

INOSSIDABILE

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Summary

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

AN ANNOUNCEMENT TO THE READERS OF INOSSIDABILE (Ai lettori di INOSSIDABILE)

Dear readers, it was September 1965, when the first issue of our magazine INOSSIDABILE came out. We have now reached issue N° 220 and, since then, four issues per year have always been published with precise regularity, reporting examples of stainless steel applications in the most various industrial sectors, in addition to the technical pages and the space reserved for the activity of our association. Unfortunately, recent pandemic events have caused our magazine to suffer a small setback as well, so this issue comes out “concentrated” and cadenced “June/September”, so it was not possible to respect the traditional quarterly frequency for this year. We apologize to our faithful readers for this, hoping that they will continue to find, also in the next editions, interesting technical/applicative ideas that can increase interest and curiosity in stainless steel as often INOSSIDABILE has managed to do.

The director, Fausto Capelli

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STAINLESS STEEL REBAR: SAFETY AND DURABILITY FOR THE GENOA BRIDGE (Barre inox: sicurezza e durabilità per il ponte di Genova)

In the new Genoa San Giorgio Bridge, designed by Renzo Piano and inaugurated last 3rd August, stainless steel rebar plays a key role in ensuring not only structural strength but also resistance to corrosive phenomena, for maximum structural safety. Stainless steel has been provided in the areas considered the most delicate from the corrosion resistance point of view.

In detail, REVAL® (trademark of Acciaierie Valbruna) EN 1.4307 (AISI 304L) stainless steel was supplied. Since stainless steel, thanks to its intrinsic properties, allows considerable savings on maintenance costs for structures that, as in this case, are exposed to aggressive environments, this choice results to be the most economical solution in the long term. Other relevant characteristics of stainless steel rebar are their high mechanical strength, high ductility, excellent energy absorption capacity during seismic events, as well as low magnetic permeability and better fire resistance, compared to carbon steels.

Stainless steel rebar produced and supplied by: Acciaierie Valbruna SpA – I-36100 Vicenza VI – Viale della Scienza 25, phone: +39 0444 968211, costruzioni@valbruna.it, www.valbruna-stainless-steel.com

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**FROM OUR MEMBERS
CSM GROUP, THE 360-DEGREE
INNOVATION FROM VENETO REGION:
A SUCCESSFUL WAY IN INDUSTRY 4.0**

(CSM GROUP, l'innovazione veneta a 360°: via di successo nel mondo 4.0)

In an increasingly fast and unpredictable world, in CSM Group, a Veneto-based company leader in the manufacture of production machines (CSM Machinery) and stainless steel tube (CSM Tube, with over 50 million meters exported worldwide), it has been clear for a while already that it is not enough to “adapt” to the change, but it must be anticipated, turning great challenges into equally great opportunities. It is Elisabetta and Marco Trolese, the two sons of the founder Giorgio, today at the head of CSM Group, who are pushing the accelerator of change to maintain the market leadership in Europe and gain positions in the US and South American markets, where they have production facilities. In CSM Group, this has been made possible by focusing on certain concepts, i.e. believing in people, valuing their ideas, investing in smart working and digital transformation, in an Industry 4.0 point of view.

The fact that the two company offices, although in the same municipality, were not close to each other, and the subsequent opening of offices in Brazil and the USA, has already forced the company to invest and adopt the concepts of Industry 4.0 and the digitalization of its infrastructure.
CSM Tube SpA – I-31013 Cimavilla di Codognè TV – Via del Lavoro 60, phone: +39 0438 471100, fax: +39 0438 470606, info@csmtube.com, www.csmtube.com

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**CORROSION BEHAVIOUR OF
STAINLESS STEEL LONG PRODUCTS
WITH DIFFERENT DELIVERY
CONDITIONS (SECOND PART)**

(Comportamento a corrosione di prodotti lunghi di acciaio inossidabile con differenti stati di fornitura (seconda parte))

As reported in the previous issue, Centro Inox has recently carried out an investigation to estimate the different corrosion behaviour of long products (bars) in stainless steel, considering the types of material and the delivery conditions most frequently marketed.

In this article, the results coming from the remaining tests will be discussed and the conclusions of this investigation will be provided.

IMMERSION TESTS IN FeCl₃ – Its aim is to evaluate pitting and crevice corrosion resistance in an oxidizing and chloride-containing environment. Crevice corrosion phenomena have been found for all tested materials. The distinction between ground and drawn finish was very slight in this case. As far as pitting is concerned, a better behaviour was noted for the ground finish, for all the materials analysed. The AISI 430F samples showed the worst behaviour.

ATMOSPHERIC EXPOSURE TESTS – The resistance to atmospheric corrosion was assessed in two totally different environments: urban and marine atmosphere (Milan and a Sicilian coastal town, respectively). At the end of the tests conducted in Milan, the samples showed only slight traces of staining. The marine atmosphere exposure test, on the other hand, resulted in strong staining on the ferritic stainless steel bars, with localised attacks. The austenitic stainless steel bars showed superficial staining, but to a lesser extent than that found in ferritic SS. For all materials, the ground finish showed better behaviour with respect to the drawn one.

SALT SPRAY TESTS – Considering austenitic stainless steels, only AISI 303 showed signs of



attack: the number of pits and, consequently, their density is higher in samples with drawn finish. The same behaviour was found for AISI 430, where, however, a higher number of pit and a higher pit density was measured. AISI 430F showed the worst corrosion resistance.

CONCLUSIONS – AISI 316 showed the best corrosion resistance. Overall, corrosion resistance is generally a function of the PREN index. The presence of the element sulphur in AISI 303 and AISI 430F resulted in a lower corrosion resistance with respect to their un-resulfurized “counterparts” (AISI 304 and AISI 430, respectively). AISI 430F was the stainless steel, among those tested, with the lowest corrosion resistance. To conclude, the ground finish generally had a better behaviour than the drawn finish with the same material.

We would like to thank Rodacciai SpA for the material supplied, RTM Breda and Politecnico di Milano for the tests carried out. We would also like to thank the research group PoliLaPP (Laboratorio di corrosione dei materiali “P. Pedeferrì”) of Politecnico di Milano, coordinated by Prof. Marco Ormellesse, within which Eng. Giuseppe Diana participated in the investigation as a graduate.

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THE STAINLESS STEEL CLOUD GATE (La porta delle nuvole è in acciaio inox)

Installed at the AT&T Plaza in Chicago's Millennium Park, the work “Cloud Gate” is made of EN 1.4301 (AISI 304) stainless steel. For its realisation, given its particular “bean” shape, 3D modelling was necessary to provide the guidelines for the calenders used to curve the sheets (1 mm thick). Their “SuperMirror” finish, together with the particular shape characterizing “Cloud Gate”, allows the work to reflect and distort the city skyline. A special technique was used to weld the numerous sheets without leaving any trace on the surface.
Artist: Anish Kapoor / *SuperMirror stainless steel produced by Rimex Metals Uk and distributed exclusively in Italy by:* Steel Service Srl – I-26845 Codogno LO – Via Armando Diaz 80/C, phone: +39 0377 379821, fax: +39 0377 400818, commerciale@steelservicegroup.com, www.inoxcolorato.com

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CHAMPAGNE FOR NIZZA PARADISE RESIDENCE

(Champagne per il Nizza Paradise Residence)
The article reports an important application of a leading European manufacturer of coloured stainless steel sheets: the Nizza Paradise Residence in Lugano (Switzerland), where a well-known architect chose this product for the facework. The external facing of the building is made of Champagne Pallinato (“Shot-peened Champagne”) coloured EN 1.4301 (AISI 304)

stainless steel sheets, having a thickness of 1 / 1.2 mm, for a total of 40 tons. The “Champagne” surface finish was obtained by electrochemical colouring thanks to the INCO-process, i.e. a colouring obtained by “interference”.

Stainless steel supplied by: Steel Color SpA – I-26033 Pescarolo ed Uniti CR – Via per Pieve Terzagni 15, phone: +39 0372 834311, fax: +39 0372 834015, info@steelcolor.it, www.steelcolor.it / **Project carried out by:** Mino Caggiula Architects SA – CH-6900 Lugano (Switzerland) – Viale Cassarate 1, phone: +41 091 9225637, fax: +41 091 9225638, info@minocaggiula.ch, www.minocaggiula.ch

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STAINLESS STEEL INSULATION SYSTEMS (Sistemi di coibentazione inossidabili)

This article describes two insulation systems recently furnished by a company whose core business is the design and construction of both civil and industrial insulations.

The first example is a lamellar decanter used in water and wastewater treatment plants. Its thermal insulation was obtained by means of mineral wool and an external covering in EN 1.4301 (AISI 304) stainless steel with a 2B finish and a thickness of 0.6 mm. The second insulation system concerns a reactor for resins. It was carried out by exploiting several layers of a polymeric insulating material and an external metal cover in EN 1.4301 stainless steel, characterized by the same finish and thickness as the previous case.

Insulation systems made by: Coifer Srl – I-24043 Caravaggio BG – Via Leonardo da Vinci 47, phone: +39 0363 51597, fax: +39 0363 53011, info@coifer.it, www.coifer.it

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CORROSION: STAINLESS STEELS AND SUPER-ALLOYS

ADVANCED THEORETICAL AND PRACTICAL COURSE

(Corrosione: acciai inossidabili e superleghe. Corso teorico-pratico avanzato)

22-23-29-30 October 2020

Centro Inox, in collaboration with PoliLaPP – Laboratorio di corrosione dei materiali (Material Corrosion Lab) “P. Pedeferrì” of Politecnico di Milano, organizes the fifth edition of the advanced theoretical-practical course on corrosion of stainless steels and superalloys. The aim of this course, which is developed over four days and is proposed with the distance learning method, is to provide in-depth knowledge on the theory and morphology of corrosion phenomena of stainless steels and superalloys, on aspects concerning the correct selection of materials according to the uses and corrosion environments, on the main corrosion tests conducted in laboratory.

Official language: Italian. The complete programme and the registration form are available on Centro Inox website: www.centroinox.it

For further information and registration:
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e-mail: eventi@centroinox.it

STUDY DAY “FCMs (MOCA) AND WELDING”

**(Giornata di studio “MOCA e saldatura”)
27 October 2020 - 9.15÷ 7.00**

**Location: Istituto Italiano della Saldatura – Sala U. Guerrera – Genova Lungobisagno Istria, 15
With the collaboration of Orbitalum Tools GmbH**

In the food sector, FCMs (Food Contact Materials, “MOCA” in Italian) declarations are becoming increasingly important for those companies operating in this field. In a panorama as varied as it is important, we are going to offer, with this study day, an in-depth examination of the aspects that characterize the application of welding processes, with a particular focus on their influence on the requirements related to food safety. The day, organised by Centro Inox and the Italian Institute of Welding, with the collaboration of Orbitalum Tools GmbH, consisting of a theoretical and a practical part, is intended for all processing companies using stainless steel welded products. The aim of the day is to shed light on the requirements, laws and regulations of the industry, as well as the use of the technologies that best suit this purpose.

Official language: Italian. The complete programme and the registration form are available on Centro Inox website: www.centroinox.it

For further information and registration:
Italian Institute of Welding: Ivana Limardo – ivana.limardo@iis.it – phone: +39 010 8341373
Centro Inox: Giovanna Ferrario – eventi@centroinox.it – phone: +39 02 86450559

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OIL ON CANVAS? BETTER, OIL ON... STAINLESS STEEL!

(Quadri olio su tela? No olio su... inox!)

In this article some examples are given where oil painting is used in synergy with stainless steel. The artist uses EN 1.4301 (AISI 304) stainless steel sheets with a 2B finish (thickness from 1 to 2 mm) as canvas. The stainless steel is not totally covered by the painting, therefore its aesthetic value is added to that of the painting itself, obtaining unique works.

Artist: Fiammetta Mora – I-20070 Vizzolo Predabissi MI – Via S. Antonio 2/8

CENTRO INOX

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