
Industry Outlook
FLOW METER MANUFACTURERS
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D. V. Krishnan,
Managing Director
HTM
HYDRAULICS
PROVIDING INTERNATIONAL
STANDARD FLOW METERS
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Industry Outlook

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EDITOR'S NOTE

Measuring the Flow

Be it for oil & gas industry or water and wastewater industries or any other industry, flow meters are finding their applications in a wide range of areas. As technology increases their accuracy, control, and reliability, their usage is expanding even more. In this issue, we have focused on this niche segment. The cover story of this issue features HTM Hydraulic which has more than 26 years of experience in the flow meters domain. It strives to provide an end-to-end assistance to its clients, right from selection to installation and servicing of the flow meters. Moreover, to be on par with the terms of quality, the team only offers the flow meters manufactured by UK based Webtec Products Ltd. - a company with more than 60 years of experience in development of flow meters. In collaboration with Webtec, HTM offers a range of products that includes but is not limited to — flow meters, flow testers, data loggers, sensors for pressure, temperature & speed, flow indicators, flow control valves, and more. Also featuring in the issue is Anand Water Meter Manufacturing (AWM), which manufactures the industry renowned water meters brand 'Anand Asahi' and has been able to not only build a positive reputation in the industry but create a niche in the market. AWM is the first water meter company to get ISI certificate, and also the first to export water meters. Reading on you will find more such interesting stories.

In addition, the issue also acquaints you with the other top companies in this field. After studying the industry landscape in-depth, we have zeroed in on the top 10 companies that have excelled with their meticulous approach. Having proven their dedication to efficiency in order to meet the customer expectations in an end-to-end manner, these companies have stood out from the crowd.

We look forward to receiving your feedback and suggestions.

Sudhakar Singh

Sudhakar Singh
Managing Editor
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IC Inderpreet Kaur, Senior Member, IEEE

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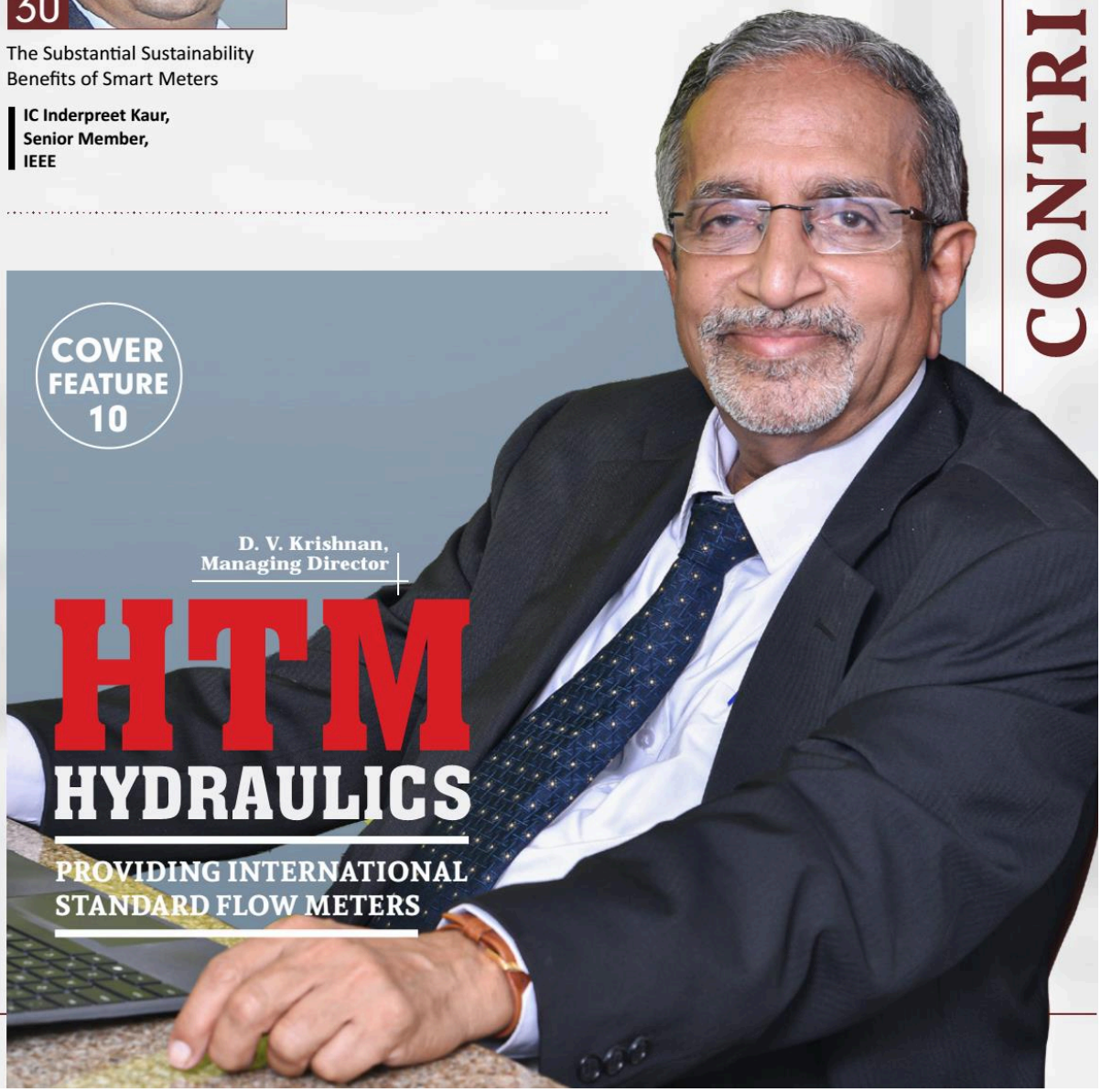


COVER FEATURE 10

D. V. Krishnan, Managing Director

HTM HYDRAULICS

PROVIDING INTERNATIONAL STANDARD FLOW METERS

► INDUSTRY INSIGHTS

ACCELERATING NEXT-GENERATION MANUFACTURING GROWTH WITH A ROBUST CLOUD STRATEGY

By Madan Mewari, Senior Vice President, Birlasoft

Madan Mewari, Senior Vice President

The manufacturing industry is experiencing a paradigm shift with changing customer expectations, rising production costs, intense competition, and volatile markets. They are looking for ways to drive customer satisfaction, boost efficiency and expense factor reduction, and build a sustainable competitive edge. To their advantage, the proliferation of next-generation intelligent technologies such as Industrial Internet of Things (IIoT), digital twin, artificial intelligence, machine learning, and advanced analytics is presenting opportunities to streamline the entire manufacturing value chain and accelerate significant business outcomes. But, are manufacturers and their suppliers equipped to quickly and effectively integrate transformational technologies with their existing enterprise systems? The answer lies in their propensity to embrace cloud solutions.

According to BCG, by this year, more than 70 percent of corporate workloads are expected to be running on public, hybrid, or private-cloud. And manufacturers must follow suit. Primarily because the cloud can deliver exceptional benefits in terms of IT cost reduction, business agility, and application performance. Some estimates suggest companies can save anywhere between 15-40 percent in IT operating costs with cloud adoption. Moreover, with advancements being made across commercially available PaaS and IaaS solutions, migrating to the cloud is becoming considerably less daunting. Manufacturing CIOs and Chief Digital Officers looking to drive large scale digital transformation initiatives will significantly benefit from the scalability and flexibility of the cloud. With faster provisioning of compute and storage and no CAPEX requirement, manufacturers can accelerate innovation since the time to production is reduced drastically. Furthermore, the cost savings from cloud deployment can be diverted towards building new solutions and applications.

WHAT'S IN THEIR WAY?

There are some challenges that CIOs and Chief Digital Officers may face while adopting cloud solutions. The top ones being

data security, interoperability, and vendor lock-in. These concerns are compounded when you consider the length and breadth of the manufacturing value chain and the number of stakeholders within the ecosystem– all using disparate applications and data formats. Also, the terabytes of transactional and operational data generated daily require tamper-proof storage and must be easily retrievable. CIOs and Chief Digital Officers may worry about the latency while processing high-volume transactions and mining data in the cloud. This concern is especially genuine because manufacturers have relied on on-premise infrastructure and highly-customized monolithic ERP applications for decades, and there might be significant organizational inertia while making a move to the cloud. There is also the hesitation of being dependent on a single cloud provider for resource provisioning and technology enhancements.

Most of those concerns can be alleviated by recognizing the advancement in cloud technology. While the first phase of cloudification may involve the migration of non-critical workloads to the cloud, the real benefits can only be experienced by going cloud-native. That means that companies need to build and run applications on the cloud and adopt DevOps and cloud-native architectures to drive continuous improvements and enhance application performance. Further, CIOs and Chief Digital Officers can also optimize their cloud costs and reduce vendor lock-in by using cloud solutions from multiple providers and picking the best that each vendor has to offer. And based on their risk appetite and specific business requirements, they may choose the most appropriate cloud deployment model – public, private, or hybrid – each providing different levels of flexibility, customizability, and control. Adopting cloud solutions and unlocking their real value would necessitate manufacturing CIOs and Chief Digital Officers to focus on building a robust API strategy. The execution of this strategy would promote interoperability, deploy proven integration middleware for operating a multi-cloud environment, and bolstering data security processes and governance processes.

HOW IS CLOUD HELPING REALIZE MANUFACTURING 4.0?

Early adopters and innovators in the manufacturing space are beginning to witness the transformational benefits of the cloud. The most significant way in which cloud impacts manufacturers is by enabling innovation and promoting the adoption of the fourth industrial revolution (4IR) technologies. Cloud allows IT teams to quickly provision infrastructure, build proofs of concept, showcase the business value of novel solutions, and move those to production seamlessly leveraging the superior scalability of the cloud. With on-premise infrastructure, gaining access to resources would be a time-consuming, costly, and often bureaucratic process. Long story short, adoption of the cloud strategy is democratizing innovation. Moreover, in a highly globalized business environment, the cloud provides the necessary tools for collaboration, allowing developers from any geography to participate in digitalization projects.

> THE MOST SIGNIFICANT WAY IN WHICH CLOUD IMPACTS MANUFACTURERS IS BY ENABLING INNOVATION AND PROMOTING THE ADOPTION OF THE FOURTH INDUSTRIAL REVOLUTION (4IR) TECHNOLOGIES

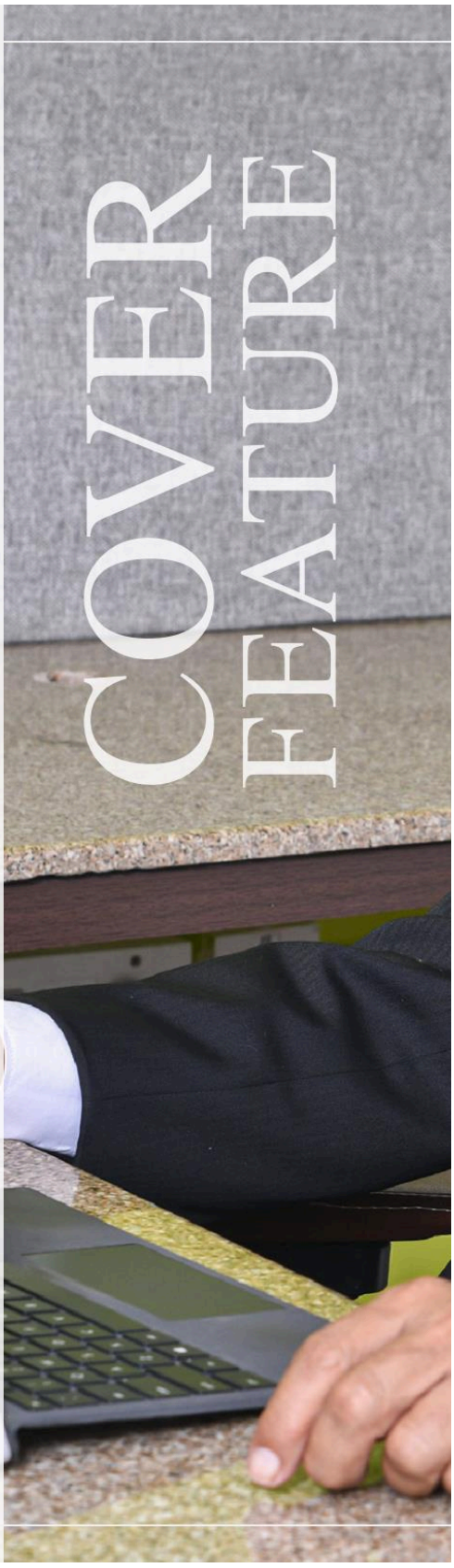
As more and more companies embrace cloud technology, legacy on-shore applications will be replaced with cloud-native applications tightly integrated with rapidly evolving technologies– such as machine learning, the Internet of Things, artificial intelligence, and data analytics. That will pave the way for ERPs to transform from 'tools for efficiency' to 'tools for strategic decision-making'. In

Industry Outlook TOP 10
FLOW METER MANUFACTURERS 2022

HTM HYDRAULICS

PROVIDING INTERNATIONAL STANDARD FLOW METERS

By Abhrasnata Das



While flowmeters are calibrated under ideal laboratory conditions, the environments into which they are installed greatly vary. Hence, while choosing a flow meter for any application, multiple performance parameters like accuracy, repeatability, design and more, become critical in determining the application of the system. With multiple variables on the line, choosing an inappropriate flow meter quickly leads to negative outcomes such as- poor flow and related controls, bad quality products, incorrect fiscal and allocation measurement, etc. This in turn massively affects the ROI while damaging the overall operation. Having said that, opting for an experienced flow meter provider with an in depth domain knowledge holds great importance to ensure quality, productivity and ROI.

With more than 26 years of experience in the flow meters domain, Htm Hydraulic strives to provide an end-to-end assistance to its clients right from selection to installation and servicing of the flow meters. Moreover, to be on par with the terms of quality, the team only offers the flow meters manufactured by the UK based Webtec Products Ltd. a company with more than 60 years of experience in development of flow meters. In collaboration with Webtec, HTM now offers a range of products that includes but is not limited to- flow meters, flow testers, data loggers, sensors for pressure, temperature & speed, flow indicators, flow control valves, and more.


D. V. Krishnan,
Managing Director

"HTM Hydraulics, starting as a distributor for Webtec from 1996 has brought in awareness and service support to all major Industries from Hydraulic, Mobile, Construction & Machine Tool Fields. Today, our in depth technical and domain knowledge and Webtec's impeccable product quality ensure an unmatched experience and service to our customers", states D. V. Krishnan, CEO at HTM Hydraulics.

Quality Centric Approach

As an ISO 9001:2015 certified entity, HTM Hydraulics has always been stringent about the quality of the products that are delivered to its clients. The unbendable desire to provide quality has also led to collaboration between HTM and Webtec.

"Webtec is the manufacturer with a proven track record over 60 years in meeting the global requirements, backed up by design capability, excellent manufacturing, assembling & testing facilities. The given statistics of Webtec has time and again proved to be an invaluable asset for us and our clients", mentions Krishnan.

As a company, Webtec has also been playing a proactive role in India right from the beginning to inform the Indian clients about its technology-infused products. "The team of Webtec has extensively visited India and Indian Industries since the beginning. They have taken the initiative for training Customers & HTM engineers in handling Webtec's products, ensuring safety for personnel, equipment and environment. Moreover, it has also jointly taken part in the product promotion programmes like- EXCON & Con-Expos", adds Krishnan.

Extensive Domain Knowledge

A customer-centric entity, HTM Hydraulics has been delivering its services in the field of hydraulics for over 45 years. The current seven members of HTM now hold a collective experience of more than 150 years.

To continue its legacy in the flow meter domain, the team has extensively trained itself and has visited the UK at a regular interval for training, ensuring awareness in product handling, servicing and calibrations. Today, the team members of HTM strive to provide comprehensive information and guidance to the customers, users of the Instruments; thereby ensuring optimum productivity.

> **Our in depth technical and domain knowledge and Webtec's impeccable product quality ensure an unmatched experience and service to our customers**

To further enrich its customer experience, the team is working to inaugurate Webtec's Repair & Re-calibration facility in India that will benefit all customers in terms of product performance & quick actions. In

AI IN AGRICULTURE: A BOON FOR AGRIBUSINESS?

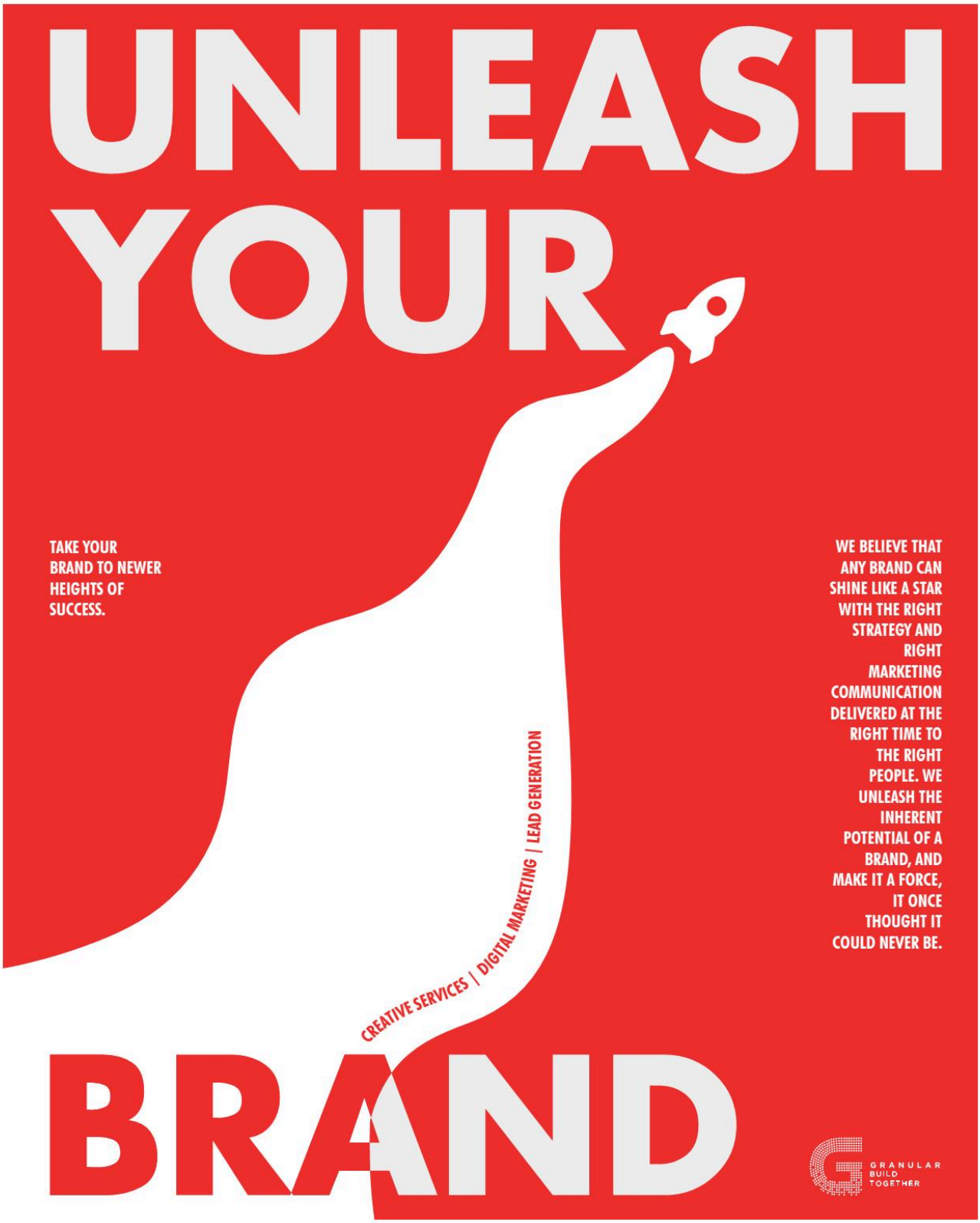
By Dr. Asmita Chitnis, *Director, Symbiosis Institute of International Business (SIIB)*

Agriculture is by far the most 'organic' sector in the world which serves the economy unconditionally. According to a survey by IBEF, 58 percent of rural households are dependent upon agriculture in India and agriculture is one of the most exported commodities in the world. As there is a sudden jump in the use of technology in different sectors, it is observed that the agricultural sector is also getting inclined towards technology. AI (Artificial Intelligence) being a prime reason behind this shift.

The population of the world is rapidly increasing and so is the demand for the food supply. The traditional methods of agriculture are not enough to provide for the demand rate. Agribusiness is a blooming field of professionals who are enhancing the work rate to feed the demands. Initially, the application of AI for an organic process like agriculture was certainly against all traditional principles. And there was a lot of resistance, to begin with. However, the demand for more efficiency and accuracy in the sector ended up asking for more involvement of AI.

AI is a boon for a lot of sectors and it is a technology for the future. The future beholds the idea of urbanization which is inevitable. Considering the drastic changes happening all around the world, people involved in agribusiness require to outperform themselves and show inexplicably exquisite results. Those results are bounded by the limited time available and human errors. So the use of AI and other technologies is the

Dr. Asmita Chitnis, Director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CREATIVE SERVICES | DIGITAL MARKETING | LEAD GENERATION
GRANULAR
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TOGETHER

need of the hour which can certainly help overcome these challenges and will make the entire process error-free and effective.

APPLICATION OF AI IN AGRICULTURE: CROP & SOIL MONITORING

Agriculture is all about the natural process. The soil and crop are two variables of the business. Continuous monitoring of both variables is extremely critical. Recently, the sector is witnessing the massive application of IoT and AI technologies as these technologies help in automating and accelerating the otherwise lengthy monitoring process thus providing increased efficiency and accuracy.

PREDICTIVE AGRICULTURAL ANALYTICS

Risk prediction and time-keeping during the process of agriculture are a must. AI is proving its worth in the vital parts of this field. Sowing seeds, watering the crops, pest attacks, and many more events are automated and are accurately predicted and executed. This reduces a lot of human efforts thereby providing a lot of comfort in the entire process.

DEMAND & SUPPLY CHANGE ANALYTICS

Keeping tabs on the demands and supply chain is a must. Analytics will only help the cause and is perfectly efficient to maintain the flow of the business. Companies are using real-time data to enhance profitability.

YIELD MAPPING

AI provides the comfort of yield mapping before even starting your agribusiness. Yield mapping is a prediction tool that helps in identifying the location which will provide the maximum yield together with the quantity of this yield in the given conditions. Agricultural specialists can now predict the potential soil yields for a given crop through all the necessary data through yield mapping.

BRINGING IN MORE INVESTMENTS

Looking at the current growth prospects in agriculture, there is a greater need to bring in more investments in this sector and acting upon them with maximum efforts. More and more companies and brands are venturing into this sector. The use of advanced technologies like AI and ML are making the whole process effective and efficient thus making the agribusiness field more attractive than ever before.

AI in agribusiness can enhance the abilities of farmers to maximize their potential. It supports the flow of traditional to innovative farming. Also, AI looks into the prime objective of managing the risks to help farmers in an effective manner. Implementing AI in agribusiness on a global scale seems a bit far-fetched dream right now. But it is the way forward with the new and promising opportunities in the field of agriculture. In

THE PANORAMA

HOW MECHANICAL SEALS ARE EVOLVING

The consumption volume of mechanical seals is linked to downstream industries and international economy. As there will forever be some uncertainty within the international economy, the expansion rate of mechanical seals trade might not keep that quick. However, it has been forecasted that the market of mechanical seals remains promising. The product average worth declined within the past few years because of the technology development, the common worth can keep the trend within the few future years because of increasing mature producing technology and lowering. price of raw materials. COVID-19 will have an effect on the worldwide economy in three main ways: by directly moving production and demand, by disrupting supply chain and market disruption and by its money impact on companies and money markets. But the Mechanical Seals market is projected to reach $4610 Million by 2025, at a CAGR of 4.1 percent.

"Based on the material type, metal seals are likely to remain dominant whereas plastic seal is to gain greater acceptance in the market, driven by the growing usage of plastic seals in e-Commerce, retail industry, and pharmaceutical industry. They are also ideal for securing intermodal containers worldwide as they required a special bolt cutter for the removal of metal bolt seals", says Stratview Research, a global market intelligence firm.

Some of the current trends and factors that are pushing the growth of the mechanical seals industry are as follows:

O-PRO SEAL: PREVENTING LEAKAGE AS A DOUBLE SEAL BARRIER

One of the leading manufacturers of mechanical seals has introduced this product. O-Pro seal uses a series of O-rings to create a robust seal and lubrication chamber in a single piece seal. This new feature can be fitted throughout pumps which cover flows to 295 m^3/hr, discharge pressures to 14 bar and liquid viscosities between 20 – 1700 cSt at temperatures between -15 degree Celsius to +175 degree Celsius. The O-Pro Barrier seal which replaces both bushing and sealing equipment, packing or mechanical seal with a machined seal gland. This innovative design combines a bracket bushing and seal gland made of hardened cast iron with two sets of double O ring seals for reliable sealing and easy maintenance. The pair of static O-rings seal externally on the bracket and the pair of dynamic O-rings seal internally on the shaft preventing process fluid from leaking out of the pump and reducing wear between the shaft and the bushing. The area between each set of inner and outer O-rings is filled with lubricating liquid, providing lubrication whilst also acting as a double seal barrier fluid to prevent leakage along the shaft. This is an important technology which is being adopted by many other companies and is driving the growth of the market currently.

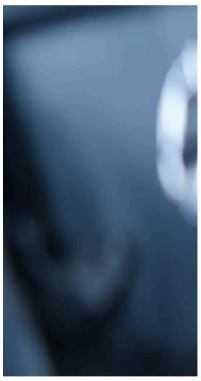
Mechanical seals prevent pumps from leaking by containing the pressure of the pumping process and withstanding the friction caused by the pump shaft rotating. This leads to less wasted product, money saving, and less clean up. Mechanical

seals are the most common cause of pump downtime and account for more pump repair costs than any other part of a pump. Therefore, it's important that they are installed and maintained properly to prevent failures.

Here are some of the challenges that are to be looked out for.

INSTALLATION ERRORS

Installation errors can easily damage mechanical seals so it's incredibly important that mechanical seals are installed by a professional and that the installation instructions are followed exactly. If a pump is started with an incorrectly installed seal major damage could occur and potentially damage other parts of the pump as well as the seal. In recent years, scholars from all walks of life have performed research on mechanical seals and achieved various results. One of the research scholars in this field established a numerical simulation model of a noncontact mechanical seal considering the thermal deformation of the seal end face and the heat transfer of the film between seal faces. The results showed that thermal deformation cannot be ignored when designing mechanical seal structures under high operating conditions. Another research scholar studied the vaporization evolution trend of film on a seal end face considering face deformation. Notably, a large temperature gradient can adversely affect the stability of the film at the seal face.



POOR OR ABSENT LUBRICATION

A mechanical seal might fail due to poor lubrication or no lubrication at all. When there is no liquid around the seal it will be subjected to increased amounts of friction which will increase the temperature inside the pump. This rapid increase in temperature can cause burnt elastomeric parts and damage O-rings or rubber on the seal. This usually happens when there is no pumped medium in contact with the seal rings to transfer the heat. Also, when lubrication is poor or absent mechanical seals made of hard materials will make quite a loud noise, this will cause parts of the seal to vibrate which can reduce the life expectancy of both the seal and the pump. A recent research study has established a numerical model of multifield thermodynamic coupling. The correctness of the model was verified by experimental research, and the model was developed into software convenient for application

Some of the future technologies that are to be looked for are digitalized pumps and on–board CM which would help in reducing the risks of leakage.

DIGITALIZED PUMPS – AN IDEAL SOLUTION TO MODERNIZE INDUSTRIES

As the world adopts digital solutions such as IoT, data analysis and network connectivity into accelerating their operations, the pump industry is resorting to digitalization for better water management, identifying faults, capture live data and all the while through a remote monitoring option. Modern pumps are being developed to fit the needs of constructions of the future, where output is required to be delivered faster, with more competence; and integrating digital technologies into pumps is the potential solution to offer this. The integration of IoT in such pump solutions develops a human-machine interface that allows for a closer look into operating pumps in real-time with lesser human effort. Smart sensors, a significant asset of IoT, is an example of this, which integrates embedded sensors and external sensor arrays. IoT's interconnectivity creates a network of every device equipped with smart solutions for an ecosystem of wireless connections across a facility to work in agreement.

ON-BOARD CM & INTELLIGENT SUPPORT SYSTEMS: PROSPECTIVE TECHNOLOGIES

On-board condition monitoring (CM) will help in reducing the expenditures associated with premature equipment failure or seal failure. It identifies the signals of poor performance and sends a signal to the operator to take necessary actions to rectify the parameters, which in turn significantly brings down the repair cost. This also saves costs associated with production losses. However, mounting those devices or adding pressure switches, temperature switches or any relevant equipment without changing the seal design offers a tough challenge to seal manufacturers. Emergence of nanotechnology has resolved some of these hurdles. However, lack of availability of transmitters, proximity devices, and temperature and pressure sensors in a nano scale is still a prime challenge.

Future technologies that can convert these devices into nano components and incorporate them into mechanical seals are anticipated to increase adoption of on-board condition monitoring, which is expected to be a truly revolutionary development in seal construction and performance. "Manufacturers that offer a comprehensive package constituting mechanical seals, aftermarket support, and diagnostic capabilities are at a competitive advantage. Mid-tier manufacturers must focus on research and development and innovation to gain a competitive advantage", states Frost & Sullivan Industrial Automation & Process Control Programme Manager Ashwin Annareddy. With the future of the mechanical seals industry lying in the hands of researchers, the industry is expected to remain in progression in the long run notwithstanding the effects of the pandemic.

Industry Outlook TOP 10 FLOW METER MANUFACTURERS 2022

The global flow meter market size was valued at $8.29 billion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 5.7 percent from 2021 to 2028. The increasing demand for flow rate measurement in O&G management applications across the globe is expected to drive the growth of the market over the forecast period. The adoption of measurement technologies and instruments would also gain traction in other sectors, such as water and wastewater, power generation, and pulp and paper over the forecast period.

The demand for intelligent systems flowmeter is expected to increase over the foreseeable period as the integration of IoT has led to the introduction of smart measurement solutions. Advancements in technologies such as wireless monitoring and control, advanced sensors, and digital readouts are expected to drive the growth of the market over the forecast period. Manufacturers of the product are increasingly adopting the Internet of Things (IoT) sensors for smart metering solutions.

The major players in the market are mainly targeting the O&G sector and investing aggressively to offer innovative products and solutions to measure the flow rate of liquids, gases, and vapors. Rapid urbanization across developing countries in the Asia Pacific drives the need for adequate water and wastewater management and power generation. As a result, the demand for the product in water and wastewater application is expected to be high in the region.

The magnetic flowmeters segment held the largest revenue share of approximately 25 percent of the total market share in 2020. The product has further been classified into wired and wireless magnetic flowmeters. Ultrasonic and Coriolis segments are anticipated to witness a high growth rate exceeding 7.5 percent from 2021 to 2028.

Industry Outlook in this issue presents a list of 'Top 10 Flow Meter Manufacturers – 2022' who have leveraged their extensive industry expertise and experience in bringing innovative solutions. The following list has been prepared after being closely scrutinized by a distinguished panel of judges including CXOs, analysts and Industry Outlook editorial board. We recognize their valuable contribution to the ever expanding and competitive market and their ability to sustain themselves and emerge as top contestants through their reliable products and services.

TOP 10 FLOW METER MANUFACTURERS - 2022

COMPANY	MANAGEMENT	DESCRIPTION
Acorn Controls Pune acorncontrols.in	**Harshavardhan Vasant Sahasrabudhe,** Director	Leading Manufacturers of Ultrasonic flow meters , Parts of Electromagnetic flow meters, Hydrogen Gas Monitor, and related
Anand Water Meter Kochi anandwatermeter.com	**Joseph George,** CEO	Being pioneers in water meter manufacturing in India, it is the first company to receive ISI licensing certificate(in 1964) and also the first company to export water meters from India
Flexim India New Delhi flexim.com	**Akbar Ali,** Technical Leader	A market leader in the field of clamp-on ultrasonic flowmeters and real time concentration and density monitoring as well as advanced process analytics using clamp-on ultrasound and inline refractometry
Flui Tec Instruments & Construction Bangalore fluitec.net	**Raju B. G.,** Director	A popular organization dealing in superior quality Flow Meters, Competitive rates and On-time deliveries
Htm Hydraulic Bangalore htmhydraulics.in	**D. V. Krishnan,** CEO	Provides technologically integrated and ultramodern High Pressure management systems and solutions for diversified applications at affordable prices and on time delivery
Kritsnam Technologies Hyderabad kritsnam.com	**K Sri Harsha,** CEO	Collaborates with businesses that are ready to adopt scientific water management practises to achieve sustainability
Leomi Gandhinagar leomi.in	**Manish S. Patel,** Manager- Sales & Marketing	A technology developer of Insertion Thermal Mass Flow Meters, with manufacturing facility meeting German technology standards
Megitech Automation Ahmedabad megitech.com	**Pramod Yadav,** Proprietor	Deals with Electromagnetic Flow meter, Vortex Flow meter, Thermal mass Flow meter, Level Instruments and many
Rockwin Flowmeter India Chennai rockwin.com	**Shankar Mathur,** Vice President	An Indian Company, engaged in designing, manufacturing, calibrating, and marketing high end Flowmeters and related equipment
Star-Mech Controls Pune starmech.net	**Uttam Shrawan Jadhav,** Managing Director	A highly qualified team of marketing, engineering & manufacturing specialist committed towards maintaining the highest standards of quality, product design & production

Industry Outlook TOP 10 FLOW METER MANUFACTURERS 2022

ANAND WATER METER

A LEADING WATER FLOW METER MANUFACTURER AIMING FOR SUSTAINED SUCCESS IN THE MARKET

The flow meters market is expected to reach 10.3 billion by 2026, clocking in an impressive CAGR of 6.2 percent between 2021 and 2026. One of the primary contributors to this growth is the increasing demand for water flow meters and even in India this is the case. In an ultra-competitive market segment, Anand Water Meter Manufacturing (AWM), who manufactures the industry renowned water meters brand 'Anand Asahi' has been able to not only build a positive reputation in the industry but it has also been able to create a niche in the market. AWM which was incepted in 1963 in Cochin by Late Chaman Lal Anand (C. L. Anand), an enterprising industrialist from Punjab (who had later in the early 70's set up two major industrial units in Kerala-Toshiba Anand Lamps & Toshiba Anand Batteries in Cochin) in collaboration with Osaka Kiko Company, Japan– the makers of reputed Asahi have completed more than half a century of glorious years in the water flow meters manufacturing industry. And now his son, Pradeep Anand, as a Director moving forward the company with proper guidance and direction. Hence the company has achieved a previously unimaginable feat in the water meters industry in India.

AWM is the first water meter company to get ISI certificate, and also the first to export water meters. With that said, the AWM is not ready to rest on their laurels and is aiming to break new business frontiers and reach for greater heights in the corporate realm. AWM has manufacturing facilities across the country and even with that being the case, the company is very conscious about the quality and consistency of their products. Their ISI licensing certificate (in 1964), ISO:9001-2015, and ISO:14001 environmental certifications, all just goes to show the importance AWM gives to quality. Over the years, AWM has cemented their position as a pioneer in the market and has consistently come out with revolutionary water meters that have become game changers in the industry. Apart from that, they also have introduced multi jet dry dial magnetic drive, C-type water meters, AMR smart meters, and class B water meters incorporating latest technologies into the market. "Backed by the constant effort from our robust R&D team, AWM has been able to develop into flag-bearers in the industry both in terms of quality and ingenuity. Both these have helped us to ensure the maximum satisfaction of our clients as well", explains Neelam Anand, chairperson, AWM.

In order to cater to the varied requirements of their clients, AWM has created a diversified product portfolio in their popular brand Anand Asahi, that includes sizes 15-40 mm sizes required in domestic segment and from 50-300 mm bulk type meters required for agricultural & industrial use. And owing to their unmatched quality, diverse product range, and competitive pricing, AWM has been widely recognized and accepted by almost all the leading water works/public health departments, corporations, municipalities, and panchayats in the country. When asked more about the national exposure the company has had over the years, Joseph George, CEO, says "We are a PAN India business that is able to cater to the various customized requirements of our clients, and this has been crucial for our sustained growth in the market. Over the years, we have successfully participated in various tenders and were awarded many prestigious water meter projects all over India. This includes supplies made to- ongoing Central Govt.funded JJM project, Delhi Jal Board, BWSSB Bangalore, KUWA project (Karnataka), Jalanidhi Project-Kerala, PHED-Jaipur, UP Jal Nigam, L&T project Vizag, Hyderabad Vishwa Infrastructure Mega project, Municipal Corporation of Brihan- Mumbai, among many others".

Evolving with the changing times, AWM has high hopes for the future and aspires to continue their growth trajectory. By being a frontrunner when it comes to technology adoption and innovation, the company is also aiming to break new business frontiers, expand their horizons, and reach the pinnacle of success in the water flow meters industry. AWM has a sister company also- Anand Zenner catering to Industrial Woltman type meters.

► INDUSTRY INSIGHTS

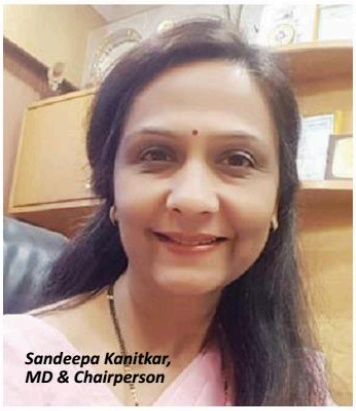
USE OF BIO-FERTILIZERS FOR CROP PRODUCTION & SOIL FERTILITY

By Sandeepa Kanitkar, MD & Chairperson, KanBiosys

Green revolution was the product of use of hybrid seeds, irrigation and most important chemical fertilizers. All these increased the yields wonderfully and transformed India from a ship to mouth economy to a country self-sufficient in food. Year after year the yields increased until they started plateauing after 1980s. The reason was primarily attributed to loss of organic matter, reduction in micro-flora, soil compaction, salinity and reduction in water holding capacity.

The ground water was obsessively removed by providing cheap or free electricity leading to depletion of ground water bodies. The soils could not absorb and retain moisture and carried with them precious top soil increasing silt and nitrates in ground water leading to mounting health hazards. This was compounded by reduction in profits due to reduction of input use efficiencies– fertilizers, pesticides and water. This was further aggravated by straw burning [rice/ sugarcane] and reduction of use of organic matter to soils.

Soils have a wonderful capacity to store carbon which not only improves its fertility but also is food and home to millions of microbes. They run the nutrient fertility cycles and also help keep absorb air pollutants. Soil Carbon acts like a bio-sponge for purifying and retaining water thereby increasing the ground water table.



Sandeepa Kanitkar, MD & Chairperson

> SOILS HAVE A WONDERFUL CAPACITY TO STORE CARBON WHICH NOT ONLY IMPROVES ITS FERTILITY BUT ALSO IS FOOD AND HOME TO MILLIONS OF MICROBES

There is a micro-ecosystem consisting of many agriculturally important microbes for Nitrogen, Phosphorus, Potassium, Zinc supplementation and more [N fixers, P solubalizers, Zn, K mobilizers] Efficient strains can be formulated into useful products called bio-fertilizers.

Field bio-efficacy show that bio-fertilizers help to improve the nutrient use efficiency of chemical fertilizers too adding to a favourable cost benefit ratio

for the farmer. Nutrient management microbes also exhibit plant growth promoting properties. These products are registered at the Fertilizer Control Order [FCO] and can be used for seed dressing, soil broadcasting and foliar sprays. Next Gen bio-fertilizers are available as liquid bio-inoculants or in conventional carrier based form.

World-wide market for bio-fertilizer is around $1.68 billion which is less than $155 billion worldwide chemical fertilizer market. The CAGR of bio-fertilizers is around 13 percent as against chemical fertilizers which is just around 3.8 percent. Recent developments in genomics, fermentation and formulation technology is proving boost to develop novel formulations of bio-fertilizers. The driver for the bio-fertilizer markets are food safety and improving the efficiency of chemical fertilizers which stands at less than 30 percent in conventional agriculture.

The rest 70 percent are either washed away causing algal blooms in rivers or fixed in unusable form in soils like phosphates. The demand of bio-fertilizers is also fuelled by increase in area of organic farming - a $4 billion dollar market in India for organic food which is growing at the rate of 23 percent CAGR. Bio-fertilizers are certified for organic farming and can improve the yields of organic as well as conventional farming systems.

Presently there are numerous small companies engaged in the production of bio-fertilizers. The main ingredient for their mass scale implementation is shelf- stability which determines their success on field. Government is taking special steps to provide extension support for creating awareness amongst farmers. However, the success will be more pronounced when it modifies the seed act by allowing various seed companies to factory seed microbes on seed as well as by allowing dry-coating on chemical fertilizers. Factory seeding of bio-fertilizers can be a boon for the huge class of small and marginal farmers growing rice, wheat, soybean, cotton and more. This will be an easy source of nutrient for them and applying microbes at the seed stage is, 'well begun is half done'.

Industry Outlook TOP 10 FLOW METER MANUFACTURERS 2022

KRITSNAM

DIGITAL WATER RESOURCES MANAGEMENT SYSTEMS POWERED BY AI & DATA-DRIVEN APPROACH

Water management has become crucial across industries over the past few decades due to the alarming issue of water wastage and also depletion of naturally available resources due to climate change. Managing resources to save water through monitoring of waterflow in industrial plants while measuring the amount of water used in each process are the essential parts of any industrialized operation and will allow companies to improve their water security in the coming years.. Thus, the emergence of technologically evolved smart flow meters has proved to be a cost-saving aid for businesses, in terms of easy operation and maintenance of water data across the organization. The global flow meter market was valued at $9114.39 million in 2021 and is expected to reach $14859.14 million by 2029. Creating a more environmentally awakened industrial atmosphere, Kritsnam's mission is to make water management affordable, easy, and data driven. Through Dhaara, Kritsnam's cloud-based live water budgeting platform, organizations can project their water plans, map and track actual vs. planned usage, identify gaps and uncover potential opportunities for corrective and preventive actions. Businesses can now objectively evaluate water risks and manage their water footprint digitally with smart water flow measuring devices which are battery operated and easy to install. The platform enables users to chalk out water budgeting plans suitable to their needs.

As the government has put forward strict protocols for water management and measuring procedures, several organizations are opting for digital flow meters over the conventional ones due to their high accuracy rate of measurement. However, the huge amount of data that these applications generate needs to be recorded and monitored thoroughly in order to provide value to the user. This is where Kritsnam has leveraged its wisdom derived by years of research and experiments to build Dhaara, a data-driven and AI induced water flow measurement solution that ensures sustainable water management practices. With its inbuilt telemetry system and capability to communicate with remote servers, Kritsnam's ultrasonic flow meters are offering water measurement capabilities across all parts of India.

Array of Innovations

Kritsnam offers Dhaara Smart water meter and Dhaara Live dashboard services for advanced and seamless water management. Dhaara Smart is an IoT based ultrasonic flowmeter with latest sensor technology. The battery powered water meter is energy saving and comes with tamper detection technology that alerts the user of any kind of unauthorized alteration in the appliance. The AI technology helps in higher measuring efficiency and also to keep the error rate within standard permissible limits. The inbuilt GPRS/4G telemetry enables hassle free and secure transit of data to the recipient's servers. Data privacy and security are of utmost importance that have been factored in while developing Dhaara Smart. The meters are assembled, calibrated with an in-house calibration setup and tested for quality before being shipped to the end user's location. Dhaara is a plug and play device which does not require supervised installation support for the customer. An installation guide is provided along with the meter that guides the user step-by-step on how to get the meter up and running. The solution comes along with simplified dashboard services to provide remote tracking through mobile phone application or PC and give the user detailed information on daily consumption, weekly consumption, flow rates, pump working hours and idle times, etc. From ground water abstraction to water auditing for commercial, industrial and domestic water usage to smart irrigation practices, Kritsnam has brought in an inclusive water management solution across the spectrum.

K Sri Harsha, CEO of Kritsnam adds, "Our top priority is to develop flow meters that address present challenges like water wastage and mismanagement whilst effectively and effortlessly measuring water flow in the areas of commercial and industrial water supply, water data automation and others. All our systems are compliant with the ISO-4064 standards and also follow the guidelines provided by Central Ground Water Authority (CGWA)".

Vision for the Future

In the advent of next generation technologies elevated by AI, IoT and other digital pushes, the need to adopt accurate and more feasible measurement solutions has given birth to smarter water management mechanisms. As industries and businesses are becoming equivalently nuanced day by day, the scenario of transcendence is opening new horizons for further innovation keeping sustainability as a key factor. With Dhaara, Kritsam is eyeing on adding to their unique technological boons and taking water intelligence to futuristic heights. "In the days to come, we want to build technology enabled tools and solutions that give a new dimension to smart water management systems all across the globe", Harsha further adds. In

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STAR-MECH CONTROLS INDIA

MANUFACTURING HIGH-QUALITY FLOW METERS USING ADVANCED TECHNOLOGIES

The flow meters market size is anticipated to reach $10.3 billion by 2026. Major factors driving the growth of this market include the rising demand for flow meters for use in oil & gas and water & wastewater industries. Since increasing global focus on water and wastewater treatment is leading to higher use of flow meters, the demand for flow meter is increasing in this industry and these facilities demand flow meters with higher accuracy, control, reliability, performance and compatibility with different monitoring technologies.

One such company that specializes in the engineering, design, manufacturing and distribution of a variety of flow measurement products is STAR-MECH CONTROLS INDIA. As an ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 along with IBR certified company, STAR-MECH believes very strongly in the quality and reliability of its products. By being responsive to its customers' needs, STAR-MECH has always strived to meet the requirements religiously. The company provides extensive engineering support for product selection and application and adds value to the product.

In-house Gravimetric Flow Calibration lab

While a highly qualified team of marketing, engineering and manufacturing specialist committed towards maintaining the highest standards of quality, product design and production are an uncountable asset of the company. The in-house gravimetric water flow calibration laboratory further adds to the strength of the company.STAR-MECH has more than 37 years of experience in the process industry sector.

The Journey

Established in 1985 by an enterprise engineer Uttam Shrawan Jadhav, STAR-MECH is now an established name in the field of the process industry. STAR-MECH is in the business of flow meters, flow elements, valve manifolds and accessories offering complete solution for instrumentation. The product range includes V cone meter, Diamond shaped averaging pitot tube (Fluid-Bar), multi-hole restriction orifice assembly, PTC6 flow nozzle for performance testing, special venturi tubes for oil & gas petrochemicals, Mass flow computer, orifice plate assembly, integral orifice plate assembly, flow nozzle, venturitube, aerofoil, valves and manifolds (isolation, 2,3 and 5 Way), petended Digital Air Gauge and related accessories.

STAR-MECH is the first in India to design and manufacture Averaging Pilot Tube (Fluid-Bar), design registered under number 160687. The Averaging Pilot Tube (Fluid-Bar) has wide

Uttam Shrawan Jadhav, Managing Director

range of applications of measurements in large pipes, ducts and stacks. It is the most economical in energy saving and easy to install flow sensor.

International standards & proprietary design

All products of STAR-MECH are manufactured according to the international standards and proprietary design data of the company. The companies STAR-MECH works with are all national & international EPC contractors and consultants. The end users are from oil & gas, refinery & petrochemical, power generation, metals and mining, sugar, cement, chemicals, water and waste water, pulp and paper, food and beverages, pharmaceuticals and others.

"We believe in skilled manpower, which is our invaluable asset. By leveraging this unmatched expertise, we offer innovative solutions to add value to our customers. We always strive to offer timely quality services to our Customers", says UttamShrawanJadhav, Managing Director, STAR-MECH. "We have developed in-house gravimetric water calibration facility for the calibration of differential type of flow meters, mass flow meters, magnetic flow meters, ultrasonic flow meters, flow elements, valves etc. which is accredited by NABL", he adds.

"We have a wide range of products which provide solution to any type of application. Many government, semi-government, public, private organizations, industrial houses approves and recommend our products and this is what sets us apart from the other companies in this segment. We are a regular supplier to various super critical thermal power plants by NTPC to NPCIL. We have specialist working with critical materials like A 335-P91, A 335-P92,inconel, titanium, tantalum, and so on". he further adds.

STAR-MECH is ready to launch Air Flow Meter, specially designed for air applications. Moving ahead, STAR-MECH plans to work on projects related to development of advance flow meter and flow element.

POST HARVEST DISTRIBUTION CHANNEL: AN UNRESOLVED & AILING ISSUE

By Tejas Vyas, Director- Products, Bigbasket

If one looks up the definition of 'fresh', what comes up is 'just produced'. Imagine a just produced spinach's journey - traveling from the small hectares of nondescript farms to the hustle-bustle of a city's market, huffing and puffing all the way over many days, exchanged between multiple wry hands, haggled over incrementally and finally, the exhausted spinach gets consumed; purchased at a price over 10 times the original value. More often than not, the same spinach would not even make it to a kitchen and gets discarded somewhere along this long journey.

AGRI SUPPLY CHAIN: THE FORGOTTEN STEP CHILD

The Green Revolution changed India. India witnessed increased production because of enhanced cultivation methods and irrigation systems. While there has been a drastic improvement in the yield per acre, an unresolved and ailing issue that remains is the post harvest distribution channel. A 2011 UN study shows that close to 45 percent of fresh produce gets wasted in developing nations like India. Not only does this hurt the farmer but also the consumers as the quality deteriorates and prices increase exponentially. Inadequate storage facilities and the lack of market linkages hurt the farmers at the first mile and the wastage gets compounded during distribution. Startups and corporations have been hard-pressed to solve this problem despite the tremendous opportunity primarily due to the multitude of policy challenges and regulations to operate any sort of business in the hinterlands. Add to that, a poor credit system and an ineffective formal banking model that hampers most entrepreneurs. Structurally, there are a lot of reforms and investments needed to uplift this sector. Unfortunately the farm-to-fork model continues to be a pipe-dream.

ORGANIZED RETAIL: THE PANACEA

Organized retail in developed nations accounts for over 60 percent of food retailing. The overall wastage is lower

Tejas Vyas,
Director of Products

than 10 percent which still makes it more efficient over the unorganized sector. A well-defined and systematic supply chain infrastructure can orchestrate the fine line between meeting the demands of the farmers and benefiting consumers and retailers. The farmers in such a setup

- Have access to trained agronomists to optimize the quality of produce
- Follow a predictable pattern of harvesting cycles based on market demand
- Maximize yield
- Receive a consistent price year round
- The consumers in such a setup
- Get seasonal and fresh produce at a consistent price year round

> THE ORGANIZED FOOD RETAIL SECTOR IN INDIA IS STILL AT A NASCENT STAGE COMPARED TO THE DEVELOPED ECONOMIES, WITH A SMALL NUMBER OF PLAYERS TRYING TO CREATE A NEW PARADIGM

- The retailers in such a setup
- Seek to aggregate the right amount of inventory, balancing it to reduce wastage
- Optimize with technology powered storage and cold chain solutions
- Optimize on first mile logistics across grids of farming centers based on shelf life of the produce

The organized food retail sector in India is still at a nascent stage compared to the developed economies, with a small number of players trying to create a new paradigm. For these players to thrive there is a continued need to manage everything in-house from supply chain, logistics, selling, sourcing, stocking, merchandizing, trend analyzing etc. While having to keep prices low enough to be able to compete with the traditional sector, it is no wonder profitability is a mirage.

CERTAIN CONDITIONS HAVE CREATED THE PRIMORDIAL SOUP FOR ORGANIZED RETAIL IN INDIA:

1. India opened up food retail for foreign direct investment in 2016. A shot in the arm for the players/entrepreneurs in the organized retail sector.
2. The average consumer is now willing and able to pay a premium for quality and speed of delivery. With two-thirds of the country below the age of 35, with disposable incomes and an ever-increasing spending habit, adoption of apps like BigBasket, Amazon, Flipkart and more is at an all-time high.
3. In the recent past there has been a tremendous rise and growth of logistic/delivery companies whose claim to fame is their technology platform. The delivery fleet in colorful Tshirts that adorn company logos swerve on their bikes in every by-lane and alley delivering just about anything. IOT enabled trucks and its drivers tapping on their apps is not uncommon anymore.
4. 4G networks have proliferated across the country making it the second largest internet user base in the world. Access is easier than it has ever been and is getting democratized. It is not surprising that more and more companies are now targeting the rural consumer base.
5. Cold chain solutions, which were previously unheard of and cost prohibitive, are now more accessible. The market for extremely perishable commodities stands to benefit the most from this.
6. Corporations are adopting technology solutions like never before with an aim to reduce costs.
7. Data led decision making is the future. Demand forecasting, once an art, is now a science.

FARM IN A FORK?

Imagine this. Farmer gets a notification on his phone at 7pm. It is a demand for 10kg spinach to be delivered the next morning. Farmer harvests it at 5am, hands it over at the nearest processing center where farmer is paid at par/above market value. The processing center collects the spinach, logs it into the Warehouse Managing System using an app and dispatches it using a cold chain solution to the nearest warehouse 50 kms away at 11am. By 1pm, the spinach is ready to be transported to a temperature controlled vending machine, a further 10 kms away where it finally finds a resting shelf space. A savvy mother passes by the machine at 4pm, buys the spinach via a mobile app and picks it up from the vending machine. Palak paneer served at the family table at 8:30pm. Fresh from the farm.

► AFTERWORD

INCENTIVISING THE AGRARIAN SECTOR WILL LIFT THE INDIAN ECONOMY

By Shravan Charya, Founder & CEO, SocioLadder

There is not going to be a 'post-COVID 19' scenario for industries, or otherwise for at least another year now. What we already have is a new normal that we have to adapt to and learn to co-exist with the virus. That said, the chain reactions across industries and the impact on every aspect of human behaviour is without precedent.


Shravan Charya, Founder & CEO

The lack of opportunities in the villages drives people to migrate to large industry-heavy cities. This puts a lot of pressure on infrastructure and social systems in cities. Invariably, given the dominance of the primary sector among the majority populace, it will be here that the most important scenario change can, and ought to take place.

> ONLY BY IMPLEMENTING ECONOMIC POLICY SHIFTS AND BRINGING-DOWN THE COST OF CAPITAL CAN THERE BE A SIGNIFICANT GROWTH AND IN-TURN THIS COULD PERHAPS TRIGGER A SECOND WAVE OF LIBERAL GROWTH IN THE COUNTRY

Agriculture still adheres to a subsistence model, with little commercial exploration happening on a large scale. Now is a great opportunity for governments, both at the Centre and State levels, to recalibrate funds and shift focus on the primary sector, specifically on agriculture. If subsidies are properly calibrated, they can give rise to a lot of supporting industries in semi-urban and rural centres. If people are provided with enough incentives to stay in the primary sector, it can lead to decentralizing resources from urban centres, as it also helps revive the rural economy.

There is already a reverse migration that has been triggered. Governments can capitalize on and deploy this wave of reverse migrants back into the primary sectors by providing some subsidies and investment mechanisms to motivate them. The large part of the relief packages that have been announced can be made use of to give an impetus to the agrarian sector. This is a great opportunity to shift focus and change the economic frontiers of India.

Now, all these measures have to be seen in the context of changes happening in the global landscape. If you look at urban concentration of growth in Indian cities, the main economic activity revolves around just a few specific sectors, driven by outsourcing, IT and ITeS verticals. This hegemony is going to dramatically change at least in the midterm, say some three years, meaning there are not going to be many opportunities in the cities, and migration itself might reduce for the next few years. It is thus a great chance for the Indian economy to realign its focus and shift from its practice of concentrating only on the urban. This is what the post-COVID 19 narrative of the Indian economy is going to look like – disproportionate increase in costs and subsequent increase in prices in most retail sectors, and the need to deploy reverse migrants into entrepreneurial pursuits in primary sectors.

In the emerging economic landscapes, patient capital ought to be made available to not just agriculture, but also to budding entrepreneurs and small & medium industries. Only by implementing economic policy shifts and bringing-down the cost of capital can there be a significant growth and in-turn this could perhaps trigger a second wave of liberal growth in the country.

For the social sector, there has to be a lot of encouragement for social entrepreneurs by giving them non-capital intensive or a non-capitalistic means of funding their operations. Now, a lot of social entrepreneurs come under the same method of P/E method for investments being available to them; that needs to change. The Finance Minister Nirmala Sitharaman's proposal to create a social stock exchange must happen in the next three months. If that happens, you'll see a huge wave of social entrepreneurs who are focused on welfare economics.