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FOUNDRY FRONTIER

MONTHLY NEWSLETTER

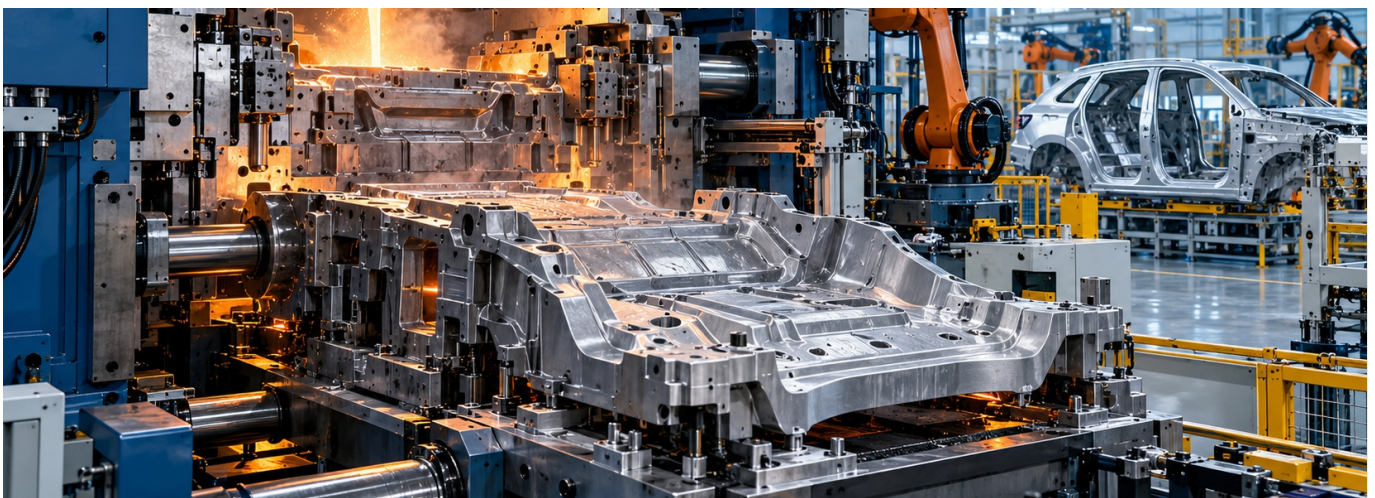
INDIA: GIGACASTING RAISES THE CAPITAL THRESHOLD FOR THE COUNTRY'S AUTOMOTIVE FOUNDRIES

- *6,000-9,000 tonne die-casting presses promise lighter vehicles and simpler assembly, but require investments far beyond the machine itself*
- *High tooling costs, lower production volumes and multi-powertrain platforms complicate the business case for Indian manufacturers*
- *The technology is likely to concentrate structural casting among a handful of large, integrated foundries*

Gigacasting is emerging as the next major investment theme for India's automotive supply chain as original equipment manufacturers (OEMs) increase the use of aluminium-intensive vehicle architectures. High-pressure die-casting (HPDC) presses in the 6,000-9,000 tonne range can produce large structural components such as rear underbodies in a single shot, replacing more than 70 stamped sheet-metal parts and eliminating over 1,000

spot welds from conventional vehicle assembly.

For OEMs, the technology promises lighter body structures, fewer welding robots and body shops that can be up to 30% smaller. For India's foundry industry, however, gigacasting raises the minimum capital required to compete for future automotive programmes and could reshape the industry's competitive landscape over the next decade.



The competitive advantage shifts from casting to capital

India's automotive foundry industry has traditionally remained fragmented. Small and medium-sized foundries have expanded incrementally by adding melting furnaces, machining capacity or conventional HPDC machines as customer programmes grew, allowing investments to be phased over time and spread across multiple customers. Winning a structural casting programme requires simultaneous investment in multi-thousand-tonne HPDC presses, high-capacity melting furnaces, automated molten aluminium transfer systems, vacuum-assisted casting equipment, robotic handling systems, trimming presses, machining centres, heat treatment facilities, X-ray inspection systems and structural dies costing millions of dollars. Most of those investments are dedicated to specific vehicle programmes and generate acceptable

returns only when supported by long-term production commitments, shifting the competitive advantage from operating an efficient foundry to financing an integrated manufacturing ecosystem.

Large Tier-1 suppliers with stronger balance sheets, established OEM relationships and integrated manufacturing operations can spread those investments across multiple vehicle programmes. Smaller and medium-sized foundries that have historically competed through flexible production and lower capital intensity may find it increasingly difficult to justify investments running into several hundred crore rupees before the first commercial casting leaves the factory, making financial capacity and programme scale as important as metallurgical expertise.



The casting press is only one part of the investment

A 6,000-9,000 tonne HPDC casting cell typically requires an investment of \$6-10 million, while a single structural die can cost another \$1.5-2 million.

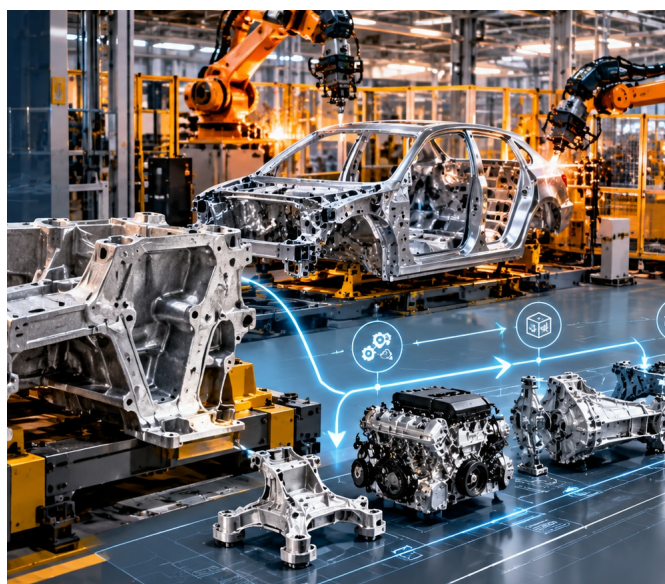
Large structural castings also require high-capacity melting furnaces, automated metal handling systems, vacuum-assisted casting equipment, robotic trimming, dedicated machining centres, heat treatment, CT or X-ray inspection facilities and significantly stronger factory foundations capable of supporting equipment weighing several hundred tonnes. Structural dies weighing tens of tonnes require specialised cranes, maintenance facilities and dedicated storage throughout their operating life, meaning manufacturers must commit capital across the entire production chain before generating revenue from a single component.

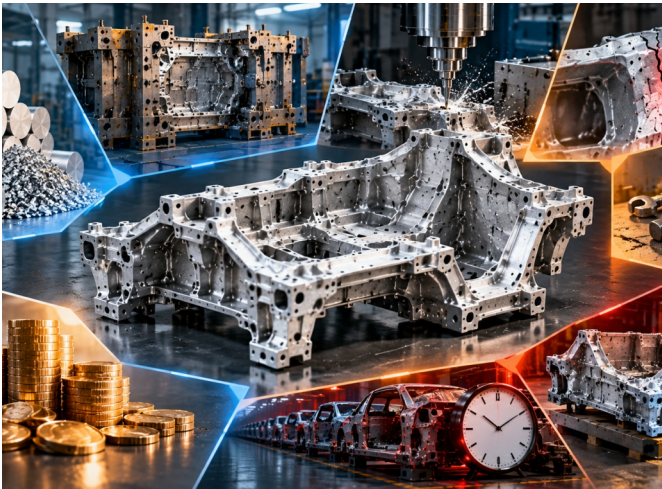
India's manufacturing model limits immediate adoption

Replacing more than 70 stamped components and over 1,000 spot welds with a single structural casting reduces assembly operations, lowers inventory, simplifies logistics and can shrink the body shop footprint by as

much as 30%. Fewer welded joints also reduce the number of robots, fixtures and inspection points required during vehicle assembly, allowing those savings to increase as production volumes rise over long model cycles.

India's passenger vehicle industry continues to operate on a different manufacturing model from many mature automotive markets. Manufacturers frequently build petrol, diesel, CNG, hybrid and electric variants on common production lines, allowing production to shift with consumer demand without dedicating capacity to a single propulsion technology. Individual vehicle platforms also operate at lower annual volumes than those for which gigacasting was originally developed, making it considerably more difficult to recover investments across dedicated structural casting lines.





Tooling becomes a strategic production risk

Structural castings require the injection of 80-100 kg of molten aluminium within milliseconds, exposing dies to repeated thermal cycling that accelerates heat checking, thermal fatigue and cracking. Conventional automotive HPDC dies can often be repaired by replacing inserts or carrying out localised weld repairs, whereas structural dies weighing several dozen tonnes and incorporating complex ribs and thin-wall sections are substantially more expensive to repair or replace.

A conventional body structure comprises numerous individual stampings that can be manufactured independently. A single structural casting replaces many of those components, meaning die failure or major

maintenance can interrupt production across an entire vehicle programme rather than a single assembly operation, increasing the cost of downtime and making tooling reliability as important as production efficiency.

Lower manufacturing costs may shift costs elsewhere

Conventional unibody construction allows damaged structural members to be repaired or replaced individually following moderate collisions. Large one-piece structural castings are considerably more difficult to repair using conventional body-shop techniques, meaning damage that previously required replacement of a subframe member or localised structural repair may instead require replacing an entire casting, increasing repair costs and potentially affecting insurance claims and total ownership costs.

Those repair economics have prompted some global manufacturers to evaluate modular structural castings that retain many of the manufacturing advantages of gigacasting while improving serviceability after accidents. That approach may prove particularly relevant in India, where vehicle affordability and lifecycle ownership costs remain central purchasing considerations.

Outlook

The earliest commercial applications in India are likely to remain concentrated in premium vehicles, export-oriented programmes and high-volume platforms capable of supporting dedicated structural casting lines. Wider adoption across the domestic passenger vehicle market will depend on whether production volumes, platform standardisation and aluminium-intensive vehicle architectures become sufficient to justify the required capital investment.

Suppliers capable of financing integrated casting ecosystems, securing long-term OEM programmes and absorbing the risks associated with specialised tooling are likely to strengthen their competitive position. Smaller foundries that have traditionally competed through production flexibility and incremental investment may increasingly focus on conventional castings and niche applications as the capital required to participate in structural aluminium components continues to rise.



INDIAN FOUNDRY SCRAP PRICES SURGE IN SEP'26 AS SUPPLY TIGHTENS AMID STRONG STEELMAKER DEMAND

*Indian foundry scrap prices rose sharply in September as scrap availability tightened and demand from steelmakers strengthened amid reduced sponge iron supply, writes **S Shankar***

India's foundry scrap prices climbed higher in September 2026, with both processed plate cutting and low manganese cold-rolled (CR) busheling prices increasing across key markets. The gains were particularly sharp in Chennai and Coimbatore, reversing the declines recorded in August.

Price surge across tracked markets Scrap shortage, strong steelmaker demand drive price hikes

Processed plate cutting prices increased by INR 2,150-3,950/tonne (t) m-o-m across the assessed markets. Chennai recorded the highest increase of INR 3,950/t to an average of INR 39,800/t in the first half of September from INR 35,850/t in August. Coimbatore prices increased by INR 3,850/t to INR 41,500/t, while Kolhapur and Kolkata rose by INR 2,650/t and INR 2,150/t to INR 41,200/t and INR 41,500/t, respectively.

Low manganese CR busheling prices also strengthened across all assessed markets. Kolhapur recorded the largest increase of INR 1,900/t, reaching INR 44,700/t. Chennai and Coimbatore prices increased by INR 1,300/t each to INR 43,600/t and INR 45,400/t, respectively.

The sharp price rise was driven by strong demand from secondary steelmakers and a shortage of melting scrap. Lower sponge iron/DRI production and supply disruptions reduced the availability of substitute raw materials, increasing dependence on scrap and further tightening scrap supplies. Raw material shortages and strong buying interest pushed sellers to raise offers amid limited availability. However, firm casting demand limited the scope for production cuts, forcing foundries to procure melting scrap at higher prices. Pig iron prices also increased, pushing up the cost of key raw materials. As a result, the shortage primarily increased foundry input costs and squeezed margins, rather than significantly reducing production.

Outlook

Prices may remain firm in October, supported by tight scrap and sponge iron availability and steady demand from secondary steelmakers. However, buyers' resistance to elevated scrap and secondary steel prices may limit further gains, while the festive period could temporarily reduce buying activity. A clearer price direction may emerge after the festive period, depending on steel demand and raw material availability.



