

INOSSIDABILE

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Summary

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Editorial - STAINLESS STEEL AND SUSTAINABILITY

(Inox e sostenibilità)

In general, when we talk about sustainability, we refer to a variety of different concepts. If this concept is applied to the environment in which we live, we refer to the durability of a particular "organized set" in a position to respect life. If we carefully consider the roles stainless steel can play to protect the environment, we discover that this material can play an active role when, for instance, it contributes to the construction of plants and systems designed to fight pollution. Stainless steel plays a preventive role, when we think, for example, about its contribution to the construction of tank farms for toxic waste or desulphurization plants. Finally, we should not neglect its alternative role, when we focus on all parts and components in which stainless steel is used to replace ecologically incompatible materials, or those requiring polluting processes. Furthermore, the stainless steel used for parts and components can be re-used at the end of their useful life, for the production of new stainless steel, and consequently does not produce waste that needs to be disposed in dumps. Finally, stainless steel scraps, even if stocked in the open, do not create pollution, and the possibility to 100% re-use them for the production of new stainless steel allows to considerably economize in raw material costs, as for example, in the case of ferroalloys.

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A STAINLESS STEEL "TEMPEST"

("Tempesta" d'acciaio)

"Tempesta" (Tempest) is a line of EN 1.4016 (AISI 430), BA finish, furnishing elements. These pieces of furniture are light and easily stackable, and have a perfectly ergonomic and a stylistically elegant structure. The name of this line derives from the optical effect given by the stainless steel plate, which is punched and scattered with countersunk holes simulating the presence of water drops. The collection includes: a stackable chair, a stackable armchair, an armchair coupled with a small table, a stool, a stackable deck chair, and finally, a set of tables with a tubular stainless steel structure.

Manufacturing Company: Graepel Italiana S.p.A. – Via Fondi 13 – I-46018 Sabbioneta MN, phone +39 0375 220101, fax +39 0375 220262, info@graepel.it, www.graepel.it / **Design:** Pepe Tanzi / **Photographs:** Enrico Colzani, Vincenzo Graepel

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FROM OUR MEMBERS

ACCIAIERIE VALBRUNA

ACCIAIERIE VALBRUNA is a leading brand in the production of stainless steel, nickel alloy, and titanium "long products". VALBRUNA has three production plants based in Vicenza, Bolzano, and Fort Wayne (Indiana - USA). VALBRUNA offers a wide and diversified range of products, which includes more than 700 types of special steels: ferritic, martensitic,

austenitic, refractory, precipitation-hardening, and duplex stainless steels; nickel-copper, nickel-chrome, and iron-nickel-chrome alloys, titanium stainless steels and titanium alloys. Several products developed for particular applications are covered by registered trademarks: **MAXIVAL**[®] - identifies a group of steels offering high workability in mechanical chip removal processes, as well as the same mechanical and corrosion resistance properties as those provided by conventional steels. **MAGIVAL**[®] - identifies a group of highly workable ferritic stainless steels developed for magnetic applications requiring high magnetic permeability and low coercive force. **MARINOX**[®] - this trademark identifies a group of austenitic, precipitation-hardening, and duplex stainless steels used in particular for the production of propeller shafts and in the shipbuilding industry. **REVAL**[®] - refers to improved-adherence concrete reinforcing bars made of stainless steels destined to the building industry and architectural works. **BIOVAL**[®] - refers to a range of stainless steels including titanium and titanium alloys, especially developed for surgical plants and instruments, characterized by high biocompatibility, corrosion resistance, and excellent purity standards. **AEROVAL**[®] - identifies a group of stainless steels and nickel alloys for applications in the aerospace industry.

These trademarks are completed with: Stainless steels, nickel alloys, and titanium stainless steels for the power generation industry; Stainless steels and nickel alloys for the oil and gas industry; Iron-silicon alloys for applications requiring greater electric resistivity and permeability, low coercive force, and less residual magnetism compared to carbon steels and **MAGIVAL**[®] stainless steels. **Quality, Environment, and Security** - The definition and management of the Corporate Quality System, ensured by the ISO 9001:2008, AS 9100 Rev. C, ISO/TS 16949:2009 certification, involves the organization of all corporate processes.

ACCIAIERIE VALBRUNA SPA

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REFURBISHMENT OF DRINKING WATER TRANSPORTATION NETWORKS: A CONSOLIDATED TRENCHLESS TECHNOLOGY MEETS THE LATEST GENERATION OF STAINLESS STEEL

(Risanamento delle reti idropotabili: una consolidata tecnologia trench-less incontra l'inox di ultima generazione)

On different occasions, several pages of the magazine INOSSIDABILE were devoted to the problems related to drinking water. The great attention paid to this issue, inspired a research project aimed at checking the possibility to adapt a consolidated trenchless technology (TECHINOX[®]) for the refurbishment of drinking water transportation networks, to the characteristics of a new-generation ferritic stainless steel (470LI – EN 1.4613). Hereafter, we report a description of the different elements of this project, and the related conclusions.

The TECHINOX[®] Trenchless Technology – This

technology belongs to the so-called "trenchless" or "no-dig" technologies. The main steps of TECHINOX[®] technology are reported in the **Picture 1. The Latest Generation of Ferritic Stainless Steel: 470LI (EN 1.4613)** – The ferritic stainless steel grade 470LI (which is going to take the new official denomination of EN 1.4613) is an innovative material characterized by: excellent resistance against corrosion (comparable to the resistance provided by grade 316), good weldability and cold-forming possibility, considerable economic advantages. **The Research Project: Stages, Conclusions, and Future Developments** – The research project included the following stages: production of 5 conduit prototypes making use of 470LI stainless steel (**Picture 2**); metallographic characterization of the longitudinal welding seam; electrochemical characterization of passivity in drinking water according to EN 16056:2012; pressure tightness hydraulic test has exceeded 14-bar value; global and specific migration test (of the welded area) according to Ministerial Decree 174/2004, which intends to test the suitability of stainless steel used for drinking water. The metallographic characterization (**Picture 3**) confirmed the suitability of the used welding processes and their correct use. The use of the procedure provided for by the lately published EN 16056:2012 standard, is surely a quite innovative feature. As a matter of fact, this standard establishes a parameter for assessing the state of passivity of a stainless steel in drinking water as a basic element for establishing its conformity to this specific use. **Picture 4** points out the excellent performance of 470LI compared to the reference 1.4404 (316L) steel grade. Finally, the compatibility assessment, from a sanitary point of view, was certified by the procedures provided for by the Italian law on materials coming into contact with drinking water (**Table 1**). To conclude, this research project certified a perfect compatibility between a consolidated refurbishment technology used for drinking water transportation networks and a recently introduced stainless steel grade.

This article is a summary of the research activities carried out in 2012, which involved the following organizations: CSM (Organization in charge of the research project, and of the metallographic and electrochemical analysis), Acciai Speciali Terni (Supplier of 470LI stainless steel), SMAT – Società Metropolitana Acque Torino S.p.A. (Development and proprietary rights of TECHINOX[®] technology), Centro Inox (Coordination of activities), Centalferro (Production of the prototypes), RTM Breda (Leaching tests).

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STAINLESS STEEL CABINETS: ALL PROPERTIES ARE "LOCKED" IN A MARK

(Armadi di acciaio inossidabile: tutte le qualità "rinchiuse" in un marchio)

This article deals with a new display of appreciation for an action pursued by the "Mark for Stainless Steel Products" characterizing stainless steel products in Italy, focusing on cabinets for dressing rooms, pigeon-hole cases, and "industrial" shoe racks.

The firm owned by Mr. Alboni is one of the first



organizations which was able to take in the market the opportunity offered by the steel mills to use alternative stainless steel alloys to the traditional austenitic stainless steels (304 and 316 grades), which have always been recognizable through the "magnet test". The "Mark for Stainless Steel Products" proved to be, in this case too, an effective vehicle to communicate customers the novelty and the safety of these alloys.

Manufacturing company: Facilitas s.r.l. – Via Lazio 7, A/B/C – I-41050 Montale R. MO, phone +39 059 530570, fax +39 059 4909000, facilitas@facilitas.it, www.facilitas.it / **Stainless steel mark:** issued by Centro Inox, www.centroinox.it/marchio

STAINLESS STEEL: QUALITY DESIGN AND QUALITY PRODUCTS

(Acciaio inox: il design di qualità è inossidabile)

Along with its line of products of excellence (finished products, forged wrought iron and stainless steel parts), a well-known company based in Malo (Vicenza) chose long since to add also EN 1.4301 (AISI 304) and EN 1.4401 (AISI 316) stainless steel grades as structural materials for some of its outdoor products, such as parapets, sheltered platforms, and other products. The development of a line of staircases called "Glasstree" is the result of this new partnership, and is only one of the latest projects that fully prove the value of stainless steel.

Pict. 1 – "Bars Round": banisters and parapets of timeless style. The upright sections have 42.4 mm diameter, and are anchored both laterally and to the floor.

Pict. 2 – Sheltered platform system.

Pict. 3 – Stainless steel and glass blend each other and combine the modernity of lines and shapes with tradition, forming a comfortable winding staircase. The handrail has 42.4 mm diameter, and the round bars 12 mm diameter.

Manufacturing company: Ind.i.a. Spa – Industria Italiana Arteferro – Via Vicenza 6/14 – I-36034 Malo VI, phone +39 0445 580580, fax +39 0445 580874, india@arteferro.com, www.arteferroinox.com / **Design:** Roberto Santi, Matteo Nabissi

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THE USE OF SILVER ICE® IN THE PRODUCTION OF CHIMNEYS

(L'impiego del Silver Ice® nel settore delle canne fumarie)

The company this article is focusing on is based at San Severino Marche (Macerata), and lately produced a chimney made of anti-fingerprint stainless steel (Silver Ice®). This special transparent coating treatment protects stainless steel against fingerprints, preserves its elegance and quality, and offers it a captivating, appealing and innovative look. Silver Ice® was applied on an AISI 430, 0.5 mm thick, stainless steel base. In addition to the typical characteristics of stainless steel, this transparent coating offers high resistance against scratches, can be easily cleaned, has high formability levels and ensures greater corrosion resistance properties. With this kind of pre-coating system, it is possible to reach extremely thin thickness layers, which perfectly adhere to the steel.

Manufacturing company: Multiclima S.r.l. – Via Antonio Meucci, Zona ind.le PIP 6 – I-62027 San Severino Marche MC, phone +39 0733 645675, fax +39 0733 645780, info@multiclimasrl.com, www.multiclimasrl.com / **Stainless steel produced by:** Acciai Speciali Terni S.p.A. – Viale B. Brin, 218 – I-05100 Terni TR, phone +39 0744 490282, fax +39 0744 490879, marketing.ast@acciaiaterni.it, www acciaiaterni.it

AN IDEAL SHOWCASE IN TERMS OF PRESTIGE AND TECHNOLOGY

(La vetrina ideale per prestigio e tecnologia)

The headquarters of the car dealer described in this article are located in the industrial compound of the municipality of Isola delle Femmine (Palermo) between

sea and mountains, within a landscape covered with citrus groves. The project included the recovery, restoration and enlargement of an existing industrial shed, with the addition of a body at the two ends of the shed, and the construction of two new buildings. Stainless steel and glass were extensively used in order to "lighten" this rather heavy structure. The inalterability of the surface over time, makes stainless steel an ideal material choice in the case of critical environments. To build the large glass windows, the size of which is at the limit of all technical feasibility, the designer resorted to profiles for the curtain wall of the building. The profiles are made of polished-finish EN 1.4404 (AISI 316L) stainless steel. The same stainless steel alloy was used for the profiles for manufacturing the window frames, this time with a Scotch-Brite finish. Since these profiles have very narrow sections, they consequently produce a smaller visual impact, providing greater brightness to the interiors, as well as ensuring them an unlimited useful life and extremely reduced maintenance interventions.

Work: Nuova Concessionaria BMW MINI Elauto srl, Isola delle Femmine PA / **Project:** Arch. Filippo Quattrocchi, Palermo / **Workshop:** Sermet srl, Palermo / **"Termica UP" and "Sistemacciaio" profiles:** Secco Sistemi Spa – Via Terraglio 195 – I-31022 Preganziol TV, phone +39 0422 497700, fax +39 0422 497705, info@seccosistemi.it, www.seccosistemi.it

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STAINLESS STEEL AND CORROSION. AN ADVANCED THEORETICAL-PRACTICAL COURSE – Milan, 16-17-29-30 May, 2013

(Acciai inossidabili e corrosione. Corso teorico-pratico avanzato)

Centro Inox, in partnership with PoliLaPP (the Material Corrosion Laboratory of the Department of Chemistry, Material and Chemical Engineering of the Polytechnic of Milan) organized this 4-day course aimed at studying in depth the theme of corrosion related to stainless steel.

This is a unique event in this area, since the theoretical lessons, aimed at studying in depth these topics, will be supported by practical laboratory activities.

The teachers who will alternate during the lessons have a long-lasting academic experience combined with a significant practical ("in the field") experience in several application areas.

To all participants will be given a complete technical documentation on stainless steels, as well a certificate of attendance. **Location:** PoliLaPP - Laboratorio di Corrosione dei Materiali "Pietro Pedferri" - Politecnico di Milano - Dipartimento Chimica, Materiali e Ingegneria Chimica "G. Natta" - Via Mancinelli 7 - Milano (Italy). **Timetable:** 08.30 a.m. ÷ 01.00 p.m. / 02.00 p.m. ÷ 05.30 p.m. **Registration Rate per Person:** 1,750 € + VAT 21%. 20% discount for Centro Inox Members, Centro Inox Servizi Srl Affiliated and Registered Companies

Additional information: Centro Inox Servizi Srl, eventi@centroinox.it, www.centroinox.it, phone +39 02 86450559, +39 02 86450569, fax +39 02 860986

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NATIONAL WELDING DAYS - Genoa, 23-24 May, 2013

(Giornate Nazionali di Saldatura)

Istituto Italiano della Saldatura organized on 23-24 May, 2013 at Porto Antico di Genova – Centro Congressi, the seventh edition of the National Welding Days.

Organization Secretariat: Istituto Italiano della Saldatura - Ente Morale – Lungo Bisagno Istria 15 – I-16141 Genova, phone +39 010 8341389, fax +39 010 8341399, gns7@iis.it, www.iis.it

DRINKING WATER: A NEW EN STANDARD

FOR THE EVALUATION OF STAINLESS STEELS

(Acqua potabile: una nuova norma EN per la valutazione degli acciai inossidabili)

CEN TC 164 "Water Supply", which deals with the formulation of the tests aimed at evaluating the conformity of various materials coming into contact with drinking water, developed the standard EN 16056:2012 "Influence of metallic materials on water intended for human consumption - Method to evaluate the passive behaviour of stainless steels", published in May 2012.

TABLE REFERRING TO THE CHEMICAL ANALYSIS OF THE MAIN STAINLESS STEEL GRADES, AND CORRESPONDENCE OF THEIR DIFFERENT DESIGNATIONS ACCORDING TO EN, AISI AND ASTM

(Tabella dell'analisi chimica dei principali acciai inossidabili e corrispondenza fra le designazioni secondo EN, AISI e ASTM)

This new table (in Italian language) has been conceived as a guidance for identifying both the chemical composition of the main stainless steel grades, and the approximate correspondence of their names according to EN European Standards, AISI Manual, and ASTM Standard and Specifications.

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WHEN FLOWERS HAVE AN "ART NOUVEAU" STYLE

(Quando i fiori hanno uno stile "Liberty")

"Liberty" (as in Italy the Art Nouveau style is called) is a vertical gardening system formed by intertwined stainless steel wires and bars forming a mesh in which stainless steels basins are included. The greatest quality of "Liberty" consists in its durability over time. The only required maintenance interventions are those concerning plants. An irrigation system is installed on the wall, and for this purpose, the use of a water-resistant metal, such as stainless steel, becomes an essential feature. The round bars are made of EN 1.4301 (AISI 304) stainless steel of 3 mm diameter, and 1,500 mm and 1,000 mm length, while the 2 mm diameter wires are made instead of EN 1.4401 (AISI 316) stainless steel, and the 1 mm thick plate is made of EN 1.4301 (AISI 304) stainless steel. The upper and lower end of the mesh are TIG welded in order to join and fasten the three wires, and avoid that the last round bar slips out.

Metal mesh produced by: Tessitura Tele Metalliche Rossi O & C Srl – Via dell'Artigianato 16 – I-22079 Villa Guardia, phone +39 031 480350, info@ttmrossi.it, www.ttmrossi.it / **Gardening:** Eden all'Orizzonte – Via Balossa 75 – I-20026 Novate Milanese MI, phone +39 02 6464065, info@eden-orizzonte.it, www.eden-orizzonte.it / **Product marketed by:** Agro Service, phone +39 02 36532235, www.gravitygarden.it

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