COLUMBUS STAINLESS [Pty] Ltd

MEMORANDUM

100 YEARS OF STAINLESS STEEL

As with any great story, the invention and history of stainless steel is not only one of controversy and intrigue, but also an inspiring story of how a product changed the world in less than a century.

Although there is some debate as to who invented stainless steel, the fact is that an acid resistant alloy was first patented in Germany 100 years ago by Krupp engineers, Eduard Maurer and Benno Strauss. This alloy was the basis for the development of austenitic stainless steels, the most popular group of stainless steels in use today. However, it was not until the next year, 1913, that Harry Brearley first commercialised stainless steel.

At the time, Brearley was the manager of the Brown Firth Research Laboratory in Sheffield, England. He had been tasked with improving the erosion resistance of gun barrels. He decided to add an unprecedented amount of chromium, about 12%, to iron. He then noticed that this steel would not etch with acid and, furthermore, when the gun barrels made from this new steel were stored outside, they did not rust. The result was the first martensitic stainless steel. Harry Brearley immediately recognised the commercial significance of this new steel. As luck would have it, the town of Sheffield was famous for cutlery manufacture and it wasn't long before the first rust-free knife blades were produced. Unfortunately the directors of the company refused to patent this rust-free steel as they did not see the advantage of rust free knife blades. After all, the knives still had to be washed. Brearley thus resigned and filed his own patents in North America in 1915. However, Elwood Haynes had also independently invented 12% chromium rust-free steel in the USA, but his application for a patent was turned down because of Brearley's patent, even though Haynes filed his patent first. In the end, the dispute was resolved by Haynes and Brearley setting up a company together, called the American Stainless Steel Company, whose vision was to "promote the knowledge and use of stainless steel worldwide". Certainly, in the early years, the USA certainly took the lead in developing new applications for stainless steels.

It wasn't until 1920 that Krupp announced their 1912 patent of austenitic stainless steels to the world. The ferritics stainless steels had meanwhile been developed and the duplex stainless steels, combining the best of the austenitics with the ferritics, were first developed in the 1930's. However, it was not until improved steelmaking techniques became available in the 1960's, that the duplex and ferritic stainless steels could be produced in a cost efficient manner with the desired low carbon contents. Several years later, in 1977, the utility ferritic stainless steels were invented in South Africa by Columbus Stainless. The most well-known of these steels is 3CR12. These steels combine the low cost of the ferritic stainless steels with the toughness and weldability of the austenitic stainless steels.

Stainless steels are a relatively new material and the product development seen in the last 100 years has been impressive. But the successful market development and commercialisation of a new product is often more difficult. The first successful stainless steel application was knife blades in 1913 but other notable applications were the appearance of the first stainless steel roof in America in 1924 and the first stainless steel beer brewing vessel in 1928. The largest single application of stainless steel in this period was the roof of the famous New York landmark, the Chrysler building, which was completed in 1930. Other stainless steel firsts were in railway carriages in 1931, sinks in 1933, automobiles in 1936, underwater TV cameras in 1954, razor blades in 1963 and in 1969 the Saturn V rocket for Apollo 11 contained stainless steel.

Today, stainless steel is everywhere. The applications are diverse and new applications are constantly being developed. Stainless steel is not just "stainless", it is also hygienic, strong, tough and fully recyclable for a greener future. It now plays a part in all of our lives, and has truly changed the world. Stainless steels are now the fastest growing segment of the metals industry. Columbus Stainless is proud of their contribution to the history and development of stainless steels and look forward to their future role in "adding stainless quality to life".