

INOSSIDABILE

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Summary

For more detailed information please contact directly the names indicated at the end of each notification

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BACK TO THE FUTURE FOR DELOREAN (Il ritorno al futuro della DeLorean)

Recently, one of the all-time most beloved film sagas, "Back to the Future" made a comeback. Basing on the plot of Episode 2, October 21, 2015 was the day in which Marty McFly and Doc Brown came in what was the future for them. The time machine they used in all the three episodes of the saga was the famous DeLorean DMC-12. Among the peculiarities of that car, designed by Giorgetto Giugiaro and produced only between 1981 and 1983, there was the body, which was made of brushed, non-painted EN 1.4301 (AISI 304) stainless steel. The stainless steel panels were fixed to a reinforced fiberglass single piece, which in turn was affixed to a double-Y frame chassis. The gull-wing doors could be easily opened thanks to cryogenically equipped gas-filled torsion bars. In the films of the trilogy they were in a position to perfectly give the effect of a time machine. Useless to say that "Back to the Future" represented for DeLorean a real consecration, and still today, the DMC models are particularly coveted by many aficionados and collectors.

Photographs, by courtesy of: F. Boixareu – V. Alfonzetti / *Fig. 3:* from Allegheny Ludlum HORIZONS magazine, first quarter 1978

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BEAUTY AND PRACTICALITY OF STAINLESS STEEL AT THE SERVICE OF WELL-BEING (La bellezza e la praticità dell'inox al servizio del benessere)

A company specialized in manufacturing indoor and outdoor furnishing elements made of stainless steel produces accessories and parts of great aesthetic impact destined to spa structures and swimming-pools. These elements consist in step ladders, handrails, micro-ventilated benches, professional accessories and special routes for spas, which are all made of mirror-finish polished EN 1.4404 (AISI 316 L) stainless steel. The choice of stainless steel was justified by the high level of resistance against corrosion agents, and by the practicality, convenience, and strong aesthetic impact of this material.

Manufacturing company: Ista Inox – Via Nazionale 48 – I-24069 Trescore Balneario BG, phone +39 035.4258572, info@istainox.it, www.ista-inox.com

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FROM OUR MEMBERS

SIDERVAL STAINLESS STEEL HOT EXTRUDED PROFILES ALSO IN SINGAPORE. FROM SIMPLE ROUND-SHAPED PROFILES TO CUSTOMIZED SHAPES

(Siderval. Profili estrusi a caldo inossidabili anche a Singapore. Da semplici tondi a sagome personalizzate)

We describe in this article how an EN 1.4406 (type 316LN) stainless steel ingot of 250 mm diameter can be transformed into a customized hot extruded profile.

In 2012, Siderval obtained an important order concerning an architectural project in Singapore

named **268 Orchard Road-Singapur**, consisting of 220 tons of profiles in bars, type 316LN, in lengths ranging from 1,610 mm to 5,900 mm, to be hot extruded. These bars, supplied in three different sections, had the purpose of building the bearing structure of a shopping centre.

The whole structure in which the glass windows are fitted is supported and secured by tie-rods made of the same grade of stainless steel. The 300 series was chosen, and namely the 316LN type, because of its resistance and its excellent aesthetic characteristics.

Considering the extremely critical application conditions of these profiles, the decision fell on obtaining the starting material from rolled sections and not from continuous casting. A specification was imposed to the supplier, which included as well as ultrasound tests, also the reduction of the section from bloom into round bar for four times at least in order to avoid the occurrence of internal cracks or blowholes resulting from the hot extrusion process. The difficulties represented by the mass and by the shape of the sections could be overcome through a correct setting of the heating and extrusion parameters. To eliminate the deformations the bars were showing in their overall length, they were reprocessed on a profile straightening machine. Subsequently, in order to comply with the agreed shape and straightening tolerance parameters, all the bars were reprocessed by means of a hydraulic press in order to obtain the correct shaping of the profile, and then through a twisting machine to remove from them the torsion generated by the hot extrusion process.

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SLAG: AN EXAMPLE OF ECOLOGICAL SUSTAINABILITY IN THE PRODUCTION OF STAINLESS STEEL

(La scoria: un esempio di ecosostenibilità nella produzione di acciaio inox)

Introduction – Any industrial area the objective of which consists in reaching environmental sustainability must overcome several obstacles, among which an increased energy efficiency and waste disposal. Every year, the manufacturing process of steel, as all industrial processes, produces considerable quantities of slag and waste. Steel slag cannot be considered waste in itself but rather, due to its intrinsic characteristics, a steel mill byproduct. From an environmental point of view, there are many advantages we can obtain from exploiting and using a byproduct like slag. For example, it is possible to minimize the production levels of waste to be reclaimed and the resort to activities that could impact on the territory, such as quarries for the extraction of aggregates, and reduce CO₂ emissions. **About slag** – Steel slag is a mixture of oxides generated during the different production stages of steel by the addition of agents aimed at removing slag in the process, or by the oxidation of part of the processed metals.

Slag is a fundamental part of the production process. From the point of view of composition, slag is mainly formed by silicates. Each stage of the production process produces a typical kind of slag, the composition and quantity of which depends

on the production stage itself and on the kind of steel produced. **Re-using stainless steel slag** – The regulations in force provide for re-using slag only if it fulfils the main condition of being environmentally compatible. This condition is established by a leaching test, as prescribed by Ministerial Decree n° 186, Annex 3, April 5, 2006 issued by the Ministry of the Environment. In the case of stainless steel slag, one of the most critical elements is chrome (Cr). If we know how the oxide systems behave during the transition from the liquid to the solid state, we can plan the necessary treatments aimed at making slag environmentally friendly. For example, in the case of chrome, if we know the composition of the slag, we have the possibility to make additions, during the liquid stage, in order to balance the composition of the oxides included in it and enable the formation of spinels. In addition, by controlling the cooling speed, it is also possible to prevent the formation of Cr(VI). Therefore, it is not the Cr quantity included in the slag that determines whether or not it is environmentally friendly, but rather the way in which chrome is present and bound in the oxide system. The use of diagnostic techniques for the analysis of the oxide structure, and the knowledge of the thermodynamics of the oxide systems allows us to efficiently approach slag engineering. Through simple and economically sustainable treatments, and by preserving the quality and quantity of produced steel, we can obtain an environmentally friendly slag.

Once the application has been established, it is important to apply for the certification of the obtained SLAG product. The CE marking allows us selling the slag as any other material used in civil works, since it certifies that it complies with the characteristics and the requirements provided for by the reference technical standards in force, and is also a guarantee of product traceability.

Concerning the use rates of slag produced by the electric furnaces used for the production of high-alloy stainless steel, the main application of non-disposed slag consists in the production of bituminous concrete (53%), while the remaining quantities are used for the production of cement conglomerates (29%) and concrete (13%). **An example with some figures** – The production of stainless steel slag totals about 1/3÷1/4 of the steel produced. In 2014, Italy produced about 0.5÷0.38 Mt of stainless steel slag. With reference to an average value of 0.4 Mt, and considering an average slag density of 2.4 t/m³, the overall volume produced totalled 166,000 m³. Knowing that a motorway lane has 3.75 m width, and supposing to completely re-use the stainless steel slag produced in 2014, it would be possible to cover 445 km of road surface or 222 km of road foundations. With this method we would avoid mining a quantity of quarry material forming a 16.6x100x100 m parallelepiped.

Conclusions – Slag is an extremely important element in steel production. It allows obtaining high-quality and high-purity steels and contributes to minimize heat losses and refractories consumption. The mechanical characteristics of slag make this material a substantial alternative to natural quarry aggregates. This obviously applies to stainless steel slag, in which the presence of chrome and other alloy elements does not impair its re-use. On the contrary, it has been ascertained that the slag originating from the "stainless steel cycle" has better

mechanical characteristics than that originating from the carbon steel production cycle.

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SMART INNOVATION (L'innovazione intelligente)

An Italian industrial reality stands out among the world major manufacturers of dishwashers and professional washing machines for objects. This company, established in 1985, became in 2003, part of a prestigious Italian group, which is considered the undisputable world leader in the production of catering machinery. In its planning office, this company designs and develops all kinds of machines for the most diverse applications: from the food processing industry to big users and OEMs, such as for example, super-sea cruisers or hospital centres.

The choice of this company towards stainless steel was steered by the need to guarantee the corrosion resistance of its appliances, since chemical agents have to be used to wash them.

The company makes use of different kinds and grades of stainless steel, among which EN 1.4301 and EN 1.4401 (AISI 304, AISI 316) austenitic steels in different finishing options, such as 2B, BA, satin finish, Scotch Brite, etc., and EN 1.4016 (AISI 430) ferritic steel for ancillary applications, in 0.8 - 1 - 1.2 - 2 mm thickness.

Manufacturing Company: DIHR Ali Spa - Via del Lavoro, 28 - I-31033 Castelfranco Veneto TV, phone +39 0423 7344, fax +39 0423 720442, dihr@dihr.com, www.dihr.com / **Stainless steel supplied by:** Aperam Stainless Services & Solutions Italy S.r.l. - Divisione Massalengo - Loc. Priora - I-26815 Massalengo LO, phone +39 0371 49041, fax +39 0371 490475, leonardo.frosali@aperam.com, www.aperam.com

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THE PROJECT FOR THE RENOVATION OF MONT BLANC ROPEWAYS (Il progetto di rinnovamento delle funivie del Monte Bianco)

The new ropeways of Mont Blanc reach Helbronner Peak in two stretches on a new line replacing the three previous lines, which have been demolished. This impressive project, which has improved the overall efficiency of the system, provided for the complete reconstruction of the three plants. The new plants were opened to the public in the month of June 2015. The ropeways have a considerably higher loading capacity, and have eliminated long queues, thus significantly improving and enhancing the experience of climbing on the highest mountain peak in Europe. The downhill station, shaped like a wave, was designed and built north of the residential area of Entreves considering the studies on the avalanche wind, which were started in 1997 after an avalanche. The intermediate "Pavillon" station is located at 2,600 m height and is the interchange point between the first and the second stretch of the ropeway. The drawn-close bending surfaces of the infill walls envelop the covered spaces and have considerable heights, which were forced to a great extent by the strict profile of the cableway line. The uphill "Helbronner Peak" station is located at 3,500 m height, in the realm of perennial snow, and looks like a huge crystal coming out of the rocks, which strongly links the concept of the station to one of the most important functions of the inner spaces, entirely devoted to house the exhibition of the Mont Blanc crystals and rocks. Steel and many complements made of stainless steel, such as tie-rods and turnbuckles, are the typical structural elements of all the external covers of the three stations, which are lined with zinc-titanium sheets. The project provides for an extensive use of EN 1.4401 (AISI 316) stainless steel, which in

addition to its undoubted aesthetic characteristics, is capable to effectively combine with metal carpentry and glass, thus attaining considerable mechanical characteristics. In addition, at those heights, stainless steel plays an essential role thanks to its resistance to external agents, which ensures its performance even at very low temperatures. Moreover, stainless steel has found several further applications in the safety-related systems, such as life lines, fall protection systems, and above all, external parapets, in which it elegantly combines with painted and galvanized steel. Stainless steel has been used also for all the sealing elements of the glass parapets, as it perfectly matches with the colour of ice. Finally, stainless steel was chosen also for special fittings, such as for example, the counter of the downhill ticket office, and other furnishing elements.

Customer: Funivie Monte Bianco Spa - Courmayeur AO / **Planning and design:** Associazione Temporanea di Imprese: Dimensione Ingegnerie srl (lead group representative and service coordinator), Funiplan srl, Arch. Carlo Cillara Rossi, S.I.M.E.TE srl, Studio Corona Srl, Proteo Srl, Studio Cancelli Associato, Ing. Sergio Ravet, Dott. For. S. Durante, Dott. For. P. Terzolo, Dott. Geol. R. Vuillemoz / **External design studio:** Holzner & Bertagnolli Engineering srl / **Architectural planning and design:** Arch. Carlo Cillara Rossi / **Technical architectural planning:** Ing. Guido Incarbone - Proteo Srl / **Construction supervision:** Ing. Marco Petrella - Dimensione Ingegnerie srl / **Construction:** Consorzio Cordée Mont Blanc - **Cableway construction technology:** Doppelmayr Italia srl / **Site management:** Geom. Renzo Cipriano - www.cordeemontblanc.eu

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ADVANCED COURSE ON STAINLESS STEELS - 9th EDITION MILAN, JANUARY 26-27 AND FEBRUARY 2-3, 9-10, 16-17, 2016

(Corso "Gli Acciai Inossidabili" - 9ª Edizione)

This course has been organized by Associazione Italiana di Metallurgia together with the Association of Engineers of Milan, and in cooperation with Centro Inox.

Four years after the previous edition, Associazione Italiana di Metallurgia proposes once again, with the cooperation of Centro Inox, an advanced course focused on stainless steels, addressed to technical experts, researchers, professionals, and in general to all those who work in Italy in the steel industry. This course offers all participants an opportunity for increasing and updating their knowledge, and in particular, allows the companies belonging to this sector to plan an appropriate action aimed at training and keeping up to date their technical staff.

The ninth edition of this course will be based on a single module divided into 8 days, which privileges a simpler format compared to the past editions, and aims at promoting attendance and participation. The first days of the course will deal with basic metallurgy, the main characteristics of steel, and corrosion resistance. A second group of days will be focused on stainless steel production processes, process technologies, and applications. The monographic lessons are connected one another in a logic and consequential way, so as to facilitate participants to learn and panoramically study the issues included in the agenda. The teaching staff belongs to different university departments and industrial areas. Teachers and lecturers are prepared to offer all participants, during the lessons and the subsequent debates, a direct testimony of their professional experience.

Additional information and applications:

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THE STAINLESS STEEL MARKET (Il mercato dell'acciaio inossidabile)

Unione Concommercio Milano, Corso Venezia 47

Milan, Thursday March 3, 2016 - h. 9.00

A one-day meeting organized by Centro Inox and Assofermet, with the participation of SMR Group.

- ✓ **Changes occurred in Italy's distribution system**
- ✓ **Market data on production and consumption: stagnation or recovery?**
- ✓ **Global situation within and outside the European Union**
- ✓ **Overview and trend of raw materials**

Preliminary agenda:

- **Welcome address to participants and introduction**
 - **Overview of stainless steel production and consumption at a global and a European level (Import and Export - Far East: China and Taiwan)**
 - **Inquiry results: map of distributors and service centres**
- Coffee break*
- **Consumption allocation by market areas. Latest developments? Growth? Stagnation?**
 - **Overview of the raw materials**

Lunch break

Afternoon session

Open debate with market leaders

Questions and answers

Additional information and applications:

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NATURAL WORLD AND ARTIFICIAL WORLD JOINED INTO AN APPLE

(Mondo naturale e mondo artificiale ricongiunti in una mela)

Before the opening of Expo 2015, Piazza del Duomo in Milan changed its face hosting from May 3 to 18, 2015 the work "Terzo Paradiso - La Mela Reintegrata" (Third Paradise - The Reintegrated Apple) made by the artist Michelangelo Pistoletto. This work, which represents a huge apple, has an extraordinary size: 8 m height, 7 m diameter, and an overall weight of 13 tons. The Apple rests on a central vertical 8 m high column made of EN 1.4301 (AISI 304) stainless steel, from which 15 metal arms depart to divide the structure into eight segments. The structure is enveloped by 50 cm wide panels of grass stitched to one another. Around the Apple, placed in the centre of the square, on an overall surface of over 1,000 m² the symbol of the "Third Paradise" has been reproduced using more than 150 bales of rice straw. This symbol reproduces the mathematical sign of the infinite, which for Pistoletto represents the fusion of the "natural paradise" with the "artificial paradise". The "Reintegrated Apple", which in the artist's opinion represents the primordial fruit, the emblem of the reconciliation between nature and artifice in the Third Paradise, after having been exhibited in Piazza del Duomo, has been offered by Cittadellarte - Fondazione Pistoletto to the city of Milan, and will be placed in Piazza Duca d'Aosta, in front of the Central Railway Station.

Artist: Michelangelo Pistoletto - www.lamelareintegrata.org / **Design:** Cittadellarte - Fondazione Pistoletto, phone +39 015 0991454 - in cooperation with: FAI - Fondo Ambiente Italiano - with the sponsorship and support of: Comune di Milano - sponsor: Expo Milano 2015

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