THE HEAT IS ON

AS INDIA'S LARGEST PRODUCER OF SECONDARY ALUMINUM AND ZINC ALLOYS, CENTURY METAL RECYCLING HAS POSITIONED ITSELF TO BE A KEY SUPPLIER TO THE COUNTRY'S BURGEONING AUTOMOTIVE AND MOTORCYCLE MANUFACTURING SECTORS.

STORY AND PHOTOS BY ADAM MINTER

It's a steamy January weekday in the suburbs of Chennai, India's automobile manufacturing capital, but the heat is having no noticeable effect on the hundreds of people working at CMR Toyotsu Aluminium India. A group of Japanese engineers is busy fine-tuning one of the facility's furnaces while, in another part of the building, hundreds of workers are hand-sorting shredded mixed nonferrous scrap—Zorba—imported from around the world. At the far end of the plant, stacks of secondary aluminum ingots await delivery to customers.

The operation, on 9.5 acres of converted farmland, is a 70-30 joint venture between Century Metal Recycling (New Delhi), India's largest manufacturer of secondary aluminum and zinc alloys, and Toyota Tsusho Corp. (Nagoya, Japan), a subsidiary of Toyota Motor Corp. Currently the facility has the capacity to produce 30,000 mt of secondary aluminum alloy a year, but that's just a start. "More

CMR's seven facilities use some of India's most advanced furnaces (inset) to produce up to 202,000 mt of secondary aluminum alloy and 8,000 mt of secondary zinc annually, primarily from scrap grades such as Zorba (background).

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furnaces will go there," says Mohan Agarwal, CMR's managing director, pointing to a large open space in the middle of the plant's warehouse.

Welcome to the high-tech, fast-growth future of India's secondary metals industry. This development has been a long time coming. For more than two decades, India's economy and its recyclers have languished in China's shadow. Yet India's middle class has expanded steadily, boosting demand for more consumer goods, including cars and motorcycles. In 2015 India was the world's sixth-largest automobile market, with much better growth potential than the United Kingdom, Japan, and Germany—the third-, fourth-, and fifth-largest auto markets, respectively. According to the Society of Indian Automobile Manufacturers, auto sales in India were on track to rise about 8 percent for the year ending in March and could jump as much as 12 percent in the next fiscal year starting in April. India's recyclers, long viewed as polluting, low-tech, and low-wage operators, are adjusting quickly to the new market reality in which the world's top automobile and motorcycle manufacturers are ramping up production in India and demanding higher quality, environmental compliance, and volume from their suppliers.

For three decades, Mohan Agarwal and his family have been at the leading edge of this transition, first as partners in a small joint venture and, starting in 2006, as the founders of Century Metal Recycling. CMR has grown with India's automobile sector to now consist of seven plants—six spread over northern India and one in Chennai, the southeastern city sometimes known as India's Detroit. Two of its operations are joint ventures with Japanese conglomerates: CMR Toyotsu Aluminium India in Chennai and CMR Nikkei India, a 74-26 joint venture between CMR and Nikkei MC Aluminium Co. (Tokyo) in Bawal, southwest of New Delhi. Combined, CMR's facilities employ 2,000 people and have the capacity to produce 202,000 mt of secondary aluminum alloy and 8,000 mt of secondary zinc annually. The present production level of 150,000 mt gives the company a 45-percent market share in north India and about a 25-percent market share in the whole country, Agarwal says.

Along with its investments in growth and expansion, CMR has invested heavily in innovation, bringing significant technological and environmental upgrades to India's secondary metals sector. In addition, it was the first Indian smelter to deliver liquid metal to die-casting customers, Agarwal notes. And there's more to come. The company has plans to build additional plants in India's fastest-growing regions. Although Agarwal takes pride in the company's rapid growth and market position, ultimately the company has built its success on quality, he says. "Century Metal Recycling's pricing is the Indian reference price [for secondary aluminum]. If you want to be the reference price, then you must have the best quality, and we believe we do."

JUMPING AT AN OPPORTUNITY

CMR's roots are in Calcutta (now called Kolkata), where Mohan's father, Gauri Shankar Agarwala, grew up. He wasn't interested in joining his family's gem business, so he moved to Delhi to pursue a law career. In 1986, as Mohan was completing his degree in accounting, a family friend with an aluminum business in Kolkata asked if they would be interested in forming a joint venture to expand the business into Delhi in aluminum die casting. "I was the right age," Mohan Agarwal says, "so I jumped at the opportunity." The company—which they named Century NF Casting—started production in Faridabad, near New Delhi, with a roughly 220-pound-capacity furnace, and Mohan never looked back (and never took his accounting finals).

Their timing was impeccable. The mid-1980s witnessed the birth of the modern Indian automobile industry, with foreign manufacturers spurring large investments and joint ventures in the sector. "Before that," Agarwal says, "cars in India used very little aluminum."

Despite growth in the automotive sector, Century NF Casting struggled to find business, so it shifted to making secondary alloys. At the time, Indian law prohibited companies from importing scrap, and India wasn't generating much of its own scrap, so the company used primary metal and prime scrap. "It was so easy—just add a little copper, a little silicon," Agarwal recalls. With several competitors in the Delhi area, business was tough, but the downturn in aluminum prices in the early 1990s eliminated many of them.

In 1999, the company built a larger plant with 12,000 mt of annual capacity, and two years later it began importing aluminum scrap from the European Union. It initially imported primarily mixed aluminum—scrap grades Tense, Taint, and Tabor—but over time its appetite for high-quality Zorba grew. Agarwal realized that the company's growth depended on its ability to meet the high quality standards of international manufacturers, so he traveled to Japan and bought new furnace technology for the company's operations. "Our furnaces became a benchmark for India, and our caster was the first of its kind in this country," he says.

By the time the plant was running at maximum capacity, in its second year, Agarwal started looking for new technology again. This time he found it in Italy—40-mt furnaces, decoating equipment, a rotary shear, and a metal circulation pump. The steep cost prompted the Agarwals' long-term partners to bow out, but Agarwal and his family forged ahead with the investment on their own, naming the company Century Metal Recycling in 2006. "People ask me, 'Why Century in Century Metal Recycling?'" Mohan smiles. "It's about the future."

A QUALITY AND SUSTAINABILITY FOCUS

In 2014, Narendra Modi became India's prime minister after campaigning on a platform of economic reform. The centerpiece of his administration is a campaign—dubbed "Make in India"—that seeks to encourage foreign and domestic investment in high-tech manufacturing in India in 25 different economic sectors. One goal is to quadruple India's automobile output by 2026. Doing so will require not only new factories but also extensive improvements to India's infrastructure.

Any visitor to India can quickly see the

A loader (below) feeds imported Zorba into one of CMR's sortation lines. Pieces over 35 mm are conveyed to the top level of a two-story platform (bottom) for hand-sorting. CMR trains its workers as sorting specialists to recognize a single type of metal (right).

(At top) CMR executives P.M. Gautam, CEO, and Mohan Agarwal, managing director, visit the firm's Unit 1 facility in Palwal. At CMR, Zorba smaller than 35 mm is sized and then sent through a wash line (middle) for further sorting by density. A CMR employee (above) sorts copper and brass recovered from the sorting line.

infrastructure upgrades in the works. Late one weekday morning, P.M. Gautam, CMR's CEO, accompanies me on the 90-minute drive south from Delhi to Unit 1, CMR's first solo plant, which opened in Palwal in 2006. The bumpy roads are choked with traffic and dust from a highway widening and improvement project that includes new elevated commuter trains on the road's shoulder. Along the way, we pass Faridabad, home to hundreds of automotive-related companies.

CMR's Unit 1 plant sits on nearly 11 acres on the edge of a rural village. Visitors and trucks arrive and depart through secure gates; a truck scale is a few feet inside the gates. A few hundred feet beyond the entrance, piles of Zorba are visible in the distance, next to a two-story sorting platform of a design I've never before seen, where roughly three dozen workers hand-sort the mixed metal.

The process starts when a front-end loader feeds a bucket of Zorba into a trommel. Pieces over 35 millimeters in diameter are conveyed to the upper level for sorting. There, two rows of female workers hand-sort the mixed material, tossing it into chutes that empty into bins below. On the ground level, a smaller group of men and women take a second look at the remaining aluminum-rich material, removing any missed impurities.

Aside from the two-story structure, what makes this hand-sorting system different from others in Asia, especially China, is the degree of specialization. In most hand-sorting operations, each worker learns to sort the whole range of materials in a load of Zorba, separating more than half-dozen metals into bowls or bins. CMR initially trains its workers to identify and pick out one material. "So here," Gautam says over the clanking of metal, "the workers are just [picking out] the copper and brass, not the magnesium or zinc. They don't have to be so experienced."

Sorters undergo on-the-job training for an initial period of two weeks so the company can see if they'll work out. From there, they move to the conveyors and focus on a single material. Over time, they advance to different lines in the plant commensurate with their experience and skill. "At the end of the day," Agarwal explains, "everything that goes into our furnaces has been touched by hand at least once."

Even though hand-sorting remains essential to CMR's operations, the company processes mixed metal pieces smaller than 35 mm in diameter using eddy-current separation equipment, a wash line, and a gravimetric system that sorts material based on its density. The separated streams are then hand-sorted,

A forklift (top left) carries a crucible of hot aluminum dross to the in-house dross processing line at CMR's Unit 1 plant in Pawal. Secondary aluminum ingots (above) await shipment to the company's customers, primarily Indian automakers and motorcycle manufacturers. CMR operates its seven plants with environmental controls that often exceed Indian government requirements, such as the bag house (above right) at its joint-venture plant in Bawal.

with separate lines for cast, heavies, light-gauge material, nonmetallics, small cast, and small heavies.

The company takes even more steps to ensure quality control. Elsewhere in the complex, CMR's best sorters stand at tables and carefully work through piles of heavies—primarily coppers and brasses—left over from earlier sorting efforts. The company stores this high-value material in a fenced-off area, secured under lock and key. Meanwhile, to ensure that it maintains quality standards from the start, CMR takes representative samples from every incoming container of scrap and sorts and audits them. The company uses that data to inform its future scrap buying decisions and as a quality check.

As Gautam and I tour the sorting warehouse, we pass some of CMR's scrap inventory, including bundles of radiators and aluminum wire—which the company shreds on site—as well as piles of Tense and Taint that workers break up with hammers. We then enter a warehouse with furnaces that have the capacity to produce 25,000 mt of aluminum ingot annually. The facility serves customers within a roughly 60-mile radius, which encompasses much of northern India's thriving automotive sector. As we approach the furnaces, Gautam points to large pipes that capture the heat associated with furnace exhaust and use it to pre-heat incoming scrap. That move, which significantly reduces the energy needed to melt the scrap, is one example of how CMR has made environmental sustainability part of its operations and image.

"We see environmental protection as something that separates us from our competitors," Agarwal says, "so we often go beyond even what the government requires." For example, at its newer plants—including the joint-venture operations with its Japanese partners—the company has installed baghouses even though current regulations don't require them. "Recycling is a green business," he says, "but you're not being true to that mission if you're spewing smoke. So we stay a step ahead."

As Gautam and I chat in Unit 1, a forklift rolls past carrying a container of hot dross bound for CMR's dross recovery process, which allows the company to extract residual aluminum on site rather than sending it elsewhere for processing.

To ensure the quality and check the composition of its scrap feedstock, CMR melts samples of every incoming load (top). Akshay Agarwal (above), Mohan Agarwal's son, displays some of the scrap inventory at CMR's joint-venture plant in Bawal, which he is slated to manage.

For CMR, the reward for its extensive processing, sorting, testing, and melting efforts sits in neat stacks near the plant's loading bays: hundreds of specification-grade aluminum ingots ready for shipment to customers, including Maruti Suzuki, Honda, Yamaha, and Hero, India's top motorcycle manufacturer.

MOLTEN METAL PIONEER

Unit 1 and its high-quality ingot might be CMR's foundation, but the future, Agarwal says, is liquid metal, delivered just in time in insulated ladles to die casters, saving them time, energy, and metal yield they would lose from melting secondary ingot or sow. The result is considerable cost savings as well as productivity and efficiency gains.

CMR has long had ambitions to provide liquid metal to die casters, but it has had to overcome several hurdles, including India's inadequate road infrastructure, a lack of government regulations on the transport of liquid metal, and customers that lacked the equipment to accept liquid metal shipments in large volumes. Its—and India's—first liquid metal plant, which it constructed in 2008, is connected to Hero's die-casting plant—Rockman Industries—in Haridwar, northeast of New Delhi. "We put a gate between our plant and theirs, and [we] drive the metal over via forklift," Agarwal explains.

The plant, which is still operating, has the capacity to produce 30,000 mt a year, was an "instant success," he says. Not long after it started operating, CMR accepted an invitation from Sunbeam—then India's biggest die caster—to build a similar plant in Gurgaon, southwest of New Delhi.

The true revolution in Indian liquid metal deliveries happened in 2012, however, when CMR signed its joint-venture agreements with Toyota Tsusho and Nikkei MC Aluminium. Those agreements attracted private equity investment from AIF Capital (Hong Kong), a firm that looks for middle-market companies with growth potential in Asia. With its new partners, CMR was poised for a new era of growth. Even though CMR's Japanese partners showed it how to do over-the-road deliveries of molten metal, it still took months of work to convince local authorities that such deliveries were safe. "Once we showed them that this has been done for years safely, they understood," Agarwal says.

THE CHANGE IS EVERYWHERE

Bawal, site of the CMR Nikkei India joint venture, is another automotive and motorcycle hub about two hours southwest of New Delhi. The 300-employee facility, on 6 acres, has the capacity to make 30,000 mt of alloy a year, with most of that metal delivered in 1,800- to 2,200-pound lots to customers within 9 miles of the plant. "We deliver every 15 minutes, 24 hours per day," says Akshay Agarwal, Mohan's son, who is in line to run the plant. "We follow the operations of our customers."

At first glance, the Bawal plant is similar to Unit 1 and other CMR operations. The hand-sorting and washing lines are identical in concept, and the quality-control standards are uniform, but there are more men working on the lines than there are at other CMR plants. "Workers are getting harder to find," Akshay explains. Rising labor costs, in fact, are forcing the company to consider installing a flotation plant to help with the sorting process. The Bawal plant also differs from other CMR facilities in its setup: It has three 10-mt melting furnaces and

two 15-mt holding furnaces for liquid metal. Ladles awaiting shipment to nearby customers are lined up near the furnaces, and delivery trucks labeled "Molten Aluminum" in English are parked near a loading dock. As Akshay walks through the plant, another truck returns from a run to a customer. "It's not easy to run a liquid metal plant," he says. "You have to be ready and prompt 24 hours a day, but we've learned how to do it well."

CMR has plans to continue expanding in the next year or two, with the fast-growing state of Gujarat, on India's western coast, the first destination on its list. A facility in that coastal state would reduce CMR's logistics costs for scrap imports and—in the future—finished metal exports. "That's an opportunity waiting for us," Mohan Agarwal says, expressing optimism about CMR's prospects. He has no interest, however, in building plants on the massive scale of China's biggest secondary aluminum smelters, some of which now are closing or operating significantly below capacity, he notes. He prefers the flexibility of having numerous smaller facilities.

In another optimistic sign, the Indian government announced in late January that it's considering establishing a national policy on recycling, which would include reviewing trade policies such as the country's 2.5- to 5-percent duty on scrap metal imports. That duty puts secondary products at a disadvantage compared with finished goods, which Indian buyers can import duty-free thanks to several free-trade agreements. "It has hurt our profitability," Agarwal says, "but we've managed." Eliminating the duty would benefit India's recyclers, including CMR, but the company isn't waiting around for such changes. Indian consumers are clamoring for more transportation options now, and carmakers, motorcycle manufacturers, and the recyclers that supply them are expanding quickly to meet their demand. To Agarwal, the market change is apparent everywhere he looks. "You can see it on the road today—lots of cars, everywhere," he says. ■

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