

voestalpine celebrates 60 years of the LD process

On 9 December 1949, a pioneering decision was made in Linz to construct a steel mill based on a completely new technology, the Linz-Donawitz process (LD process). Only three years later, on 27 November 1952, the world's first LD steelmaking plant was commissioned at the site of the current headquarters of voestalpine AG. This was closely followed by a second plant that was put into operation on 22 May 1953 in Donawitz. The LD process was one of the century's most significant industrial inventions that instantaneously revolutionized the global steelmaking industry. It established the voestalpine Group as a leading metallurgical company and formed the basis for the Group's consistent technological and qualitative developments as a global player. The voestalpine *Stahlwelt* in Linz is currently hosting a special exhibition on 60 years of the LD process and showing how this innovation has changed the world. The exhibition runs until the end of the year. Entrance is free of charge.

Steel is the world's most commonly used construction material and is found almost everywhere. It has played a key role in creating the preconditions for modern mobility, efficient energy production and contemporary urban development. The invention of the LD process in Linz and Donawitz was certainly one of the ground-breaking discoveries that changed the entire steel industry 60 years ago and helped make this development possible. The breakthrough enabled significantly more steel of a better quality to be produced in a shorter time and much more economically. It also opened up a host of opportunities for two young companies, *Vereinigte Österreichische Eisen- und Stahlwerke Aktiengesellschaft* in Linz and the *Oesterreichisch-Alpine Montangesellschaft* in Donawitz. Almost no other invention has had such an impact on global economic growth. The willingness to accept the large risk involved in making these decisions is worthy of our greatest respect, but above all it was the courage and spirit of innovation represented by this new process, rather than reliance on tried and tested methods, which is so impressive. "The LD process is both a legacy and a mission for future generations," says Wolfgang Eder, Chairman of the voestalpine Management Board.

70 percent of global steel produced using the LD process

More than two-thirds of the world's steel today is produced using the LD process. Invented 60 years ago, it remains a global production standard. Steel is 100% recyclable and of equal quality when recycled. As a construction material, it is an important driver of the global economy. Of the 1.5 billion tons of steel produced globally in 2011, at least one billion tons were produced using LD-process-based technologies. "The LD process remains a symbol of what makes voestalpine stand out and what its employees represent: the ability to make possible the apparently impossible, to approach problems as an opportunity to learn and to use challenges as a means of developing new perspectives," says Eder. Clear strategic focus on the latest technologies and most demanding quality products and a value chain that is longer and more comprehensive than those of the competitors will be the strategy for the coming years. "The Group will continue to actively expand its research and development capacities and position itself even more strongly as a global technology pioneer, especially in the mobility and energy sectors," Eder declares.

With this pledge in mind, expenditure on research and development was increased to the record level of EUR 132 million for the 2012/13 business year. Despite global economic crises and

austerity programs, expenditure over the past ten years in this key area has grown by an average of 11% annually. There will be a further investment during the coming business year.

The LD process in detail

The Linz-Donawitz process (LD process) is a steel production process in which oxygen is blown into carbon-rich hot metal to convert it into low-carbon steel. During this process, a refractory-lined container, a so-called LD converter vessel, is charged with hot metal and a cooling agent (scrap or sponge iron). A water-cooled lance is used to blow industrial oxygen into the molten heat. During this refining process, the tramp elements carbon, silicon, manganese, sulfur and phosphorus are continually reduced. Depending on the type of steel to be produced, certain alloys can be added after oxygen blowing. The steel is then tapped into a ladle at a temperature of roughly 1650 °C. As with so many inventions, the spirit of innovation, persistence, courage and a good deal of luck also played a role in the discovery of the LD process. After international experiments in adding oxygen to hot metal in the 1930s were unsuccessful, similar experiments were also instigated in the Linz steelmaking plant at the end of the 1940s. It was planned to blow the oxygen directly into the molten iron. However, one of the lances was faulty. Consequently, oxygen escaped and was blown directly onto the surface of the liquid iron. This was sufficient to significantly improve the purity of the produced steel, and that is how the success of the LD process was established.

The voestalpine Group

The voestalpine Group is a steelmaking, processing, and technology group that operates worldwide and manufactures, processes and develops high-quality steel products. With 500 production and sales companies in more than 50 countries on five continents, the Group has been listed on the Vienna Stock Exchange since 1995. With its top-quality flat steel products, the Group is one of the leading partners to the automotive and domestic-appliance industries in Europe and to the oil and gas industries worldwide. The voestalpine Group is also the world market leader in railway switch technology, special rails, tool steel, and special sections. In the 2011/12 business year, the voestalpine Group reported revenue of more than EUR 12 billion and an operating result (EBITDA) of EUR 1.3 billion. It staffs roughly 46,500 employees worldwide.

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