Dedicated to Diecasting Industry

ALUCAST®

PARTNER IN PROGRESS FOR ALUMINIUM AND DIE CASTING INDUSTRY

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Bangalore	9	29	8	**46**
Chennai	8	23	10	**41**
Coimbatore	1	6	2	**9**
Delhi	20	45	11	**76**
Others	6	24	2	**32**
Overseas	5			**5**
Pune	22	76	28	**126**
TOTAL	**71**	**203**	**61**	**335**

INDEX

Editorial - N. Ganeshan	Page 03
Simulation of Heat Treatment Process for Aluminium Alloys - TRANSVALOR S.A. France	Page 04
ALUCAST News	Page 08
Friction Stir Deposition: The Future of Repair, Recycling, and Sustainable Manufacturing - Vinit Jha, ETA Technology Pvt. Ltd.	Page 09
Gold Standard in Aluminium Die Casting ...the Alubee Way - G Praburam, Alubee Die Casters Pvt. Ltd.	Page 11
The Evolving Role of Helium Leak Testing in Modern Manufacturing - Sunil Joshi | Tekman India Pvt. Ltd.	Page 14
ALUCAST Snippets	Page 17
ALUCAST 2026	Page 19
Bühler Page	Page 22

ALUCAST® PARTNER IN PROGRESS FOR ALUMINIUM AND DIE CASTING INDUSTRY

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N. Ganeshan
Editor

Dear Readers,

In today's competitive manufacturing scene, the foundry industry stands at the crossroads of tradition and transformation. Casting is an art, which is as old as civilization itself and has been profoundly reshaped by modern technology. From 3D printing and simulation software to automation and artificial intelligence (AI), technological integration is redefining productivity, sustainability and product quality in casting processes. For aluminium foundries and wider casting community, embracing these innovations is no longer a choice but a necessity for survival and growth.

One of the most significant advances in recent decades is the widespread adoption of computer-aided design (CAD) and casting simulation software. Tools such as MAGMASOFT, ProCAST, FLOW-3D and other comparable simulation tools enable foundry engineers to visualize the solidification process, predict defects and optimise gating and riser systems before a single casting is poured. This digital prototyping minimizes costly and time-consuming trial & error runs and enhances casting yield. By simulating thermal gradients, flow turbulence and shrinkage tendencies, foundries can achieve higher dimensional accuracy and fewer rejections. This data-driven approach not only saves material and energy but also promotes a culture of precision engineering.

Additive manufacturing (AM) is perhaps the most revolutionary technology entering the casting arena in the recent past. 3D printing of sand moulds, cores and even patterns enable greater design flexibility & lower tooling time. Complex geometries & complicated cooling channels that were once impossible or uneconomical to make using conventional methods can now be realized quickly and cost-effectively. For aluminium foundries, 3D-printed sand moulds eliminate the need for physical patterns, speeding up product development and enabling rapid prototyping. This capability is beneficial in sectors like aerospace and automotive, where lightweight, intricate components are in high demand. Moreover, additive manufacturing aligns perfectly with sustainable manufacturing goals, like reducing waste, energy consumption and inventory control.

Modern casting facilities are increasingly adopting robotic automation to handle repetitive, hazardous or precision-demanding tasks. From Die handling and pouring to fettling and inspection, robots enhance consistency, safety and throughput. Coupled with programmable logic controllers (PLCs) and Internet of Things (IoT) devices, foundries can monitor and adjust operations in real time. The concept of the "smart foundry", a digitally interconnected environment where machines communicate and adapt dynamically, is fast becoming reality. Real-time process monitoring helps identify inefficiencies, predict equipment failures, and ensure consistent quality. This shift toward automation is not about replacing human skill but about empowering foundry personnel to focus on higher-value tasks such as process optimization and innovation.

With vast amounts of process data being generated daily, artificial intelligence (AI) and machine learning (ML) offer powerful tools for performance improvement. AI algorithms can analyse casting data to identify hidden patterns, predict defects, and recommend corrective measures even before problems occur. All in all, Artificial Intelligence and Data Analytics have started turning Information into Insight. For instance, predictive maintenance powered by AI can alert engineers when a furnace, pump, or die-casting machine is nearing a fault condition. Similarly, process optimization algorithms can fine-tune parameters such as pouring temperature or mould preheating based on previous results. By converting data into actionable insights, foundries can achieve consistent quality and reduce downtime, that are key factors for profitability in current production techniques.

Modern technology is also helping us respond to growing environmental and regulatory pressures. Energy management systems, waste heat recovery units and recycling technologies are enabling foundries to minimize carbon footprints. The use of renewable energy sources, along with real-time monitoring of energy consumption, ensures that production is not only efficient but also environmentally responsible. Sustainability and Energy Efficiency are major factors to a technology with a Green Purpose. In aluminium casting specifically, advancements in melt treatment and filtration technologies have improved metal purity and reduced scrap rates.

While technology transforms processes, people remain at the heart of every successful foundry. The adoption of advanced technologies demands continuous learning and skill development. Training programs, workshops, and academic–industry collaborations are vital for equipping the next generation of metallurgists, engineers, and technicians with digital competencies. The Human Element in foundries need training for the Technological Future. Our Aluminium Casters' Association has a unique role to play here in bridging traditional craftsmanship with modern innovation through shared knowledge, seminars and research partnerships. The effective application of modern technology in casting processes is not merely about adopting new tools—it is about transforming the very philosophy of manufacturing. It is about combining our deep metallurgical expertise with data-driven intelligence, sustainability, and innovation. The challenge before us is clear. We need to embrace technology not as a disruptor but as an enabler of excellence, a path way to Casting a Smarter Future.

***

Simulation of Heat Treatment Process for Aluminium Alloys

Julien Barlier, Nadine Kosseifi, Stephane Grosso | TRANSVALOR S.A. France

Abstract

Heat treatment processes are essential to fine tune the mechanical properties of a part. Controlling and predicting the effects of heat treatment are increasingly crucial for the manufacturing industry. Heat treatment involves carefully controlling the heating and cooling of a metal to modify its microstructure and improve its mechanical properties. For cast parts, this often means hardening the surface (case hardening) or enhancing the overall strength and toughness.

The key objectives of heat treatment processes are microstructure evolution, temperature evolution, distortion, residual stresses, anywhere in the part Simulation technology will help to predict the above well and helps to achieve objectives like.. reduction of shop floor trails and safety risks and improvement of working conditions; process and quality control; productivity and flexibility; and reduction of environmental footprint. We would like to present the importance of simulation technology in the casting heat treatment process.

INTRODUCTION

TRANSVALOR S.A. is a France based organization and which is one of the leading players in the field of simulation software for material forming and casting processes. Transvalor is born of research and has maintained a strong association with the Center for Material Forming research center (CEMEF - Mines ParisTech), whose main activities are centered around different metallurgical processes with numerical computation.

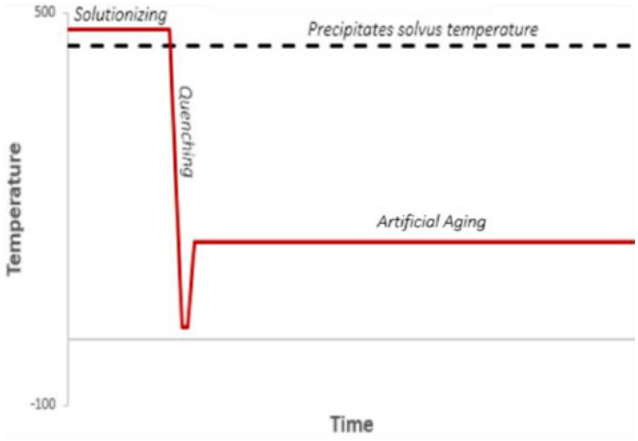
TRANSVALOR constantly offering the best solutions to our customers by integrating advanced features and making it as an integral part of their regular activities. The microstructure of the final parts is a crucial aspect of the casting process that industrial manufacturers must master to compete.

The weight reduction of the transportation systems is a major challenge for the industry, and the margin reduction prohibits the traditional trial and error on the shop floor. Simulation technology is one the best ways to obtain quick responses to these challenges.

One of our unique products SIMHEAT® is the effective solution to simulate heat treatment processes of metallic alloy (including carbon steel and aluminium Titanium) and obtain true insights of workpiece distortion, residual stress, and microstructural evolution. These models predict the local physical and mechanical properties in aluminum components in response to precipitation hardening on well-known Al-alloys of the 2xxx, 6xxx and 7xxx series.

Aluminum is a durable light material that is easy to cast or form. It is only through heat treatment, however, that it obtains the necessary mechanical properties for industrial purposes.

Aluminum heat treatment cycles: Heat treatment of aluminum is mainly based on precipitation mechanisms. There are three classic stages as shown in the diagram below.



Aluminum heat treatment cycle

Aluminum alloy solutionization: The solutionizing phase is intended to eliminate precipitates in the matrix of the material. This complex phase is not yet simulated. Instead, the hypothesis is made that the material properties are reinitialized to an ideal state.

Aluminum alloy quenching: The quenching phase accelerates cooling to avoid the formation of a coarse non-hardening precipitate, and to keep the solid solution at lower temperatures.

In **SIMHEAT**®, quenching is represented through two models:

- A phenomenological model based on the calculation of a quenching factor, QFA, which measures the effectiveness of quenching.
- A thermomechanical model that gives access to residual stresses and predicts potential cracks due to quenching.

The quenching factor quantifies the ability of an aluminum alloy to harden during quenching. If the quenching is sufficiently energetic, this factor is worth 1 and the alloy has the maximum capacity to harden. In the opposite case, if the quenching is slow, this factor is worth 0 and the capacity of the alloy to harden is null.

$$QFA = \frac{(\sigma - \sigma_{min})}{(\sigma_{max} - \sigma_{min})}$$

Where σ is the hardness

$$QFA=1 \Rightarrow \sigma = \sigma_{max}: \text{fast quenching}$$
$$\&$$
$$QFA=0 \Rightarrow \sigma = \sigma_{min}: \text{low quenching}$$

Where:

- σ_{min} = pure aluminum hardness (1xxx H2 or H4): ~30 HV
- σ_{max} = max hardness obtained at the Jominy curve: 175 HV

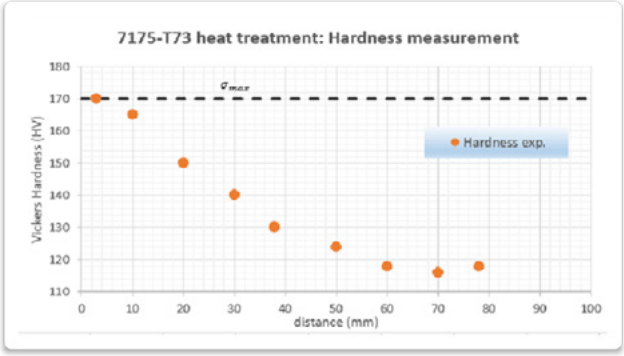
The QFA factor depends on the amount of untransformed solute during quenching. In the anisothermal cooling description, the QFA factor is given by:

$$QFA = \exp\left(\sum_{j=1}^{j=n} -\frac{\Delta t_j}{\frac{K_2}{n} \cdot \exp\left(\frac{K_3 \cdot K_4^2}{R \cdot T_j \cdot (K_4 - T_j)^2}\right) \cdot \exp\left(\frac{K_5}{R \cdot T_j}\right)}\right)$$

The parameters K2, K3, K4, K5 and n are defined using a Jominy test. Where:

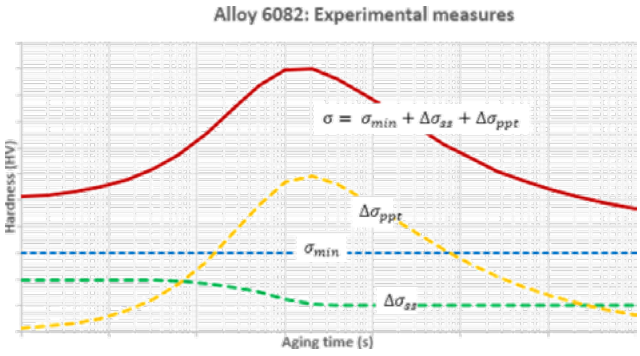
*K*2 = constant related to the reciprocal of nucleation site numbers
*K*3 = energy required to form a nucleus (J.mol-1)
*K*4 = homogenization temperature
*K*5 = diffusion activation energy
n = 1 (hardness varies linearly with the amount of solute available)

Jominy test for hardness measurement



Measurement of Vickers hardness as a function of distance

Artificial ageing of aluminum alloys: After quenching, an artificial ageing stage is performed at temperatures normally between 100 and 200 °C. The goal is to control the rate of precipitates that harden the metal. Artificial ageing is characterized and simulated using a Shercliff-Ashby method which establishes that the final mechanical resistance is the sum of the pure aluminum strength (σmin), of hardening due to the formation of a solid solution (Δσss), and hardening due to second-phase precipitates (Δσppt) as shown below:



Coupling QFA & Shercliff-Ashby models

By coupling both the QFA & Shercliff-Ashby models, it is possible to fully simulate a consecutive quenching and ageing treatment of an aluminum alloy.

$$\sigma = \sigma_{min} + (\Delta\sigma_{ss} + \Delta\sigma_{ppt}) * QFA$$

We can also be able to predict residual stress distribution and the amplitude of the distortion profile caused by the quenching and artificial ageing steps. The Von Mises effective stress values presented in Figure 1 are found to be within the range of acceptable tolerances, like that obtained in traditional quenching1], between 0 MPa and 140 MPa.

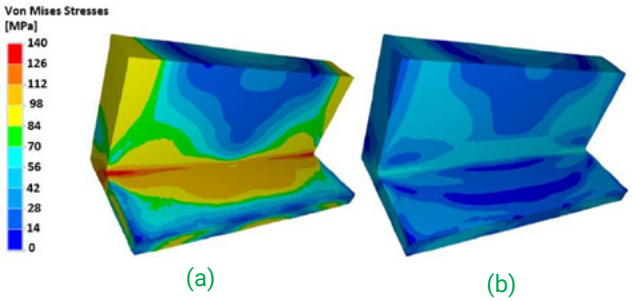
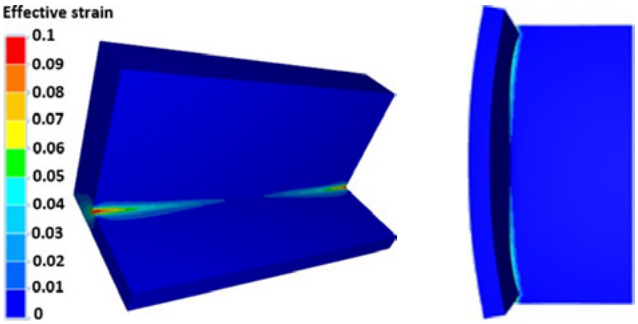


Figure 1: Von Mises stress (MPa) for 2024 L-Shape (a) after quenching and (b) after quenching and artificial ageing.

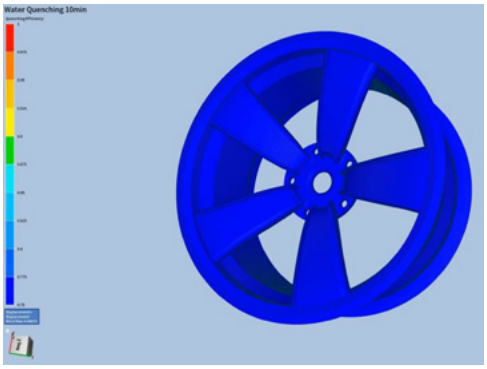
Stresses tend to drastically increase during quenching due to large thermal gradients and are partially relaxed to half their maximum values after ageing at 190°C. We can note that we do not consider the effect of precipitation on residual stresses, which would probably help to relax the microstructure after ageing. In Figure 2(a), the effective strain obtained after quenching is shown and local plastic deformation due to quenching is observed. By using simulation technology, it



(a) (b)

Figure 2: (a) Quenching simulation for the 2024 L-Shape (a) Plot of the equivalent strain after quenching and (b) Distortion due to quenching magnified x20. The L-shape is shown from a top-view, the distortion of the thin section is particularly visible.

is possible to highlight this plastic deformation and amplify the result of the distortion by applying a multiplicative factor on the scale of displacement. It thus becomes very easy to understand where the distortions are the greatest and to make comparisons with a non-deformed shape. Figure 2(b) shows this numerical functionality; it is easier to understand how the L-shaped workpiece bends due to the spray quenching used in this study.



Evolution of the quenching factor after quenching and artificial ageing of an aluminum 6061 wheel rim.

This animation presents the evolution of the quenching factor after quenching and artificial ageing on a wheel rim. Numerical simulation ensures your components' mechanical performances and a mastery of the product's dimensions by minimizing distortions.

Advantages of SIMHEAT® for aluminum heat treatment:

- Artificial ageing based on a Shercliff-Ashby model for heat-treatable aluminum alloys;
- A distortion model applicable to aluminum alloys;
- Material sensor tracking to plot characteristics over the treatment;
- After artificial ageing, the contributions of precipitate and solid solutions to hardening are identified;
- Complete results: temperature, quenching efficiency, HV/HRC hardness, residual stress, yield stress.

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ALUCAST WEBINARS HELD IN OCTOBER - NOVEMBER 2025

Title	**Management for Success**
Date	**Friday, 17th October 2025**
Time	**4:00pm to 5:00pm IST**
Venue	**Online via MS-Teams**
Speaker	**Mr. Vishwas Kale, MD, Vijayesh Instruments Pvt. Ltd.**

Key Takeaways:

- Gain practical insights on applying management tools beyond theory.
- Learn from an entrepreneur's journey, including both successes and failures.
- Understand how concepts like Quality, Leadership, and AI can be applied in real-world scenarios.
- Motivation to achieve success through experience, adaptability, and continuous learning.

Title	**Competitive Al / Mg Casting Technology by YIZUMI**
Date	**Monday, 10th November 2025**
Time	**3:00pm to 5:00pm IST**
Venue	**Online via MS-Teams**
Speaker	**Mr. Stefan Fritsche, Chief Strategy Officer, YIZUMI Holdings Co. Ltd.** **Ms. Dr. Yuxiao Zhang, Head of R & D, YIZUMI Germany GmbH**

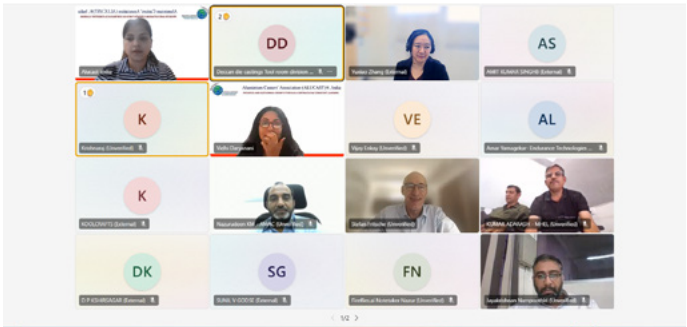
Key Highlights:

1. LEAP & NEXT2 Injection Technology – Stefan Fritsche

- Genuine real-time closed-loop injection control.
- Dynamic parameter adjustment during the full shot cycle.
- Reduced porosity, higher consistency, and improved part quality.
- Lower scrap rate and better process repeatability.
- Cost savings through improved productivity and reduced downtime.

2. Thixomolding of Magnesium – Dr. Yuxiao Zhang

- Energy-efficient alternative to traditional Mg die casting.
- No protective gases required.
- Digital Twin + real trials to define a reliable process window.
- Evaluates impact of fraction solid, mold temperature, and injection speed.
- Predicts influence of gating and component design.
- Supports optimized, sustainable, low-risk production.



Friction Stir Deposition: The Future of Repair, Recycling, and Sustainable Manufacturing

Vinit Jha | ETA Technology Pvt. Ltd.

Manufacturers are being pushed from three directions at once: tighter cost control, higher performance requirements, and stricter sustainability goals. That combination is driving interest in technologies that let industry do more with less; repair instead of replace, reuse scrap instead of landfilling, and produce large metal parts without the headaches of melting-based processes. Friction Stir Deposition (FSD) also called Additive Friction Stir Deposition (AFSD) is a solid-state metal additive technology that answers many of those needs. It's not just for aluminum: FSD is being explored for steels, titanium, nickel alloys, and metal–matrix composites (MMCs), and it's moving fast from lab demonstrations toward industrial use. This article explains what makes FSD different, where it makes the most commercial sense today, and why companies in casting, aerospace, marine, and heavy equipment should pay attention.

A NEW WAY TO SHAPE METAL WITHOUT MELTING IT

Think of FSD as a way to "cold-forge" metal into shape, layer by layer. Instead of melting metal, FSD presses and rotates a metal feed (rod, hollow rod with powder, or chips) against the part while moving along a programmed path. Friction produces heat enough to soften the metal but not to melt it. Severe plastic deformation stirs the material and bonds it to the substrate. The result is a dense, metallurgically bonded deposit with a refined microstructure and strength often comparable to forged metal. Because the material never liquefies, common fusion problems like porosity, hot cracking, and large residual stresses are much reduced or absent.

WHY FSD IS GAINING ATTENTION FROM INDUSTRY?

a. **Repairs that restore value:** For foundries and casting shops, scrapped or damaged castings are costly. FSD lets you add metal only where needed rebuilding worn features, repairing cracks or holes, and restoring dimensional tolerances. The repaired region can achieve metallurgical continuity with the parent material, producing serviceable components rather than scrap. This directly reduces rework costs and scrap rates and shortens lead times for replacement parts.

b. **Large-scale, lower-cost builds:** Powder bed systems struggle with size and cost when builds get large. FSD systems deposit kilograms per hour, making them suitable for meter-scale structures such as tooling, die blocks, frames, and rings. That scalability is attractive for companies who need big, structural metal parts without the huge energy and material costs of casting and forging.

c. **Material flexibility and multi-material options:** Although AFSD early work focused on aluminum, researchers and industry are demonstrating deposition with titanium, stainless steels, and even high-strength steels, plus metal–matrix composites produced by feeding powders or particulates through hollow feed-rods. That opens opportunities in aviation, defense, energy, and industries that require exotic alloys or surface enhanced parts.

d. **Sustainability & recycling:** One of FSD's most compelling industrial arguments is its ability to reuse chips and scrap directly as feedstock turning machining waste into new components or repair material in a solid-state process that consumes far less energy than melting and remelting. For high-volume manufacturers, this can dramatically cut material costs and carbon footprint.

e. **Less post-processing:** Deposits from FSD often have favorable microstructures and lower residual stress, meaning less heat-treatment and fewer distortion corrections than fusion-built parts. For operations balancing shop floor time and throughput, that's significant.

WHERE FRICTION STIR DEPOSITION IS ALREADY MAKING A DIFFERENCE?

a. Aerospace: repair, build, and hybrid manufacturing

Aerospace is a natural early adopter. Aircraft assemblies rely heavily on high-strength aluminum, titanium, and nickel alloys, and many parts are large, mission-critical,

and expensive to replace. FSD's ability to deposit and forge materials without melting makes it ideal for:

- Repairing structural components (ribs, skins, frames) and restoring fatigue-critical features.
- Building tooling or fixtures at scale from aerospace-grade alloys.
- Cladding or locally reinforcing parts for improved stiffness or wear resistance.

Several research studies and industry demonstrations show AFSD used to repair and rebuild aerospace-grade panels and rings, achieving properties acceptable for structural use. Adoption is aided by the process' compatibility with CNC and robotic platforms for automated repair stations.

b. Foundries & Cast-Al industries: high-value repair and hybrid parts

Foundries often confront castings with local defects misruns, cold shuts, or erosion damage. Instead of a full re-pour, FSD can:

- Deposit sound material into the defect area.
- Rebuild boss features, mounting surfaces, and flanges.
- Provide a route to upgrade cast parts with locally tailored properties (e.g., wear or corrosion resistant overlays).

For cast-aluminum shops, that means fewer scrapped castings, improved yield, and a competitive service offering: "we repair and upgrade your parts on-site." Several case studies specifically evaluate AFSD for cast aluminum repair in automotive and marine components.

c. Heavy equipment, marine, and energy: durability and on-site repairs

Offshore, mining, and power generation components are often expensive to remove and replace. On-site AFSD repair systems — including portable rigs — have been proposed and prototyped to fix worn hubs, shafts, and housings without full disassembly. The Navy and defense sectors have funded pilot projects exploring portable FSD repair units for aluminum, titanium, and high-strength steels. This makes AFSD compelling for operations that value rapid turnaround and minimal logistics.

d. Emerging: composites, surface engineering, and biomedical (potential)

FSD can also introduce reinforcement particles or powders into a deposited matrix, creating tailored metal-matrix composites suitable for wear surfaces or electrical contacts. Early research shows successful incorporation of ceramic particles (e.g., B4C) into aluminum matrices. There is interest and some early lab work exploring friction-based processing of titanium surfaces for biomedical implants (improved osseointegration and surface roughness), but applying AFSD directly for implant manufacture or load-bearing biomedical components remains exploratory and will require extensive validation and regulatory approval. In short: promising, but not yet mainstream for medical implants.

READINESS AND LIMITATIONS - WHAT INDUSTRIAL ADOPTERS SHOULD KNOW?

Industrial readiness: Several companies and academic groups have matured FSD hardware and demonstrated repeatable deposits in production-relevant alloys. Commercial players are offering AFSD services and machines; pilot use in aerospace repair and defense demonstration projects show the technology is moving into practical use.

Limitations to plan for:

a. **Feature resolution:** FSD is best for medium-to-large features. Fine, intricate geometries are not its strength; typical surface finishes need machining for tight tolerances.
b. **Tool wear:** Working with hard alloys and abrasive reinforcements increases tool wear; tool design and material choice is critical.
c. **Process control & qualification:** Achieving consistent properties requires tight control of rotation speed, feed, force, and thermal management; qualification protocols are still being standardized for many alloys.
d. **Regulatory hurdles for biomedical applications:** Any implant application must pass stringent biocompatibility and mechanical validation through regulatory bodies expect a long development path.

Nevertheless, for many industrial applications repair, large component fabrication, and sustainable recycling FSD is ready for pilot production and niche deployment.

CONCLUSION - WHY IT MATTERS NOW?

Friction Stir Deposition answers a pressing industrial question: how do we make and maintain large, high-value metal structures while cutting costs and environmental impact? For aerospace, casting, marine, and heavy equipment industries, FSD is more than a novelty. It is a practical new tool for repair, upcycling, and large-scale manufacturing. While certain areas (like biomedical implants) require more validation, the core capabilities metallurgical bonding, solid-state recycling, and high deposition rates are real and relevant today. If your business works with aluminum, titanium, steel, or metal composites and especially if you handle large parts, expensive castings, or remote repair needs FSD deserves a spot on your technology roadmap.

Vinit Jha
Research and Development Engineer
ETA Technology Pvt. Ltd.

Gold Standard in Aluminium Die Casting ...the Alubee Way.

G Praburam | Alubee Die Casters Pvt. Ltd.

THE 11 PILLAR FRAMEWORK.

1. Vision & Orientation.

"Begin with the end in mind - everything else aligns."

Every world-class die-casting organization begins with one question:

- What future am I creating, and why?
- In our industry, where capital intensity is high, skill is specialized, and customer expectations rise every quarter, vision clarity becomes the differentiator.
- A true vision answers:
- Where are we today?
- Where do we want to be?
- By when?
- Does this excite me deeply?
- If passion and vision do not match, execution collapses.
- You cannot scale what you are not passionate about.
- In die casting, vision orientation means:
- Choosing the right customer segments. (EV, HVAC, motors, automotive)
- Choosing what not to do.(rejecting misfit business)
- Building capacity ahead of demand.
- Creating a multiyear road map for machines, moulds, talent, and technology.
- Just like a pet's care depends on the owner's intention, an organization's destiny depends on leadership's end objective.

Vision orientation:

- It's long term goal vs short term distraction.
- Vision orientation is not a sentence; it is a discipline, attitude, and behavior.
- It is the invisible engine of our industry.

2. Quality & Process.

"Quality is invisible in its presence but unforgettable in its absence."

- In high-pressure die casting (HPDC), quality and process are inseparable.
- Porosity, blisters, carbides, blowholes, misruns … these defects do not appear randomly.
- They appear only when process discipline collapses.
- Post-mortem helps no one. A rejection analysis cannot save last month's output.
- Only continuous process health can.
- Quality is a DNA that starts from:
- Die design philosophy
- Gating and venting
- Vacuum levels
- Thermal management
- Shot control
- Die coat selection
- Real-time parameter monitoring
- Process excellence means:
- The first shot and the last shot must behave the same
- There must be zero variation between operator A and operator B.
- Preventive action must be stronger than correction.
- Process owner = Quality owner
- That must be the operating principle.
- When process becomes culture, the factory becomes predictable and predictability is the Gold standard.

3. Brand & Positioning.

"You are not one in the crowd. You are one above the crowd."

- A die-casting company becomes a brand when the market trusts its consistency, character, and capability.
- Brand building in die casting means:
- Maintaining uniformity across all batches.
- Committing to timelines irrespective of internal challenges.
- Owning problems before customers point them out.
- Sharing insights proactively.
- Even a great brand fades if positioned poorly.
- Where you stand matters.
- A premium die caster should not play in low-cost,

mass-rejection industries.
- A company aspiring for global customers must present itself in global forums.
- A brand becomes gold standard only when it stands where gold stands.

4. People & Profit.

"Business is people. Profit is the consequence."

- In die casting, machines create pressure.
- People create performance.
- Right talent in wrong roles causes cost leakage.
- Wrong talent in any role causes culture leakage.
- People become assets when:
- Responsibilities are clear.
- Accountability is measurable.
- Ownership is encouraged.
- Learning is continuous.
- Feedback is normal.
- Recognition is consistent.
- Performance -Productivity -Profitability..this is the chain.
- Every die-casting company must invest in understanding people behavior.
- When associates know 'why' they do ,'what' they do ,their 'how 'becomes stronger.
- Profit becomes predictable when people become powerful.

5. Courage & Confidence.

"Courage with calculation creates growth."

- Die casting is a game of capital, courage, and continuous upgrades.
- To grow, a company must take:
- Bold machine investments.
- New innovative developments.
- New customer onboarding experiments.
- Advanced technologies (vacuum, shot monitoring, thermal control ,IOT, etc.,)
- Courage is deciding.
- Confidence is delivering.
- Where does confidence come from?
- From competence.
- When people know the subject deeply…process, tooling, metallurgy, machining…confidence becomes natural.
- The gold standard requires both: courage to expand, and confidence to execute.

6. Communication & Storytelling.

"Communication builds connection. Stories build conviction."

- In die casting, problems are common.
- Miscommunication makes them catastrophic.
- Communication is the bridge between:
- Production & Quality
- Quality & Customer
- Customer & Marketing
- Management & Teams
- Clarity avoids confusion.
- Transparency avoids escalation.
- Storytelling, however, builds identity.
- When teams understand the "story behind the company," they feel connected.
- When customers hear the "story of the plant," they develop trust.
- A strong internal and external narrative makes people believe, belong, and build.

7. Continuous Learning & Improvement.

"One of the greatest mistakes a man can make is not learning from his past mistakes."

- Die casting is too dynamic to remain static.
- Alloys change.
- Cycle times reduce.
- Customer expectations increase.
- Market demands
- Global quality at Indian cost..
- Mistakes are inevitable.
- Not learning from them is unforgivable.
- Kaizen is the key.
- Every rejection is a teacher.
- Every breakdown is a lesson.
- Every customer return is feedback.
- Every new project is a learning curve.
- Every SOP revision is an upgrade.
- Internal maturity is when the organization responds to mistakes.
- This is how companies become institutions.

8. Ideas & Implementation.

"Idea is 1% idea and 99% implementation."

- Innovation is not limited to R&D labs.
- It can be:
- A new spray pattern.
- A modified gate.
- Reduced cycle time.
- A better machining fixture.
- A new trimming method.
- A smarter layout.
- A redesigned material flow.
- Every next thought is an idea.
- But only those thoughts that are executed become competitive advantage.
- Execution is everything.
- In die casting, speed of implementation is often the only differentiator.

9. Global Standards & Customized Culture.

"Anything can be copied from an organization except its culture."

A gold-standard die-casting company must be global in its:

- Layouts.
- 5S.
- Safety.
- Traceability.
- Process documentation.
- Data monitoring.
- Equipment selection.
- Maintenance discipline.
- But culture cannot be imported.
- Culture must be built …day by day, conversation by conversation.
- A world-class company blends:
- Global standards + Local cultural strengths.
- Culture at Alubee is defined by the 3Rs:
- Results-Relationships-
- Responsibility.
- Culture protects the company even when technology is copied.

10. Knowledge & Graduation.

"As knowledge grows, people should grow."

- People must not remain in the same position for five years if their knowledge is growing.
- Graduation gives meaning to learning.
- Technical training in each function is important.
- We need to have in-house university where people learn and graduate.
- It can be on machine learning,
- Leadership capability building,
- Multi-skill development etc.,
- A knowledge-based company cannot be defeated.
- It becomes a self-developing ecosystem.

11. Remind & Review.

"What gets reminded gets remembered. What gets reviewed gets done."

People need reminders for remembering.

That's why reminders are essential.

Reminders reinforce:

Vision, Behavior, StandardCommitments, Deliverables, etc…

Reviews create:

- Accountability, Alignment, Speed & Focus.
- A strong review culture does not micromanage it micro-aligns.
- A company that reminds daily and reviews weekly will always stay ahead.

CONCLUSION:

The Alubee Framework for Gold Standard…

When these 11 pillars become culture, not just concepts, a die-casting company becomes unstoppable.

- Vision gives direction.
- Process gives predictability.
- People give power.
- Culture gives continuity.

This is the Alubee Way…

A practical, implementable, human-centric, and globally benchmarked framework for every die-casting industry aspiring to become the Gold Standard of Aluminium Die Casting.

Happy die casting!

G Praburam
Managing Director
Alubee Die Casters Pvt. Ltd., Hosur

The Evolving Role of Helium Leak Testing in Modern Manufacturing

Sunil Joshi | Tekman India Pvt. Ltd.

Customers expect perfection. This has been a constant factor when it comes to performance of products they invest in. Across industries, quality remains the single biggest factor influencing customer satisfaction, followed closely by reliable service. This focus on quality is not just a passing trend-it will remain a cornerstone of industrial success for years to come.

What once seemed unachievable is now standard, thanks to revolutionary technological advancements that have reshaped how industries ensure quality, reliability, and performance.

Conventional leak testing methods - such as air pressure decay or bubble test aren't precise. They cannot accurately quantify leak rates and are influenced by ambient temperature and humidity changes. However, Helium Leak Testing, particularly through the vacuum method, is immune to these external factors, providing highly accurate, reliable results.

Among the various quality assurance techniques available today, Helium Leak Testing (HLT) stands out as one of the most advanced and efficient methods for quickly detecting leaks in components. Beyond ensuring the quality and performance of products, helium leak testing plays a vital role in user safety and environmental compliance.

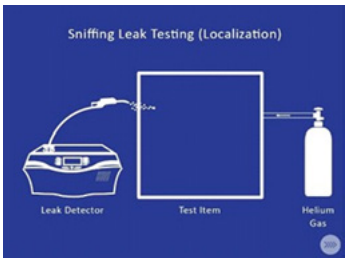
Over the years, the cost of helium leak testing technology has decreased significantly, while its accuracy, ease of use, and level of automation have improved. Modern systems now offer enhanced flexibility, allowing manufacturers to adapt testing methods to their specific applications and production environments.

WHAT MAKES HELIUM IDEAL FOR LEAK TESTING

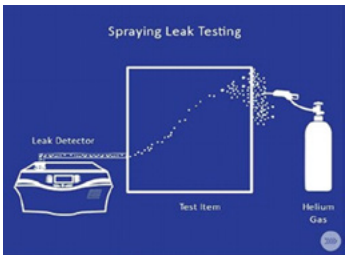
- **Inert and Non-toxic:** Helium is a noble gas that does not react with metals or casting materials. It's non-flammable & non-toxic. This ensures the integrity of the component is not compromised during testing.
- **Non-destructive testing:** The method does not damage the part, allowing it to be used on fully finished components, where leak-tightness is critical.

CHOOSING THE RIGHT LEAK TESTING METHOD

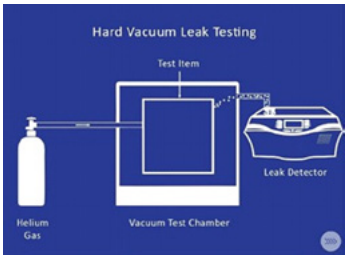
Selecting the right leak testing method depends on several factors such as test pressure, internal volume of the product, production quantity, and acceptable leak rate. The most common industrial methods include:



1. Sniffing: In this process the component is pressurized with helium while a detector probe, or "sniffer," is moved along the component's exterior surfaces. The sniffer will then detect any escaping helium to pinpoint the exact location of a leak. Using a "sniffer" probe with helium allows technicians to precisely locate the source of a leak. This is valuable, for rework or for identifying recurring issues with the casting process itself.



2. Spraying: In spraying process the component is first evacuated and connected to a Helium Leak Detector (HLD). Helium is then sprayed externally around the joints of the component or areas to be inspected. If a leak is present, helium molecules will enter inside the component through the leak path and the HLD will detect the presence of helium, confirming a leak.



3. Hard vacuum (in-side out): In this process the cast part is placed inside a sealed vacuum chamber and then pressurized with helium. If there are leaks, the helium will escape into the chamber and be detected by a Helium Leak Detector. This is the most sensitive method and measures the integral leak rate (total leakage).

With the rising cost of helium, companies are increasingly exploring alternatives such as high-efficiency Helium Recovery Systems, diluted helium mixtures, or even hydrogen-based leak testing using forming gas (a mixture of 5% H2 and 95% N2), depending on specific testing requirements.

However, simply knowing how to operate a leak detector is not sufficient to establish a robust testing process. Manufacturers must take into account critical factors such as calibration methods and frequency, along with data traceability and quality control reviews, particularly in automated testing systems. Ensuring process reliability through proper calibration, documentation, and adherence to defined procedures is essential for maintaining consistent product quality.

EFFICIENCY THROUGH AUTOMATION

Modern HLT systems are designed to meet high-volume production demands with unmatched speed and precision:

- **Fast cycle times:** Automated helium leak detection systems are designed for high-volume production lines. The test cycles are typically extremely fast, often lasting only few seconds, which significantly increases efficiency.

- **Supports automation:** The testing procedure can be fully integrated and automated into the manufacturing line. Leaky parts can be detected and sorted automatically.

- **Accurate leak localization:** Sniffer probe with helium help identify leak sources precisely, reducing rework time and improving process reliability.

ADDRESSING COMMON CUSTOMER CONCERNS

Despite the advantages of helium leak testing, customers may still have certain apprehensions:

1. "Helium testing is too expensive?"

While helium leak testing may appear more expensive than conventional methods, it often proves indispensable when traditional techniques cannot achieve the required sensitivity. Viewed from a cost-of-quality perspective, it typically results in greater savings over the long term.

2. "It requires specially trained operators?"

Not a concern anymore! This challenge can be easily mitigated through Automation, which simplifies operations, reduces dependency on manual skills, and enhances repeatability.

3. "Maintenance costs for Helium Leak Detectors are high?"

Modern helium leak detectors are designed for reliability and long service life, minimizing maintenance requirements and downtime, provided they are properly calibrated and maintained.

4. "In the case of H2 leak testing, safety is a major concern?"

When hydrogen gas is mixed with nitrogen (i.e., diluted), there is no oxygen in the mixture. A gas mixture containing less than 5.7% hydrogen in nitrogen is non-flammable in air under standard conditions (as per ISO 10156 and EN 60079-20-1 standards). Therefore, a 5% H2 + 95% N2 mixture remains below the Lower Flammability Limit (LFL).

HELIUM: CRITICAL FACTS AND RECOVERY IMPERATIVES

Helium is a precious and limited resource. Once released into the atmosphere, it escapes into space and is lost forever. Yet, industries such as aerospace, healthcare, and electronics rely heavily on helium for its unique properties, making its conservation a global concern.

In recent years, both the cost and availability of helium have become major challenges. Prices have risen sharply, and supply disruptions have become increasingly common. As a result, having a Helium Recovery System is no longer just a smart choice-it's a necessity.

By installing a recovery system, manufacturers can capture, purify, and reuse helium that would otherwise be wasted during testing or production.

This helps in:

- Reducing costs-minimizing dependence on new helium purchases.
- Supporting sustainability - conserving a non-renewable natural resource and reducing environmental impact.
- In short, a Helium Recovery System transforms what was once a cost and a waste into a sustainable, strategic advantage for the future.

INVESTING IN THE FUTURE OF MANUFACTURING

Investing in a helium leak detector or a fully automated testing system is a strategic step toward strengthening process control, product reliability, and brand credibility. The selection of testing methodology, pressure parameters, and helium concentration should be carefully aligned with specific application needs and targeted quality standards.

As customer expectations continue to evolve, Helium Leak Testing continues to set the benchmark for manufacturing excellence - enabling industries to achieve superior precision, reliability, and sustainability while ensuring adherence to stringent regulatory and quality requirements.

When customized Helium Leak Testing systems are integrated with Helium Recovery Solutions, they deliver a sustainable, high-precision testing approach ideal for continuous production environments. In particular, for casting applications, this combination not only optimizes operational costs but also reinforces long-term sustainability objectives.

Together, they deliver a sustainable, precise, and efficient solution that supports the evolving needs of modern manufacturing.

Sunil Joshi
Managing Director
Tekman India Pvt. Ltd.

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April 2026	Improving Surface Finish of Die Cast Parts
June 2026	Defect Analysis & Remedies in Die-Casting
August 2026	Cost Optimisation in Aluminium Casting Process
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ALUCAST SNIPPETS

TATA MOTORS PARTNERS WITH THINK GAS TO EXPAND LNG INFRASTRUCTURE FOR COMMERCIAL VEHICLES

India's largest commercial vehicle manufacturer signs MoU to strengthen refueling network as industry pushes for cleaner freight transportation amid growing competition

Tata Motors has entered into a partnership with THINK Gas to develop liquefied natural gas (LNG) infrastructure for commercial vehicles across India. The memorandum of understanding, announced October 30, 2025, aims to accelerate the adoption of LNG-powered trucks for long-distance freight transportation.

The collaboration focuses on identifying freight corridors and logistics clusters for LNG infrastructure expansion. THINK Gas, backed by investors including I-Squared Capital, Osaka Gas, and Sumitomo Corporation, will ensure fuel quality standards and supply reliability while offering preferential pricing to Tata Motors customers.

LNG trucking represents a growing segment in India's commercial vehicle market as companies seek alternatives to diesel fuel. LNG, natural gas cooled to liquid form at extremely low temperatures, provides higher energy density than compressed natural gas (CNG), enabling trucks to travel 600-1,000 kilometers on a single fill. The fuel produces approximately 30% lower carbon dioxide emissions compared to diesel, along with significant reductions in particulate matter and nitrogen oxides.

India currently operates approximately 1,500 LNG-powered trucks, a fraction of the 300,000 medium and heavy-duty diesel trucks sold annually. The Ministry of Petroleum and Natural Gas plans to establish 1,000 LNG stations along major highways and industrial areas, with 49 stations already directed for development by state-run oil companies. The government aims to power 33% of trucks with LNG by 2030.

Rajesh Kaul, Vice President and Business Head for Trucks at Tata Motors, stated that LNG presents a solution for long-haul trucking as India advances toward sustainable freight movement. The company has developed vehicles designed to deliver fuel efficiency and reduced emissions. Somil Garg, Senior Vice President at THINK Gas, said the partnership would help strategically scale the company's expansion plans. THINK Gas currently operates 18 liquefied and compressed natural gas stations, with additional facilities under development. The company's proposed corridor will connect industrial hubs, agricultural regions, and logistics centers across the country.

The partnership comes as competition intensifies in India's emerging LNG truck market. GreenLine Mobility Solutions, part of the Essar Group, operates the majority of LNG trucks currently on Indian roads and plans to deploy 5,000 vehicles by March 2025. Blue Energy Motors, also associated with Essar, launched India's first LNG trucks in September 2022 and has deployed 500 vehicles across various sectors.

Major manufacturers including Volvo and Ashok Leyland have announced plans to enter the LNG truck segment. Adani Total Gas has commissioned its first LNG station and plans to build 50 retail outlets over the next three to five years. State-run Indraprastha Gas aims to establish 100 LNG stations by 2030.

The expansion faces challenges including higher upfront vehicle costs compared to diesel trucks. An LNG truck typically costs around 85 lakh rupees including trailer, insurance, and registration fees. Limited refueling infrastructure remains a constraint, with existing terminals concentrated in Gujarat, Maharashtra, Kerala, and Tamil Nadu.

Financial institutions have shown initial hesitancy toward LNG vehicle financing, though some non-banking financial companies have begun funding these vehicles. Industry analysts suggest widespread adoption will require continued infrastructure development and potentially government incentives such as tax reductions or priority lane access for LNG vehicles.

Tata Motors, part of the $180 billion Tata Group, maintains a 42% market share in India's commercial vehicle segment. The company has expanded its alternative fuel portfolio to include battery electric, CNG, LNG, hydrogen internal combustion, and hydrogen fuel cell technologies.

The announcement follows recent corporate restructuring at Tata Motors. The company's commercial vehicles division changed its name to Tata Motors Limited effective October 29, 2025, with equity shares pending listing on the Bombay Stock Exchange and National Stock Exchange of India.

Medium and heavy commercial vehicles currently consume approximately 40% of diesel fuel in India. The transportation sector accounts for 13.5% of the country's carbon emissions, with heavy-duty transport identified as the largest contributor to urban air pollution. Industry estimates suggest that even a 10% switch from diesel to LNG by 2032 could reduce India's oil import bill by $1.5 billion.

INDIA'S CORE SECTOR OUTPUT INCREASES BY 3 PER CENT IN SEPTEMBER 2025; STEEL AND CEMENT LEAD.

India's eight core industries grew 3% in September 2025, driven by strong steel and cement production. Get the latest industrial output data and sector-wise analysis.

India's Index of Eight Core Industries (ICI) rose by 3 per cent in September 2025 compared to the same month last year, driven by strong performances in steel, cement, electricity, and fertilisers, according to provisional data released by the Ministry of Commerce and Industry.

"Steel production increased by 14.1 per cent in September, 2025 over September, 2024" - Ministry of Commerce and Industry. The ICI measures the combined and individual performance of production of eight core industries viz. coal, crude oil, natural gas, refinery products, fertilizers, steel, cement and electricity. The Eight Core Industries account for 40.27 per cent of the weight of items in the Index of Industrial Production (IIP) and serve as a key indicator of industrial activity.

The final growth rate of Index of Eight Core Industries for August 2025 was observed at 6.5 per cent. The cumulative growth rate of ICI during April to September, 2025-26 is 2.9 per cent (provisional) compared to the corresponding period last year.

While certain sectors showed resilience, the overall momentum was tempered by marginal decline in some areas.

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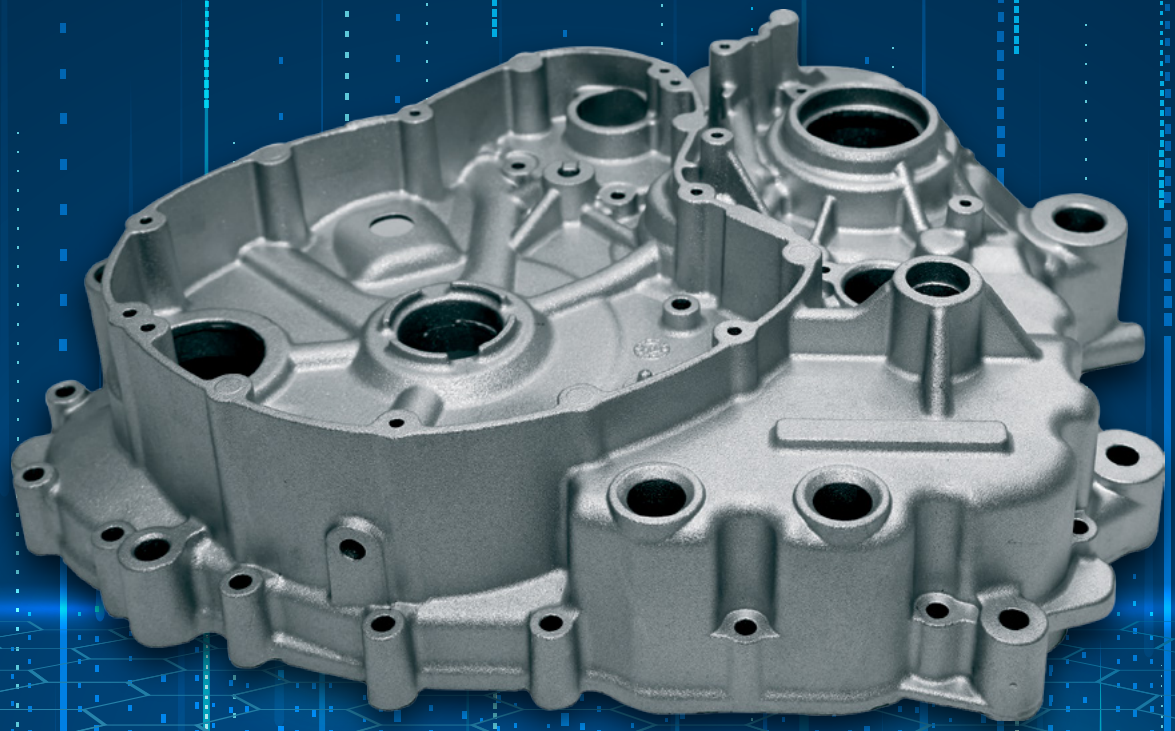

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Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-September 2025									
Report I - Number of Vehicles									
Category	Production			Domestic Sales			Exports		
Segment/Subsegment	April-September			April-September			April-September		
	2024-25	2025-26	% Change	2024-25	2025-26	% Change	2024-25	2025-26	% Change
Passenger Vehicles (PVs)*									
Passenger Cars	8,73,288	8,62,803	-1.2%	6,60,098	6,21,886	-5.8%	2,05,091	2,29,281	11.8%
Utility Vehicles(UVs)	15,23,145	16,23,849	6.6%	13,43,363	13,53,270	0.7%	1,67,757	2,11,373	26.0%
Vans	79,799	83,419	4.5%	77,682	75,926	-2.3%	3,831	5,230	36.5%
Total Passenger Vehicles (PVs)	**24,76,232**	**25,70,071**	**3.8%**	**20,81,143**	**20,51,082**	**-1.4%**	**3,76,679**	**4,45,884**	**18.4%**
Commercial Vehicles (CVs) - M & HCVs									
Passenger Carrier	28,042	40,420	44.1%	30,590	32,114	5.0%	4,441	7,450	67.8%
Goods Carrier	1,50,528	1,52,581	1.4%	1,38,105	1,39,834	1.3%	5,132	8,121	58.2%
Total M&HCVs	**1,78,570**	**1,93,001**	**8.1%**	**1,68,695**	**1,71,948**	**1.9%**	**9,573**	**15,571**	**62.7%**
Commercial Vehicles (CVs) - LCVs									
Passenger Carrier	31,938	31,112	-2.6%	27,435	28,701	4.6%	2,106	2,173	3.2%
Goods Carrier	2,78,206	2,97,749	7.0%	2,50,073	2,62,853	5.1%	23,713	25,696	8.4%
Total LCVs	**3,10,144**	**3,28,861**	6.0%	**2,77,508**	**2,91,554**	5.1%	**25,819**	**27,869**	7.9%
Total Commercial Vehicles (CVs)	**4,88,714**	**5,21,862**	**6.8%**	**4,46,203**	**4,63,502**	**3.9%**	**35,392**	**43,440**	**22.7%**
Three Wheelers									
Passenger Carrier	4,62,852	5,46,338	18.0%	3,06,463	3,30,075	7.7%	1,51,294	2,16,511	43.1%
Goods Carrier	59,097	59,482	0.7%	54,503	55,383	1.6%	1,888	2,742	45.2%
E-Rickshaw	12,267	6,261	-49.0%	10,946	6,662	-39.1%	17	23	35.3%
E-Cart	1,791	2,226	24.3%	1,887	2,330	23.5%	-	-	-
Total Three Wheelers	**5,36,007**	**6,14,307**	**14.6%**	**3,73,799**	**3,94,450**	**5.5%**	**1,53,199**	**2,19,276**	**43.1%**
Two Wheelers									
Scooter/ Scooterettee	37,82,478	41,24,266	9.0%	34,97,300	37,21,709	6.4%	3,14,533	3,22,604	2.6%
Motorcycle/Step-Throughs	80,76,280	84,52,894	4.7%	64,07,887	62,73,944	-2.1%	16,41,804	20,97,158	27.7%
Mopeds	2,60,565	2,49,381	-4.3%	2,59,793	2,40,986	-7.2%	2,808	12,648	350.4%
Total Two Wheelers	**1,21,19,323**	**1,28,26,541**	**5.8%**	**1,01,64,980**	**1,02,36,639**	**0.7%**	**19,59,145**	**24,32,410**	**24.2%**
Quadricycle									
Quadricycle	3,512	2,216	-36.9%	107	4	-96.3%	3,494	2,214	-36.6%
Grand Total of All Categories	**1,56,23,788**	**1,65,34,997**	**5.8%**	**1,30,66,232**	**1,31,45,677**	**0.6%**	**25,27,909**	**31,43,224**	**24.3%**

* BMW, Mercedes, JLR and Volvo Auto data are not available. ** Daimler data is not available Society of Indian Automobile Manufacturers (15/10/2025)

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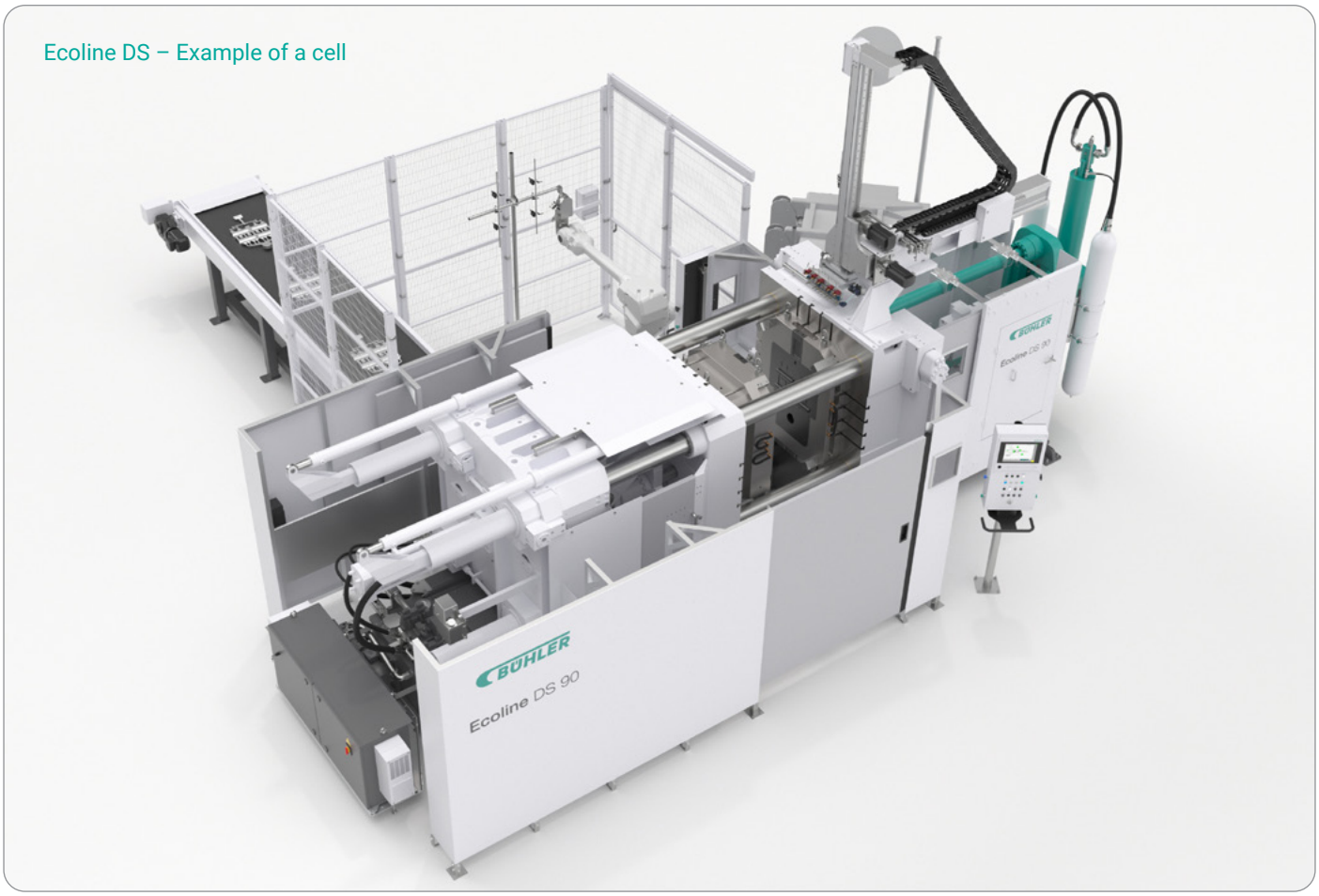
	2024-25	2025-26	% Change	2024-25	2025-26	% Change	2024-25	2025-26	% Change
Passenger Vehicles (PVs)*									
Passenger Cars	10,01,385	10,02,076	0.1%	7,67,618	7,38,487	-3.8%	2,36,625	2,63,576	11.4%
Utility Vehicles(UVs)	17,50,069	18,74,993	7.1%	15,69,297	16,22,739	3.4%	1,96,637	2,45,249	24.7%
Vans	91,963	96,272	4.7%	89,335	89,463	0.1%	4,948	5,797	17.2%
Total Passenger Vehicles (PVs)	**28,43,417**	**29,73,341**	**4.6%**	**24,26,250**	**24,50,689**	**1.0%**	**4,38,210**	**5,14,622**	**17.4%**
Three Wheelers									
Passenger Carrier	5,52,888	6,53,630	18.2%	3,68,994	3,97,389	7.7%	1,77,402	2,58,015	45.4%
Goods Carrier	69,692	70,037	0.5%	66,042	67,246	1.8%	2,561	3,104	21.2%
E-Rickshaw	14,447	7,817	-45.9%	13,031	8,179	-37.2%	34	23	-32.4%
E-Cart	2,397	2,708	13.0%	2,502	2,924	16.9%	-	-	-
Total Three Wheelers	**6,39,424**	**7,34,192**	**14.8%**	**4,50,569**	**4,75,738**	**5.6%**	**1,79,997**	**2,61,142**	**45.1%**
Two Wheelers									
Scooter/ Scooterettee	45,01,285	48,63,082	8.0%	42,18,500	45,45,712	7.8%	3,57,898	3,69,830	3.3%
Motorcycle/Step-Throughs	97,17,538	99,52,684	2.4%	77,98,583	76,09,412	-2.4%	19,62,263	24,78,707	26.3%
Mopeds	3,12,539	2,88,347	-7.7%	3,12,173	2,92,242	-6.4%	4,326	13,908	221.5%
Total Two Wheelers	**1,45,31,362**	**1,51,04,113**	**3.9%**	**1,23,29,256**	**1,24,47,366**	**1.0%**	**23,24,487**	**28,62,445**	**23.1%**
Quadricycle									
Quadricycle	3,867	2,901	-25.0%	111	4	-96.4%	3,878	2,766	-28.7%
Grand Total of All Categories	**1,80,18,070**	**1,88,14,547**	**4.4%**	**1,52,06,186**	**1,53,73,797**	**1.1%**	**29,46,572**	**36,40,975**	**23.6%**

* BMW, Mercedes, JLR, Volvo Auto data is not available and Tata Motors data is available for Apr-Sep only. Society of Indian Automobile Manufacturers (14/11/2025)

Bühler Ecoline DS: Proven Performance for Today's Die-Casting Challenges

The die-casting industry faces increasing challenges every day. Customers and products require ever higher quality standards, while production-cost pressure continues to rise. There is a growing need to track the process data to guarantee consistent high quality of cast parts and ensure data traceability over the entire value chain.

Ecoline DS – Example of a cell



Bühler's Ecoline DS platform stands out as an established and trusted solution that addresses these industry challenges head-on. With its seamless integration capabilities for both peripherals and digital services, the Ecoline DS delivers full transparency of cell productivity. Its versatility allows users to monitor and optimize processes in real time, ensuring consistent quality and traceability across every cycle.

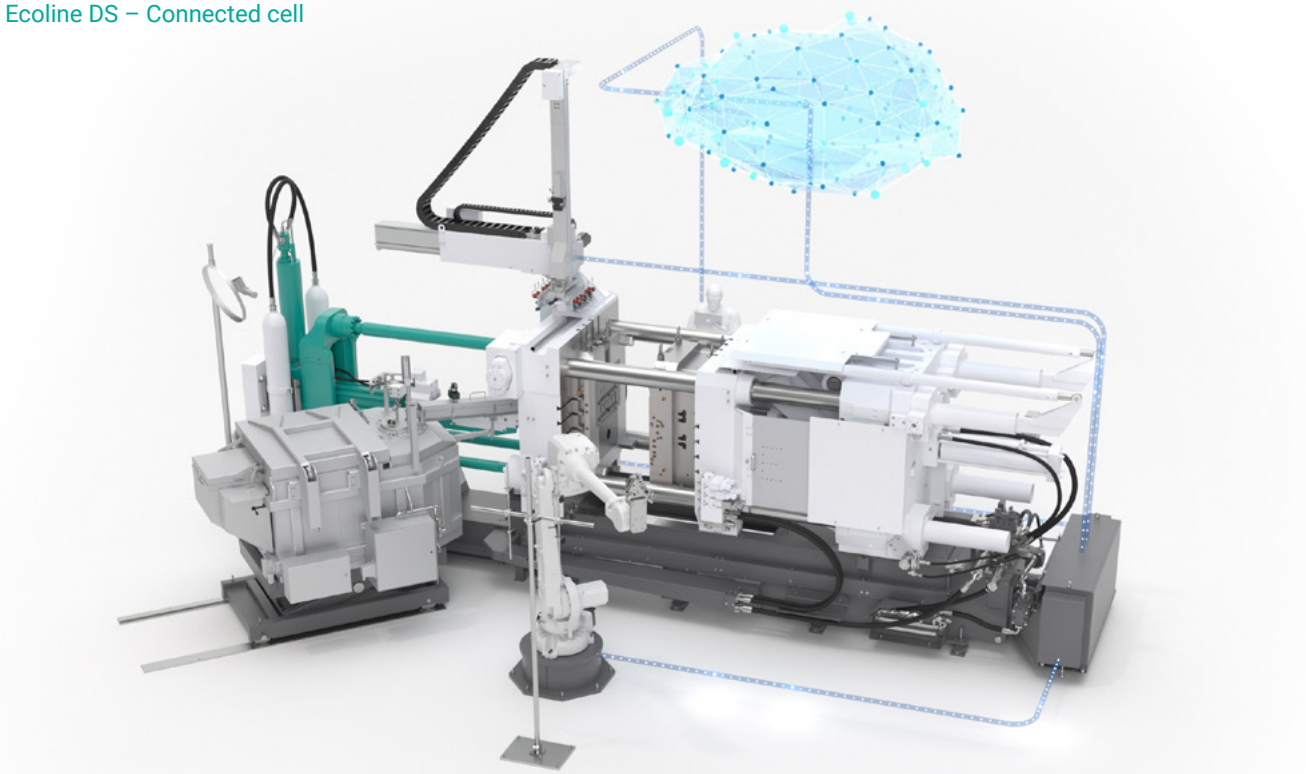
EFFICIENCY THROUGH ADVANCED ENGINEERING

One of the hallmarks of the Ecoline DS is its capacity to reduce cycle times and minimize scrap, all while maximizing cell availability. Used in over 900 installations worldwide, the Ecoline machine series offers premium Bühler quality, available in a range of sizes with locking forces from 3,400 to 9,000 kilonewtons. Central to its efficiency is the proven Bühler toggle system, engineered for precise die closure and rapid movement, contributing to shorter cycle times and reliable performance.

POWERFUL AND PRECISE INJECTION

The Ecoline DS features a robust injection unit capable of delivering 210-bar hydraulic pressure. This powerful system ensures strong dynamics, quick filling speeds, and high final pressures, which are critical factors for producing complex, high-quality cast parts. Automated first-phase algorithms further optimize the filling process, enabling efficient production at the touch of a button.

Ecoline DS – Connected cell



SMART CONTROL AND USER-FRIENDLY OPERATION

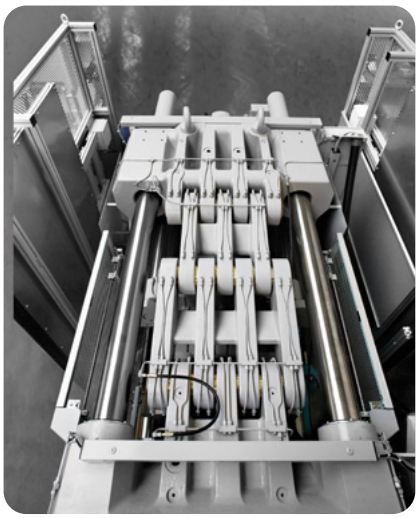
Designed with the operator in mind, the Ecoline DS boasts a compact control system that focuses on essential die-casting functions. The intuitive multi-touch panel, combined with a graphical user interface, makes operation straightforward and accessible. Fully integrated peripheral equipment, all tuned for seamless interaction, ensures that the entire cell operates smoothly and efficiently.

DIGITAL SERVICES AND DATA TRACEABILITY

A defining feature of the Ecoline DS is its networking capability, which guarantees complete traceability of all production data. This connectivity unlocks a suite of digital services, including real-time dashboards displaying key performance indicators and insights into downtime analysis. These tools empower users to identify bottlenecks, drive continuous improvement, and maintain an edge in a competitive market.

RELIABLE, FUTURE-READY PERFORMANCE

The Bühler Ecoline DS has proven itself as a dependable option for die-casting manufacturers. Its consistent track record in enhancing yield and supporting uptime speaks to its usefulness in helping manufacturers address evolving customer needs, both now and in the future.



Ecoline DS – Toggle System

Your feedback is appreciated!

Do you have any additional wishes to improve your digital experience, or are you missing any features? Get in touch with us directly at:

die-casting@buhlergroup.com