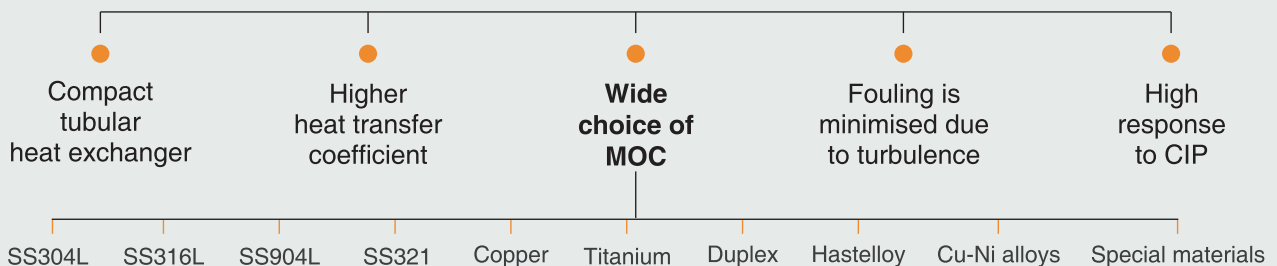
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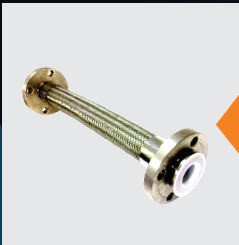


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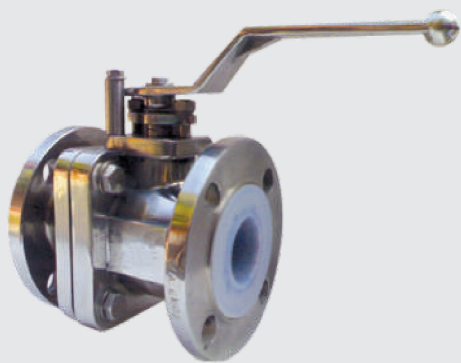
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## Revival of Closed Fertilizer Plants

Government of India is reviving five closed fertilizer plants of Fertilizer Corporation of India Limited (FCIL) and Hindustan Fertilizer Corporation Limited (HFCL) namely Talcher, Ramagundam, Gorakhpur and Sindri plants of FCIL and Barauni plant of HFCL by formation of Joint Venture Companies of nominated PSUs for setting up new Urea Ammonia plants of 12.7 Lakh metric tonne per annum capacity each.

Name of Fertilizer plant	Location of the plant	Expected Date of Commissioning
Talcher Fertilizers Ltd.	Talcher, Odisha	Sept, 2023
Ramagundam Fertilizers & Chemicals Ltd.	Ramagundam, Telangana	May, 2020
Hindustan Urvarak & Rasayan Ltd.	Gorakhpur, Uttar Pradesh	Feb, 2021
Hindustan Urvarak & Rasayan Ltd.	Sindri, Jharkhand	May, 2021
Hindustan Urvarak & Rasayan Ltd.	Barauni, Bihar	May, 2021

## Medical Device Parks

Department of Pharmaceuticals has a sub-scheme viz. Assistance to Medical Device Industry for Common Facility Center under the umbrella scheme for Development of Pharmaceuticals Industry. Under this sub-scheme, financial assistance to the tune of Rs.25 Crore or 70 per cent of the project cost, whichever is less is provided for creation of common facilities under any upcoming Medical Device Park promoted by State Governments/State Corporations. Department has received four proposals seeking financial assistance under this sub-scheme from the State Governments of Andhra Pradesh, Telangana, Kerala and Tamil Nadu. The “in-principle” approval has been given to proposals received from State Governments of Telangana, Kerala and Tamil Nadu while “final approval” has been given to proposal received from Andhra Pradesh.

Under the above sub-scheme, Department has accorded “final approval” for financial assistance of Rs.25 Crore to the project of State Government of Andhra Pradesh for setting up of Common Facility Centre for Superconducting Magnetic Coil. However, no financial assistance has so far been disbursed. The objective is to increase the competitiveness, easy access to standard testing facilities and value addition in the domestic Medical Device Industry through creation of such common world class facilities in a Medical Device Park.

## G &W Ltd Display Cutting-Edge Rust Preventive and Maintenance Products at Oil & Gas Expo World 2020 in Mumbai

Grauer & Weil (India) Ltd participated in Oil & Gas World Expo 2020 held from March 4 to 6 in Mumbai. The expo is one of the largest integrated energy tradeshow which brought together stakeholders from upstream, downstream, natural gas, refining and petrochemical and power industries to common platform.



This is the first time that Grauer & Weil (India) Ltd participated in the expo. The company displayed a host of stellar products related to the Oil and Gas industry. It has been working on Fluro-Polymers, Nano technology and other products that will last for 25 years under saline conditions. There are many more products that are being worked upon to meet the requirements of the Oil and Gas Industry. A highlight of this expo for Grauer & Weil (India) Ltd was its major focus on its cutting-edge rust preventive and maintenance product called Grodal GPS 40. The product belongs to the company's lubricant division. It basically acts as a rust loosener for threaded joints where nuts and bolts become difficult to open because they develop rust. Other products displayed at the exhibition included High Flash Rust Preventive Oil and Barium Free Rust preventive (Eco friendly).

The Oil & Gas World Expo proved to be a major networking platform for Grauer & Weil (India) Ltd considering that it was a global exhibition that provided an all-encompassing platform to showcase hydrocarbon processing technologies, oil field equipment & services, advanced automation, emission control & environmental technologies, digital solutions, surface engineering & corrosion control solutions. More than 140 exhibitors from India and overseas displayed technologies, equipment and services. The products from Grauer & Weil (India) Ltd received an overwhelming response from visitors because of the growing demand for rust preventives which become dry after some time. The company is known to offer such products. Its products also have a high flash point to avoid fire hazards. The company has also developed various coatings to meet challenges in the industry. Recently, the team developed a special rapid cure fast setting Epoxy paint which can be applied under water with minimal surface preparation. It has also developed under insulation products for higher thermal shock absorbing property.

All products from Grauer & Weil (India) Ltd are environment friendly and conform to stringent international standards while assuring optimum quality to end users. With the use of latest and state of the art technologies, the products are designed to give high performance and provide cost effective solutions. Speaking about G&W's participation in the expo, Mr. Hemant Dange, AVP, Grauer & Weil (India) Ltd said, “We are thrilled to be a part of this expo because Oil & Gas World Expo is one of the biggest platforms for stakeholders from the industry to exchange knowledge and create networking opportunities. It has provided great visibility for the company and we were able to reach out to global as well as domestic players. There have been ample networking opportunities and we could also share our expertise with others.”

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## USD 410 million Global Contract for Navin Fluorine

Navin Fluorine International, one of the country's largest manufacturers of fluorochemicals, has signed a USD 410-million contract with a global company to supply high-performance products in the fluorochemicals space over the next seven years. According to the press release this contract will enable it to venture into the production of a new product. The capex and project for the new product will be executed through its wholly-owned subsidiary, Navin Fluorine Advanced Sciences Ltd (NFASL). The company will invest USD 51.5 million to set up the manufacturing facility in Dahej and around USD 10 million for captive power plant. Mr. Radhesh Welling, Managing Director, Navin Fluorine, said the contract, the company's largest, will enable it to become the leader in the production and delivery of high-performance products within the fluorochemicals space. The agreement will help it further expand its product portfolio, he added. The supplies are expected to commence from Q4 of FY22.

## Epsilon Carbon to Infuse Rs 900 Cr in Carbon Black Plant

Epsilon Carbon, a coal tar derivatives company, plans to make an investment of Rs 900 crore in setting up a carbon black facility at Bellary in Karnataka. Company plans to set up initial capacity of 1.15 lakh TPA in the first phase and targets to commission by third quarter of 2021. The unit will produce both hard and soft grades of carbon black and the carbon black oil/anthracene oil generated in the coal tar distillation process will be used as feed to the carbon black unit, providing a complete backward integration support. In the second phase, company will expand to 3 lakh TPA by 2024.

At present, the company operates a 2.2 lakh TPA coal tar distillation facility that caters to 40 percent of the demand for pitch in the aluminum industry. The integrated carbon black complex will be the first-of-its-kind manufacturing facility in India to use waste coke oven gas from steel plants as a fuel, making this an environment-friendly set-up with lower CO<sub>2</sub> footprint. In addition, the plant with its captive low-sulphur feedstock, will have the lowest sulphur oxides and nitrogen oxides (SO<sub>x</sub>/NO<sub>x</sub>) pollutant levels which are much below those of the current carbon black manufacturing facilities in India.

## HPCL Opens Retail Outlet in Bhutan

HPCL's first Retail outlet in Bhutan has been commissioned on 11th March, 2020 in partnership with State Trading Corporation of Bhutan (STBCL), a Govt. of Bhutan entity. The outlet was inaugurated by the venerable Latshog Lopen of Bhutan Central Monastic body in the presence of CEO of STBCL, Shri Kuenga Namgay, in a traditional ceremony to the delight of the customers present. The outlet has best of infrastructure facilities including full-automation. The staff deployed at the outlet have been trained at our Skill Development Institute in Visakhapatnam. This is the first of the 22 outlets planned as per the MOU with STBCL at select high potential sites in Bhutan. As per this MOU, HPCL will give technical & brand support to STBCL in setting up and running the outlets apart from supplying products to the outlets. Commissioning of this Retail Outlet marks HPCL's presence in Retail Petroleum industry outside country and fuels their aspiration to spread into new geographies.

## Promotion of Green Fuel

Government of India has notified the National Policy on Biofuels 2018 which inter-alia envisages increase usage of biofuels in the energy and transportation sectors of the country. The policy aims to utilize, develop and promote domestic feedstock and its utilization for production of biofuels thereby increasingly substituting fossil fuels. National Policy on Biofuels 2018 envisages an indicative target of 20% blending of ethanol in petrol and 5% blending of bio-diesel in diesel by 2030. Public Sector Oil Marketing Companies (OMCs) are also promoting cleaner fuels in the country. The Government is adding CNG facilities at retail outlets and as on 1st February 2020, public sector oil marketing companies have already installed CNG facilities at 1438 retail outlets, 1989 CNG stations across the country and is setting up Compressed Bio Gas (CBG) facilities under the Sustainable Alternative Towards Affordable Transportation (SATAT) initiative of the Govt. of India. The outlets will start dispensing dispensing BS VI Grade fuel w.e.f 1st of April 2020. The Government is also setting up of Electric Vehicle Charging Stations.

Further, Petroleum & Natural Gas Regulatory Board (PNGRB) is the authority to grant authorization to the entities for the development of City Gas Distribution (CGD) network in Geographical Areas (GAs). Providing Piped Natural Gas Connection (PNG) and establishment of Compressed Natural Gas (CNG) Stations are the part of the development of CGD network and the same is carried out by the entities authorized by PNGRB. Six (6) GAs for development of CGD networks in Kerala namely Ernakulam District GA, Kozhikode & Wayanad Districts GA, Malappuram District GA, Palakkad & Thrissur Districts GA, and Alapuzha, Kollam & Thiruvananthapuram Districts GA in Kerala and Kannur, Kasargod & Mahe Districts GA in Kerala & Puducherry have been authorised.

## Ministry of Jal Shakti Discusses Treating Industrial Effluents & Sewage Water

Discharge of untreated & partially treated sewage and industrial effluent is primary cause of pollution of river and water bodies. As per the report published by Central pollution Control Board (CPCB) in March, 2015; sewage generation from urban areas in the country is estimated at 61,948 million litres per day (mld), against which available sewage treatment capacity was 23,277 mld. Discharge of raw sewage into water bodies cause depletion of Dissolved Oxygen (DO) in river and thus, adversely impact aquatic life. Cleaning of river through proper sewage management is a continuous process and Central Government is supplementing the efforts of the State Governments and Union Territories in addressing the challenges of pollution of rivers by providing financial and technical assistance through schemes like National River Conservation Plan (NRCP) and Namami Gange. The NRCP has so far covered polluted stretches of 34 rivers in 77 towns spread over 16 States in the country with a sanctioned cost of Rs. 5870.54 crore. Under Namami Gange, the rejuvenation of Ganga and its tributaries have been taken up. So far, a total of 310 projects have been sanctioned at an estimated cost of Rs.28790.66 crore under Namami Gange. Of these, 116 projects have been completed and made operational.

In addition, sewage infrastructure are also created under programs like Atal Mission For Rejuvenation & Urban Transformation (AMRUT) and



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Smart cities Mission. Operation and maintenance (O&M) of STP and sewage pumping station is the responsibility of the State Governments/ Urban local body concerned. Lack of adequate sewer networks & house connection and unsatisfactory operation and maintenance are major reasons for under utilization of sewage treatment plants (STPs). Central Government has been regularly asking the States to improve the performance of STPs. In addition, CPCB had issued directions on 21.04.2015 to the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) under the Water (Prevention and Control of Pollution) Act, 1974 asking them to issue directions to Local Authorities responsible for sewage management in their respective cities/towns and to submit time bound action plans for collection, transportation and treatment of sewage generated in urban area. CPCB has also issued directions on 09.10.2015 to Local Authorities under Environment (Protection) Act, 1986 for sewage management in Class I Cities and Class II towns and asked them to ensure that treated waste water is disposed in rivers and water bodies in accordance with the stipulated standards.

### Statistics: Export of Petroleum Products

Domestic oil and gas producers paid a total amount of approximately 34,300 crore to the Government of India as Cess, Royalty and Profit petroleum during the year 2018-19. In addition, total amount of royalty paid to State Governments during 2018-19 from oil and gas production is approximately 13,400 crore.

Export of petroleum products			
	2018-19		
	Quantity	Value	
	Million Tonne	USD (Billion)	(Crore)
LPG	0.4	0.3	1976
Petrol	12.9	8.6	60419
Naphtha	7	4.1	28893
Aviation Turbine Fuel	7.4	4.9	34030
Kerosene	0.02	0.01	98
Diesel	27.8	17.6	123519
Light Diesel Oil	0.1	0.05	364
Lubes/Lube Oil Base Stock	0.01	0.02	106
Fuel Oil	2.2	0.9	6537
Bitumen	0.02	0.01	72
Petcoke/Carbon Black Feed Stock	1.1	0.5	3255
Others			
(Include VGO, Benzene, Hexane, MTO, Sulphur etc.)	2.1	1.2	8429
Total product export	61.1	38.2	267697

Courtesy: MoPNG

### Government Allots 33 CBM Blocks

In the last 5 years till February 2020, the three states of Jharkhand, West Bengal & Madhya Pradesh produced 2999.77 MMSCMD CBM. CBM producing blocks and operators include : Great Eastern Energy Corporation Ltd in Raniganj South & Raniganj East in West Bengal, Reliance Industries Ltd in Sohagour (West) in Madhya Pradesh and ONGC in Jharia and Bokaro in Jharkhand.

The Ministry of Petroleum and Natural Gas has brought out the policies and notifications after Coal Bed Methane (CBM) Policy 1997. 33 blocks have been allotted to various companies in four CBM bidding rounds. Operators are required to take environment clearance from Ministry of Environment, Forest and Climate Change before starting CBM operations in the area.

### Cumulative Renewable Energy Capacity of 132.15 GW Installed

As part of Intended Nationally Determined Contributions as per the Paris Accord on Climate Change, India has undertaken to install at least forty percent of its total electricity generation capacity from non-fossil fuel sources by 2030. As on 29th February 2020, a cumulative renewable energy capacity of 132.15 GW had been installed in the country, with an additional capacity of 46.69 GW under various stages of implementation and 34.07 GW under various stages of bidding. As on same date, the country had cumulative installed capacity of 138.93 GW from non-fossil fuels sources. The cumulative renewable energy capacity and cumulative capacity from non-fossil fuel sources constituted 35.80 per cent and 37.63 per cent of total electricity generation capacity of 369.12 GW installed in the country as on 29th February, 2020, respectively. (c): The source-wise and state-wise details of renewable energy projects implemented

### Indian Chemical Sector Needs to be Future-Ready

Wuhan, the epicenter of coronavirus is the capital of the Hubei province. The petrochemical and chemical industries have been traditionally among Hubei's pillar industries, also contributing much to China's chemical exports. The unfortunate coronavirus epidemic in China is likely to only increase in intensity over the next few weeks and months and the exports around the world are likely to get impacted, as also it is likely to impact Chinese chemical imports to India as well. High dependency on chemical imports is not a good sign for the Indian economy considering that this is a core industry, often called the 'Industry of Industries' with many other businesses depending on it for survival. The cascading impact of this will be felt in many industries, which India can barely afford at this juncture.

The Indian chemical sector needs to be future-ready for situations like these and there is a need to strengthen India's domestic Chemical production base, which is the backbone of India's industrial and agricultural development. The chemical industry needs to better its feedstock allocation policy, government investments in chemical clusters across the country, easier access to capital due to its capital

To be continued at page no 16...

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# Digital Acceleration in Specialty Chemicals

Specialty chemicals producers face particularly demanding challenges due to the complexity of operations and the increasing variety and number of products their downstream customers require. These companies require greater efficiency in innovation and new production introduction, and digital technologies offer a profitable solution to these challenges.

Generally chemical companies have been slow to harness the value enabled by digitalization, as retail and consumer companies have quickly adopted these new technologies. Even oil & gas companies, which have similar operational efficiency and productivity concerns, have moved more rapidly. The challenge for many companies is gaining enough understanding to harness the advantages that are possible with digital technologies. Organizations struggle to learn the terms, correlate with current and future assets, harness data to ensure safe and secure operations and leverage advanced models to develop greater business expertise.

Digital technologies have always focused on efficiency improvement in operations, and now performance can be accelerated through new developments like artificial intelligence, machine learning and multivariate analytics. Specialty chemicals producers can capitalize on these value



opportunities in digitalization by accelerating innovation; optimizing across the value chain and aligning with customer demands.

Innovation allows businesses to meet customer demands while also staying ahead of competitors. Specialty chemicals manufacturers are continually looking to innovate and enhance product performance at lower cost – often with fewer or alternative raw materials. Digital technologies can boost productivity and reduce errors by easing the transition from laboratory to plant production processes. Researchers at Dow Chemical

call this “model-guided experimentation.” They use first-principles modelling tools to accelerate the time to market for new polymers, running simulations to adjust process conditions in advance of the plant trials.

Aligning with customer demands is another important success factor in the competitive specialty chemicals segment. Planning and scheduling tools boost responsiveness to changing customer needs, while also maintaining a view toward profitability. Global specialty chemicals producer Momentive is focused on aligning with



Specialty chemical producers have achieved quality improvements of 10 to 20% by implementing Real-Time Quality Monitoring, Golden Batch Profiling and Procedural and Recipe Control.

its diverse customer demands across its silicones, quartz and ceramics business units. Momentive applied AspenTech supply chain tools across a complex mix of 16 manufacturing sites in 3 regions that operated batch and continuous processes and bulk and packaging assets. The company was able to optimize scheduling for the variety of asset capabilities and business demands for each, improving customer fulfillment and decreasing supply lead time by 10 days while also cutting some site inventories by 25 percent.

Aspen Technology has been working with leading chemicals manufacturers for nearly 40 years. This experience provides significant insight on how companies can best succeed by enabling digital tools. The following observations have emerged from our engagement with industry leaders:

- Leaders leverage technology to ensure an ongoing competitive advantage and improved business decision-making.
- Leaders have a strong organizational focus and understand that this is key to successful implementation.
- Leaders execute differently and know that acting on new technology developments is key to staying ahead of the competition.
- Leaders have a relentless focus on operational excellence and use digitalization solutions to ensure a meaningful impact on asset-intensive businesses.
- Leaders have a holistic asset optimization strategy that moves beyond operational considerations, to consider design and maintenance as well and deliver value at each stage.

For details contact:



*Dr. Paige Morse,  
Chemicals Industry Marketing Director,  
Aspen Technology, Inc.*





intensive nature, and simpler pollution compliance laws. Policies favoring the chemical sector will give a fillip to all industries dependent on this industry, from Led lights to electronics, from EVs to apparels, thereby giving a boost to the entire Indian economy.

India Imports from China (Value USD thousand)				
	2016	2017	2018	Total
Chapter 28	555739	578403	1059546	2193688
Chapter 29	5585553	6570779	8519960	20676292
Chapter 38	815969	1243588	1390738	3450295
Chapter 39	1837338	2137748	2691032	6666118

Total Chemicals & Petrochemicals Sector	32986393
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Trade Comparison Chemicals & Petrochemicals Sector	
China Imports from India vs India Imports from China (Value Usd thousand)	24893436

Indian deficit = 24893436

India Imports from China (Quantity Tons)				
	2016	2017	2018	Total
Chapter 28	651209	586349	1243164	2480722
Chapter 29	1541210	1692689	1988444	5222343
Chapter 38	340227	377861	380092	1098180
Chapter 39	997754	1075097	1174024	3246875

Total Chemicals & Petrochemicals Sector	12048120
---	----------

Trade Comparison Chemicals & Petrochemicals Sector	
China Imports from India vs India Imports from China (Qty tons )	-6507336

Indian deficit = 6507336

## Record Results in Grundfos Strengthen Foundation for the Future

Grundfos reaches its 10% profitability target one year ahead of time and secures the highest ever sales, employee satisfaction and customer loyalty. Strong traction on sustainability performance continues. In 2019, net turnover in Grundfos increased by 3% to DKK 27.5bn, which is the highest level in Grundfos' 75-year history. This corresponds to 2.2% organic growth in local currencies compared to 2018. Earnings before interest and tax (EBIT) grew by 16% to DKK 2.8bn, or 10.1% of turnover. Adjusted for items not related to the operations of the company, the performance EBIT reached 10.6% of net turnover, which makes 2019 the first year the Grundfos Strategy 2020 target of 10% return on net turnover has been achieved. "We are happy with the financial result and very satisfied with our ability to drive continued growth while positively impacting the world's climate and water challenges," says Mads Nipper, CEO and Group President, Grundfos.

"While we expect 2020 to be a challenging year, the starting point

for our Grundfos Strategy 2025 journey is very strong. We have a strategic ambition to be a key contributor to the world's climate and water challenges, while continuing to serve our customers even better and deliver solid financial results," says Mads Nipper.

## LANXESS Achieves Full-Year Target for 2019 Despite Challenging Environment

Specialty chemicals company LANXESS had a successful fiscal year 2019 in an increasingly challenging economic environment. EBITDA pre exceptionals increased by 3.3 percent to EUR 1.019 billion. As guided, the earnings came in roughly in the middle of the range of EUR 1.00 billion to EUR 1.05 billion. In the previous year, the company generated earnings of EUR 986 million. The strong results in the Advanced Intermediates, Specialty Additives and Performance Chemicals segments compensated for the decline in the Engineering Materials segment, due in particular to the weak demand from the automotive industry. Earnings were supported by advantageous exchange-rate effects, especially from the U.S. dollar. The EBITDA margin pre exceptionals for the full year reached 15.0 percent for the first time in the company's history, against 14.4 percent a year ago. "In 2019's difficult economic environment, we withstood the first true test since our realignment. LANXESS is now more profitable and more stable than ever," said Matthias Zachert, Chairman of the Board of Management of LANXESS AG. "Even in these challenging times, we increased our margin to a new record high and further strengthened our financial base for new growth projects. In 2020, we will be increasingly devoted to the high-margin consumer protection business and new applications in the field of battery technology."

As of December 31, 2019, the Leather business unit is recognized as a discontinued operation. Sales and operating earnings – and the corresponding prior-year figures – were restated. As part of the strategic realignment the company intends to sell the business unit. LANXESS already disposed of the chrome chemicals business and its interest in the chrome ore mine in 2019. At EUR 6.802 billion, LANXESS' group sales were around the previous year's level (EUR 6.824 billion). At EUR 240 million, net income from continuing operations was 14.9 percent down on the previous year's figure of EUR 282 million. It was reduced in particular by exceptional expenses for the realignment of the organometallics business.

On its growth course, LANXESS intends to focus more sharply on consumer protection products and is therefore adjusting its segment structure, effective immediately. The Saltigo, Liquid Purification Technologies and Material Protection Products business units make up the new Consumer Protection segment. The Consumer Protection segment is replacing the former Performance Chemicals segment. The project for the commercial extraction of battery-grade lithium at the U.S. site in El Dorado, Arkansas, which LANXESS started with its partner Standard Lithium, has made further progress. LANXESS expects its operating business to remain stable in fiscal 2020. However, the company expects the effects of the coronavirus epidemic to impact the operating result by between EUR 50 million and EUR 100 million for the year as a whole. Overall, LANXESS therefore expects EBITDA pre exceptionals to be between EUR 900 million and EUR 1.0 billion. For the first quarter of 2020, the specialty chemicals company is currently anticipating charges of around EUR 20 million from the coronavirus epidemic.

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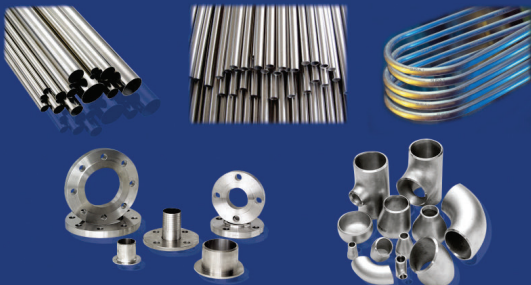
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## Frames India Moves to Larger Office



Frames India has moved to a new and larger office. The inauguration ceremony of the new office was on March 3, 2020 in presence of Marten van den Berg (Ambassador of the Kingdom of the Netherlands in India). Marten van den Berg did the formal opening and ribbon cutting ceremony in the presence of Guido Tielman (Consul General of the Kingdom of the Netherlands), Chandrakant Salunkhe (Founder & President, SME Chamber of India & India International Trade Centre), Ronald Vochtelo (Chief Financial Officer), Uday Kulkarni (Managing Director Frames India), and other stakeholders.

Uday Kulkarni, Managing Director of Frames India is very pleased with the Frames India's transformation journey so far. "The new office is a major milestone. The office has a modern ambience, is environmental friendly, and has the capacity to accommodate more than 150 employees. It will promote the rapid growth of Frames India by attracting and nourishing the best talent in the energy industry."

## Preem Selects Hydroflex™ for Renewable Fuel Plant with Potential to Save 2.5 Million tons CO<sub>2</sub>

Preem has chosen Haldor Topsoe's HydroFlex™ renewable fuel technology to produce clean renewable diesel and jet fuel at their Gothenburg refinery in Sweden. The 16,000 barrels-per-day unit will have a yearly production capacity of approximately one million cubic meters of fuels which corresponds to about 25% of Sweden's estimated consumption of renewable fuels in 2030. This volume of renewable fuel can reduce emissions from cars and planes by

2.5 million tons CO<sub>2</sub> every year. The new plant is scheduled to be put on-stream in 2024 and will be completely dedicated to producing renewable fuels from tall oil, tallow, and other renewable feedstocks.

"Preem wants to continue the transformation towards a sustainable society and increase the production of renewable fuels in Sweden. The new plant is an important milestone for us, but this is only the beginning. Preem's goal is to become the world's first climate-neutral petroleum



and biofuels company, with net zero emissions in its entire value chain before 2045, and production of renewable fuels is an essential part of that ambition. Preem was one of the first transportation fuel companies to begin the transformation towards renewable fuels. For more than a decade, the company has collaborated with Topsoe to innovate the field. "We are deeply committed and proud of our collaboration with Preem, who is a true frontrunner in renewable fuels. We have worked together on renewable fuels since 2007, and in 2010 we brought the first revamped co-processing unit on-stream to produce renewable diesel. Since these early days, we have increased efficiencies and production volumes in our shared effort to make renewable fuels a viable alternative. We are genuinely excited to begin the next ambitious phase of our partnership," says Morten Schaldemose, EVP of Haldor Topsoe. As a result of Preem choosing the HydroFlex™ technology with its capacity to produce renewable jet fuel, Preem has signed a letter of intent with the airline SAS to bring this fuel to the Nordic markets. The project is based on HydroFlex™, a world-leading, industry-proven Topsoe technology that produces renewable fuels, such as gasoline, diesel, and sustainable aviation fuel, from all renewable feedstocks. Topsoe will license and supply basic engineering, proprietary equipment, catalysts, and technical services. HydroFlex™ can be deployed in both grassroots units and revamps for co-processing or stand-alone applications.

## Polymer Delivers Significantly Enhanced Cure Performance for Epoxy Resins

Chemical Process Services Ltd, is a new specialist polymer design and development company and has researched and developed a new series of 'green' epoxy curing agents. The Furalkamine range of polymers combat the withdrawal of conventional Mannich base grades prohibited in Europe under REACH regulations or due to inclusion of undesirable residual monomers. The Furalkamines are a new form of Mannich base curing agents, derived from pentosane-rich biomass. Subsequent reaction with a variety of amines influences the processing characteristics and offers a new solution to low temperature cure



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and cure under adverse conditions, whilst maintaining regulatory compliance. These attributes make them ideal as the principal curing agent or modifiers for other curing agents in the formulation of solvent free or high solids, low VOC maintenance specialised marine coatings, flooring and adhesives.

A patent is pending for this new chemistry and CPS are developing the products further. Bitrez will be manufacturing the Furalkamine grades under licence from CPS. Paul Jones, managing director of Bitrez and CPS, and the inventor of the Furalkamines, said: "Our new Furalkamine grades are a great example of how we lead the way in continually pushing the boundaries of chemistry to provide our customers with innovative bespoke solutions. These solutions fill the gaps generated by removal of products, like conventional Mannich base curing agents, from the marketplace due to regulatory changes. "Our focus on regulatory compliance, sustainability and reduced hazard rating whilst providing the highest technical performance is one of the reasons why we are growing so rapidly." Resin manufacturers were recently forced to withdraw or rationalise some conventional Mannich base curing agents from their product range because of REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) compliance.

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## Integrated Servo Drive for Automation Outside of Control Cabinets

The new AMI812x series of integrated servo drives expands the compact drive technology portfolio (up to 48 V DC) from Beckhoff by extremely compact devices for distributed field installation.

The integration of servomotor, output stage and fieldbus connection in a space-saving design makes the drives ideal for automation outside of control cabinets in the motion power range up to 400 W.

As an EtherCAT slave, the AMI812x integrated servo drive can be placed directly on the machine without a control cabinet and without upstream I/O level, allowing for the implementation of highly compact machines without control cabinets. At market introduction, the AMI812x series includes three overall lengths in the F2 flange code with standstill torques from 0.5 to 1.1 Nm. The AMI812x is optionally available with a multi-turn absolute encoder without battery backup and with a

backlash-free holding brake. With an additional sealing ring, the servo drive achieves high IP 65 protection rating and is suitable for all installation positions. The STO safety function can be integrated as an option via the TwinSAFE Logic.

The fast control technology, based on vector current and PI speed control, supports highly dynamic positioning tasks. Numerous monitoring options, such as over and undervoltage, overcurrent or motor utilization via calculation of an I T model, offer high operational reliability. The operating state is indicated by integrated status LEDs.

## Thyssenkrupp Commissions Phosphoric Acid Plant for Coromandel International at Vizag

thyssenkrupp Industrial Solutions (India) has successfully commissioned a 450 TPD Phosphoric Acid plant for Coromandel International Limited at their Vishakhapatnam plant in Andhra Pradesh, India. The scope of the contract, which was awarded in 2017, included arranging of license, know how, Process Design Package, Basic and Detail Engineering, Project Management, Technical Procurement and Supervision during Construction, Start-up and Commissioning. The plant is based on the dihydrate technology of Prayon, Belgium.

Commenting on the completed plant, Mr. Amir Alvi, Executive Vice-President and Head of Manufacturing of Fertilizers, said "The plant is successfully commissioned and production parameters are being met. We are really pleased with the efforts of the thyssenkrupp team. There has been very good synergy between thyssenkrupp and the licensor Prayon, and these efforts reflect in the completed plant that is helping us meet our project plans." Mr PD Samudra, MD & CEO, thyssenkrupp Industrial Solutions (India) said: "Phosphoric Acid is an important requirement in the manufacture of DAP-NPK, which is a Phosphatic fertilizer manufactured by Coromandel International Limited. We have been promoting Phosphoric Acid projects starting from rock phosphate to our Indian customers, based on process know-how of Prayon from Belgium. We are privileged to have been able to support Coromandel International Limited in setting up this project. It makes us proud to have been associated with them for over 2 decades in a variety of phosphatic fertilizer and low-temperature cryogenic storages for Ammonia. The successfully commissioned plant vindicates our expertise in implementing fertilizer projects and the trust placed in us by Coromandel International, a reputed and leading Fertiliser producer in India.' The plant is functioning smoothly.

---

## Continuous-Fiber-Reinforced Thermoplastic Composites from LANXESS for Safety-Critical Structural Components

Tepex continuous-fiber-reinforced thermoplastic composite materials from LANXESS have huge potential for use in many areas, including the lightweight construction of structural safety components. A child seat headrest that has been developed as a technology demonstrator serves to illustrate the opportunities on offer here. The component is produced in a particle-foam composite injection molding (PCIM) process. "The insert made of Tepex can reduce the weight of the headrest by up to 30 percent in comparison with the commercially produced component variant – and with comparably good crash performance, too. It also simplifies the production process," explains Dr. Klaus Vonberg, an expert in lightweight construction at the Tepex Automotive Group of the High Performance Materials (HPM) business unit at LANXESS. Tepex is developed and produced by LANXESS subsidiary Bond-Laminates GmbH, which is based in Brilon, Germany. The demonstrator is the

result of a transnational research project funded by the German Federal Ministry for Economic Affairs and Energy as part of the Central Innovation Programme for Small and Medium-Sized Enterprises (SMEs) (German acronym: ZIM). Participating in this program are the Department of Lightweight Structures and Polymer Technology (SLK) at Chemnitz University of Technology, Polycomb GmbH based in Auengrund in Thuringia and the child seat manufacturer Avionaut based in Szarlejka, Poland, which produces the child seat that serves as a reference.

## Thermax Displays its Edge in Technology and Sustainability

Thermax Limited, a leading energy and environment solutions provider participated at Boiler India 2020. The company being one of the prominent exhibitors displayed its capabilities as 'One Thermax' offering a comprehensive range of utility solutions right from energy generation to dissipation - heating and cooling equipment, turnkey power plants, waste heat recovery units, systems for water and wastewater management including wastewater recycle, air pollution control and performance improving chemicals with a focus on sustainable offerings.

Highlights of the display comprised an actual Shellmax Global Boiler, a smart and compact boiler with international standards; biomass-based heating solutions; in-place sewage treatment and other water treatment solutions; efficient steam accessories and a range of chemicals for special applications.

Apart from physical exhibits, a series of captivating visual displays were showcased, such as making and shipping of the largest battery of modularised boilers from India for the biggest refinery in Africa; IoT solutions for boilers and chillers as a game-changer and simulated working of high technology products.

M.S. Unnikrishnan, MD & CEO, Thermax said, "I am thrilled that Boiler India 2020's maiden initiative has received excellent response with over 150 exhibitors displaying India's advancement in boiler technology. I am delighted with Thermax's participation to showcase our capability, not only in boilers but allied areas and up to power plant engineering. It is important for the world to see us as the best company in sustainable energy and environment solutions."

Thermax also displayed its product portfolio of its recent venture into the 'Urban' segment to address critical customer needs in the realty, commercial, hospitality, healthcare and infrastructure domains. The offerings span heating, solar PV, water solutions and chemicals.

Thermax's belief being firmly anchored in its purpose of 'Conserving Resources and Preserving the Future', showed in its comprehensive display. The company focused on innovative green technologies that not only help reduce environmental impact but also help customers reduce their carbon footprint and save operational expenses. These include

waste heat recovery systems, flue gas desulphurisation systems, vapour absorption machines, power from waste and renewables.

Thermax was also one of the key participants at various panel discussions and presentations held alongside the expo on all the days. Various members from the company including business leaders, category heads and technical experts covered subjects ranging from boiler selection and feasibility of fuel change; pathway for successful boiler manufacturing and modularisation of boilers; latest trend in welding; and the future of the boiler industry in India and the global scenario.

## Azelis Joins 'Together for Sustainability'



Azelis, a leading global distributor of specialty chemicals and food ingredients, is thrilled to announce to have joined Together for Sustainability (TfS), global initiative for sustainable supply chains. This membership follows on Azelis' membership to UN Global Compact and Gold rating from EcoVadis, thus testifying to company's resolute course of action to be catalyst of change when

it comes to sustainable business models and become benchmark for the industry. Azelis is now part of the global network of 25 TfS member companies who represent a global turnover in the chemical industry of 422 billion and a global spend of 281 billion. Operating as a unique, member-driven organisation and peer-to-peer network, TfS member companies shape the future of the chemical industry together. Azelis Corporate Social Responsibility (CSR) program is built around four pillars: resources and environment, labor and human rights, fair business practices and sustainable procurement, all directly contributing to 10 UN Sustainable Development Goals (SDGs). Azelis holds a Gold rating by EcoVadis, a prerequisite to join the TfS initiative, which places the company in the top 1% of distributors assessed by EcoVadis. This latest membership is in line with Azelis' strategic course of becoming industry benchmark when it comes to sustainable business practices.

Dr. Hans Joachim Müller, Azelis CEO comments, "Our dedication to CSR and sustainable business models has been at the core of our business decisions for a while now. That dedication has been recognised twice by EcoVadis' Gold rating so joining TfS was a next logical step for us. The TfS concept benefits both TfS member companies and suppliers, taking away bureaucratic burden from us so that time and energy can be spent on the improvement of sustainability performance. As a global business, with operations across EMEA, the Americas and Asia Pacific, Azelis takes its responsibilities very seriously, always looking for new ways to make a positive impact on society and minimise its footprint, whilst delivering the best possible products and services."



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# A Three Phase Strategy for Successful Digital Transformation

In this article, Adrian Park, Hexagon's PPM Division, discusses how digital transformation can support reducing cost and improving efficiency for the chemical industry.

**D**uring 2020, digital transformation is increasingly being seen by the chemical industry as a differentiator and potential vehicle for growth against a backdrop of increasing geopolitical uncertainty, volatile commodity prices and sluggish economic growth<sup>1</sup>. Firms are under pressure to protect – or increase – margins through any means. In almost every case this will require cost reduction and production efficiency improvements.

These gains must be realized relatively quickly too as competitors race to achieve the same outcomes. Improvement programs based on trial-and-error, particularly within a production environment, tend to be costly in time and money.

Mirroring other industries, chemical companies are turning to data to better manage investment in change and improvements. Which is why digital transformation programs are becoming more common; according to the World Economic Forum, the Chemistry and Advanced Materials Industry alone could unlock over \$550 billion of value for the industry, its customers and wider society<sup>2</sup>. Similar value may be available to any industry vertical through digital transformation.

## Applying Digital Transformation to operations

Digital transformation is the process of

applying digital technologies to improve business efficiencies, reduce risk and improve customer experiences.

Businesses already collect data to support safe and effective operations, and to prove compliance of processes and product to regulatory authorities.

The goal of digital transformation is to extract actionable insights from available information that can be applied to improve operational efficiency – and safety. As digital technologies mature, the volume of unstructured data being collected and actioned will grow exponentially. Firms will need technology and expertise to balance the increased complexity of their operations with safety critical processes.

But even with the most skilled technical team in the world, most organizations will struggle to deliver the returns expected. The learning curve associated with new technologies such as Artificial Intelligence, Machine Learning and Advanced Analytics is so steep that you cannot wait for engineers to develop required skills in house; to stay ahead of your competitors will require strategic partnerships that help you make sense of digital technologies and the data being generated.

The overall goal of any digital transformation program is to make all of the right information available at the right time in context with the work undertaken

– and to ensure all your employees are working from a single version of the truth. Interoperability across the operations IT landscape will be critical to maintaining data throughout the entire asset lifecycle.

## Digital Transformation and Operational Digital Twins

A prerequisite for successful digital transformation is an accurate digital representation of the physical facility, what is now generally referred to as the Digital Twin.

The Digital Twin provides the single, authoritative source of trusted facility information. It can significantly reduce the 20-30% of the working day typically spent trying to find information and eliminate the need to physically walk the facility to verify information and associated costs and risks.

The reduced time to locate information can improve on-tool time and reduce idle waiting time for plant floor workers. The tracking and traceability of all changes in the Digital Twin provides demonstrable compliance to meet the requirements of regulatory authorities. The improved fast, easy access and visualization of information on 3D models and 2D drawings including data from CMMS and data historians results in faster, better decision making in trouble shooting, emergency situations and day to day planning and execution of work.



The Digital Twin provides a platform for managing processes such as management of change, technical queries, action management and assisting in day to day activities including maintenance, inspection and operations rounds.

An operational digital twin comprises the information and documentation that accurately describes the configuration of the physical components including their topographic and geometric relationships. This information requires to be augmented by transactional data from maintenance, inspection and reliability systems and real-time information from sensors or a data historian such as OSI/PI or AspenTech IP21.

Many companies struggle with this very first step of building a digital twin for facilities that may be decades old with little structured information. Fortunately, technologies are now available to extract information from existing drawings, documents, spreadsheets, legacy databases and other sources validate and consolidate information to provide a basic digital twin. If 3D models are available these can be incorporated. Where 3D models are unavailable or not accurately reflecting the current as-is state of the facility then laser scans and high-quality digital photographs provide an accurate, photo realistic interface to the digital twin. The high effort previously associated with identifying tagged locations in the laser scan is now being

### Real-life Digital Transformation Story: Covestro

Covestro, a world-leading supplier of high-tech polymer materials, has partnered with Hexagon's PPM Division to facilitate the digitalization of the engineering and operations landscape.

Covestro identified several challenges related to its existing asset documentation management, such as duplicated data entry, delayed information exchange between engineering disciplines, manual work efforts, as well as insufficient possibilities for data analysis, thereby increasing costs. By digitalizing its asset information, which will be one of the steps toward becoming a fully digital enterprise, Covestro expects to overcome these challenges and realize multiple benefits across all lifecycle stages.

Hexagon solutions will be used in a selection of Covestro's current engineering projects and in the maintenance and operations work in the future as a part of the digitalization program for engineering, operations and maintenance activities, "OSI2020" (Optimized System Integration).

Stephan Krebber, program director for digitalization of production & technology, OSI2020, said, "Our OSI2020 program aims to implement digitalized plant operations by 2020. We chose Hexagon PPM as one of our digital transformation partners for the IPEP (integrated plant design and engineering platform) project to help us to digitalize our work processes and asset information."

addressed using Artificial Intelligence and Machine Learning to assist in identifying components in the laser scans.

Once the digital twin is available it can be accessed through a web browser, providing access anywhere, anytime on any device with no software installation or plug-ins needed.

Synchronizing the digital twin with other systems in the operations IT landscape such as maintenance systems, inspections systems, reliability systems and others ensures cross-application

consistency and enables the seamless navigation between systems.

Once a digital twin is built it must be sustained to reflect facility modifications and a comprehensive management of change process with concurrent engineering is required to control multiple simultaneous changes and demonstrate compliance

### Building a Connected Worker strategy

Digital transformation is about collecting data and applying insights at every part of your business. Analysis and insights are not purely for defining corporate strategy – they need to be applied on the plant floor too.

If you can get information into the hands of your front-line employees, you empower them to make better, safer decisions. But there are some significant barriers to overcome.

First, where is your data stored? The digital twin is a prime source, but other data may be required from ERP,



*A prerequisite for successful digital transformation is an accurate digital representation of the physical facility, what is now generally referred to as the Digital Twin.*

operational management or other systems. The longer workers spend looking for information, the less time they have for their core duties.

The second issue is how you provide access to information. For maximum efficiency, they need access to data wherever they are. This allows connected workers to act quickly – without leaving the plant floor.

To make workers truly connected, these systems also need to be available ‘on the move’. The majority of employees (81%) already own a smartphone ; your firm can tap into employee experience of using mobiles to provide certified industrial devices and apps that can be put into use with minimal training<sup>3</sup>.

This approach offers several significant benefits; a reduced learning curve because employees already know how to use mobile devices, increased data accuracy as data is captured in situ, etc.

And don't forget - a truly connected worker has access to contextually relevant data. Observations and notes can be recorded immediately, eliminating the need to manage cumbersome paper in the field and transcribe details later.

Typically there is a drop in productivity at the beginning and end of every shift. The outgoing manager must complete their notes and records ready for handover – and the longer they are away from their core responsibilities on the production floor, the more productivity is affected.

The same is also true of the incoming shift. Output will be impaired until the shift manager is able to access information relating to observations and priorities from the previous work session. They will also be unable to assign tasks or provide advice about safe working until that discovery is complete. If the manager must leave the production floor to obtain that data, the loss of productivity is extended.



*A Connected Worker Strategy enables front-line workers to make better, more informed decisions.*

With accurate, real-time data literally in the palm of their hands, connected workers are fully empowered to make smarter decisions - even at the individual level. Improving individual productivity and efficiency will have a large cumulative effect across the whole business.

### **Realizing increased productivity and output with Shift Operations Management**

No matter how safe your production line, workers always face an element of risk. Machinery, chemicals and the general operating environment all create potential dangers that need to be recognised and mitigated.

Usually, risks are highlighted during assessments, either before or after work has begun. These risk assessments are further augmented by observations each day in the form of shift logs. The log is an important tool for maintaining compliance and raising standards in day-to-day operations by keeping a record of observations and activities throughout the shift.

Like any record-keeping, shift logs are more accurate - and therefore useful – when completed in real time rather

than waiting until the end of the shift. Handwritten logs are often hard to read and cannot be distributed and summarized. Accuracy is vital for achieving true shift excellence and capturing logs digitally at source is the best way to achieve this.

First, accurate records prove that all work complies with corporate guidelines and applicable laws. Increased accuracy also allows you to identify – and rectify – non-compliance or poor practices early.

Second, improving accuracy and quality of logs also simplifies the end-of-shift handover process. The incoming shift manager knows they have all the information available about outstanding issues, and any remedial work already undertaken.

By granting mobile access to shift log information, any authorized employee can read the latest safety briefings. Everything they need to know is available in the palm of their hand – so they can start work safely, immediately.

Employees can also add observations, instructions and warnings, raising safety standards on the current shift. By keeping information flowing within the team and on to the next shift, everyone is better



equipped to take decisions that protect them against accidents and incidents.

Using data access to foster a culture of shift excellence will have a significant effect on operations. Over the past 35 years, human procedural error has been directly responsible for 321 fatalities, 1165 injuries and more than \$150bn losses in manufacturing. Anything your organization can do to minimize those losses should be welcomed.

### Meeting the challenges of the future today

Digital transformation and data are key to addressing the challenges your business faces in both short and long term. Improving working standards on the

plant floor will yield immediate savings and efficiencies as well as reducing risk. And restructuring operations behind the scenes will help to create efficiencies and savings that deliver year after year into the future.

It's just a question of knowing how to invest, and the platforms best suited to help you meet those goals through improved consolidation, integration and availability.

### Reference:

- 1) *The Complete Executives' Guide to Digitising Operations 2020* © Hexagon PPM
- 2) *Digital Transformation Initiative Chemistry and Advanced Materials Industry* <http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/white-paper-dti-2017-chemistry.pdf>
- 3) *Mobile Fact Sheet – Pew Research Center* - <https://www.pewresearch.org/internet/fact-sheet/mobile/> ■

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### FORM IV

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I Hemant K Shetty, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Date: 20<sup>th</sup> January 2020

Signature of Publisher

# Impact of Union Budget on Chemical Industry

The chemical industry is the backbone of industrial and agricultural development of any country and India is not different from others developed countries. Realizing the industry's ambitious growth targets will always require a combination of policy intervention, company-level initiatives, meaningful industry-academic partnerships, wise and strategic investments, and larger international connection.

The role of chemical industry in the economic growth of a country is well established worldwide. From the ubiquitous cell phone, to solar panels producing carbon-free energy, to LED lights providing efficient lighting, from latest medical facility to modern aerospace industry — all are made possible by chemical industry products. In India, the chemical industry occupies a pivotal position in not only meeting basic needs but also in improving quality of life as well. Although India is relentlessly deficient in conventional petro-chemical hydrocarbons, the country has grown a well-developed refining industry that provides raw materials to numerous basic chemical industries.

The **chemicals industry of India** contributes 2.1% towards the nation's **GDP** and accounts for almost 16% of **India's** manufacturing **sector**. It contributes 10.5% of our foreign trade. The Current market value of the chemical industry in India is 160+ billion US\$ and is projected to reach 300+ billion US\$ by 2025. The chemical industry affects almost all the sectors, directly or indirectly, such as agriculture, pharmaceutical, electroplating, automobile, coating, polymer additives, real state, power plant and many more. Without a smooth supply of chemicals, there will be hindrances to commercial activities and companies' production, whoever is using them as ingredients. Unfortunately, the chemical

industry is facing a lot of problem, and many factors are responsible for this. The chemical industries have to ensure the both, the compliance with environmental laws, and sustained growth of the industry. This is the biggest challenge for chemical industries in the current scenario of changing technology and environmental regulations every day. However, the industry can mitigate the supplier chain risk by preparing for these challenges early with proper planning and adequate steps.

## Advancement of Human Civilization

Chemical industries have contributed significantly to the advancement of human civilization by providing a growing understanding and ability to manipulate chemical molecules. It is the chemical industry which is responsible for converting raw materials like natural gas, oil, water, air, minerals and metals in to more valuable products. It is consistently searching and providing the solution to our day to day challenge in life. The union budget 2020 is dedicated providing "**ease of Living**" to all citizen in term of "**Aspirational India, Economic Development and Caring India**". The chemical industry has been instrumental in human development and products created by the chemicals industry. It has had an effect on all area of life, such as health, agriculture, hygiene, food, Coating & painting, aerospace, environmental and petrochemistry etc. Chemical Industry

produces more than 80,000 different types of products and some new products are being added everyday by innovation and development. These products are used by individuals as well as other industries. Chemical sector is of strategic importance to the sustainable development of human being and plays a vital role in the economic development of any country. The new innovation in chemical industry can play very important role in the field of agriculture, hygiene & health, clean energy, food packaging, Painting & Coating etc. The chemical industries may provide the answer of many challenges of the 21<sup>st</sup> century including improving the health protection and care.

It can help us to understand the reasons of the various incurable diseases like cancer, corona virus, Lupus, Parkinson's, AIDS, Alzheimer's disease etc., which in turn will be helpful to improve care and protection by diagnostics and sensors for the prevention and detection of deadly diseases.

Food science is another branch of chemical application. The study of chemical processes and interactions of all biological and non-biological components of foods will help us to understand how the food products change under certain food processing techniques and ways either to enhance or to prevent them from happening that. For example, enhancing a process would be to encourage fermentation of dairy products with



microorganisms that convert lactose to lactic acid; or preventing the process of browning on the surface of freshly cut Red Delicious apples using lemon juice or other acidulated water. For centuries, chemicals, such as salt, spices, and sulphides, have been added to food to improve taste and help with preservation. Processed food industry depends on identification of new additives, mostly chemicals, that can help preserve the foods.

Furthermore, the innovation of more efficient catalytic chamber for automotive engine may help us to cut the significant amount of green house and other poisonous gases. So chemical industry can really bring the changes to make the life easier and enjoyable which is what intended in 2020 union budget.

### The Union Budget

Another focus of the 2020 union budget is innovation based new economy. The world has really shrunk due to globalization and communication revolution in recent past and so is our chemistry. Chemistry has gone down to nano and molecular level due recent development in nanotechnology and molecular -chemistry and -biology. The new trends of nanotechnology, thermos and photo switchable molecular magnet may realize the dream of molecular switch and data storage. The complex molecule like DNA and RNA in our biological system act as coded data and messenger for complex biological process like protein synthesis, DNA replication cell division etc. Drawing the inspiration from biological system, chemical industries can come up with material to rewrite the way of computing and data storage in the future. The government is determined to open up the quantum technology with wide application in the field of computing, communication and cyber security. We are so much dependent on digital technology for our day to day life that cyber security is the

need of our time. Here also the chemical industry has to take the responsibility to develop the innovative materials to support the technological requirements. Government has budget 8000 crore for quantum technology in the 2020 union budget which will change the way of computing and digital technology.

### Shedding the Tag of Polluting Industry

Government focussed on Swachh Bharat Mission and allocated 12,300 crore in 2020 union budget for solid waste collection, source segregation and processing. Pollution and environmental concern are one of the biggest challenges for chemical industries. Actually, the chemical industry is tagged as the most polluting and hazardous industry. The chemical industry must focus to shed the “tag” of being most “polluting industry”. The emerging global trends of chemical industry reveal that it is witnessing a gradual eastward shift – towards Asia. India, undoubtedly, will account for a substantial share of the new market. But at this point we have to look this trend with a different angle. Why the chemical industry is shifting towards eastward? Obviously, the simple answer is: The chemical industry is hazardous and polluting and that is why the developed country are shifting all the chemical processing industry from their lands to the developing or underdeveloped countries. For them the India is the best choice and that's why India is getting huge chunk of business in chemical industry from western countries. In this upcoming scenario, a focus on sustainability would certainly be one of the many expectations from Indian chemical companies. The pollution level in many of Indian metros and industrial cities is above the alarming level and the impact of chemical industry on it will only deepen it in the coming years. The Bhopal gas leakage incident is still fresh in mind people. The main issues the chemical industry will have to address

**Green Chemistry** is the new trend in Indian chemical industry. **Green chemistry** is the design of chemical products and processes that reduce or completely eliminate the use or generation of hazardous substances. The goal of green chemistry is to eliminate pollution at the source, to enhance efficiency, to save resources and energy and to achieve sustainable development of chemistry and the chemical industry. The electroplating technology, an allied of Chemical industry, are one of the most polluting industries in the world. Electroplating plant uses a lot of water, acids and alkali along with various other electroplating chemicals which also includes cyanides, hexachrome, amines and heavy metals, surfactants etc. Most of these chemicals are very hazardous and very dangerous for both the environment and living beings - plants and animals. Recently, at many places, electroplating clusters have started adopting **zero discharge policy** and set up centralized water treatment and recycling plant. The awareness and concern for the environment and next gen among the industrial community is a great sign. This is one of the great moves seen recently in India. 2020 union budget focussed on clean and green India.

actively in the next 5 years are related to water, environmental concern, raw materials, and energy use and last but not the least, the hazardous management. Government intent is very clear with focus on clean India movement, focus on make in India to boost manufacturing sector, development of the new economic corridor and the encouraging to adopt the zero defect – zero effect manufacturing policy. But the sustainable growth in chemical industry in India is not possible unless the industry, government and technical and research institutes work

together in coherent way to address these issues proactively and collaboratively. The saddest part is the lack of proactive collaboration between the Industries and Research institutions in India. Many of our research institution are doing great scientific work which could have huge industrial impact and value but due to lack of proper collaboration industry is unable to take advantage of it. In the similar way, many of the industries are also involve in research work and are doing great job. It is not that the initiative to bring them together was not taken. To bring them together to benefit each other "The Council of Scientific and Industrial Research" (CSIR) was set up even before independent in 1942 with the immediate goal to bring science and technology to the country and develop research capabilities which would support industry. Today, CSIR is known for its cutting-edge R&D knowledge base in diverse Science & Technology. But chemical industry has not garnered the fruits of institution's knowledge base properly. Nevertheless, India have demonstrated a commitment to sustainability and initiated a range of sustainability programs, drawing on best practices adopted by global peers. However, unlike other industries such as pharma, cement, IT, software and still industry, where sustainability as an agenda has evolved in a broad-based manner among industry players, the chemical Industries (companies) in India have yet to take a collective corrective measure to maintain the sustainability of the sector. The actual strength of chemical industries in India is the main hurdle in for the proper organised structure of the sectors. 50% of Indian chemical industry are still unorganised, dominated by 80% MSMEs. The main challenges are to upgrade them to fulfil the requirement of new environmental compliances and make this sector a non-polluting sector. Even if majority of these small-scale industry shown commitment and initiated

a range of sustainability programs, based on best practices adopted by global peers, but the lack of knowledge, infrastructures and requirement of additional capital investment are coming in their way.

### **Zero Defect – Zero Effect**

2020 union Budget very much stressed on manufacturing sector, digitalization, environment, innovative technology, and "zero defect – zero effect manufacturing". Chemical industry sector is the measure manufacturing sector of the modern economy of any developing nation. In India also Chemical industry contribute 16% to manufacturing unit and its affect all most all other sectors directly or indirectly. The goal of zero defect zero effect required the digitalization and automation of the chemical process in the industry. It is a vast task for the companies but not impossible. We have well developed indigenous digital and automation technology is available at hand and many companies are already in the process of fully automated chemical process. An organised structure or association supported with government body and institution can make a big difference. The MSMEs which constitute majority of chemical industries will not only face financial issue but they also lack the technological knowledge.

The Indian chemical industry needs to upgrade itself to meet international standards. That will also improve their performance in global trade. The MSMEs which constitute majority of chemical industries, are of smaller capacities and operating at uneconomic scales of production with obsolete technologies. The industry, especially the small and medium enterprises sector, does not have access to capital to upgrade technology on its own. They actually need to be supported by the system. Of course their initiation and commitment are must. If they will not change as per the demand of changing business environment, they won't stand

global competition especially with China and other developing nation. To remain globally competitive and comply with requirements like REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) & RoHS (The Restriction of Hazardous Substances) - European Union regulation which addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. The level of pollution in groundwater and air pollution have reached at alarming level in most of the chemical industrial areas.

Many Indian chemical companies are in the forefront of environmental, water, health, hygiene, and safety performance, but the non-compliant attitude of many other companies and ineffective enforcement efforts in some industrial clusters are damaging the environment at very large scale. The provision in 2020 union budget is quite positive and encouraging for chemical industries, but needed to be done more. The government should come up with more incentives for ease of doing business, so that MSMEs are encouraged to adopt best policies and practices. The Central Pollution Control Board (CPCB), the State Pollution Control Board (SPCB), and chemical industry need to emplace the right incentives and determination to promote environmental protection in the chemical industrial area. That will help them in achieving their long-term business goal. In succession, MSMEs can do value addition to their business by become policies compliant. Once they do so, it will help them to become more competitive to their global peers in the future.

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# Seamless Fluoropolymer Linings offer Sustainable Solution to Resist Corrosion

Increasing domestic demand along with growing export from India brings lot of new capital investment in India to hit USD 300 billion mark in next 6-7 years for building new chemical plants which requires large amount of investment in fixed capital and process equipment. Author shares the Challenges and Solutions in Chemical industry for PTFE Lined Columns & Tanks for Corrosion management.

India has large chemical industry in Asia Pacific with a steady growth rate of 7-9 % in Chemicals, pharmaceuticals and specialty Chemicals with overall market size of more than USD 150 Billion makes India 6th largest chemical manufacturer in the world. Larger domestic demand along with growing export from India brings lot of new capital investment in India to hit USD 300 billion mark in next 6-7 years for building new Chemical plants which requires large amount of investment in fixed capital and process equipment.

Growth comes along with multiple challenges including key raw material availability, new technologies, digitization, safety concerns and equipment compatibility to handle corrosive & hazardous chemicals at optimized cost. There are multiple solutions to corrosion mitigation practiced in chemical industry & every solution has its own pros and cons. Fluoropolymers like PTFE, PFA, and PVDF etc. as barrier lining material (3mm to 12 mm thick) have been used in chemical process equipment lining for corrosion management since more than 50 years. Key applications include Fluoropolymers Lined Pipes, Fittings, Valves, Pumps, Columns and Tanks etc. whereas premature failure lead to increased downtime and production losses.

As of now there are handful of quality Fluoropolymers lined equipment

manufacturers in India but the number is gradually increasing. In the last decade the industry has taken cognizance from the challenges in fluoropolymer lined process equipment and the key value chain players have taken corrective actions to upgrade overall performance of these equipment. These efforts have given much needed impetus and positive drive as well as helped equipment manufacturers to understand tough

challenges and offer innovative solutions to the customers. This includes new manufacturing technologies for larger seamless PTFE liner manufacturing > 400 NB to 2000 NB (16 inch to 80 inch) for heavy process equipment's like columns, vessels, scrubbers etc. This is a very proud moment for the industry to realize the Make in India initiative by developing substitutes with high quality Fluoropolymers lined equipment's at



36 inch dia. PTFE lined equipment for corrosive chemical handling.

reasonable cost & minimum delivery time thus reducing dependence on imports.

Resistotech Industries Pvt. Ltd is one of the leading Indian players in this domain and achieved significant milestones in producing Fluoropolymers lined equipment. The company has state of the art manufacturing facility spread across 3600 sq. feet near Nashik to produce Fluoropolymers like PTFE, PFA, PVDF Processing and Lining. Delamination is one of the challenges in the long run that one needs to consider while using welded PTFE sheet lining process, which is not the case with seamless fluoropolymer lined equipment.

Directors of company, Mr. Prashant Patil and Mr. Vaibhav Naphade have 20 years of experience in Fluoropolymers processing and Lining for Pipes, Fittings and Large diameter equipment's for full vacuum applications for aggressive corrosive media handling. Under the guidance of the Managing Director of Resistotech, they have accepted toughest challenges in chemical industry and after 10 months of continuous trials and developments efforts successfully developed India's largest diameter seamless extruded PTFE Liner up to 900 NB (36 inch/ 900 mm dia) & 6 meter length. 900 NB PTFE Liner has been successfully lined inside mild steel tanks for handling corrosive chemicals under partial vacuum conditions. Currently it is installed and working absolutely satisfactory at one of the leading specialty chemical manufacturer in India. This successful case has built significant confidence for Resistotech and helped them to showcase their success case at many chemical manufactures in India and overseas.

The company has installed many installations with 400 NB (16 inch/ 400 mm dia) under partial to full vacuum condition at elevated temperature range of 120-180 degree Celsius.

Mr. Prashant Patil proudly mentions that they are extremely delighted with this differentiated achievement through proprietary technology and started receiving firm orders from many reputed local and international process equipment manufacturers, end users and engineering consultants for larger diameter seamless PTFE lined columns, vessels and equipment. He elaborates that there are 30 different parameters that need to be controlled for larger diameter PTFE Liners and 10 of them are most critical to get desired level of quality performance as per international quality standards like ASTM F1545 for PTFE Lined products. Even bigger sizes like 1200 NB (1200 mm) to 2000 NB (2000 mm) diameter liners are also in pipeline of development to use for large sized Tanks and Column seamless lining.

Resistotech has continued to gain lot of appreciation from end customers & engineering consultants to address their application specific needs and has become one of the preferred partners for development and supply of complicated & tailor made quality Fluoropolymers Lined products in India. Through differentiated and unique offerings, Company has achieved excellent growth in last 5 years with CAGR of more than 40 % which is remarkable and planned to grow aggressively in coming 5 years with significant investment in new facility for production, development and Quality Control for lined equipment's near Nashik.

Resistotech plans to expand the global footprint and scouting for partners in the Middle East & USA to spread the technological advancement for larger benefit of chemical industry in corrosion management solutions. The company is currently focused on complex challenges due to aggressive chemical handling under full & partial vacuum systems in industries like Paper & Pulp, Specialty Chemicals and Fluorochemicals,

#### Challenges:

- Limited knowledge on right selection of raw materials and consistency.
- Wrong Fluoropolymers grades selection without understanding of exposed chemicals & process conditions like Pressure, Vacuum, temperature, permeation performance etc.
- Limited knowledge on manufacturing technologies & many unorganized players.
- Lack of testing facilities as per International quality standards.
- Manufacturing limitation on larger size Fluoropolymers lined equipment with limited local option & dependency on imported lined equipment's at very heavy cost. For example large Diameter PTFE lined Columns > 400 NB (16 inch) under vacuum & high temperature conditions.

#### Corrective Actions:

- End user education and awareness from equipment manufacturers via focused seminars
- Participation in global technology Conferences & Exhibitions like Chemtech to increase customer engagement and awareness.
- Active involvement from Fluoropolymers material manufacturers and Engineering process consultants for successful implementation of Lined equipment.

Refineries, Pharma API, Chloroalkali, Steel processing, Pickling, Agrochemical & pesticides manufacturers to find alternative solutions to expensive import substitutes & exotic metals like Titanium, Tantalum and Hastelloy for selective process equipment's within range of Fluoropolymers. ■

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## Polyethylene Pressure Pump

Giga Pipe Systems offer solid wall polyethylene and polypropylene pressure pipes using the most up-to-date extrusion machinery supported by technologically advanced automation systems and ultra sound thickness controls.

The production range is from 600 to 5,000 mm outside dia with a pressure range from 3.2 to 25-bar (45 to 360-psi) and higher for special circumstances.

The standard lengths of the pipes are 6 and 12 meters. However, the Company can supply any length on customer request. Pipes with special dia and thickness can be manufactured for different uses such as re-lining of oil pipes and industrial applications. Pipe production is according to the international standards ISO 4427 and ISO 4437 and DIN 16961.

For details contact:

Giga Pipe Systems India LLP  
Tower-A, 10<sup>th</sup> Floor, Vatika Mindscapes 12/3  
Sarai Khwaja, Sector 27, Mathura Road  
Faridabad, Haryana 121 003  
Tel: 0129-6616200 (Extn 201)  
E-mail: info@gigapipe.in

or Circle Readers' Service Card 00

## Static Mixing System

Complete skid-mounted static mixing systems are designed to meet the needs of each user. The available mixer designs include the LPD, a low-pressure model typically used for low viscosity turbulent flow mixing of fluids and for gas-liquid mixing. This design is offered in many materials of construction and to 48-inch dia. These mixers are easily customized to include special feed nozzles and injectors for major and minor product streams.

The second design, the ISG includes specially machined elements with passageways that guarantee the mixing of any pumpable material. After passing through ten elements the ISG will layer materials over 2,000,000 times to provide a microscopically layered mixture. ISG elements are stackable in any quantity to provide mixing quality as needed in the process. The ISG is supplied in a range of cast or machined materials to suit the application through 12-inch dia.

For details contact:

Ross Process Equipment Pvt Ltd  
Plot No: D-233/3, Chakan Indl Area  
Phase II, Village: Bhamboli, Tal: Khed  
Dist: Pune, Maharashtra 410 501  
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## Vertical Blender



Vertical blenders are an excellent design alternative for applications that are shear sensitive or where space on the plant floor is at a minimum.

The gentle blending action of the slow turning blending screw is far gentler than that of a horizontal blender. The blending screw orbits the conical vessel wall while it turns and gently lifts material upward. The materials are then thrust at the upper most batch level towards the centre of the vessel and then move slowly back down the centre, while mixing with materials being moved upward by the orbiting screw.

When compared to horizontal blenders this design has several advantages: gentle blending action is ideal for friable or shear sensitive materials; one blender can be used for a wide range of batch sizes, ranging from as small as 10% of the rated capacity; nearly 100% of the blended materials are discharged through the bottom valve after completion of the blend cycle; use nearly 50% less power per unit being blended; and less floor-space and are ideally suited to multi-story facilities.

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## V-Blenders



V-Blenders designs are most often used for the intimate dry blending of free flowing solids. The solids being blended in these units can vary in bulk density and in percentage of the total mixture. Materials being blended are constantly being split and intermixed

as the shell rotates. Normal cycle times are typically in the range of 15 minutes, however, can be less depending on the difficulty of blending. V-Blenders are stocked in 5, 10 and 15 cu ft capacity. Each is constructed of type SS 316 and is internally polished to a 240 grit sanitary finish. The exterior is polished to an easily cleaned 150-grit finish.

All Ross V-Blenders are supplied with intensifier bars to permit de-agglomeration as needed. Discharge is accomplished through a manually operated butterfly valve. The valve is positioned 24" from the floor when in the bottom position. All units are provided with appropriate safety railings and appropriately interlocked. Stop-Start and E-Stop Pushbuttons are included with all blenders.

For details contact:

Ross Process Equipment Pvt Ltd  
Plot No: D-233/3, Chakan Indl Area  
Phase II, Village: Bhamboli, Tal: Khed  
Dist: Pune, Maharashtra 410 501  
Tel: 02135-628400, 628401

or Circle Readers' Service Card 00

### Puncture Resistance Tester



Puncture resistance tester clamps the sample on a fixture and is pierced with the help of a pendulum released from 90° position. The pendulum head is made pointed in a pyramid shape. Different weights are provided in the pendulum for different scales. A pointer is fitted in the pendulum, which gives the reading in a calibrated scale.

The CFB box may get impact from the sharp corner of any article during handling and transportation. They may be simulated by the puncture resistance testing machine. Higher the CFB quality better will be the puncture resistance value.

For details contact:

Presto Stantest Pvt Ltd  
1042 DLF Indl Area, Phase I  
Delhi Mathura Road  
Faridabad, Haryana 121 003  
Tel: 0129-4272727  
E-mail: info@prestogroup.com

or Circle Readers' Service Card 00

### Capacitance Level Transmitter



Capacitance level transmitter works on the principle of change in capacitance value, due to change in liquid level. Here the liquid acts as the dielectric, the probe and tank wall as electrodes. The change in capacitance value is converted to analogue output. It is available for conductive as well as non-conductive liquids. PTFE sleeve is provided to the electrodes for better insulation and to withstand high temperature.

It finds application in diesel tank, solvent tank, STP tank, water tank (RO, DM, soft and raw), acidic and alkaline tank.

For details contact:

Filpro Sensors Pvt Ltd  
No: 130, 10<sup>th</sup> Cross, Pete Chennappa Indl Estate  
Kamakshipalya, Magadi Main Road  
Bengaluru, Karnataka 560 079  
Tel: 080-23286463  
E-mail: sales@filprosensors.com

or Circle Readers' Service Card 00

### Ultra-compact Industrial PC Series



Measuring just 82 x 127 x 40 mm and combining high computing performance with a fanless design, the new C6025 IPC is an ideal choice for demanding control applications where green, sustainable IT is also a requirement. It is built around the Intel Core i U processors that deliver Core i performance capabilities yet consume significantly less power than other processors of the same series. The 8<sup>th</sup> Gen Intel Core i U processors used in the C6025 also offer an advantage which is typical of evolving PC technology: higher performance at the same price point. With this new addition, the Beckhoff portfolio of industry-ready and long-term available Industrial PCs now spans five CPU performance classes – from ARM through to Intel Xeon – for max scalability.

The IPCs energy-efficient Intel Core i U processors, in combination with an advanced cooling design, enable fully passive heat dissipation via a heat sink on one side. Housed in an aluminium and zinc die-cast enclosure, the C6025 offers a feature set that includes the following: up to four CPU cores; 4 GB DDR4 RAM (expandable to 8 GB); 40 GB M.2 SSD with 3D flash memory; 1 x DisplayPort video connector; 4 x USB 3.0 ports; on-board Ethernet controller with 3 x 100/1000Base-T ports; operating temperature range of 0 to 50°C.

The power-efficient, ultra-compact C6025 Industrial PC expands the broad IPC portfolio from Beckhoff with a device that offers a performance level situated between the entry-level devices with Intel Atom CPUs and those with high-performance Intel Core i-Series processors. With this addition, the product portfolio better addresses the growing trend towards compact, fanless Industrial PCs while supporting applications with highly intensive computing requirements.

For details contact:

BECKHOFF Automation Pvt Ltd  
Suyog Platinum Tower, 9<sup>th</sup> Floor  
Naylor Road, Off Mangaldas Road  
Pune, Maharashtra 411 001  
Tel: 020-67064802  
Fax: 91-020-67064899  
E-mail: a.phatak@beckhoff.com

or Circle Readers' Service Card 00

## Concentrated Sulphuric Acid



The plant produces dry HCl gas by the process of distillation of 30 per cent hydrochloric acid with concentrated sulphuric acid as entrainer.

Feed sulphuric acid is fed from top to the packed column and feed 30 per cent hydrochloric acid is also fed to the column. Both the acids flow concurrently. HCl gas is generated by mixing of the two liquid acid feeds. The top portion of the packed column acts as drying zone for the product HCl gas. Condenser/cooler is provided on top of column to cool the outgoing HCl gas. Suitable drying section removes final traces of moisture from outgoing HCl gas. The bottom product from the plant is spent sulphuric acid with 70 per cent strength (with 1 to 1-1/2 per cent HCl content). It is cooled in heat exchanger prior to discharge.

All the wetted parts of the system are fabricated from corrosion-resistant materials (glass and PTFE).

For details contact:  
Ablaze Glass Works Pvt Ltd  
E-52 Sardar Estate, Ajwa Road  
Vadodara, Gujarat 390 019  
E-mail: srshah@ablazeglassworks.com

or Circle Readers' Service Card 00

## Shaft Power Monitor



Emotron M20 shaft power monitor your shield against overloads and damage, helps you save time and money. It protects your pumps and other equipment against damage and detects process inefficiency. Early warnings allow you to take preventive action. Unique features include measuring shaft power output and using the motor as a sensor. The

result is reduced maintenance and installation costs, extended equipment lifetime and increased reliability.

It detects over and underloads, sends warning or stops the pump. Uses pump motor as sensor, eliminates need for external sensors. No moving parts increase reliability. Shuts pump before it runs dry.

For details contact:  
CG Power and Indl Solutions Ltd  
Drives and Automation  
Plot No: 9, MPAKVN, Phase 2  
New Indl Area, Mandideep  
Madhya Pradesh 462 046  
E-mail: drives.mktg@cgglobal.com  
drives.service@cgglobal.com

or Circle Readers' Service Card 00

## Ultra EC Brushless Motors with Ultra High Torque



Portescap is globally ISO 9001:2008 certified and their production site in India is also ISO 14001:2004 and OHSAS 18001:2007 certified. Portescap offers 2 more new length sizes under its ECT range of Ultra EC Brushless Slotless motors: the 35 mm 22ECT35 and the 48 mm 22ECT48. These new 22ECT motors along with higher torque capacity are light in weight and come in a compact package which helps in further miniaturization of the customer application.

Their 22ECT motors are specially optimized for high continuous torque at low to medium speeds, maximizing power between 10K and 20K rpm.

The 22ECT motors are powered by their patented Ultra Coil Technology and patented multipolar rotor design, which provides torque of up to 41.6 mNm. The 22ECT motor weighs almost 28 per cent lesser than comparative motors and it is the lightest 4 pole motor which can be adapted in most applications in the medical and industrial markets especially in industrial hand tools where high torque lightweight motor is required to reduce the fatigue of the user. The new 22ECT is also an ideal choice for applications such as humanoid robots, lab automation equipment, electric grippers and land surveying devices.

Portescap succeeds in providing a high quality, long lasting and high performance brushless motor which is an ideal choice for geared applications because of its minimal speed drop and low motor heating under load. Their low inertia makes them an exceptional option for applications requiring fast stopping, starting and acceleration. The new 22ECT motors are available with hall sensors and a total of 3 different coils to match your speed and voltage requirements. Upon request, Portescap can also provide options for customization including gearboxes, encoders, coil variations and mechanical interface modifications.

For details contact:  
Portescap  
Unit No: 2, SDF-1  
SEEPZ-SEZ  
Andheri (E), Mumbai 400 096  
Tel: 022-42006200  
Fax: 91-022-42004036  
E-mail: sales.asia@portescap.com

or Circle Readers' Service Card 00



## Solid State Relay



Solid state relay used in numerous applications where electro-mechanical relays together with protective components used to be installed in power semiconductor devices with corresponding protective electronic circuits so-called solid state relays (SSR) are used. SSR does not incorporate any moving parts in the load switching circuit and is therefore insensitive to shock and vibration. As long as it is not exposed to excessive thermal stress; SSR will outlast an electro-mechanical relay by millions of operation. The advantages include no more than 10 operations, low emi high surge capability, high resistance to shock and vibration, high resistance to aggressive chemicals and dust, no electro-mechanical noise, logic compatibility, fast switching and low coupling capacitance.

The applications include controlling of temperature in electric ovens, plastic processing system, injection moulding machine, packaging industry, electro systems, heating application, furnace, traffic lighting controls and more. These are available in DC-AC (input DC and output AC) available in single phase version as well as 3-phase version up to 250 amps, AC-AC version in single phase as well as 3-phase available up to 175 amps, linear voltage control version up to 150 amps, linear current control 4-20 mA version available up to 100 amps, DIN-mounted SSR relay module up to 36 relays having current rating up to 5 amps, PCB-mounted DC-AC as well as AC-AC relay available up to 5 A. DIN-mounted heat sink suitable for all types of SSR for heat dissipation are also available.

For details contact:

MRK Engineers

15/1A2, Plot III, Lakshminagar

Ramamoorthy Street, Moondramkattalai (Post)

Chennai 600 128

E-mail: ramakrishnan252008@yahoo.com

or Circle Readers' Service Card 00

## Frequency Inverter



NORD DRIVESYSTEMS offers an ATEX-compliant, decentralised frequency inverter that not only is economical in operation but also comes in Protection Class IP 69K. This guarantees the complete sealing of the housing, even for processing applications which require frequent high pressure cleaning. Many applications do not fully utilise the immense scope of functions of modern frequency inverters. To fill the gap which has resulted between simple motor starters and full featured frequency inverters, NORD DRIVESYSTEMS has developed the NORDAC BASE – SK 180E. This compact frequency inverter concentrates on the essential functions for pumps and conveyor technology (PI/speed control, energy saving, communication with peripherals) and results in significant savings.

The NORDAC BASE includes power ranges up to 2.2-kW and can be mounted decentralised, outside the switch cabinet (mounting to the wall or on the motor is possible). The inverter is flexible with regard to accessories and function, and a great number of communication interfaces make it compatible with all common bus systems. The drive controller offers high precision control. IP 69K offers ultimate protection against the ingress of dust and jets from high pressure water and steam cleaning.

The SK 180E is designed to control synchronous and asynchronous motors. Energy-efficient operation is possible due to its energy saving function for partial load operation: the motor power can be adapted to load changes automatically. The NORDAC BASE comes with an integrated PLC. The intelligent drive electronics reduces the load on the higher level system control unit and allows for a modular plant design. Application data can be evaluated in real time by the decentralised PLC, eg, for the optimisation of diagnostic facilities.

The SK 180E can be modified for operation in explosive environments. Depending on the area of application (conductive or non-conductive dust), the modifications also include the replacement of the transparent diagnostic caps with a version made of aluminium and glass. This allows the operation of the frequency inverter directly in a hazardous area (ATEX 22-3D).

For details contact:

Getriebebau NORD GmbH & Co KG

Getriebebau-Nord-Straße 1

22941 Bargteheide / Hamburg

Germany

Tel: +49 45 32 / 2 89 -0

Fax: +49 45 32 / 2 89 -22 53

E-mail: pl.muthusekhar@nord.com / Joerg.Niermann@nord.com

or Circle Readers' Service Card 00

## Dock Shelters



Sheltered, safe and secure materials handling is the concern of all the industry nowadays, in the logistics area of any industry where

the material is usually prone to dust, rainfall, insects, etc; the need of sheltered materials handling is the top concern.

In order to facilitate sheltered materials handling, loading docks are equipped with the dock shelters and dock seal. Dock shelters and dock seals are placed at the exterior of the doors openings and forms a shelter between the dock bay and the lorry while the loading or unloading of the material is taking place.

The vehicle reverses into the dock shelter which seals it off, giving weather protection during the loading and unloading. Their range of dock shelters is most suitable at sites when a tight seal is needed.

For details contact:

Avians Innovations Technology Pvt Ltd  
Gat No: 60/61, Dehu-Moshi Road, Chikhali  
Pune, Maharashtra 412 114  
Tel: 020-71400600  
Fax: 91-020-71400654

or Circle Readers' Service Card 00

## Thermic Fluid Heaters



HIBACHI Engg Pvt Ltd offers thermic fluid heaters up to 10 mln Kcal/hr (11.6 MW heat output), temperature up to 300°C (with mineral/synthetic oils), up to 350°C (with specialised thermal oils) and up to 400°C (vapour and liquid phase heating).

Fuel options includes light diesel oil/diesel/furnace oil/natural gas/LPG/solid fuels - wood, coal, PKS, baggase, etc. HIBACHI Engg has world class coil making facility, which ensures uniform bending of pipes.

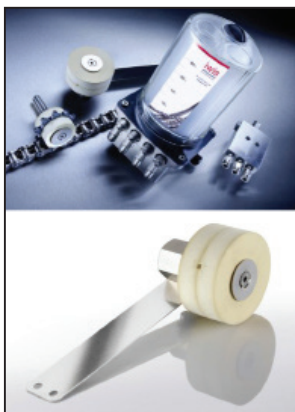
THERMI-ON thermal oil heating systems are indirect heating systems. It is the most efficient low cost heating system at higher operation temperatures compared to steam or electrical heating. Heater efficiency on liquid and gas fuels can be up to 91 per cent and operating temperature can be up to 400°C. Various fuel options based on geography - coal, briquettes, agrowaste, PKS, palm fibre, liquid and gases.

For details contact:

HIBACHI Engg Pvt Ltd  
F-302 Dreams Mall  
L B S Marg, Bhandup (W)  
Mumbai 400 078  
Tel: 022-21663324, 21663325  
E-mail: info@hibachiengg.com

or Circle Readers' Service Card 00

## Chain Lubrication Application



Regular maintenance and lubrication are essential to ensure low wear and extend the service life of a chain drive. More than two thirds of all chain failures can be avoided with proper relubrication. The new CLA lubrication system from iwis, Chain Lubrication Application (CLA) permanently delivers lubricant to the chain drive and other components and in this way ensures a long chain service life economically, cleanly and with absolute precision.

When developing the new lubrication system for chain drives, iwis Engineering, the in-house R&D department, concentrated on maintenance. The objective was to extend the service life of the chain by ensuring that the chain is lubricated properly. And the result is a highly efficient minimum quantity lubrication system. The special applicator, which is made from a high-performance material, acts as a reservoir via which small quantities of lubricant are continuously delivered to the employed chain drive at the precise locations where it is actually needed. This prevents the operating roller chain from not being supplied with enough lubricant and also prevents unnecessarily large volumes of oil from being dispensed onto the chain and its environment - an environmentally-friendly green solution that also

lowers costs and reduces the risk of contamination of plant equipment.

The CLA pumps can be operated separately with time control or can be simply integrated in the machine's PLC. The compact size simplifies the task of retrofitting the device in existing plant and machinery. Thanks to a pump pressure of up to 70 bar, the distributors are able to supply as many as 16 lubrication points with sufficient oil without contaminating the environment and wasting valuable lubricant. The special applicators, which are made from PU foam, are extremely robust and are available in many variants, including custom designs.

For details contact:

Iwis Engine Systems India Pvt Ltd  
Unit B-604, 5<sup>th</sup> Flr, Level Six  
Teerth Technospace  
S No: 103, HISS No: 2 to 14  
Baner, Pune, Maharashtra 411 045  
E-mail: Rajendra.Narkhede@iwis.com

or Circle Readers' Service Card 00

### Perforation Tester



Perforation tester is a consistent tool to quantify the perforation strength or tensile ability of perforated materials like pouches, thermoplastic films, paper and packaging. They are used after separation of two consecutive sheets. It is important to know the efficiency of the pre-cut perforations. The perforation strength should be enough to ensure the product cohesion in order to separate the samples easily.

Perforation tester reveals the perforation strength force required to remove perforations, which has been applied to standard test specimen under specified conditions at a specified angle.

For details contact:

Presto Stantest Pvt Ltd  
I042 DLF Indl Area, Phase I  
Delhi Mathura Road  
Faridabad, Haryana 121 003  
Tel: 0129-4272727  
E-mail: info@prestogroup.com

or Circle Readers' Service Card 00

### Stiffness Tester



Stiffness tester can be used to measure stiffness or flexural rigidity of paper and paper board. Stiffness tester is used to determine the resistance of paper and paper board to bending. The economic value of paperboard highly depends upon its bending resistance or stiffness.

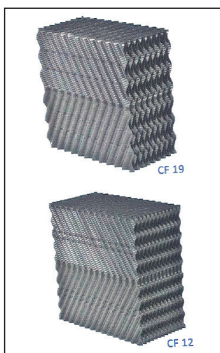
The instrument is a two-directional pendulum type system. Force is applied to the lower-end of the specimen by a pair of rollers attached to the driving disc. The resulting torque tilts the pendulum from its vertical position and the reading is shown by the pendulum. This is a Taber Type instrument.

For details contact:

Presto Stantest Pvt Ltd  
I042 DLF Indl Area, Phase I  
Delhi Mathura Road  
Faridabad, Haryana 121 003  
Tel: 0129-4272727  
E-mail: info@prestogroup.com

or Circle Readers' Service Card 00

### Structured Fill Media for Efficient Water Treatment Process



High-performance film media improve trickling filter efficiency to achieve the highest effluent standards for biological processes, eg, nitrification and other treatment applications. Multiple structural designs generate good biological growth and adjustable foil thickness supports all required loads.

Hewitech's film media made with a direct inline foil-forming and final thermo-welding assembly process grant

a robust fill structure for a long lifespan.

Controllable foil thickness and multiple media structure enables fills stabilities to be optimised to various plant designs, which also has a fill self-supporting character in case of high biological load on the film media surface.

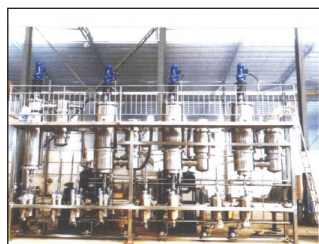
Cross fluted fill media has been used successfully over decades in highly efficient and energy saving water treatment plants around the world.

For details contact:

Hewitech GmbH & Co KG  
Am Langenhorster Bahnhof 16  
D 48607 Ochtrup, Germany  
Tel: +49 2553970260  
E-mail: info@hewitech.de

or Circle Readers' Service Card 00

### Short Path Evaporator



KEPs short path evaporator is an alternative and economical solution for high vacuum distillation/fractionation. KEP has developed short path evaporation technology with innovation and revolution

at an optimised capital and operating cost. Short path evaporation is a thermal separation technique that provides minimum pressure drop, permitting high vacuum operation down to 0.001 mbar. Short path evaporation is excellent for gently processing heat-sensitive, high boiling products.

Features residence time of few seconds, important for heat sensitive products; operation pressure as low as 0.001 mbar (a). Hence, production can be distilled at lower temperatures to avoid degradation; suitable for viscous products; excellent turndown capability; low product hold-up, good for hazardous materials; and low power requirements.

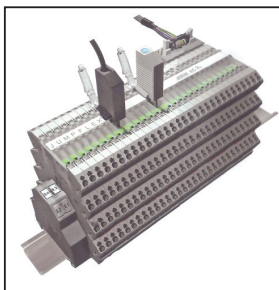
For details contact:

KEP Engg Services Pvt Ltd  
6-A-52, Opp: Park, Nr Vedant International School  
Apurupa Colony, Jeedimetla  
Hyderabad, Telangana 500 055  
Tel: 040-23096275  
E-mail: info@kepengg.com

or Circle Readers' Service Card 00



## Signal Conditioners



The Series 857 Jumpflex Signal Conditioners feature a coherent housing concept with jumper possibilities for all products at every clamping point, eight push-in CAGE CLAMP connections and an overall width of only 6.0-mm. These features play a key role in forming the basis for

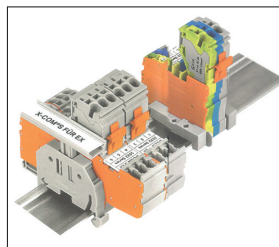
a successful overall solution. Additional benefits include safe isolation, extended operating temperature range and calibrated configurable signals. Combined with excellent technical specifications, these features lead to a line of advanced signal conditioning solutions that maximize panel space while reducing signal wiring and downtime.

For details contact:

WAGO Kontakttechnik GmbH & Co KG  
Postfach 2880 - 32385 Minden  
HensastraBe 27 32423 Minden, Germany  
Tel: +49 571/887 - 0, +49 571/887 - 222  
E-mail: info@wago.com

or Circle Readers' Service Card 00

## Pluggable Rail-mount Terminal Blocks



WAGOs Series 2022 pluggable rail-mount terminal block sampler simplifies component replacement, minimizes the time and expense for system wiring, prevents wiring errors and ultimately reduces the downtime of sensitive equipment.

It is the first system providing

the Ex nA Type protection for use in hazardous areas. Complete modules can be easily and quickly exchanged, expensive on-site installations are no longer necessary. Ex sign and extended item number .../0999-0953 are printed on the side of both carrier terminal blocks and female plugs with Ex approval. With a max conductor size of 2.5-mm<sup>2</sup> (14 AWG) they are designed for a nominal current of 20-A. Shorter locking levers (factory-mounted) make accidental disconnection more difficult, while providing additional safety.

For details contact:

WAGO Kontakttechnik GmbH & Co KG  
Postfach 2880 - 32385 Minden  
HensastraBe 27 32423 Minden, Germany  
Tel: +49 571/887 - 0, +49 571/887 - 222  
E-mail: info@wago.com

or Circle Readers' Service Card 00

## One-Click Dashboard



Many machine builders and systems integrators looking to transform their business models have identified machine and plant process data as being a core fundamental. When it comes to tailoring new data-driven services to individual customer requirements, however, they need solutions that are as cost-efficient as possible. TwinCAT Analytics supports this kind of Engineering 4.0 approach with the One-Click Dashboard, a new feature that reduces the once time-consuming process of dashboard creation to nothing more than a simple mouse click.

TwinCAT Analytics' automated functionality for converting analysis configurations into executable PLC code now also includes dashboard generation. With One-Click Dashboard (OCD), all it takes for users to generate an entire HTML5-based analytics dashboard based on the PLC code and to load it into a selected Analytics Runtime container is a simple mouse click. When the process completes, users receive a network address that they can then use to access the dashboard in a web browser. This ability to generate dashboards without the need to write a single line of code or design graphics is a huge time-saver within the engineering process. Based on TwinCAT 3 HMI, the new functionality provides at least one HMI Control for every TwinCAT Analytics algorithm, each with an up-to-date tile design that follows the latest web standards. The controls contained in a dashboard can be selected individually in an algorithm's properties with the aid of a control preview. Users can also combine multiple algorithms within an individual HMI Control.

Automatically generated dashboards can be customized by configuring individual user settings. Despite this high level of flexibility, dashboards that are created automatically may not always meet every user's needs, so when TwinCAT 3 HMI projects are generated, they are integrated into Visual Studio as well. This enables users to adapt their dashboards to their requirements in the graphical editor. Even with dashboards that need extensive customization, the engineering process still involves far fewer clicks than the conventional approach, saving significant time and expense.

For details contact:

BECKHOFF Automation Pvt Ltd  
Suyog Platinum Tower, 9<sup>th</sup> Floor, Naylor Road  
Off Mangaldas Road, Pune, Maharashtra 411 001  
Tel: 020-67064802, Fax: 91-020-67064899  
E-mail: a.phatak@beckhoff.com

or Circle Readers' Service Card 00

## Industrial Vacuum Cleaners



Dustcontrol UK offers its upgraded range of powerful Tromb vacuum cleaners.

The trio of new additions to the Tromb family include the DC Tromb 400 dust extractor, DCF Tromb pre-separator and the combined DC Tromb Twin dust extractor and pre-separator.

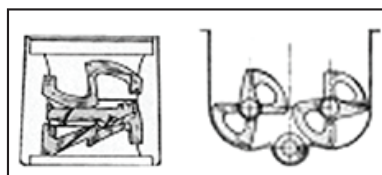
The remodeled versions of the Tromb range meet modern safety requirements while offering ergonomic and modular functions. One of the major updates is that the new DC Tromb Twin Model is separable, meaning the dust extractor and pre-separator are easily detached and re-assembled from each other to make transport simple. Other updates to the new range include a simpler filter change system and a motor package that is easier to remove. In addition, improved motors and a sturdier chassis have seen the Tromb family go through a significant expansion and upgrade.

The new range is not just powerful, robust and effective but also versatile and can handle all kinds of fine dusts and materials on a construction site, created from cutting concrete, sanding, grinding or drilling floors or walls, as well as dust from many other industrial factory processes. Ultimately, the new range ensures those working in industries where hazardous dust is prevalent, will be able to carry out their jobs in a safe and healthy environment.

For details contact:  
Dustcontrol UK Ltd  
7 Beaufort Court, Roebuck Way Knowlhill  
Milton Keynes MK5 8 HL, U.K.  
Tel: 01327 858001

or Circle Readers' Service Card 00

## Kneader Extruder



Kneader extruder combines the efficiency of a double arm - sigma blade mixer with the convenience of

an extrusion screw for the mixing and discharging of heavy viscous materials.

The kneader extruder includes a set of counter-rotating kneading blades and a discharge screw. The blades are mounted on a horizontal axis in a u-shaped trough. Below the blades in a separate cavity is the discharge screw. During the mixing cycle the blades rotate towards each other while the mixing screw rotates in a reverse direction, constantly feeding new materials into the mixing blades. After the mixing/kneading cycle is complete, the screw is reversed and it transports the mixed materials from the mix zone out through a discharge die and on to further processing or packaging.

The kneader extruder has several advantages over conventional non-screw discharge kneaders.

Many sizes and designs are available to meet the most stringent process needs. Kneader extruders are manufactured in many sizes from 1 through 1,000 gallon capacity.

For details contact:  
Ross Process Equipment Pvt Ltd  
Plot No: D-233/3, Chakan Indl Area  
Phase II, Village: Bhamboli, Tal: Khed  
Dist: Pune, Maharashtra 410 501  
Tel: 02135-628400, 628401, 628402, 628403  
E-mail: mail@rossmixers

or Circle Readers' Service Card 00

## Integrated Measuring Point Manager



Monitoring incoming goods and product quality is very important for a lot of processes. These measurements are often done at various stages in the production process. SensoTech's mobile LiquiSonic Lab system is the perfect solution to get fast, precise and reliable measurements.

Additionally, the LiquiSonic Lab System creates detailed datasets every time the user saves a measuring, which simplifies the subsequent analysis tremendously. The controller menu provides an overview of historical data for every measuring point. Deviations, eg, in quality are well comprehensible at any time.

These data can be easily transferred to the process control system via ethernet or USB devices. Every recording generates an entry with date, time and the name of the measuring point in the event logbook. Prospective, the LiquiSonic Lab system optionally comes with a scanner for an easier handling. After scanning, eg, a QR code, the controller will automatically switch to the correct measuring point and the measurement can be taken right away.

For details contact:  
SensoTech GmbH  
Steinfeldstr 1  
39179 Magdeburg-Barleben  
Germany  
Tel: +49 39203 514100, Fax: +49 39203 514109  
E-mail: info@sensotech.com

or Circle Readers' Service Card 00

## Industrial Networking



The Advantech B+B SmartWorx line of industrial networking products provides robust, reliable, sophisticated connectivity all the way from the network edge to the network core. They transfer

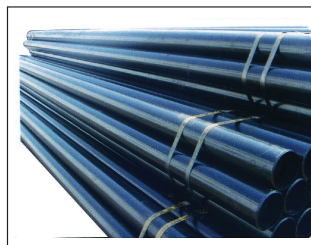
data between copper, fiber and wireless connection and translate multiple generations of data networking protocols, whether the data comes from legacy serial and Modbus devices or the latest industrial Internet of Things (IoT) equipment. Where wired connections are threatened by harsh environments, Advantech B+B SmartWorx provides ruggedized devices that will keep your data flowing and isolated devices that will stop electrical transients (surges) cold. When wired connectivity is impractical, Advantech provides a host of industrial grade wireless solutions to ensure data can still be transmitted and received wherever it is needed.

For details contact:

Advantech Industrial Computing India Pvt Ltd  
79/2 City Centre, 5<sup>th</sup> Floor  
Outer Ring Road, Ballari  
Opp: Hebbal Bus Stop  
Subramani Nagar, Hebbal  
Bengaluru, Karnataka 560 024

or Circle Readers' Service Card 00

## Carbon Steel & Alloy Steel Pipes



Superior Steel Industries are one of the biggest importers, stockholders and suppliers of carbon steel and alloy steel LSAW/DSAW/HSAW and seamless pipes. Their stock capacity is almost 40,000-m/tonne of pipes ranging from

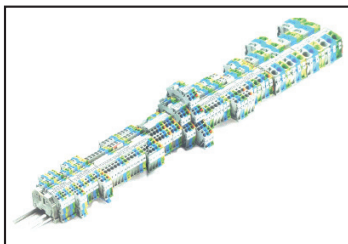
½" NB to 24" NB in case of seamless and from 18" NB to 100" NB in case of SAW pipes. The company stock all grades right from API 5L Gr B PSL1 to API 5L X70 PSL2. The stock is not limited to Indian origin only but also from Europe, Japan and USA. Apart from bare pipes, Superior Steel Industries can also supply pipes with 3LP/3LPE and FBE coating with certificate as per EN 10204 3.1/3.2. Their stocks are approved by almost all Third Party Inspection agencies like LRIS, BV, SGS, TUV, DNV, VELOSI, etc.

For details contact:

Superior Steel Industries  
Mardia Bhavan, 6<sup>th</sup> Khethwadi Lane  
Mumbai 400 004  
Tel: 022-66287900, 66287979, 23877979  
Fax: 91-022-23855719, 66287999  
E-mail: superiorsteel@vsnl.com

or Circle Readers' Service Card 00

## S Rail-mount Terminal Blocks



In various industrial applications and modern building installations, rail-mount terminal blocks are expected to provide more than just reliable electrical connections. The TOPJOB S rail-mount terminal block system is suitable for all through and ground conductor terminal blocks for Ex e I/II applications.

They provide the most reliable connection for extreme environments such as gas, dust or mines.

TOPJOB S through terminal blocks with blue insulated housing are suitable for use in Ex I areas. Moreover, the TOPJOB S rail-mount terminal blocks offer many other advantages. The push-in

CAGE CLAMP is the heart of these terminal blocks.

This is WAGOs spring pressure connection technology that accommodates all conductor types; you may not need to prepare the conductor before termination (depending on conductor type). For example, it is only necessary to directly push in solid and stranded conductors, as well as fine-stranded conductors with ferrules.

WAGOs push-in CAGE CLAMP features industry-leading safety reserves, allowing you to use a single rail-mount terminal block system anywhere in the world in virtually any type of applications. WAGOs TOPJOB S terminal blocks provide a multi-functional line of jumpers for all types of jumper connections. Additionally, the line is compatible with the fastest marking system to not only help lower costs, but also provide additional safety and reliability through control cabinet labeling that is abundantly clear to prevent wiring errors.

For details contact:

WAGO Kontakttechnik GmbH & Co KG  
Postfach 2880 - 32385 Minden  
HensastraBe 27 32423 Minden, Germany  
Tel: +49 571/887 - 0, +49 571/887 - 222  
E-mail: info@wago.com

or Circle Readers' Service Card 00



### Polypropylene Pleated Cartridges



Polypropylene pleated cartridges use the latest gradient density micro-fibre media technology to provide a combination of excellent micro ratings, high flow rates and high contaminant holding capacities. A special combination of polypropylene media with variation in the fibre diameter has created a gradient density matrix, ranging from open on the outside to finer on the inside, thereby providing a

filter within filter, which considerably increases contamination holding capacity and throughputs.

All polypropylene construction; absolute and nominal efficiency; 0.1 to 40 micron ratings; biologically safe; non-fibre migration; thermally welded construction; FDA approved filters; and end connections to fit all standard housings.

For details contact:

National Card Board Mill

Plot No: 140-2/B/2, GIDC Estate

Dist: Baruch, Ankleshwar, Gujarat 393 002

Tel: 02646-252569, 222569

Fax: 91-02646-253002

E-mail: ncbmfilter@gmail.com

or Circle Readers' Service Card 00

### Fluoro Elastomer Tube (FKM)



Imachemton is fluoropolymer tubing (popularly known as Viton tubing) especially designed for highly corrosive chemicals and solvents used in pharmaceutical industries. It is manufactured

in dedicated controlled environment to comply critical food and pharma grade standards.

Imachemton has excellent resistance to alcohols, acids, halogenated solvents (Ex. IPA and MDC). It has greater flame and fire resistance. Its service temperature is -15°C to +250°C. It is available in 60 Shore A and 70 Shore A hardness. It is also available in black and off-white colour. It is double polybag packaged in standard pack size of 25 mtr (custom packing sizes available). Its extractable and leachable data available upon request. It is phthalate-free.

For details contact:

Ami Polymer Pvt Ltd

319 Mahesh Indl Estate

Opp: Silver Park

Mira-Bhayander Rd, Mira Road (E)

Thane, Maharashtra 401 104

or Circle Readers' Service Card 00

### NSP Series Solenoid Pumps & NXP Series Stepper Motor-driven Pumps



Neptune, part of PSG, a Dover company offers its new NSP Series Solenoid Metering Pumps and NXP Series Stepper Motor-driven Metering Pumps for chemical applications that require reliable and accurate dosing.

Featuring a durable, low-maintenance solenoid drive equipped with double-ball valves, the NSP Series from Neptune ensures consistent and precise dosing of a variety of chemicals, including acids, alkalis, coagulants and flocculants. The compact design and easy-to-use control of the NSP Series provide more efficient operation and shorter setup times for the operator. The small footprint allows it to easily integrate into dosing systems with limited space. The NSP Series is available in manually-, analog- and pulse-controlled models.

Thanks to its compact design and intelligent-drive concept, the Neptune NXP Series combines the advantages of a solenoid-driven pump with the precision of a motor-driven pump. This makes it an ideal solution to safely feed chemicals in highly accurate, reproducible applications. The NXP Series is fully adjustable to produce a constant supply stream during low-pulsation dosing, and the stepper motor with its wear-free tooth belt drive ensures a homogeneous and gentle dosing process. Available in six sizes, the NXP Series is plug-and-play and includes a universal power supply unit.

For details contact:

Dover India Pvt Ltd

No: 33, NH-4, Pazhanchur

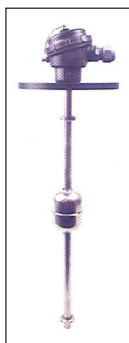
Mevalurkuppam

Chennai 600 123

Tel: 044-67193000

E-mail: rajesh.shankar@psgdover.com / ravi.prasad@psgdover.com

### Magnetic Float Switch



Magnetic float switch consists of non-abrasive float carrying permanent magnet and non-ferrous stem carrying one, two or multiple reed switches. The float glides along the stem and when the float nears the vicinity of reed switch, the magnetic field of permanent magnet forces the reed contact to close. The reed switch outputs are provided as potential-free contacts.

It finds application in water, cooling tower, hydraulic oil, diesel, edible oil, chemicals and pharma.

For details contact:

Filpro Sensors Pvt Ltd

No: 130, 10<sup>th</sup> Cross

Pete Chennappa Indl Estate

Kamakshipalya

Magadi Main Road

Bengaluru, Karnataka 560 079

Tel: 080-23286463

E-mail: sales@filprosensors.com

or Circle Readers' Service Card 00

### Miniature Float Switch



Miniature float switch is suitable for single level sensing. It consists of a reed switch housed inside the SS housing and a permanent magnet inside the float assembly. The float moving with the liquid level makes (NC) and breaks (NO) the reed switch contact. It is used for sensing low, high or point level in tank. The mounting is through a M10 male thread.

It finds application in hydraulic oil, water, RO water, chemical and pharma.

For details contact:

Filpro Sensors Pvt Ltd

No: 130, 10<sup>th</sup> Cross

Pete Chennappa Indl Estate

Kamakshipalya

Magadi Main Road

Bengaluru, Karnataka 560 079

Tel: 080-23286463

E-mail: sales@filprosensors.com

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### Distillation Plant with Glass-lined Reactor



Distillation plant with glass-lined reactor is used for production scale chemical synthesis, distillation, solvent recovery and rectification processes. Glass shell and tube condensers are used along with glass-lined reactors.

Complete process piping is also made of borosilicate glass 3.3. These plants usually operate under vacuum. It is suitable for operation under high vacuum and low pressure. Setup can be configured up to 600 DN for large size reactors.

Process can be visually monitored thereby improving production safety and reliability. Measurement and control of devices can be easily equipped. It has high corrosion-resistant coupling and fasteners. Shell and tube type heat exchanger available up to 50 m<sup>2</sup> for improved heat transfer efficiency.

For details contact:

Ablaze Export Inc

E-52/4 Sardar Estate

Ajwa Road, Vadodara

Gujarat 390 019

Tel: 0265-2570105

E-mail: info@ablazeexport.com

or Circle Readers' Service Card 00

### Hot Tack Tester



Hot tack tester Prima Series is a consistent tool used to perform hot tack and heat seal performance test of laminated films, plastic films, adhesive tapes and other similar flexible plastic products. Presto hot tack

tester is manufactured under various test standards such as ASTM F 1921, ASTM F 2029.

Features excellent system controls with latest HMI-based touch screen display; preset accurate test results under pneumatic pressure control; strong heating jaws for performing tests; no slippage in case specimen is tightened uniformly using clamping knobs without any loops; USB caption available for storing test data; speed control through variable frequency drive; PID temperature controller setting through HMI control; fully automatic test after simple setting; and easy to access in-built self-calibration facility.

For details contact:

Presto Stantest Pvt Ltd

I-42 DLF Indl Area, Phase I

Delhi Mathura Road, Faridabad

Haryana 121 003

Tel: 0129-4272727

E-mail: info@prestogroup.com

or Circle Readers' Service Card 00

## Mechanical Vapour Recompression Evaporation System



Mechanical vapour recompressor is used to increase the pressure of the vapours, which are generated in the separator. An increase in pressure in compressor will increase the condensation temperature of the water vapour (steam) rendering it usable to heat the original mixture in a calandria. It is this resulting temperature difference produced by compressing the water that enables a highly-efficient heat transfer to occur. As the water vapours condense in the shell side of calandria, it releases its latent heat to further heat the original mixture, which in turn produces more steam. Found to be the most economical choice when there is no boiler available or when electrical power is priced competitively in comparison to steam.

Features gentle evaporation of the product due to low temperature differences; reduced load on cooling towers since no residual vapours, due to the complete recompression of the process vapour, cooling water consumption is negligible; easy capacity controlling through variable frequency drive; efficient vapour compression technology to minimise operating cost; due to absence of the recycled cooling water, electricity, water and maintenance costs are saved; high water recovery rate up to 98 per cent; recycling the latent heat of the steam and avoiding fresh steam consumption, makes MVR more energy saving.

For details contact:

KEP Engg Services Pvt Ltd  
6-A-52, Opp: Park, Nr Vedant International School  
Apurupa Colony, Jeedimetla  
Hyderabad, Telangana 500 055  
Tel: 040-23096275  
E-mail: info@kepengg.com

or Circle Readers' Service Card 00

## Probes for Water Cut Monitor



AMETEK Drexelbrook has been working in the oil industry, helping eradicate this silent killer. The knowledge and experience that Drexelbrook holds has been integrated in our level and water cut monitoring instruments. These are manufactured to deliver trustworthy data, and to do so with proven quality even in harsh environments. One of the most reliable instruments on the market is the Universal IV water cut monitor. In fact, it is regarded as one of the toughest protectors of the production budget.

RF Admittance technology is used to ignore coatings and build-up that can plague day-to-day operations. All probes used for the Universal IV water cut monitors are manufactured with patented Cote Shield technology to ensure proper performance under these conditions. This means that even with the sticky materials measured at oil wells, the data is accurate and reliable. A wide selection of probes means customers have the ideal choice for any application. The length of the probe can vary. Drexelbrook probes typically measure across more than 15 inches of sensing area, whereas many competing products only measure 2 inches, meaning the Universal IV water cut monitor provides a more reliable evaluation of the passing media than the competition. RF Admittance technology measures the differences of dielectric constants of water and oil in the media passing by the probe. The monitoring can be performed at up to 1,500 PSI and 230°C/450°F. A primary application for water cut monitors is on LACT skids monitoring the quality of upstream oil flow post separation, ensuring trustworthy data for transferred oil.

For details contact:

AMETEK Drexelbrook  
205 Keith Valley Rd  
Horsham, PA 19044, U.S.A.  
Tel: +1 215-674-1234, +1 215-293-4185  
E-mail: drexelbrook.info@ametech.com

or Circle Readers' Service Card 00

## Moisture Meter



Presto offers electronic moisture meter (Model PMM-10) for paper, wood and corrugated boxes. The thin pins make it easy to measure the moisture content of sawn timber; chipboard and fiberboard materials up to a max thickness of 25 mm. It has facility to store data hold, maximum, minimum readings.

It has electrical resistance based technology for checking moisture content; data display on LCD digital display; average of 100 test readings can be accumulated; inbuilt calibration facility; and 0-100 arbitrary scale, for obtaining relative moisture indications on other material.

For details contact:

Presto Stantest Pvt Ltd  
I-42 DLF Indl Area, Phase I  
Delhi Mathura Road, Faridabad  
Haryana 121 003  
Tel: 0129-4272727  
E-mail: info@prestogroup.com

or Circle Readers' Service Card 00



**NATIONAL****SRW India Water Expo**

Dates: 07-09 January 2021

Venue: Chennai Trade Centre, Chennai

Event: SRW India Water Expo aims to bridge the Component Manufacturers, Distributors and Dealers to create a network for their business and aims to provide world-class products to the market. SRW India Water Expo has established itself as a leading organizer of water events across the country. It is the one-stop destination for companies developing their teams or establishing their operations in the water segment.

For details contact:  
SRWTEMT Association India

**Chemspec India**

Dates: 19 to 20 August 2020

Venue: Bombay Exhibition Centre, Goregaon, Mumbai

Event: The Fine and Specialty Chemicals Exhibition features exhibits of organic and fine chemicals, active pharma ingredients, drug intermediates, dyes and pigments, agrochemicals, contract and toll manufacturing, coatings, cosmetic chemicals or ingredients, pigments and solvents, surfactants, laboratory chemicals and a host of specialty chemicals.

For details contact:  
Chemical Weekly  
602, Godrej Coliseum, B-Wing, 6<sup>th</sup> Flr  
B/h Everard Nagar, Off Eastern Express Highway  
K J Somaiya Hospital Road, Sion (E), Mumbai 400 022  
Tel: 022-24044477

**IFAT India**

Dates: 13-15 October 2020

Venue: Bombay Exhibition Centre, Mumbai

Event: IFAT India focuses on water treatment systems and services, water extraction, water desalination, sewage treatment services, sewers, water disposal solutions and services, water recycling techniques, sewage recycling techniques, air pollution control systems, energy from waste materials, environmental services and management, control and laboratory technologies and other related services and solutions.

For details contact:  
Messe Muenchen India Pvt Ltd  
Unit No: 762/862, Solitaire Corporate Park Bldg No: 7  
167 Guru Hargovindji Marg  
Andheri (E), Mumbai 400 093  
Tel: 022-42554700

**INTERNATIONAL****Analytica**

Dates: 19 October – 22 October 2020

Venue: Exhibition Munich, Munich, Germany

Event: Analytica provides the attendees with the opportunity to explore the areas of laboratory technology, analytic and biotechnology.

For details contact:  
Messe Munchen India Pvt Ltd  
INIZIO 507 & 508  
Cardinal Gracias Road  
Chakala, Andheri (E)  
Mumbai 400 093  
Tel: 022-42554700  
Fax: 91-022-42554719

**Plastics Recycling World Expo**

Dates: 07-08 October 2020

Venue: MESSE ESSEN GmbH, Essen, Germany

Event: Plastics Recycling World Expo will feature an international array of manufacturers of plastics recycling machinery and equipment, as well as suppliers of materials, additives and related services for plastics recyclers. The target audience will encompass all types of companies carrying out plastics recycling. These range from recycling operations sorting and handling mixed, municipal, industrial and post-consumer waste through to polymer producers and processors that are reclaiming scrap material in-house. The event will also appeal to policymakers and to companies using recycled plastics in their products.

For details contact:  
Applied Market Information Ltd  
AMI House, 45-47 Stokes Croft  
BRISTOL, Avon BS1 3QP, U.K.  
Tel: 0117 924 9442

**Valve World Expo**

Dates: 01-03 December 2020

Venue: Messe Düsseldorf-P2, Düsseldorf, Germany

Event: Valve World Expo will showcase products like a unique platform for education professionals looking to maximise access to the latest trends and innovations in education and reach the largest potential mass market, etc.

For details contact:  
Messe Dusseldorf GmbH  
Postfach 101006, 40001 Düsseldorf  
Stockumer Kirchstr. 61, 40474 Düsseldorf  
Germany  
Tel: +49-211-4560-01

## Glycerol

**Authors:** Claudio J A Mota, Bianca Peres Pinto and Ana Lúcia de Lima

**Price:** \$82.00

**No of pages:** 110 pages (Hardcover)

**Publisher:** Springer (1<sup>st</sup> Edition)

**About the book:** This book is aimed at providing a concise discussion on the use of glycerol as a renewable raw material for the chemical industry. With the increasing use of biodiesel produced from oils and fats, there is a surplus of glycerol in the world. This abundant and rather cheap raw material can be transformed in commodities and specialty chemicals, as well as in fuels. The book describes the main processes of chemical transformation of glycerol, highlighting those that are currently in commercial use and pointing out potential

processes to be used in the future.

The first chapter introduces the concept of biofuel and briefly describes the production of biodiesel. It also highlights glycerol as the main by-product of biodiesel synthesis and presents some numbers regarding the world production of glycerol. The second chapter shows the common uses of glycerol and addresses the point whether or not they can drain the large amounts of glycerol produced from biodiesel. The chapter addresses pros and cons of each use. The third chapter covers the main biotechnological processes of glycerol transformation. The fourth chapter thoroughly describes the main thermochemical processes to transform glycerol into commodities, products that will be further used in the chemical industry to produce polymers, for instance. The fifth chapter covers the production of glycerol derivatives of high added-value. The sixth chapter addresses the use of glycerol in the context of a biorefinery. The main idea is to show that many of the processes described in the previous chapters could be entirely green, using exclusively renewable raw materials.

## Mastering Digital Transformation

**Author:** Nagy K Hanna

**Price:** \$28.22

**No of pages:** 426 pages (Paperback)

**Publisher:** Emerald Group Publishing Limited

**About the book:** The information and communication technology revolution offers the promise of transforming economies and societies, and the risks of missing on a powerful techno-economic revolution and wasting scarce resources without much developmental impact. Some countries have mastered the process of digital transformation, and continue to realize substantial economic benefits. Others made substantial investments in the ICT infrastructure, with marginal impact. What makes for these differences among

countries? The author presents a systematic approach to integrate ICT into development policies and programs across sectors of economy and society. This book bridges the current disconnect between the ICT specialists and their development counterparts in various sectors so as to harness the ongoing ICT revolution to maximize development impact and minimize downside risks. Posing a holistic and strategic framework that draws on lessons learned across all sectors to guide national leaders and development practitioners interested in moving from vision to action, it is an important work for researchers and students of ICT who aim to pursue innovative, inclusive and sustainable development paradigms.

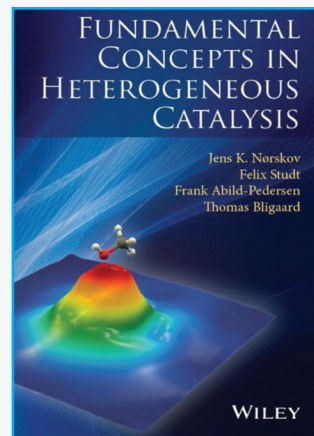
## Fundamental Concepts in Heterogeneous Catalysis

**Authors:** Jens K Nørskov, Felix Studt, Frank Abild-Pedersen and Thomas Bligaard

**Price:** \$96.20

**No of pages:** 208 pages (Hardcover)

**Publisher:** Wiley (1<sup>st</sup> Edition)



**About the book:**

This book is based on a graduate course and suitable as a primer for any newcomer to the field. This book gives a detailed introduction to the experimental and computational methods that are used to study how solid surfaces act as catalysts. The first comprehensive

text on the modern theory of heterogeneous catalysis Heterogeneous catalysis is the cornerstone of chemical industry and also holds the key to new processes for sustainable energy conversion and sustainable production of feedstocks for the chemical industry. Heterogeneous catalysis involves chemical transformations taking place at the surface of a solid, and is a very complex phenomenon. There is now a consistent set of concepts that allow an understanding of surface catalysis and they even form a basis for design principles for new catalysts.

Based on a graduate/senior-undergraduate course and suitable as a primer for anyone interested in understanding the field, this book presents the fundamentals of surface reaction phenomena including potential energy diagrams, free energy diagrams, and kinetic models; tools to reduce the complexity of heterogeneous catalysis including scaling relations; an understanding of trends in catalysis including activity and selectivity maps; an introduction to electronic structure effects in catalysis and an understanding of structural effects; application to a series of heterogeneously catalyzed reactions including reactions of interest in energy conversion; an integration of the conceptual frameworks of electro-catalysis and thermal heterogeneous catalysis; and an understanding of the effect of promoters and poisons in heterogeneous catalysis.

Unlike most textbooks in the field, the aim of this monograph is not to give a complete overview of the types of catalysts or catalytic processes, but to provide interested students and researchers with the atomic-scale concepts for understanding catalytic phenomena.

## New Contracts/Expansions/Revamps

The following list is a brief insight into the latest new projects by various companies in India.

### CHEMICALS

**Tata Chemicals**, the world's second largest soda ash manufacturer, has received green nod for expansion of its soda ash plant in Gujarat at an estimated cost of ₹ 1,042.07-crore. The proposal is for expansion of its soda ash plant located in Devbhumi Dwarka district from 10.91 to 113.16-lakh TPA and enhance captive power plant capacity from 84 to 125-MW.

The proposal was first vetted by a central government constituted green panel and based on its recommendations the Union Environment Ministry has given the environment clearance (EC) for the expansion of soda ash plant in Gujarat, subject to compliance of certain conditions and prior clearance from the wildlife angle, including clearance from the standing committee of the national board for wildlife.

As per the proposal, the expansion will be carried out within the existing plant premises of 231 hectare (including cement plant). The cost of the project is pegged at ₹ 1,042.07-crore and will be completed in two years.

Soda ash is the common name given for the technical grade anhydrous sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) finds application mainly in the production of detergents, glass, chemicals, sodium silicate, water treatment and pulp/paper.

India has the advantage of abundance of raw materials, ie, limestone and salt and growing domestic demand that favours the establishment of soda ash plants.

**Insecticides (India) Ltd** has announced a ₹ 200-crore expansion plan to increase its capacity in the next three years. In the first two years, it would spend about ₹ 100-crore, followed by an investment of ₹ 100-crore in 2020.

The firm is planning to set up an Export Oriented Unit (EOU) in Gujarat with an eye on increasing export component of the business. Exports contributed about ₹ 35-crore in the total turnover of ₹ 1,109-crore in 2017-18. The firm has a share of about 5 per cent in the ₹ 18,000-crore crop protection market in the country.

### MINING

**Jindal Steel and Power Ltd (JSPL)** recently said its 1.80-MTPA coal gasification-based DRI (direct reduced iron) plant at Angul District in Odisha has resumed operation. The plant was not operational for long due to the scarcity of coal. Now Coal India Ltd (CIL) and its arm Mahanadi Coalfields Ltd have started selling coal in adequate quantity, therefore gasification and DRI operations have resumed targeting an additional production run-rate of 1.50-million tonnes per year of steel in FY20-21 through CGP (coal gasification process) and DRI route.

Direct reduced iron, also called sponge iron, is produced from the direct reduction of iron ore (in the form of lumps, pellets or fines) to iron by reducing gas or elemental carbon produced from natural gas or coal. Many ores are suitable for direct reduction. The plant was set up by JSPL to ensure the availability of chemical and thermal energy required to produce DRI at an affordable price to reduce environmental impact of coal in the long run.

The coal gasification process converts high-ash grade coal into synthesis gas or Syngas. The syngas has replaced the costlier natural gas being used by other DRI manufacturers across the globe. The syngas is used as a reductant in converting iron ore/iron pellets into DRI/sponge iron.

The syngas produced from coal gasification contains methane, carbon monoxide, hydrogen and other such useful gases, in a particular ratio,

which are required to produce DRI from iron ore/pellets. This gasification process has a lesser impact on the environment as compared to the coal combustion process.

**Thriveni Earthmovers Pvt Ltd (Thriveni)** operates the NTPCs flagship Pakri Barwadih Coal Mining Project (PBCMP) in Jharkhand has awarded Zyfra – a joint project between Finnish-Russian digital solutions provider, the contract to implement its Intelligent Mine solution.

Zyfra's Intelligent Mine solution includes a mine fleet management system, automated drilling and blasting control system, payload and fuel level monitoring system, which allow allocating mining equipment, creating a schedule and assigning routes to mobile equipment according to the production objectives in real-time. Payload and fuel level monitoring system allow optimizing average payload of haul trucks and eliminating under and over loading.

Artificial intelligence has generated lot of interest among India's scientific community. India has made it to the top 10 countries with the largest number of publications on the artificial intelligence scientific projects and commercial rollouts conducted by research organizations and companies.

Artificial intelligence techniques help to solve such problems as optimal equipment control, raw materials consumption and quality checking. The relatively new area of computer vision is gaining popularity in industrial robotics and autonomous systems (cars, unmanned aerial vehicles, ships) fields.

Typically, machine learning techniques have been used in discrete manufacturing (44 per cent), in the process industry (22 per cent) and in the electric power industry (11 per cent). A further 23 per cent of projects belong to the industries where AI applications are at early stages of development.

**Universal Autofoundry Ltd** (539314/UNIAUTO) has opened a new unit (UNIT-II) with installed capacity of 1,800-MT per month to manufacture CI/ Ductile Iron Castings at B-51, SKS Industrial Area, Reengus, Dist: Sikar, Rajasthan. The company has made an investment of ₹ 40-crores (approx) raised from banks to set up this new unit.

Universal Autofoundry Ltd is a world class manufacturer and exporter of Grey Cast Iron and Ductile Iron, which has now made expansion by setting up a new manufacturing unit in the name of UNIT-II with installed capacity of 1,800-MT per month, which is just double as compared to the existing capacity of the Company.

**Singareni Collieries Co Ltd (SCCL)** has received a boost for its plans of increasing the coal production to 70-million tonnes in 2019-20 by getting the green nod for Kistaram open cast mine recently after suffering some setbacks in getting environmental clearance for its proposed new mines and expansion of existing ones earlier this year. The coal company has achieved a production of 64.4-million tonnes in 2018-19 and getting the environmental clearance for Kistaram open cast mine, with a capacity of 2-million tonnes per annum (MTPA), in Sathupalli Mandal of Khammam district is expected to go a long way in its plans to jack up the production by nearly 6-million tonnes. The green nod to the proposal has come three years after public hearing conducted on it. According to SCCL officials, a committee of experts in the Ministry of Environment and Forests (MoEF) that has gone through the proposal has recommended clearance to the mine earlier and stipulating several conditions to keep impact of the mining activity under check on air, water and local people. Environmental



conditions in and around Sathupalli Town were also appraised separately by the panel before giving its nod.

**MOIL** said production at its Parsoda manganese mine is expected to begin soon. The mine will be operated by open cast mining method. MOIL has been granted mining lease of Parsoda manganese mine near village Parsoda, 46-km from Nagpur in the year 2016. The lease extends for 50 year period, ie, from April 22, 2016 to April 21, 2066 and the project cost is estimated to be ₹ 19.54-crore. MOIL, under the Ministry of Steel, operates around 10 mines, including six in Maharashtra and four in Madhya Pradesh. Balaghat mine is its largest, which produces top quality manganese ore.

**Hindustan Copper Ltd (HCL)**, on 2<sup>nd</sup> February, 2019, held a groundbreaking ceremony at Ghatsila Unit of HCL for construction of concentrator plant at Rakha, initiating Chapri-Sidheswar mine, a new mine development and Rakha mine re-opening projects. CMD informed that considering the opportunity to further increase the resource base of copper mineral in the State has finalized plan to undertake depth exploration up to 1,000-meter from surface in its existing lease area in next two years. HCL, in its Unit located at Ghatsila planned to implement total five mine expansion projects to increase the mine capacity from current 4.0 to 72.0-lakh tonne. Successful implementation of the project will also reduce country's dependence on imported copper concentrate.

**NTPC Ltd** hopes its captive coal production will reach 100-million tonne as soon as its five coal blocks commence operations, aided by faster regulatory clearances and the part-privatization model of Mine Development and Operator (MDO). The success of the plan would determine fuel security of the operations of India's largest power producer.

**CIL, ONGC** to produce coal-bed methane from 10 new mines: support SAIL in one more. The Coal Ministry has identified 11 mines to produce coal bed methane (CBM). Initially, ONGC will harness the gas and then CIL will extract coal from them. In addition to the mines with CIL, the two (ONGC and CIL) will also help develop SAIL's Parbatpur coal block (Jharkhand). Here too, ONGC will first harness the CBM. SAIL had surrendered the Sitanala and Parbatpur coal mines. SAIL had engaged MECON to prepare a techno commercial viability report, which declared the project unviable.

**JSW Energy**, part of the Sajjan Jindal-led JSW Group, is believed to be in the race for buying out the thermal power assets of Monnet Power and Jindal India Thermal Power Ltd (JITPL) in Odisha. Monnet Power's 1,050-MW coal-based power plant near Angul was in advanced stage of commissioning. Monnet Power's parent company, Monnet Ispat & Energy had won the Mandakini coal block in Odisha in competitive bidding, it surrendered the block later on grounds of economic unviability. Besides Monnet Power, JSW Energy is also eyeing takeover of BC Jindal controlled JITPL's 1,200-MW coal-based plant at Derang near Angul. The first unit (600-MW) of the 1,200-MW plant had begun commercial operations and started power supplies to the Odisha grid. This project has been completed at a cost of ₹ 7,537-crore which includes a debt component of ₹ 5,900-crore. JITPL has power purchase agreements (PPAs) with Odisha's Gridco Ltd, Kerala State Electricity Board and Tata Power Trading Corp. Apart from JSW Energy, JITPL also had competing offers from Adani Power and Singapore's SembCorp. The valuation of the prospective deal is not known.

NLC India (formerly Neyveli Lignite Corpn) which is in the hunt for buying out power assets is understood to have shown interest in the 700-MW Odisha plant of Hyderabad-based Ind-Barath Power Infra Ltd (IBPIL). The power plant located at Sahajbahal, near Jharsuguda, has commenced commercial operations. In August last year, NLC India had floated an EoI from companies owning coal and lignite-based power projects, for a possible acquisition. NLC India's installed thermal power capacity is 3,240-MW. It runs a 10-MW solar power unit and wind power assets with a capacity totalling 37.5-MW.

**Western Coalfields** has received the environment clearance for its ₹ 263-crore expansion project in Nagpur district, Maharashtra. The proposal is to enhance the production capacity of the Gokul open cast mine to 1.875-million tonnes per annum (MTPA) from the existing 1-MTPA. The mine, located in 767.17-hectare, has a mineable reserve of 14.50-million tonnes. The clearance to the project is subject to certain conditions. The company has been asked to get 'Consent to Operate' certificate from the State Pollution Control Board for the existing production capacity of 1-MTPA and also the 'Consent to Establish' for the proposed capacity of 1.875-MTPA prior to enhancing the production capacity.

## OIL & GAS

**The Kochi-Salem Pipeline Pvt Ltd (KSPPL)**, the LPG pipeline project implemented by a 50:50 joint venture between BPCL and IOCL, will finally be commissioned up to Palakkad in April 2020.

The overall length of the pipeline has also been reduced to 206-km till Palakkad from 428-km, which was initially up to Salem. Failure in getting clearance from the Tamil Nadu government forced the company to terminate the pipeline at Palakkad, as of now.

The ₹ 1,000-crore worth project is being implemented in three phases.

The first phase from BPCLs Kochi Refinery to IOCLs bottling plant at Udyamperoor was completed about 4-5 months back. The first phase has a capacity of 12,000-15,000 tonnes a month.

The second phase of the project is from Kochi to Palakkad. The third phase (Kochi Refinery to Puthuvypeen) pipeline works lag behind with only about 30 per cent completion.

With works at Puthuvypeen resuming again recently, the 44-km pipeline works from BPCL Kochi to Puthuvupeen is back in full swing.

In the BPCL to Udayamperoor phase alone, a total of 800 LPG tanker lorries will stay away from the roads per month while in the Kochi-Palakkad stretch, over 2,200 LPG trucks will be off the roads once the project becomes operational in May-June.

**Indian Oil Corporation (IOC)** has proposed a Solapur-Hyderabad petroleum product pipeline is likely to be implemented as a strategic link by the national oil company at an estimated cost of a little over ₹ 1,006 crore.

The pipeline will serve as a crucial connection between the Koyali and Paradip refineries of IOC.

The combined capacity of the two refineries is 28.7-million tonnes. Post an augmentation of the Koyali refinery that IOC is planning, the total capacity will be nearly 32-MT. In other words, the Solapur-Hyderabad Link Pipeline (SHLP) will facilitate movement of petroleum products between the east and west coast. This, it will do by becoming a key link between two cross country facilities – Koyali-Ahmednagar-Solapur Pipeline; and Paradip-Hyderabad Pipeline – that will be 2,335-km long.

Reconnaissance survey for the pipeline from Solapur to Hyderabad has been completed. The length will be about 376-km and traverse through Gulbarga District of Karnataka. IOC has a marketing depot in Gulbarga, at a location about 130-km from Solapur. In 2018-19, the depot received petroleum products of about 360-TMT from various sources through rail and as per a study, estimated to touch about 604-TMT by 2029-30.

The proposal, in view of alignment of the depot along the proposed route of SHLP, is to connect Gulbarga depot too with the pipeline, according to official documents. While Solapur has a marketing depot, Hyderabad end of the pipeline will be connected to Malkapur, where a terminal is to be developed under the Paradip-Hyderabad Pipeline project.

An important task SHPL will undertake is maintaining supplies, in case of a planned maintenance of one of the refineries or in case of exigencies, to Maharashtra, Andhra Pradesh and Telangana. The three States together accounted for 20 per cent of petroleum products consumption in the country during 2018-19. Now, IOC sources products from other oil marketing companies in these States and rest by product movement from own sources through coastal, rail and road mode.

Thus, the pipeline will reduce dependence on other refineries and movements, and also be cost economical over time.

Considering the significance of the facility, senior officials of IOCs Pipeline and Marketing Divisions in November had decided the pipeline should be taken up on strategic basis. A detailed feasibility report has been prepared. IOC has initiated the process of appointment of financial institution/agency for financial appraisal of SHLP.

**Brahmaputra Cracker and Polymer Ltd (BCPL)** Lepetkata in Dibrugarh, foundation stone for HPG 2<sup>nd</sup> Stage Plant was laid by The Union Minister for Chemicals and Fertilizers.

A press release from BCPL said, "The proposal for setting up a Butene-1 and second Stage Hydrogenation of Pyrolysis Gasoline (HPG) plant at Lepetkata at a cost of ₹ 386-crore, has been approved by Government of India."

"In the first phase, BCPL shall set-up an HPG 2<sup>nd</sup> Stage plant at a cost of ₹ 125.99-crore. This project having the capacity of 52,000-TPA will produce a value-added product which can be blended with motor spirit," the release said.

The release further said that BCPL was commissioned on January 2, 2016 at a cost of ₹ 9,965-crore and was dedicated to the Nation by the Prime Minister, on February 5, 2016. The plant was stabilized within 8 months of commissioning and achieved full capacity operation during 2018-19.

In the current financial year also, the plant is operating at above 100 per cent capacity. Company has made remarkable progress in the last fiscal, achieving its maiden profit and is witnessing a consistent increase in its market share of Polymer, the release said.

**Essar Exploration & Production Ltd (EEPL) and ENI**, the Italian oil major, have discovered the presence of gas and condensates in the Ken Bau prospect at Block 114, Song Hong Basin, Offshore Vietnam.

ENI Vietnam is the operator of the block with 50 per cent participating interest while EEPL holds the remaining 50 per cent.

Confirming the discovery, ENI in a statement said, "Its exploration well located at Block 114, Song Hong Basin, Offshore Vietnam, has proven the presence of gas and condensate in the Ken Bau prospect. The well result indicates a significant potential of the hydrocarbon accumulation."

The exploration well Ken Bau 1X has been drilled at a depth of 95-m below water level, and reaches a total depth of 3,606-m, encountering several intervals of gas and condensate sandstone interbedded with Miocene age shale, with an estimated net reservoir thickness in excess of 100-m.

Ken Bau 1X well was plugged and abandoned ahead of the original plan due to certain technical issues, prior to reaching deeper levels that could hold significant additional resources.

"ENI is already planning to start a drilling campaign early next year to fully assess the substantial upside of the discovery," said the statement adding that Ken Bau 1X results represent a significant breakthrough for evaluating the exploration potential in the Song Hong Basin.

Mauritius-based EEPL has so far invested over \$1.1-billion in the exploration and production business in Vietnam, Nigeria and India.

Company's unconventional Hydrocarbon acreages in India are through wholly-owned subsidiary Essar Oil and Gas Exploration and Production Ltd (EOGEPL)

EOGEPL's Raniganj CBM asset in West Bengal is the first CBM asset in India to cross the threshold of 1-million cubic metres per day of gas production.

**Tokyo Gas and Centrica LNG Co** will be co-purchasing 2.6-million tonnes per annum (MTPA) of natural gas from ONGC Videsh-partnered Rovuma Offshore Area 1 project in Mozambique.

The agreement with the Tokyo Gas and Centrica LNG Co will be effective from the date production begins to the early 2040s. This takes the long-term sale tie-ups from the project to more than 9.5-MTPA, OVL said in a statement.

The development plan for the project was approved in February 2018.

Under the existing agreements, CNOOC Gas and Power Singapore Trading & Marketing have a commitment to procure 1.5-MTPA over 13 years. Shell International Trading Middle East has an agreement to procure 2-MTPA over 13 years.

Bharat Gas Resources, a wholly-owned subsidiary of Bharat Petroleum Corporation will get 1-MTPA of gas over 15 years. State-owned oil and gas company of Indonesia, Pertamina has an agreement for 1-MTPA of gas over 20 years.

The Mozambique Rovuma Offshore Area 1 project will be developed initially as an onshore LNG plant consisting of two LNG trains with total nameplate capacity of 12.88-MTPA to support the development of the Golfinho-Atum field located entirely within Offshore Area 1.

ONGC Videsh presently holds 16 per cent net interest in the Mozambique Rovuma Area-1 Offshore Project out of which 10 per cent Participating Interest (PI) is held directly by ONGC Videsh and another 6 per cent is held through its 60 per cent shareholding in Beas Rovuma Energy Mozambique Ltd (BREML). The remaining 40 per cent shares in BREML are held by Oil India Ltd.

Anadarko Petroleum Corporation is the operator of this project with 26.5 per cent PI. The other partners are: Mitsui (20 per cent), ENH (15 per cent), BPRL (10 per cent) and PTTEP (8.5 per cent).

**ONGC** will pump in ₹ 6,000-crore in drilling 200 wells over the next seven years in Assam in order to increase the output from the State.

The investment will take place in Sivasagar and Charaideo districts of Upper Assam, besides planning to hire over 300 persons in the State.

The wells are proposed to be drilled during the next seven years starting from the previous financial year.

**Cairn Oil and Gas**, which is part of the Vedanta Group, has drawn up plans to spend over \$ 1.1-billion in coming 18 months to improve the crude oil production from the Mangla, Bhagyam and Aishwarya fields in Barmer.

The announcement comes at the heels of Cairn Oil and Gas completing a decade of operations at the Mangla Processing Terminal in Barmer recently. "With implementation of Alkaline Surfactant Polymer (ASP) enhanced oil recovery, we aim to increase the recovery factor from 36 per cent to over 50 per cent. This means that we will be able to extract more than half the crude oil present in the fields," said Ajay Kumar Dixit, Chief Executive Officer at Cairn Oil and Gas.

The current production from the Mangla, Bhagyam and Aishwarya fields is to the tune of 135,000-140,000 barrels of oil equivalent per day (kboepd).

Cairn Oil and Gas currently produces a fourth of India's total domestic oil production and targets an immediate production of 300-kboepd by 2020-2021. The target by financial year 2021-22 is to have a production of 500-kboepd.

**Hindustan Petroleum Corpn Ltd (HPCL)** has informed that there are no roadblocks in setting up the 9-MMTPA refinery-cum-petrochemical complex at an approved cost of ₹ 43,129-crore at Pachpadra in Barmer district of Rajasthan.

In addition to motor spirit and diesel, the refinery envisages production of major products like Ethylene and Propylene derivatives. These derivatives are used as feedstock in various ancillary industries, viz, packaging, textile, petrochemical industry, etc.

**Haldia Petrochemicals (HPL)**, plans to deploy an innovative technology for its project that seeks to convert crude oil into chemicals and petrochemicals directly. As opposed to the customary production of refined petroleum products, HPL's plant will concentrate on higher output of petrochemicals. "They will be setting up the refinery to produce chemicals and petrochemicals. The direct conversion of crude to petrochemicals will be the first of its kind in the country unlike other refineries, which are producing petroleum products. Such technologies are used widely in China," said an official privy to the development. HPL, is setting up an integrated refinery with aromatic complex for production of paraxylene and purified terephthalic acid (PTA) units in the first phase. The production capacity of paraxylene unit will be 1.6-million tonne per annum (MTPA) and PTA will have 2.5-MTPA capacity. The first phase of the HPL project approved is expected to be operationalised within five years of allotment of land. HPL has committed an investment of ₹ 28,700-crore (\$4.05-billion) in the first phase on its Odisha project. Recently, the High Level Clearance Authority (HLCA) in Odisha headed by Chief Minister gave its nod to the proposal, which HPL submitted on March 1, 2019. Official sources have touted HPL's proposal as the country's single-largest domestic investment in the last 12 months.

**Vedanta Ltd** has received environment clearance for the expansion of its oil and gas operation in Rajasthan that would entail an investment of ₹ 12,000-crore. The proposal is to expand onshore oil and gas production from the existing 3,00,000-BOPD (barrels oil per day) to 4,00,000-BOPD and 165-MMSCFD (million standard cubic feet per day) to 750-MMSCFD from the 'RJ-ON-90/1' block located in Barmer and Jalore districts, Rajasthan. The environment clearance (EC) is, however, subject to compliance to certain conditions. The estimated project cost is ₹ 12,000-crore. The company aims to implement the project in a phased manner during seven years. The project involves oil augmentation to produce up to 4,00,000-BOPD and 250-MMSCFD of associated gas from the oil field and natural gas augmentation to produce up to 500-MMSCFD.

Total area of the oil and gas block is 3,111-sq km. Out of it, the project presently covers an area of 1,501.7-hectare in Barmer and Jalore districts. Additional 150 hectare of land in Barmer district will be used for the proposed expansion. The 'RJ-ON-90/1' block' comprises of Vedanta Ltd and state-run ONGC for hydrocarbon exploration, development and production activities in the block, while Cairn Oil and Gas division (part of Vedanta Group) is the operator of the block.

**BPCL-Kochi Refinery** is going ahead with its second petrochemical project to produce polyols at an investment of ₹ 11,300-crore. An import substitute, polyols are used in the production of polyurethanes used in diverse products such as automotive seats, mattresses and shoe soles.

The project is expected to go on stream by 2022. BPCL is in talks with various global firms to finalise the technology for six different products. There is a huge

demand for polyols and it is growing at 10 per cent per annum providing good scope for MSMEs to set up units in the complex. The first petrochemical project of BPCL-KR constructed at a cost of ₹ 5,500-crore is all set to commence operations. It will produce acrylic acid, acrylates and oxo-alcohol that are used in the manufacture of paints, super absorbent polymers, detergents, adhesives, sealants and solvents. The technology has been sourced from Mitsubishi, Air Liquide Global and Johnson Matthey Davy. The two projects will facilitate ₹ 13,000-crore forex savings per annum for the country. With the completion of the second petrochemical project, BPCL-KR is expecting around 16 per cent increase in its turnover in three years. BPCL-KR is slated to complete its fuel upgradation project to comply with BS-VI norms this year. The project cost is around ₹ 3,300-crore.

**Vedanta Ltd** announced an oil discovery in its Krishna Godavari basin block in the Bay of Bengal. The block previously had a gas discovery in the very first well drilled.

Vedanta holds 100 per cent participating interest in the block. "Multiple reservoir zones were encountered in the well H2 within the Mesozoic sequence between the depths of 3,310 to 4,026-metres with hydrocarbon indications during drilling and downhole logging," it said. The zone from 3,403 to 3,431-metres was tested through conventional well testing (Drill Stem Test) and flowed oil to the surface. "Further appraisal will be required to establish the size and commerciality of the oil discovery. The first exploration well A3-2 drilled in the block was a gas discovery. Cairn India, the company Vedanta bought and merged with itself, had in June 2010 won the KG-OSN-2009/3 block in the 8th round of New Exploration Licensing Policy (NELP). It had committed to drill six exploratory wells on the block. These were expandable to 10. The KG basin is a proven basin where there have been many hydrocarbon discoveries. The company acquired around 1,000-sq km of 3D seismic data based on which it drilled two wells. KG-OSN-2009/3 offshore block in the Bay of Bengal was originally spread over in an area of about 1,988-sq km which was later reduced to 1,298-sq km due to exclusion of area within firing range. It is located in the shallow waters of the Indian Ocean along the East coast of India, approximately 1.5 km from the Indian coastline.

**Chennai Petroleum Corpn Ltd (CPCL)**, the Indian Oil Corpn's (IOC's) group company is planning to set up a greenfield refinery at Nagapattinam in Tamil Nadu, at a cost of ₹ 27,460-crore. The products, including motor spirit (MS) and high speed diesel (HSD), which will be produced from the refinery will help meet the latest BS-VI specification in the southern States. The new refinery will be part of the Government of India's plan to set up a petroleum, chemicals and petrochemicals investment region (PCPIR) in this region. The boards of CPCL and IOC have accorded in-principle approval for the 9-million metric tonne per annum (MMTPA) refinery at CBR at an estimated investment of ₹ 27,460-crore, plus or minus 30 per cent. The investment includes ₹ 2,800-crore for setting up a polypropylene unit of around 500 thousand metric tonne (TMT) per annum capacity. Detailed feasibility report (DFR) preparation is underway. The refinery is expected to be operational by 2023-24. The products from the refinery will meet the latest BS-VI specifications. It will produce valuable products, including liquefied petroleum gas, petrol, diesel, aviation turbine fuel, polypropylene, etc, besides petrochemical feed stocks. The petrochemical complex will also feed stocks to downstream industries, including pharma, paint and lacquer, printing inks, adhesives, coatings, chemicals, automobile lubricants, and PVC, among others. CPCL operates two refineries with a total capacity of 11.5-MMTPA (10.5-MMTPA at Chennai and 1-MMTPA near Nagapattinam) in Tamil Nadu. The company's crude throughput increased to 10,789-TMT in 2017-18, from 10,256-TMT in 2016-17. Its profit after tax stood at ₹ 913-crore in 2017-18, as compared to ₹ 1,030-crore in 2016-17.





# “Fostering Excellence & Relevance in Evolving Ecosystems”

**Antonio Pietri**  
President and CEO  
Aspen Technology

In an exclusive interview with **Chemical Engineering World**, Antonio Pietri walks us through the Indian Chemical Industry’s embracing digital transformation and many associated factors. He mentioned, “Process industry companies have a massive volume of information to manage. These companies also have complex assets to operate in a dynamic environment and need to make constant changes, which can add up to significant improvements in profitability. This translates to an improvement in sustainability metrics, lower emissions, improved product quality and so forth. With the addition of our asset performance management (APM) software solutions, we see tremendous market opportunity, adding up to about USD 1.4 trillion across the whole manufacturing sector”.

### **Is the chemical industry in India embracing digital transformation?**

The chemical industry is not new to digital solutions, but Industry 4.0 is making a greater impact now due to emerging technologies that can help the industry better innovate and achieve operational excellence. Tools such

as artificial intelligence (AI), cloud, Industrial Internet of Things (IIoT) and Big Data shift the paradigm in daily operations for chemical processing industries. Organizations need to be pragmatic — starting with the reassessment of technologies that are aligned with a company’s goals and, most importantly, its commitment to invest in new

technologies to attain digital maturity. As such, Indian chemical manufacturers have been embracing digitalization and reassessing their requirements, as well as focusing on AI and machine learning technologies.

### **How do you compare ROIs with the cost of digital technologies?**

These technologies come with varying levels of cost, but the return on investment (ROI) can be calculated to justify that cost. Before Aspen Technology (AspenTech) implements new technology, we carry out pre-implementation analysis, which factors in the scale and size of the company. This analysis provides enough scope for a company to demonstrate optimum value creation against the investment. Companies can often start seeing ROI within a year of investment.

### **What are the contributing factors to achieving high ROI with digital technologies?**

Process industry companies have a massive volume of information to manage. These companies also have complex assets to operate in a dynamic environment and need to make constant changes, which can add up to significant improvements in profitability. This translates to an improvement in sustainability metrics, lower emissions, improved product quality and so forth. We estimate that in using our software solutions, our current customer base can annually create about USD 50 billion in value. With the addition of our asset performance management (APM) software solutions, we see tremendous market opportunity, adding up to about USD 1.4 trillion across the whole manufacturing sector.

### **How can digitalization enable the chemical industry to address its major concerns?**

Organizations need to embrace digitalization to reap the accompanying competitive advantages and stay agile in responding to market disruptions. A major trend impacting the chemical industry is the transition to a circular economy. Digitalization can enable the industry to work out new business models in its new ecosystems, opening new avenues for companies to collaborate sustainably, such as the integration of refineries and chemicals plants.

Digitalization enables the chemicals industry to make complex capital and operating expenditure decisions under volatile market conditions. Simulation modeling allows costs to be estimated and decision-making to take place quickly, while taking shifting market demands into consideration. Digital solutions are also available to allow companies to support their employees with collaboration for business continuity at a time when employee and plant safety is the number one priority.

### **How do AspenTech solutions address customers' pain points?**

AspenTech addresses customers' pain points via accelerated digital transformation by optimizing assets to run safer, greener, longer and faster. In addition to the USD 50 billion of value mentioned in Q3, we believe that by embedding AI in our existing products and creating a new set of AI capabilities, there's another USD 200 to 250 billion of value to be created for our customers. With the entire asset lifecycle in mind, customers can better design, operate and maintain complex manufacturing environments using the integrated aspenONE software. More specifically, customers can improve their competitiveness and profitability via increasing throughput and productivity; reducing operating costs and unplanned downtime; enhancing capital efficiency; and decreasing working capital requirements. Our software solutions represent industry standard in asset optimization, helping hundreds of thousands of users at more than 2,300 companies drive profitability faster and more efficiently.

### **When does AspenTech ideally engage with the project owners? Which industries does AspenTech cater to?**

Ideally, AspenTech engages process companies throughout the asset lifecycle — from design through the operation and maintenance stages. When companies decide

to make a capital investment, they use our design software to conceptualize the asset. Once the asset is in operation, we help them optimize the process and leverage predictive analytics to streamline maintenance. Beyond our core process industries, we also work with the metals and mining, pharmaceutical, and food and beverage industries, among others.

### **Tell us about your experience and expectations from the Indian market?**

AspenTech has been operating in India for the past three decades. McKinsey & Company noted that between 2016 and 2019, the Indian chemical industry maintained a compound annual growth rate of 17%. In the last 10 years, we have seen the market evolve and mature suitably to adopt the software solutions that the company offers. According to Business Today, the Indian chemical industry plans to double turnover to USD 300 billion by 2025. This creates business opportunities for digital technology providers. Overall, the momentum for companies to adopt digital technologies is building up, and it will likely scale further when businesses taste initial success. The Indian oil and gas sector has been witnessing notable investments across upstream, midstream and downstream to optimize their operations, which drives demand for digital technologies. Strong demand is likely to come from refineries' capacity expansion, integration with the downstream petrochemical industry and greenfield projects. The specialty chemical sector will likely present stronger demand for digital technologies, in a bid to produce customized products faster.

### **What was your experience hosting OPTIMIZE China? Do you plan to organize technology summits on similar lines in India as well?**

We have seen a major industry shift in achieving operational excellence. Companies are focusing on being more efficient in

production and resource usage. In the past few years, when the Chinese economy was growing rapidly, manufacturers focused on maximizing production, but the industry has since shifted its focus to operational excellence with the current slowdown. The 2018 summit pulled in huge participation from different Chinese companies, especially private-sector-based chemical manufacturers. In India, we have the executive management forum annually, as the country is a key market for us. We are reaching customers in the specialty chemicals, oil and gas sectors via seminars.

**Which products has the industry been picking up fastest in India?**

AspenTech's APM software suite is gaining traction in India, as the industry focuses on holistic optimization across the asset lifecycle. APM solutions help companies mitigate asset downtime, while also improving yield and quality. Supply chain optimization software has also gained significant adoption. With the power of digitalization, the industry is now looking at online solutions to solve day-to-day problems at the plant — focusing on value-add, instead of reactive response and “firefighting.” Of course, we also have a decades-long legacy of process optimization.

**Tell us about AspenTech's plans for the Indian market in the future.**

AspenTech will continue to invest in India with the large talent pool available. In India, our office is based in Pune. As the market evolves, we hope to be involved in large-scale technology deployment, which will require greater investment in Asia and India. Locally, the company remains committed to, and will continue to look out for, experienced chemical engineers in the process industry.

**What kind of support does AspenTech offer to the customers?**

We help clients anticipate the future health of assets via technology. Beside focusing on asset optimization across the lifecycle, we have a very structured customer support program and strong team based out of Pune. In working with customers at the pre-sale stage, we identify the pain points that they need to address. Post-sale, we have a customer support organization that provides professional support in implementing the applications. The company extends support services through a network of partners, who work with the same tools and deliver services to customers. We provide services to set up digital twins with the available plant and historical data, to detect deviation, assess root causes and derive solutions. We also work with customers to ensure proper adoption and optimization of solutions, and our training organization conducts eLearning and certification programs.

**How easy is it to use AspenTech's tools compared to those of other brands?**

AspenTech's software solutions are mainly used by chemical and process engineers. Our solutions are used in close to 900 universities across the globe, including India, as part of the chemical engineering curriculum for students, so they can learn the software. We also offer APM software, powered by AI and machine learning capabilities. Our goal is to help process engineers to easily implement our solutions in the real world. AspenTech's competitive advantage lies in our high-level industry expertise, engineering prowess and ability to help process companies transform digitally using new technologies such as AI and machine learning. We have a thorough understanding of the industry, providing a precise match between our products and what is required in the workflows. To succeed

in the real world, AI technologies must fit with the skill sets of current staff without needing an army of data science experts. AI-driven products must slip precisely into existing work processes. Low-touch techniques can help by effectively streamlining and simplifying AI so that regular employees can deploy intensely technical machine learning solutions easily and rapidly.

**Finally, what is your message for the chemical industry?**

The global chemical industry is looking bullish. The present population trend represents incremental chemical-based product consumption. However, with climate change being a prime concern, waste management is now key. Technology will be important in helping companies transition to new business models, achieve operational excellence and become more efficient. AspenTech can play a greater role in helping the chemical sector achieve new levels of performance and become more sustainable.



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### Scope for CHEMTECH + Biopharma World Expo 2021

- Refining & Petrochemical products
- Biotechnologies
- Chemical & Pharma Processing Equipment
- EPC Services
- Automation Technologies
- Environment Solutions
- Water & Wastewater Treatment Technologies
- Pumps & Valves
- Pipes & Fittings
- Packaging Solutions
- Material Handling Systems
- Analytical & Laboratory Technologies
- Consulting Services
- Equipment Fabricators

### Scope for Specialty Chemicals World Expo 2021

- Agrochemicals Intermediates
- Adhesives & Sealants
- Agrochemicals & Crop Protection
- Bulk Drugs & Intermediates
- Enzymes
- Colorants, Dyes & Pigments
- Cosmetics & Personal Care Ingredients
- Hygiene & Cleaning Chemicals
- Laboratory Chemicals
- Surfactants
- Water Treatment Chemicals
- Catalysts
- Electronic Chemicals
- Flavours & Fragrances
- Contract Manufacturers

### FACTS & FIGURES - CHEMTECH WORLD EXPO 2019

<b>612</b>	<b>18962</b>	<b>18</b>	<b>6</b>	<b>85</b>	<b>923</b>	<b>2150</b>
EXHIBITORS	VISITORS	COUNTRIES	CONFERENCES	SPEAKERS	DELEGATES	STUDENTS

### International Supporting Associations



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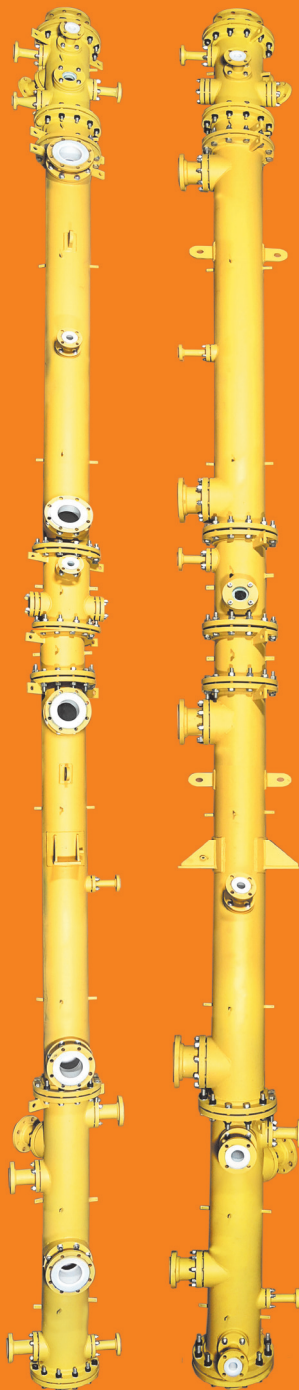






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