

PRESS RELEASE

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Compact Remelt Plant – The most efficient solution for self-sufficient billet supply

The demand for extrusion billets and forging slugs is increasing. Automotive industry drives the transformation to electromobility and light weight design, while construction industry is relying on the increased use of high-tensile aluminum components and larger profile cross-sections. While increasing their production capacities extrusion and forging companies need to focus on reducing the total carbon footprint of their products. This can be achieved and controlled by establishing an in-house billet production facility; remelting inhouse scrap, using the most efficient furnace and casting technology available.



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The Hertwich compact remelt plant concept considers the goals of maximum productivity, least environmental impact and excellent metallurgical billet quality by combining horizontal direct chill casting technology and leading-edge furnace technologies into a continuously operated process. Numerous installations of this concept operate successfully worldwide. By adding a compact remelt plant, producers of Aluminium products are able to use their inhouse scrap and purchased market scrap profitably, control the billet quality, and have the means to protect its interest and know-how behind in-house developed alloys and therefore strengthen their overall market position.

The usual annual production capacities of 10.000 tpa up to ~60.000 tpa yield significant advantages in investments as the individual machines are well coordinated with each other and operate with a high degree of automation and unified control.

While VDC casting is the preferred alternative for larger production volumes, HDC casting offers essential operational advantages, with the same metallurgical quality of billets. Casting campaigns typically last several days, supported by uninterrupted metal flow from the multi-chamber furnace. No head and butt end are generated as each log is cut to exact length at the flying saw, which is positioned immediately after the caster. Cooling water infrastructure is considerably

smaller for an HDC caster, owing to the continuous (uninterrupted) production mode, and there is NO deep and therefore expensive and difficult to maintain foundation pit required which is mandatory for VDC caster. The available billet diameters range from 2" to 16" The billets are produced for in-house production as well as to sell on the open market.

A Compact Remelt Plant includes all production equipment from charging of scrap material to finished extrusion billet or forging slugs combined into one continuously operated 24/7 automated process.

The melting furnace, a Hertwich specialty, is a stationary, multi chamber furnace, designed to melt in-house press rests, extrusion scrap, saw chip briquettes, other scrap metal, primary ingots and painted or oily scrap from the market. Charging is done with an automated machine, in large bins, whereby scrap is dry charged onto a ramp/shaft inside the furnace. After thorough preheating to some 500°C the scrap load is pushed/submerged into the melt bath. With this concept any organic impurities are gasified ahead of melting and combusted in the main chamber, thereby substantially reducing to the melting energy input. Measured specific energy consumption can be reduced to 300 kWh/t metal loss is minimized through the combination of metal preheating and submerge melting. With predominantly clean scrap metal loss is below 0,5% of charged metal is achieved. Combustion air is preheated to above 900°C and flue gas is cooled to below 200°C in the regenerators of main burners to achieve lean energy consumption. An optionally integrated flue gas treatment plant ensures that all environmental standards are met. However, the Hertwich systems not only stand for sustainability, but also for maximum economic efficiency due to low metal losses, low energy consumption and minimal personnel requirements for the operation and maintenance of the systems which results in return-of-investment times of less than 3 years.

Due to the flexible structure with two casters, two different diameters can be cast at the same time, which enables very flexible production planning Thanks to a new and improved mold technology (patent pending),

the casting speed of the Hertwich caster is further increased and so is productivity coming along with enhanced grain size and decreased shell zone thickness. The visual surface quality matches with vertically cast billets.

After casting, billets pass over storage conveyors to an inline quality inspection system before they enter the continuous homogenizing furnace. Especially for suppliers to the automotive and aircraft industries, 100% quality control in every single process step is a central factor for the successful marketing of their product. With a Helical Ultrasonic Testing Unit (100%-UT), inclusions, cavities and cracks of various kinds can be detected fully automatically, even with automatic calibration of the system, while the Automatic Billet Surface Inspection (ABSI) detects defects in the surface. Even the most probable causes of the defects are automatically assessed with these systems, stored and transmitted to the upstream and downstream machines in order to rectify them.

The continuous homogenizing furnace and cooling station are instrumental for best accuracy and uniformity of the homogenizing process, and to ensure best possible extrusion quality. Especially for 6xxx series alloy the continuous homogenizing furnace is the ideal choice in terms of billet quality and economics. Each individual log receives exactly same temperature curve, within a temperature window of plus / minus 3C from the start of heating, through the holding phase until the end of cooling. This ensures the metallurgical uniformity within all billets, which enables optimal parameter settings in the subsequent pressing or forging process.

After homogenization, the bars are tailored according to the requirements. Saws for long and short billets, as well as for slugs, can be combined with fully automatic stacking and strapping systems. Each individual product can be marked with a pin or laser marker, and labels are applied automatically to ready for shipment stacks.

The billet production plant is equipped with a state-of-the-art control system and optimized for both operation and maintenance.

A maximum of four operators are required per shift. But operation is also possible with two operators, e.g., during the night shift. The control software includes a monitoring system and associated diagnostic functions for easy fault finding, an automatic restart program to avoid human error, log tracking function for quality documentation purposes amongst other things and integration into the producers' IT system. The entire automation concept corresponds to the general understanding of a "Smart Casthouse"

In summary, Hertwich Compact Type Remelt Plant (CTRP) is the optimal solution for closed material cycles with the highest economic efficiency. The Hertwich CTRP can be also combined with a vertical casting system to make production even more flexible. For individual advice on your recycling needs, please contact Elke Deubler at elke.deubler@hertwich.com.

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Hertwich Engineering, a company of the SMS group is renowned for its future-oriented, energy saving technologies and outstanding service in aluminium casthouse. The company is active worldwide with design, supply, construction and commissioning of special machinery and equipment for the Aluminium industry. Hertwich is competent for supplying complete Al-casthouse on a turnkey basis (one-stop-shopping). The product range comprises melting equipment for aluminium scrap, conti and batch homogenizing plants, sawing plants, horizontal and vertical casting machines and quality inspection stations, etc. To stay ahead Hertwich relies on its own R&D and proprietary know-how. For 50 years, the advanced technology has revolutionized the industry and the company maintains its worldwide lead.