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JOURNAL FOR ALUMINIUM CASTING TECHNOLOGY

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GREAT DIECASTING TECHNOLOGY FORUM

'Guruprasad', 1st Floor, 37/4/A, 6th Lane, Prabhat Road, Pune 411 004 INDIA

Tel: +91 20 2567 0808, 2567 2555 | Mobile: +91 9764711315

gdctech@arkeycell.com, arkeyconference@arkeycell.com

www.gdctechforum.com

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THE BENEFITS OF FEEDEX* Nf1 EXOTHERMIC SLEEVES IN ALUMINIUM AND COPPER CASTING

Author: Arndt Fröscher



THE BENEFITS OF FEEDEX* NF1 EXOTHERMIC SLEEVES IN ALUMINIUM AND COPPER CASTING

Author: Arndt Fröscher

Since the development of FEEDEX NF1 exothermic sleeves for non-ferrous casting applications, they have demonstrated significant value in the aluminium sector. Benefits include significantly extended solidification time, increased casting yield, lower fettling and remelting, and lower emissions. The result is lower production costs and a reduced carbon footprint. These advantages have also now been demonstrated in copper casting applications, where the higher melt temperature and melt density further extends the value delivered.

THE CHALLENGE: INSULATING FEEDERS AND EXOTHERMIC POWDERS

The use of insulating feeders is common in aluminium sand casting applications with many products available on the market. These can be made from a variety of materials (fibres, spheres with organic or inorganic binders) and in a variety of shapes. The different insulating properties of these various materials result in different modulus extension factors with typical values between 1.4 and 1.5.

The insulating properties of these sleeves is often insufficient for the specific application. The feeder size may also be limited due to space constraints. In such instances, exothermic hot topping powders are applied to increase feeder performance and slow solidification.

Although the use of exothermic powders is common practice, the process is not without its challenges:

- The powders are manually applied, which can lead to variability in the amount and rate of addition.
- The time and labour involved can be significant, especially with large castings with many risers and sleeves.
- The exothermic reaction releases smoke and fume that must be extracted from the foundry environment.
- The surface of the feeder must be open during the moulding process, which can place limitations on the casting.

As a result of these issues, the idea to develop an exothermic sleeve formulation for non-ferrous applications was born, which led to the development of FEEDEX NF1 sleeves. Initially developed for use in aluminium applications, the technology has now also been successfully applied to copper casting.

THE SOLUTION: FEEDEX NF1 EXOTHERMIC SLEEVES

Exothermic sleeves have been widely used in the ferrous sector for some time. However, previous attempts at applying the same technology to non-ferrous casting had proved unsuccessful due to the lower pouring temperatures of non-ferrous alloys. An new formulation, specific to non-ferrous applications, was therefore needed with the following requirements:

- No negative impact or influence on the quality of the melt.
- Low emissions.
- Simple disposal of sleeve and sand.
- No negative impact on the sand system.
- Fast ignition.

The new FEEDEX NF1 recipe was developed to meet the above specifications. FEEDEX NF1 sleeves are highly exothermic, making the application of exothermic powders unnecessary. When the sleeve comes into contact with molten aluminium ($>600^{\circ}\text{C}$), ignition starts within 20 sec. and the exothermic reaction continues steadily, significantly

extending solidification time of the metal in the sleeve and thus delivering feed metal for a longer period (Figure 1). FEEDEX NF1 sleeves have a modulus extension factor of about 1.65. This offers several benefits:

- Manual application of exothermic powders is eliminated, improving process efficiency.
- It is no longer necessary to leave the feeder open, reducing emissions.
- Even with open FEEDEX NF1 sleeves, emissions are still reduced.
- Due to better feeding performance, sleeve dimensions are reduced, increasing casting yield and lowering remelting costs.
- The high-strength of FEEDEX NF1 sleeves makes them suitable for use on automatic moulding lines.

These exothermic sleeves are available in all common dimensions, and can be combined with breaker cores for easy knock-off – thus lower fettling costs. It is also possible to manufacture exothermic Williams cores with the FEEDEX NF1 formulation, which can be used in combination with sand feeders.

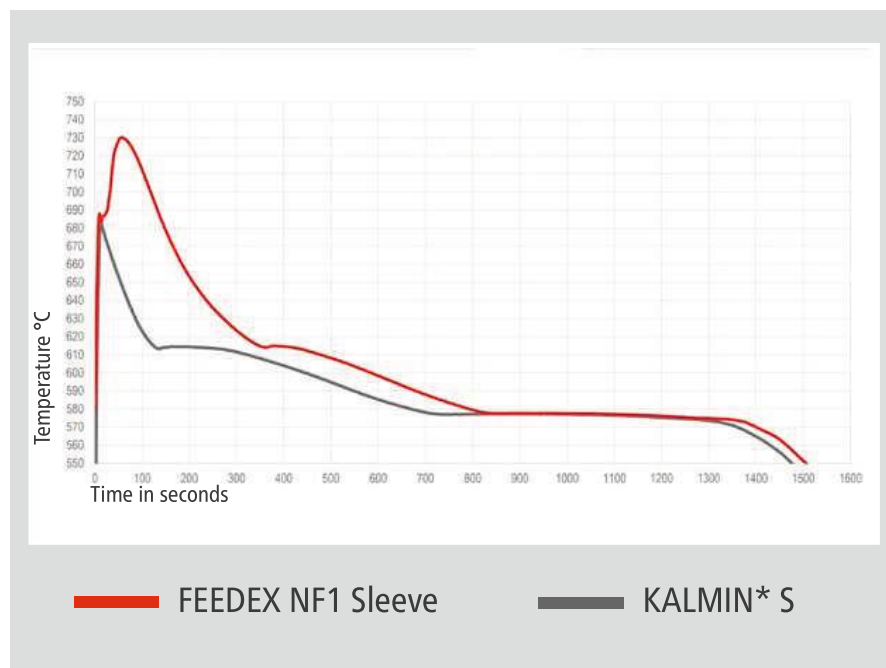


Figure 1: Typical cooling curve of a FEEDEX NF1 sleeve and a traditional KALMIN S sleeve. The exothermic reaction is clearly visible after about 20 sec. The released energy significantly delays solidification.

CASE STUDY: MARSBERGER METALLGUSS OHG

Marsberger Metallguss ohG (MMG) was founded in 1996 and is a medium-sized foundry, casting products via both sand and die casting processes. When sand casting an aluminium (AlZn-10Si8Mg) machine slide, the foundry was using eight KALMIN 50 insulating feeders and FEEDOL 20 exothermic powder to avoid shrinkage and ensure defect-free casting. Casting weight is 72kg of a poured weight of 82kg; casting temperature is 720°C.

After switching to FEEDEX NF1 sleeves, the foundry found it could reduce the number (to six) and volume of sleeves used to cast the machine slide – without impacting casting quality. The use of exothermic powder was also eliminated. As a result, the foundry saved 9kg of aluminium per casting. This significantly lowered the amount of fettling and remelting required, with a consequent reduction in both production costs and carbon footprint.

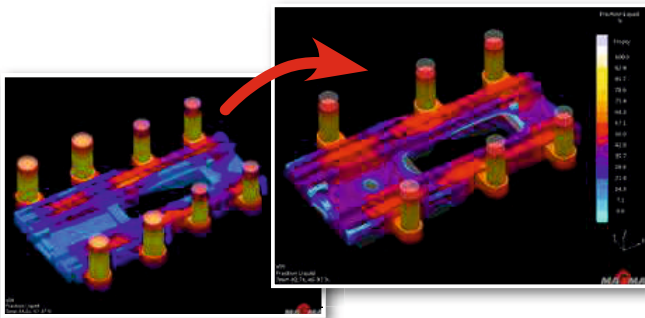


Figure 2: The application of FEEDEX NF1 exothermic sleeves optimised casting of an aluminium machine slide, reducing the number of sleeves required from eight to six, and eliminating the need for exothermic powder.

FEEDEX NF1 IN COPPER CASTING

Although FEEDEX NF1 sleeves were initially formulated for use in the aluminium sector, they have also now been applied to copper casting with excellent results. Due to the higher temperatures of the various copper alloys, the material ignites – and thus the exothermic reaction takes effect – even faster. And due to the higher density of copper compared to aluminium, the absolute saving in materials is even clearer.

These benefits were recently demonstrated at Pleiger, a Witten-based foundry that manufactures high-quality aluminium and copper castings for almost all applications. When casting in brass (CuZn34Al), the foundry was using eight insulating sleeves to achieve its requirement for zero shrinkage. However, this resulted in high material consumption and fettling costs, as well as negatively impacting productivity.

FEEDEX NF1 sleeves were implemented to improve feeding performance. As at MMG, this allowed the number and volume of feeders to be reduced: in this case to just four FEEDEX NF1 sleeves. The finished casting met all quality requirements, while saving 35kg of metal per casting. This reduces the amount of returns (lowering fettling and remelt). Overall, the solution helped to cut production costs and improve productivity at Pleiger. Carbon footprint was also reduced.

CONCLUSION

The application of FEEDEX NF1 exothermic sleeves brings a range of benefits to non-ferrous casting. These have now been demonstrated not only in the aluminium sector, but also in copper applications. The advantages include:

- High strength (can be used on automatic moulding lines)
- Quick ignition followed by a slow and steady exothermic reaction (significantly delaying solidification)
- No need for exothermic hot topping powders
- Lower emissions to the foundry environment (reducing emissions control requirements)
- Stable process
- Significant savings in molten metal (reducing fettling and remelting)
- Lower carbon footprint

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¹ Development of FEEDEX NF1 sleeves for aluminium is detailed in: Fröscher, A., 'Brand-new innovation for the non-ferrous sector: the exothermic feeder FEEDEX NF1', Foundry Practice No. 268, pp. 21-23.

ABOUT THE AUTHOR

Arndt joined Foseco GmbH in 2002 as a development engineer for Non-Ferrous. Later he moved to application engineering and became European Product Manager for Non Ferrous Methoding in 2012. With his wife and two children he lives close to Borken, enjoying the spare time with his family.

GET IN TOUCH WITH ARNDT



LinkedIn-Profile



arndt.froescher@vesuvius.com

ARNDT FRÖSCHER

European Product Manager
Methoding & Coating





FUTURE OF DIE CASTING WORLD AND INDIA'S POSITION

C. Surianarayanan - Consultant, Email : c.surianarayanan@gmail.com

The transition to electric vehicles (EVs) in India's automotive sector, particularly in the 2-wheeler and 3-wheeler segments, is likely to have several impacts on the demand for die casting dies. Die casting is a manufacturing process used to produce metal parts with high precision and dimensional accuracy. In the context of EVs, here are some ways the transition might impact the demand for die casting dies:

1. Change in Components: Electric vehicles often have different component requirements compared to traditional internal combustion engine vehicles. While certain parts like chassis, body panels, and suspension components will still require die casting, there might be a decrease in demand for engine-related components such as cylinder blocks and heads. However, the shift could lead to an increased demand for components related to battery casings, electric motors, and power electronics.

2. Lightweighting: EVs generally emphasize lightweight design to maximize range and efficiency. This could lead to increased demand for die-cast aluminum and other lightweight materials, as these materials help reduce the overall weight of the vehicle. Die casting dies would need to accommodate these materials effectively.

3. Complexity and Customization: Electric vehicle designs can be more flexible due to the simplified powertrain. This might lead to increased customization of vehicle designs and components. Die casting dies would need to be adaptable to produce a wider range of complex shapes and sizes.

4. Increased Volume: As the EV market grows, there could be an overall increase in the production volume of EV components. This might offset the potential decline in demand for certain traditional components.

5. New Tooling Requirements: Some components specific to EVs, such as battery housings and thermal management components, might have unique shapes and designs. This could require the

development of new die casting dies to accommodate these specialized parts.

In response to this shift, tool rooms (facilities where dies and molds are manufactured and maintained) should consider the following measures:

1. Diversification of Expertise: Tool rooms should invest in training and upskilling their workforce to handle the changing requirements of EV components. This could involve gaining expertise in working with new materials and designs.

2. Technological Adaptation: Embrace advanced manufacturing technologies such as computer-aided design (CAD) and computer-aided manufacturing (CAM) software to design and manufacture intricate and complex die casting dies more efficiently.

3. Material Knowledge: Develop expertise in working with lightweight materials like aluminum, magnesium, and composites, which are becoming more prevalent in EV components. Understanding the material properties is crucial for producing high-quality parts.

4. Flexibility and Customization: Tool rooms need to be adaptable to accommodate varying designs and shapes. This might involve implementing rapid prototyping and agile manufacturing practices.

5. Collaboration: Establish strong partnerships with EV manufacturers, suppliers, and research institutions to stay updated on industry trends and requirements, ensuring that the tool room remains aligned with the evolving needs of the market.

6. Sustainability Considerations: As the automotive industry shifts toward sustainability, tool rooms should consider implementing environmentally friendly practices in their manufacturing processes.

7. Investment in Research: Stay ahead by investing in research and development to innovate new die

casting techniques, materials, and designs that are optimized for EV components.

In conclusion, while the EV transition might lead to changes in the demand for specific components, it also presents opportunities for tool rooms to evolve and remain relevant in the changing landscape by embracing new technologies, materials, and approaches.

Along with this We in India lag quality steel from our country and depend on import to the fullest extent.

This has to be seriously viewed and measures to simplify the import to match the time line needed Facility for manufacturing has limitations towards the sizes to handle say for example few dies for the parts given below are not having a TOOL ROOM to take up



We lag for equipment's as well skilled team for manufacturing these dies. Education has to be connected with the industry and prepare engineers for coping this needs

The growth of the Electronics sector and the "Make in India" initiative can indeed have a significant impact on the tooling industry in India. As the electronics manufacturing sector expands and localizes production, the demand for specialized tooling will likely increase. However, there are several factors to consider when evaluating whether the Indian tooling industry can catch up with these needs:

1. Infrastructure and Technology: The tooling industry heavily relies on advanced manufacturing technologies, precision engineering, and high-quality materials. To meet the increasing demands of the electronics sector, Indian tooling companies need access to state-of-the-art manufacturing equipment, software, and processes. Investment in modern infrastructure and technology is crucial to ensure that the industry can produce the required tools with precision and efficiency.

2. Skilled Workforce: Developing a skilled workforce capable of designing, manufacturing, and maintaining complex tooling is essential. India would need to focus on education and training programs that produce engineers and technicians with expertise in tool and die making, mold design, CNC machining, and other relevant disciplines.

3. Research and Development: To meet the evolving needs of the electronics sector, the tooling industry must invest in research and development. This involves innovation in tool design, materials, and manufacturing processes to create tools that are optimized for the unique requirements of electronics manufacturing.

4. Collaboration: Collaborative efforts between tooling companies, electronics manufacturers, and research institutions can facilitate the exchange of knowledge and expertise. Such partnerships can lead to the development of cutting-edge tooling solutions that address the specific challenges of electronics manufacturing.

5. Quality Standards: The electronics sector demands high precision and reliability. Indian tooling companies need to adhere to international quality standards and certifications to ensure that their products meet global industry requirements.

6. Supply Chain Integration: A robust supply chain is essential for the tooling industry. This involves not only manufacturing the tools but also procuring the necessary raw materials, components, and technologies. Developing a strong domestic supply chain can enhance the industry's ability to meet increasing demands.

7. Government Support: Government policies that

promote manufacturing, innovation, and skill development play a critical role. Support in terms of incentives, grants, and initiatives that encourage R&D and technology adoption can boost the capabilities of the Indian tooling industry.

8. Adaptability and Agility: The electronics sector is known for its rapid technological advancements and changing requirements. The tooling industry must be adaptable and agile to quickly respond to shifts in demand and technology trends.

While challenges exist, the Indian tooling industry has the potential to catch up with the increasing tooling demands of the electronics sector, especially with the "Make in India" initiative encouraging local manufacturing. It will require concerted efforts from

various stakeholders including government, industry associations, educational institutions, and businesses to invest in the necessary infrastructure, technology, skills, and innovation. As the electronics manufacturing sector continues to grow, the tooling industry's responsiveness and ability to meet the evolving needs will be crucial in determining its success

IT is time for the Education department and the Industry ministry work hands together to bring the engineers and the manufacturing equipment to cat up before the major share is taken by the others???

Whole world is depending on the ASIAN countries and INDIA is on the top Platform.

Let's work together for the MAKE IN INDIA to come in reality other than the slogans.



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MSMEs and SMEs – their pathways and business resilience

Vishwas Kale, Managing Director, Vijayesh Instruments Pvt Ltd, Pune
vish1945@gmail.com

India is one of the fastest growing economies of the world. In the last half-decade, the economic growth has steadily accelerated and most importantly, remained very stable. One major factor is Small and Medium Enterprises (SME) sector. This article relates to both SMEs and MSMEs.

Many SMEs are young enterprises, which, when combined with their small scale, makes them a weaker counterpart for many standard market players, not only in terms of funding access but also for customers who might perceive small suppliers as too risky. Whether it is manufacturing or service industry, SMEs are increasing in the country. A majority of India's population lives in villages and small cities, the SME sector has helped to urbanize rural India.

However, SMEs face a number of challenges: some of them are listed and possible solutions:

Finance

Most businesses face problems related to manufacturing, timely purchase of raw materials, or even access to new technologies or acquire new skills due to lack of funding. Owners are unaware of the special financial privileges given to them by the government. This carelessness causes them to make some impractical financial decisions, leading to financial crises. The regulatory loopholes that cause a delay in getting licenses, insurance, and certifications also hamper the prospects of SMEs. Apart from this, India's SME sector usually does not enjoy the same creditworthiness as other big shot companies. It might be due to two reasons. First, SME owners usually do not have any asset in their name. The banks are unsure about their repayment capabilities. Lack of finance options, lack of liquidity, long paperwork, and approval process rob their chances of capitalising on real-time business opportunities.

SME owners should get knowledge of the latest schemes and policies of the government. Many private and public sector banks have also come forward to offer financial help to SMEs. The majority of them are giving business loans to small, medium, and micro-entrepreneurs. Low-interest rates, flexible

repayment policies, and easy processing are the highlights of these schemes.

Marketing and Management

The lack of managerial, entrepreneurial, and marketing skills seriously effect on the growth of the SME sector. The relevance of the right marketing strategies boost sales and acquire new customers. But the lack of professionalism and structured top management makes it difficult for the enterprises to meet the competition.

Lack of education, knowledge of market trends, consumer preferences, and access to advanced technology has also affected the development of this sector. Ineffective marketing strategies, the absence of market analysis, and identification of the target audience is a big challenge for SMEs. Limitations on expansion and modernisation, incorrect product development, and poor promotion of products are giving setbacks to SMEs in the competition.

To market any commodity, company need a brand name which is difficulty to get in the beginning. There are not enough funds to invest in brand building. SME owners must take the initiative to improve their stature in the competition. They must connect with a professional to refine their marketing skills, pricing policies, and network. A good consultant often save time and effort, and help to prevent pitfalls. However, most SMEs are lacked of experience in working with consultants. They often feel that the consultant costs is too high and they can handle it with their own staff. The government schemes to promote the sale of domestic goods should be studied.

Human Resources

Unfortunately, SMEs face a lot of inconsistencies when it comes to skilled manpower and labour law compliances. Skilled manpower is the backbone of a successful manufacturing enterprise. Moreover, the non-availability of a skilled workforce at an affordable cost is putting a block in the growth of the SME sector. Manpower shortage is the bigger issue for those SMEs which have matured and willing to grow. Manpower in numbers are available. But the problem faced by SMEs is skilled manpower. Despite being skilled, they have

problems of attitude, motivation and the right mind-set.

The middle level management is another problem. The single person keeps running here and there. Whether we make a pencil or an aircraft, the activities are same, only the magnitude or volume changes. Poor employee management and improper training and development facilities is also a big issue. Many companies also complain of poor industrial relationships and lack of manpower planning. SMEs should make efforts to organise the valuable human resource at their end. The entrepreneurs should also try to offer higher wages to the workers and retain them. To boost the productivity and morale of the employees, company should give on the job training

Family Business

Indian business has a history of family owned businesses. Such family business has been in practice since long, but changing its nature and structure over the times.

Earlier, trading and money lending was done in bazaars through shops, owned and confined to a few communities.

Large corporate business houses are still controlled by the respective families. Here the role of family patriarch is very critical and respected. This is somewhat similar to the Emperor Model in a family business. Family owned businesses continue to grow and they are a big part of the society. These also form the backbone of our economy and social related growth.

No doubt, the family owned businesses do face challenges. But they have many times shown better performances than public and multinational companies by finding solutions to overcome the limitations and also strong survival. It may not be incorrect to say that the financial performance of family owned businesses is much better than the non-family owned businesses. These include growth in revenue, gross margins, and earnings before interest, tax depreciation, reserves etc.

Indian families have traditionally a large emotional connect along with business aspirations. The commitment and passion for the business is outstanding. The next generation does get involved and participate in the business with a more progressive and energetic outlook. The older family members feel delighted when along with business expansion, wealth creation is created with the

support of the next generation.

Family businesses can no longer work to operate with old traditions and methodologies. It is necessary to change the traditional mind-sets. The era of disruptive technologies and digitization should be accepted.

It is noted that the methodology in such businesses has changed for its own survival. Due to the increase in the business size, the business families found it difficult to manage the operations and mobilize resources necessary for continuity. Therefore, the financial control of the businesses is gradually moving from the promoters to the finance providers.

Most business founders sadly find themselves at the brink of retirement with no planned succession. It could be within the family or from outside. Many family CEOs do not make a formal retirement plan. This has led to troublesome relationships, bad or delayed decision-making within the family. Many business families have decided or separated and partitioned for internal peace within the family and better management control. Of these, some succeeded and branched out bigger and better, while some failed and collapsed totally

The decision to bring an external professional is not easily acceptable for family businesses. There can be a degree of distrust, some family members worry about losing control of business that has been internally controlled for years. The cultural shock has to be accepted. Initially, there can be unreasonable expectations heaped upon the new executive. The professional can lead only if the family lets them be independent and relationship between promoter and executive is such that both are open to each other's advice.

But these obstacles, while arduous, are not insurmountable. And the results can be quite positive for the business, resulting in an external executive who brings a smart perspective on operations, wide-reaching personal connections and valuable global experience.

Information Technology

IT personnel are in high demand and it is very difficult for SMEs to attract good IT personnel. It is even more difficult to retain them. Good IT personnel are expensive and may not be affordable by most SMEs. Many of the employees in SMEs began from the ground up after working with the company for many years. Some of them are often holding supervisory and managerial positions. These employees may not

be IT literate and often have high resistance to the changes in the working process.

Most SMEs do not have formal procedure or often these are not documented. Furthermore, there is tendency for these procedures to change frequently. This makes it difficult for third party and newcomer to understand the existing business practices and match them with the IT process. As company grows, new managers are often introduced into the company. There will also be old managers who are promoted from the rank and file. Some of these managers may not been trained in the leadership and management skill. These uneven skill among the managers often caused conflicts during the implementation.

Technology

SME sector is quite behind in the race when it comes to technology. Many have limited access to IT education, knowledge, and information. It is restricting the growth of this sector. Many SME owners cannot afford to buy and use expensive technical equipment. Even if done, the workforce is not qualified enough to operate advanced technology. The result is, they are still using outdated machinery and methods of production. One important issue that comes in the way of SME development is the lack of online safety and security. Companies do not invest sizably in these measures and end up compromising their privacy and data.

SME owners should get involved in IT development programs. It will help them in understanding the latest technological developments in their sector and also increase their access to modern technology.

Some of the engineering and technical institutions such as IITs, National Institutes of Technology and CSIR Research Laboratories, are also providing R&D and technology related support facilities and services to the SMEs including training and skill development programs. However, access to these facilities are generally not easy, and often lack the business needs of entrepreneurs. But this opportunity should be tried.

Absence of appropriate technology will reduce the potential of SMEs, lower the demand for the product, switching to superior quality from rivals and lower profit margin, sometimes loses. There should be a strong focus on implementing the new age technology, through better awareness, adopting of best practices, developing indigenous technology as

well as technological collaboration with global partners.

Competition

A company has to fulfil the needs and exceed the expectations of its consumers to thrive in the competition. And any business that is not progressing with time will move backwards over time. Many SMEs still follow the traditional methods in marketing and advertising. Moreover, sales promotion and advertising are quite weaker or less effective than those of multinational companies.

Owners must be open to have changes in business strategies according to the response of the customers. They should identify and analyse the causes of their low sales. Excellent customer service and high-quality products at affordable rates are the secrets to success

Leadership

What is leadership? It does not mean "taking charge" or become a dictator, but there are many different ways of leading. It is inspiring and helping a group of people towards goal. The effect of effective leadership is people working together to achieve a goal. Leadership skills can help entrepreneurs to contribute to the achievement of goals of the group, to focus everyone's energy and resources on the task of achieving the goals. As leaders they should encourage enthusiasm and a sense of belonging among group members by showing friendliness- others will be more interested to share ideas if entrepreneurs are interested in them as people, understanding- everyone makes mistakes. They have to be constructive, tolerant and tactful when offering criticism, fairness-equal treatment and equal opportunities lead to an equally good effort and goodwill- be interested in-group goals than your personal goals

If everyone is for working toward team goals, then everyone should be reminded of the group's purpose from time to time, provided encouragement and motivation by showing appreciation for good ideas and extra effort, harmonize differences and differences between group members by stressing compromise and cooperation and most important- involving everyone

Stages for growth - decide where you are

Idea: People in this stage have an idea and want to start a business. They are still researching their service or product and potential customers.

Development: This is all about market validation, ensuring that their product or service has an existing market, and actually solves the problem identified in the Idea stage. This is where proof of concept and prototyping come in to test the market.

Launch: Here entrepreneurs and SMEs have decided to start a business and are actively building their market and refining their product or service. They might not have many or any customers, but they are ready to starting a business.

Survival: Entrepreneurs and SMEs in this stage have a business plan and are growing their revenue streams with new clients and customers. They are not booked fully for capacity yet, but now they have a viable business model.

Growth: Here SMEs are working at full steam, but the demand for their goods and services outstrips their ability to meet it. At this point, they have to delegate responsibilities and begin to separate from the day-to-day management of the company.

Expansion: SMEs have figured out what caused inefficiencies at Stage 4, have fixed it, and are now running effectively with rapid growth. They have the team, financing and support they need in order to focus on their core competencies. Alternately they have a specific plan in place for enhancement

Maturity and Scaling: SMEs that reach maturity often find that business levels off and may even slow down. This may be normal and to be expected. Other businesses will choose to expand further, after they have matured in one market. They will attempt to replicate their success, or scale their business into other markets

Business Resilience and Continuity

Resilience means, an ability to recover from or adjust easily to misfortune or change, or to be successful again after something difficult or bad has happened. Resilience is the ability of a business to withstand, adapt, and thrive in the face of shocks that are internal and external, as well as known and unanticipated.

Some of the components of being resilient are – competence, confidence, connection, character, contribution, coping, and control.

The skills needed in leadership may be stated as

- Create trust in his/her ability to cope with the situation
- Stay connected with sources of support
- Speak about what the organization is going through
- Generate positive emotions
- Establish an attitude of survivorship
- Remain helpful to others

Business resilience is very important to any business. Without it, few businesses are likely to recover from unexpected disruptions or adjust quickly enough to sudden changes in regulatory requirements or market demands.

The most critical threats and to be attended quickly are:

- Cyber attacks and data thefts
- Physical Thefts, Frauds, Vandalisms etc.
- Disturbances in utility supplies, like electricity, water etc.
- Supply chain disruption
- Availability of key skills
- Fire, floods etc.

A continuity plan could consist of:

- Identify scope of the plan
- Identify key business sectors, critical processes and workings
- Identify dependencies between various business sectors and workings
- Determine acceptable downtime for each critical function.
- Create a plan to smoothly maintain operations.

Every organization has its own individual structure, therefore solutions should be found and used to meet the needs of business disruptions. Customer relationship plays a major role. The organisation must show them the confidence that organisation's service is dependable and can be relied upon at all times. The creation of a facility management team can help in the business resilience process. The team can prepare the facilities and the workforce with the right amount of resources and processes to re-establish business-as-usual as quickly as possible

The strategies to build business resilience could be:

- Reimagining the customer experience
- Reshaping the workplace culture to ensure that it is

supportive.

- Reinforcing the leadership's core values, refreshing the leadership development plan
- Regularly igniting the workforce.

Key items to include in a business continuity plan may be:

- Business Impact Analysis
- Essential Functions
- Vital Records/Resources Plan
- Risk Assessment
- Risk Management Plan
- Readiness Handbook
- Alternate Site Procedures
- Emergency Response Plan
- Communications Plan
- Delegation of Authority
- Incident Command Structure
- Succession Plans
- Return to Normal Operations Plan

Exports

Global business provides with hundreds of enhanced opportunities. Moreover also helps to get some potential valued customers. It could be the golden key to fast growth opportunities. One can increase the sales considerably because of newer

markets where to start the sales in a fresh way.

Advantages could be:

- Need not depend on markets in India.
- If the business is affected by certain seasonal changes or deviations in demands, then can have a of re-stabilizing business by tapping other markets where entry is possible..
- Can I get a visualization of the total corporate market to exploit it to the full benefit.
- One can have no bounds for business. There are different ways to compete with the foreign companies, and sometimes can even take the risk for company benefit.

Considering international markets, there are so many opportunities that it could be beyond imagination. The obvious avenues that come with many opportunities are the markets in Middle east, Mexico, Canada, and Europe. There are many other countries, like Croatia, Lithuania, Slovakia etc. which do exist but very few from India approach them. Those markets remain untapped.

Conclusion

An effective business continuity plan will frame the ability to respond, resume, and recover. The business continuity plan becomes a lifesaver in times of disruption.



GDCTECH 2023

International Conference & Exhibition

Aluminium Diecasting Industry

1-2-3 December 2023
Chennai Trade Centre, Chennai, India



Don't miss these opportunities

- › **Project Presentations during the Conference**
- › **Best Casting display in Exhibition Hall**
- › **Product Presentations in Exhibition Hall**
- › **Quiz Programme Finale**

MINDA INDUSTRIES LTD.

(Alloy Wheel 2W Division)



- FIFO at all stages of production cycle.
- Single piece flow
- Unidirectional flow
- Minimised Material Handling.
- Raw material to finished product in one shed
- Casting movements only through conveyers or AGVs.
- Flexible production set-up for variety of models
- Training room / DOJO room for operators Training
- Implementation of Industry 4.0

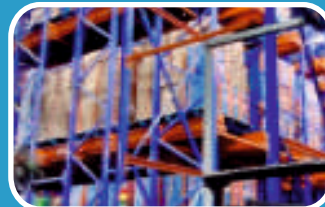
- Minda Industries Ltd has set up fully integrated manufacturing facility for Alloy wheel 2 wheeler.
- Facilities include state of art infrastructure for Foundry, Machining and Painting (Powder Coating & Liquid Painting) providing one stop solution
- Flexibility to manufacture a variety of sizes (range 10-19 Inches) & surface coats
- Location: Supa Industrial Area- 86 KM from Pune Airport
- Land: 20 acres
- Built-up: 24000 sq. mtr.
- Capacity: 4 Million Wheels p.a. , expandable up to 6 Mn



Robotic CNC Cells



Smart Conveyers



Auto Storage System



Product Portfolio



AGVs



CNC Robot



Pouring Robot



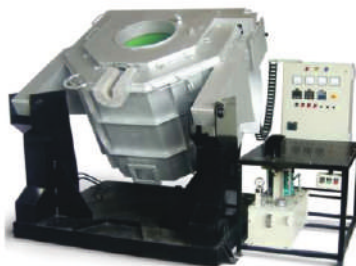
Sklenar-type Melting Furnace *"Bulk Melting solutions"*

Salient Features:

- Rugged construction with smooth & jerk-free tilting.
- Efficient combustion system.
- Easy charging of material into the furnace.
Manual or Skip Hoist type.
- Easy dross cleaning.
- Long refractory life.
- Rapid & economical melting.
- Low melt loss.



Electrical Stationary
Furnaces



Electrical Hydraulic
Tilting Furnaces



Nitrogen Degassing
Machine (auto)



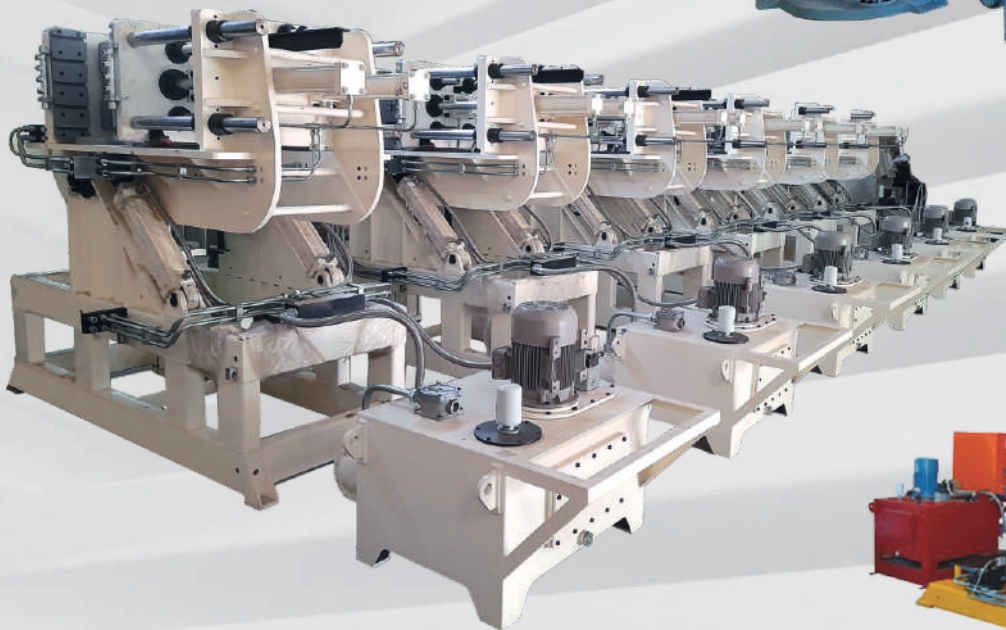
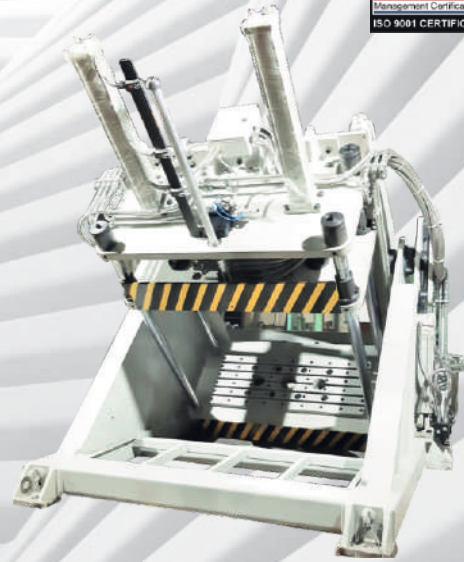
Density Index Unit

Other Products for the Aluminium Industry

- Electrical Furnaces (Crucible)
- Fuel Fired Furnaces
- Electrical & Fuel Fired Tilting Furnaces
- Heat Treatment Furnaces
- Rotary Degassing Unit
- Density Index Unit

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MSMEs and SMEs – their pathways and business resilience

Anil S. Kulkarni, Managing Director, Pooja Castings Pvt. Ltd.
askulkarni@poojacastings.in

Expenditure to be done in Purchasing Machinery or equipment for Industry is normally called as CAPEX
Broad Classification of CAPEX requirements

- 1) Replacement of Existing Old Machines or the Machines not giving consistent results.
- 2) Meeting old or new statutory compliances.
- 3) Line balancing in existing lines.
- 4) Getting ready for increased quantity/Quality requirements of existing components of existing customers
- 5) Additional resources for new Products developed.
- 6) Additional resources for new processes planned.
- 7) Additional resources for new customers planned

FOR DOING JUSTIS OF PUCHASIG ACTIVY TO BE STARTED IN ADVANCE

Replacement of Existing Old Machines or the Machines not giving consistent results.

In Preventive Or Breakdown Maintenance we identify such machines. Normally data of two figures help us in taking decision. MTBF and MTTR.

MTBF : Mean time between failure .

MTTR : Mean time to repair

From our quality audits we come to know CP/CPK values required for the operation or process

Many software's are now available at reasonable cost for the Asset managements.

Other tools like finding out OPE, (overall plant /process efficiency) COPP,(cost of poor productivity) COPQ, (cost of poor quality, will lead us to such less productive machines .

If we judiciously study and monitor these reports we get plenty of time for taking decision for replacements.

Meeting old or new statutory compliances

Foundry is identified as Hazardous process

We come across such requirements from statutory audits , customer audits or when we want our organisation to be upgraded to certain national or international standards like OHSAS , ISO 14000 or ISO

45000 . Equipment's for

Health

Safety

Fire

Effluent treatment

Managing Hazardous Waste

All these equipment's are very costly and essential for running the industry . Authorities give us sufficient time for installing. We need to prioritise, purchase and install for smooth working of industry.

- 1) Line balancing in existing lines.
- 2) Getting ready for increased quantity/Quality requirements of existing components of existing customers
- 3) Additional resources for new Products developed.

4) Additional resources for new processes planned

5) Additional resources for new customers planed

For all these requirements, carefully thought AOP (Annual Operating Plan) is very useful.

Normally most of the mid-scale companies start process of making AOP in the month of Dec – Jan. BY this time a fair understanding of next years requirements can be made by our customers.

In New Product Development, we identify requirement of additional capex required during development and is available.

As per growth plan every industry is making their three year or five-year plan for projections of additional process, customer or segment to be ventured

By using our judgement, we can finalise the projected sale and our requirement of CAPEX is ready.

WE GET SUFFICIENT TIME TO FINALISE OUR CAPEX REQUIREMENT.

PROCESS OF PURCHASING

Having finalised requirement of our CAPEX , purchase plan activity start with generating clearly defined Indent by the respective process owner who in turn is going to assure ROI to company . He is supposed to do brain storming with his team and fix specifications required , all attachments required / not required .

Normally it is seen blunders happen at this stage if

management do not involve in understanding the requirements. With support of friends or consultants in the industry we need to finalise brand for further discussions.

Get min three quotations from different manufacturers with detailed brake up of landed cost, especially when we are comparing imported and domestic manufacturer. Tabulating and studying in details help us a lot. Forgetting or not considering cost of insurance at a time may work out very costly.

Finalisation of price, especially technical equipment where we have not purchased earlier, care must be

taken to consult an expert in that area or involving him for negotiating along with you. At this stage your judgement of cost compensation you are sure to get from market or identified customer is very important. Very important part is that while finalising deal of CAPEX buying care is to be taken that source of financing is finalised. many entrepreneurs have landed themselves in to trouble by diverting short term capital for funding their long-term requirement.

HAPPY CAPEX BUYING



GDCTECH 2023

International Conference & Exhibition

Aluminium Diecasting Industry

1-2-3 December 2023
Chennai Trade Centre, Chennai, India

FIVE POSSIBLE TAKE AWAYS

Mark your dates on 1st, 2nd, 3rd Dec 2023

- 1 **Technical Presentations & Panel Discussions**
- 2 **Buyer Seller Meets**
- 3 **Over Hundred Exhibitors**
- 4 **Students Outreach**
- 5 **Many Networking Opportunities**

FOR DETAILS PLEASE CONTACT

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What Leaders Say...



1st, 2nd, 3rd December 2023
Chennai Trade Centre
Chennai, India



"Technical Papers Committee in GDCTECH has embarked upon a journey towards new horizons under the leadership of Dr. Aniruddha Karve."

D. K. Sharma

Consultant
Former Executive Vice President
GODREJ & BOYCE MFG.CO.LTD.
Former President TAGMA (India)



"Technology providers always express their confidence in GDC Tech Forum. This is seen in more than 80% of the exhibition space being booked well in advance. Catalogue Show is an excellent idea for promoting small and new enterprises as well as international technology providers."

Subodh Panchal

Managing Partner
Kastwell Foundries
Past President IIF



"It is rewarding to have such August personalities as chief guests"

Mr. Ganesh Mani,

COO, Ashok Leyland Ltd.

Chief Guest - Conference Inauguration

Dr. Shankar Venugopal,

VP & Head Technology, M&M

Chief Guest - Exhibition Inauguration

Mr. S. Ravi,

CMD, Craftsman Automation Ltd.

Keynote Speaker"

Amol Bhagwati

Managing Director
Inspiron Engineering P. Ltd.



The success story of GDC Tech over a decade is deciphered as dedicated and brilliant efforts by the astute team members. This is an excellent example of Teamwork

Ajay Tannu

Executive Director
OMR Bagla Automotive Systems Ltd



While inspiring the women engineers, M/s Inspiron Engineering has given special privilege to them. Now the women delegates can enjoy 30% discount in the Registration fees of the Mega Event and participate in the event "HUM BHI KUCH KAM NAHI"

Mohini Kelkar

Director (Sales & Marketing)
Grind Master Machines Pvt Ltd



The Buyers Sellers Meet is a unique destination where growing expectations of buyers find their way through enhanced skill sets of foundries in terms of Technology, Quality, Logistics and Business development and wider the scope for export.

M. M. Umadi

Executive Director
Sipra Engineers Pvt Ltd



I believe this Quiz Programme serves as a valuable resource for young people to effortlessly expand their knowledge. A commendable initiative by GDC Tech.

Kundan K. Jha

CEO, LM and PS Domain
Uno Minda Limited



GDC-Tech's efforts in bringing industry & academia onto a common platform will help advance the Indian Die-casting Industry

Vivekananda Lokre

Managing Director
Pyrotek India P Ltd



The Design Contest helps young engineers to mend, alter and align their concepts with the growing requirements of industry. GDC tech is thus helping them to pave the way to the upper echelons of the business world.

Viren Joshi

Chairman
Odyssey Avenue Partners Pvt. Ltd.



The Project Competition facilitates young engineers to head towards their career path building. Kudos to GDC tech for this great initiative.

Rajesh Mishra

Managing Director
Vulkan Technologies Pvt Ltd



GDCTECH Forum is a very novel forum in India to bring together Aluminium casters, from big to especially small ones. The Mega Event is a must participating for those who wish to enhance their competence by adopting new technologies and explore new markets globally.

Vishwas Kale

Managing Director
VIJAYESH INSTRUMENTS PVT. LTD.



"Keeping strong Metal Treatment technologies at the core, the 360 degree view of the event reveals the importance, interconnection and interdependence of Measure and Test, Instrumentation, Powder coating, Welding, Safety and Packaging industries for Die casting industry. I suggest GDC tech should give wide exposure to these industries at the Mega event together with the fundamental Casting Technologies."

Prasad Chavare

Managing Director and CEO
FOSECO INDIA LTD.

***WE WILL MEET
AT MEGA EVENT AT CHENNAI***



Replacement of Heater is now hassle-free and that to be in very little time....it's a big deal....

KALYANI ENTERPRISES has launched New Electrical Aluminum Melting/Holding Furnace with a single shank heater, With this new technology, we can replace the damaged heater without removing the Crucible and without Shutting down the furnace for long time. Due To This Feature, You can Save Lots Of Time And Money.....

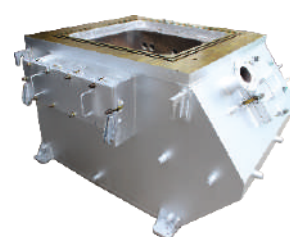
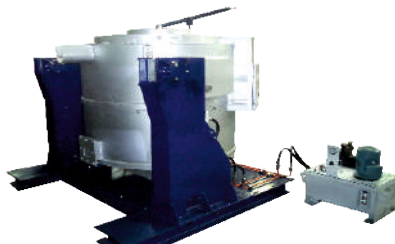
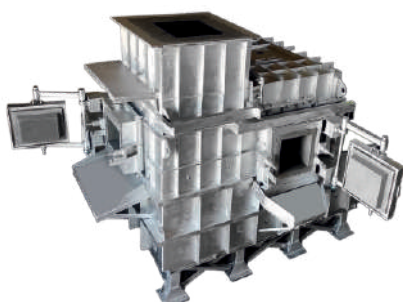
Note :- you can use this type of heater in your existing furnace with small modifications

KEY FEATURES

- No need to remove Crucible
- No need to cool down the furnace at room temperature
- Reduce production losses thus reduce energy consumption
- Increase crucible life
- Easy to remove & replace
- Heater replacement cost will be 40% due to new single leg Design
- Reduce Down time.
- Simple Design



Heater Replacement time			
Activity	Brick Lined Aluminium Melting furnace	Ceramic Insulated Aluminium Melting furnace 2 Leg Heater	New Design Aluminium Melting furnace 1 Leg Heater
Cooling time	15 - 18 Hrs.	10-12 Hrs	No need to Cool down*
Top Plate Removing time	15 Min	15-30 Mins	15-30 Mins
Crucible Removal time	15-20 Min	15-20 Min	No need to remove crucible
Failed Element identification	15-20 Min	15-20 Min	15-20 Min
Element Replacement time for 1 Element	30-45 Min	30-45 Min	10-15 Min
Crucible Installation Time	15-20 Min	15-20 Min	No need to remove crucible
Top Plate Fixing time	15 Min	15-30 Mins	15-30 Mins
Heating Time for 1st melt	4-6 Hrs	3-4 Hrs	0.5 - 1 Hrs.
Total Down Time	17-20 Hrs.	15-19 Hrs.	1.5 - 2.6 Hrs.
	Time saving compare to Brick lined furnace		15.5 - 17.4 Hrs.
	Time saving compare to Fibre lined furnace		13.5 - 16.4 Hrs.



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Brochure



Contact Us

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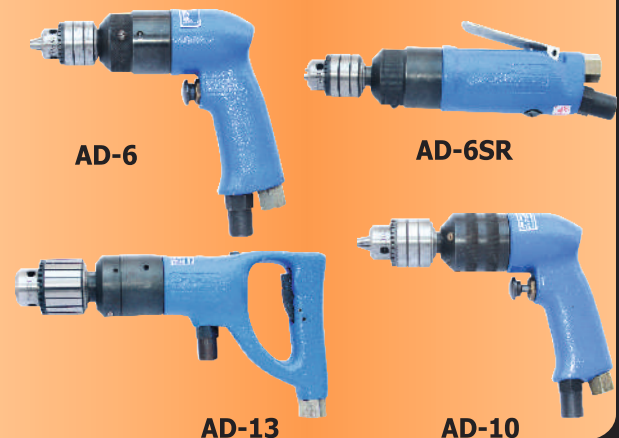
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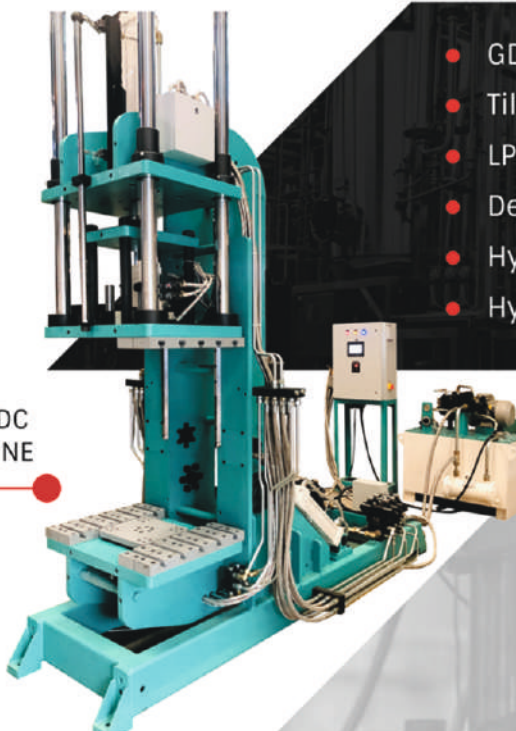


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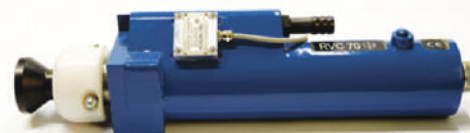
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Faculty Mr. Shrikant Bhat & Mr. Anand Joshi



Two Days Inhouse Training Programme for
Brembo Brake India Pvt Limited on Casting
Technology (GDC/PDC)

held on 25-26 August 2023

Faculty Mr. Shrikant Bhat

Two Days Training Programme On
Melting and Molten Metal Treatment of Aluminium
Casting Alloys & Casting Defects - Analysis and
Remedial Measures

at Ahmedabad Held on 12-13 September 2023

Faculties Mr. R. V. Apshankar & Mr. C. Surianarayanan
Quiz competition was also held on 12th September at
the same venue. Five teams participated and the
winner was SNAM ALLOYS PVT. LTD.



TECHNOLOGY FEAST



TECHNICAL CONTRIBUTIONS BY EXPERTS FROM

Deliver defect free die casting tool cross leveraging ML & Physics based process simulation	 ALTAIR ONLY FORWARD ALTAIR ENGINEERING INDIA PVT. LTD.
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3D Component – Tomography (NDT & 3D Xray)	 BLUE STAR PRASANTH K S & SPECTECH CS BLUE STAR ENGINEERING & ELECTRONICS LTD.
"ECO systems, Co2 Foot prints and Sustainability (Green Foundry concept)"	 Brakes India Private Limited BRAKES INDIA LTD.
High speed milling concepts with Dry Milling	 brother at your side BROTHER MACHINERY INDIA PVT. LTD.
Cost Effective Body in White Production with Large Di-Casting Cells	 BUHLER BUHLER (INDIA) PVT. LTD.
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Innovations and Advancement in Toggle Free (2-Platen) Technology Machines for Higher Productivity, Quality, Sustainability and Digitization in the Diecast Industry	 Noricam Group DISA India Limited
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Long-lasting die coatings for gravity & low pressure die casting	 JOHN WINTER JOHN WINTER & CO LTD
EV & Die casting Industry - EV Market Reality Check (EV v/s Hybrid)	 KPMG KPMG A
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Cost Effective Products for Aluminium Foundry	 Morgan MORGANITE CRUCIBLE INDIA LIMITED
State of Die Casting in North America	 NADCA NORTH AMERICAN DIE CASTING ASSOCIATION
Adoption Challenges of 3D printing and need for DFAM to assess fit for use	 NIMS SCHOOL OF DESIGN NIMS - SCHOOL OF DESIGN
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Die-casting 4.0 – A Case Study on How Die-casting-operations Can Benefit From Computer Aided Production and Resource Planning and Controlling From Inquiry to Dispatch All on One Standard Platform	 RGU RGU ASIA PTE. LTD.
Energy & Waste Reduction	 TVARIT TVARIT GMBH



"We thank all experts who have confirmed their participation well in advance"

* Subject to change..

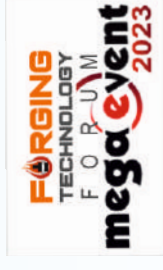
THIS WILL HELP INDUSTRY TO PLAN FOR PARTICIPATION

CONCURRENT EVENTS

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1-2-3 December 2023
at Chennai Trade Centre, Chennai, India

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Complete Degassing Solution

Morgan has introduced a complete solution to degassing needs of the foundries.



Mobile Degassing Unit



Hoist-Able Degassing System



Reduced Pressure Tester



Density Index Measuring System