

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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.... PER ASPERA AD ASTRAM (...Through the thorns to the stars)

The case we present in this article concerns the construction of an astronomical centre, in which the cupola has been covered making use of a technology that is now widely used by the contractor.

The astronomical centre includes the Astronomic Observatory and the Planetarium of Anzi, and is located at Santa Maria, a mountain village on the suggestive Monte Siri, in the province of Potenza. The dome of the Astronomic Observatory has a diameter of 4 metres, and its covering consists of stainless steel 0.7 mm thick segments radiating from the centre. The internal frame, which acts as a load-bearing structure, is formed by stainless steel tubes. The whole structure has been made of stainless steel, which ensures rust protection and limits maintenance operations exclusively to lubrication of the parts in motion. The tambour at the base of the dome is made of stainless steel tubes welded to a circular concrete wall. The observation doors, too, consist of stainless steel tubes. The 9 m diameter geode dome of the Planetarium, is provided with a double covering. The internal covering is made of EN 1.4301 (AISI 304) stainless steel sheets in size 1250x4000 mm and in 0.6 mm thickness. The dome is supported by a frame formed by stainless tubes, thus ensuring rainfall protection. The second external covering and has been made of n°7-finish polished and triangle-shaped EN 1.4301 (AISI 304) stainless steel plates. These modular sections have been cut from 1250x2500 mm sheets and are 0.7 mm thick. The tambour has a circular base formed by stainless steel tubes placed side by side. These tubes have been vertically welded to the circular tambour in order to form an internal support frame divided into segments radiating from the bottom to the top of the hemisphere. The bottom of the hemisphere is larger than the maximum diameter, in order to obtain a 360° mirror-effect of the surrounding landscape. The internal dome has been suitably insulated while the external dome has been slightly spaced from it in order to allow natural air circulating between the two domes, and to achieve a low thermal gradient inside the structure.

Planning, construction, and installation: Gambato – Via Canaletto 43 – I-30030 Gardigiano di Scorzè VE, phone/fax +39 041 5830145, info@gambato.it, www.gambato.it / **Stainless steel plate polished finishing:** Steel Color Spa – Via Pieve Terzagni 15 – I-26033 Pescarolo Ed Uniti CR, phone +39 0372 834311, fax +39 0372 834015, info@steelcolor.it, www.steelcolor.it / **Material:** Origoni Zanoletti

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MORE SPACE FOR FERRITIC STAINLESS STEEL IN THE FOOD INDUSTRY

(Più spazio per l'inox ferritico nel settore alimentare)
Through Ministerial Decree n° 215 of December 10th, 2008, "Regulation bringing amendments to Ministerial Decree of March 21st, 1973 concerning sanitary rules on packaging, containers, and tools that may come into contact with food or substances for personal use, limited to stainless steels", published by the Official Gazette n° 20, January 26th, 2009, three new types of ferritic stainless steel have been added.

The stainless steels included in the list of conforming materials are: EN 1.4509 - X2CrTiNb18; EN 1.4510 - X3CrTi17; EN 1.4521 - X2CrMoTi18-2.

Therefore, under Ministerial Decree n° 174/2004, these materials are suitable and can be automatically used also if they come into contact with drinking water.

INNOVATIVE FERRITIC STAINLESS STEEL SHELVES

(Scaffalature innovative in acciaio inox ferritico)
The elements composing the shelving, made of EN

1.4509, illustrated in this page have been studied in depth: the standards, or double uprights, may be equipped with braces, which can be easily and quickly assembled, and ensure the construction of strong, stable and versatile structures, thanks to small stainless steel cylinders, each placed at a distance of 150 mm from the other, that allow resting, through special fasteners, the ends of the shelves at the most appropriate height and do not require to completely disassemble the shelving. The equipment of the shelves, too, is quite unusual, and includes whether traditional shelves made of a single 1 mm thick stainless steel plate with a 27 mm long rounded off front edge, 40 mm long longitudinal profiles bending downwards at 90° provided with safety edges, or shelves provided with 15 mm slits placed at a distance of 35 mm, particularly suitable for the passage of cold air in cold stores and for the maturing of cheese. This product is available in different sizes, in depths of 30-40-50-60 cm, and in heights of 120-140-160-180-200 cm. Shelves are available in seven different lengths: 60-80-90-100-120-140-150 cm.

Production: Hupfer Metallwerke, Coesfeld (Germany) / **Distributor for Italy:** Hupfer Italia S.r.l. – Via L. Settembrini 32-30/A – I-20020 Lainate MI, phone +39 02 9373220, fax +39 02 9370725, info@hupferitalia.com, www.hupferitalia.com / **Stainless steel supplied by:** ThyssenKrupp Nirosta, Germany e ArcelorMittal, France

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FROM OUR MEMBERS

THYSSENKRUPP ACCIAI SPECIALI TERNI

New investments for one of the most world's important integrated site

(ThyssenKrupp Acciai Speciali Terni - Nuovi investimenti per il sito integrato tra i più importanti al mondo)

Today, ThyssenKrupp Acciai Speciali Terni, a company belonging to ThyssenKrupp Stainless, the stainless steel branch of the industrial group ThyssenKrupp AG, is the most important site for the production of rolled stainless steel sheets world wide.

In the steel mill, a VOD-type steel converter has been lately installed, as well as another the well-established technology curved continuous casting plants.

The cold-rolling area has been further expanded through the addition of a second Bright Annealing (BA) plant. Furthermore, a new hot-rolling line has been added to the existing plants. LAC10 is the world's largest hot-rolling plant, and compared to traditional rolling plants, it is provided with a new advanced cooling technology and planarity control. At the inlet of the LAC10 plant, two Z-High continuous rolling cages have been added. ThyssenKrupp Acciai Speciali Terni has also made investments in the enlargement of its **Finishing Centre**. Stainless steel products are also distributed through the network of the controlled distribution company **Terninox**, in the operating centre of Ceriano Laghetto, near Milan, and in the different branches throughout Italy.

Products. ThyssenKrupp Acciai Speciali Terni manufactures flat hot-rolled stainless steel products, which are available whether in coils or sheets, annealed and pickled, floor plates, as well as cold-rolled products, such as annealed, pickled, skin-passed, polished, decorated, satin-finished, and brushed coils, sheets, straps and bands. In particular, cold-rolled products are available in thicknesses ranging from 0.3 mm to 5 mm and widths ranging from 100 mm to 1,520 mm, while hot-rolled products are available in thicknesses up to 6.5 mm. Stainless steel products mostly belong to the austenitic, ferritic and martensitic families.

New products. ThyssenKrupp Acciai Speciali Terni has developed some **innovative ferritic** products. Thanks to the new VOD, the company has planned and developed the new super-ferritic 470LI and 460LI steels, which include in their chemical composition very high

chromium rates (equal to or exceeding 21%) and offer resistance against corrosion that can be compared to the resistance properties of the best austenitic steels. In addition to these new ferritic steels, the company has also developed AISI 444, a steel that stands out by its high corrosion resistance properties, which can be compared to those provided by AISI 316.

The coating line. The Finishing Centre includes a coating line, in which the pre-coated **Vivinox®** product range is processed. The production range includes colour (Vernest®) and transparent (Silver Ice®) finishes.

New finishes. ThyssenKrupp Acciai Speciali Terni has further extended its production range by developing new decorated, and micro-decorated designer finishes.

Service to customers. ThyssenKrupp Acciai Speciali Terni has always invested in the quality of its products, and in the last few years has increasingly invested in service provision. A renewal process has been started, in which customers and their requirements are the centre of attention of all corporate strategies and activities.

THYSSENKRUPP ACCIAI SPECIALI TERNI SPA – Viale B. Brin 218 – I-05100 Terni, phone +39 0744 490282 - www.acciaitermi.it

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STEEL AND CONCRETE: THE "PEDEFERRI'S DIAGRAMS"

(Acciaio e calcestruzzo: i "diagrammi di Pedeferrì")
Prof. Pietro Pedeferrì left us in the past month of December. We wish to commemorate him also in the pages of Inossidabile.

Reinforcement corrosion in concrete

Concrete is characterized in general by an alkaline environment with pH values exceeding 13. Under those circumstances, even in presence of water and oxygen, corrosion phenomena do not take place. These phenomena may however reveal themselves over time, as a result of two major factors: **carbonation**, a phenomenon in which the concrete pH value drops to levels close to 9. The conditions determining carbon steel passivation do not exist any longer, and as a consequence, water and oxygen can give rise to the typical phenomena of steel corrosion; the **presence of chlorides**, which can be found, for instance, in saline environments or may result from defrosting salts, and have instead the possibility to penetrate into concrete and to attack the steel reinforcement. The problems originating from carbonation and chlorides are solved by stainless steel through a film, which keeps extremely stable passivity levels even at pH levels below 9, and is unprejudiced by chloride attacks up to concentration degrees that usually can hardly be achieved on the concrete reinforcement surface. In general, chromium-nickel austenitic stainless steels offer sufficient guarantees in most cases. Only in structures subject to strong stresses, or in the case of reinforcements exposed to very aggressive environments, it is advisable to use chromium-nickel-molybdenum austenitic stainless steels, or in extreme condition, even nobler steel types.

The "Pedeferrì's Diagrams"

"Chloride / Potential" diagrams, which should be rightfully called "**Pedeferrì's diagrams**", belong to the important legacy left by Prof. Pedeferrì, and have become today an essential tool to correctly "plan" reinforced concrete.

Pict. 1 – Pedeferrì's Diagram for carbon steel (room temperature).

In zone "A" (corrosion area) corrosion starts and begins to spread. In zone "B" (also called "imperfect" passivity area) corrosion processes cannot start, but they can however propagate if they have already started (and corrosion speed lowers if the potential decreases). In zone "C" (the so-called "perfect" passivity area), corrosion processes do neither start nor spread. Moreover, if they have already started, they stop immediately and the steel passivates again. In zone "D" (the immunity area where hydrogen forms) there is no corrosion production due to



thermo-dynamic reasons, but hydrogen may form.

Pict. 2 – The diagram shows the passivity ranges of different materials depending on pH and chloride levels at a temperature of 20°C.

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NO LIMITS FOR STAINLESS: A STAINLESS STEEL BATHROOM

(Inox no limits: un bagno inossidabile)

We present in this article a work carried out by a private citizen of Florence, who planned, developed and constructed the bathroom of his house under the banner of stainless steel. He chose to use a traditional material, which can be easily found on the marketplace: EN 1.4301 (AISI 304), in the low-carbon content version, EN 1.4307 (AISI 304L) for the parts to be welded. Several standard section bars were therefore purchased, mostly in sizes 30x30x3 mm, 25x25x2 mm and 20x20x2 mm, and in addition, also tubes of different diameters and thicknesses, as well as steel plates with different surface finishing (for example, with satin finish, linen pattern finish, damask finish). With the support provided by a small mechanical workshop (equipped with lathes, cutters, drills, TIG and MIG welders, etc.), the different components and fittings of the bathroom were processed and constructed; shower cubicle, piping, flanges, shelves, supports, lighting structures, door and window frames, siphons, towel racks, and so on. The only exceptions to the choice of AISI 304/304L as sole material used in the construction of this bathroom were taps and fittings, as AISI 316 stainless steel was chosen for these parts. Flanged connections and flexible tubes were mainly used for the construction of the hydraulic system.

Construction: Alessandro Pecchioli, Florence, alessandropecchioli@yahoo.it / **Photographer:** Paolo Rocco, roc.p@tiscali.it

LIGHT AND COLOURS IMPROVE THE APPEAL OF STAINLESS STEEL TAPS

(Luce e colore aumentano l'appeal dei rubinetti inox)

The manufacturer of the taps shown in these pictures has chosen to use exclusively EN 1.4301 (AISI 304) stainless steel for all the elements and fittings of these products (with the only exclusion of the blending cartridge), due to the intrinsic characteristics of this material: long durability over time, corrosion resistance, absence of chromium-plated parts or toxic materials, complete recyclability and possibility to manufacture innovative and attractive shapes through die-casting processes. The real innovation, however, consists in a new technological system called "light-delight", which through a beam of light, allows "colouring" the water that runs out of the tap basing on its temperature. The energy required to generate the coloured light is self-produced by a micro-turbine system operated by the intake water flow towards the tap.

Manufacturer: Equa Srl – Via A.M. Pattoni 29 – I-28883 Gravellona Toce VB, phone +39 0323 840772, fax +39 0323 847707, info@equasystem.com, www.equasystem.com

MAIL BOXES: STAINLESS STEEL CASES

(Cassette postali: scrigni in acciaio inox)

An object so simple and linear at first sight, is instead the result of the application of a set of fundamental planning standards, among which the choice of the material used for its construction. In the case of mail boxes to be placed outdoor, stainless steel is considered the most suitable material, as it cannot be damaged by atmospheric agents and ensures long operational life. The stainless steel used by the manufacturer of the models shown in these pictures is an austenitic EN 1.4301 (AISI 304) steel, available either in satin- or in "scotch-brite"-finishes. Stainless steel with a "linen pattern" decorated finish, due to its fingerprint- and scratch-resistance properties, is instead used mainly for manufacturing the containers in which advertising leaflets can be introduced, which are usually put near the mail boxes placed outside the buildings. The esthetical properties and the design of the end product are improved and enhanced by the use of decorated steel elements, which increase the appeal of these products.

Stainless steel supplied by: ThyssenKrupp Acciai Speciali Terni SpA – Viale B. Brin 218 – I-05100 Terni, www.acciaitermi.it – **Marketing:** Dr. F. Ricci Feliziani, phone +39 0744 490275, fax +39 0744 490879, fabrizio.ricci-feliziani@thyssenkrupp.com / **Production:** Silmec S.r.l. – Via S. Martino, 7 – C.P. 57 – I-31020 San Zenone degli Ezzellini TV, phone +39 0423 968611, fax +39 0423 968193

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PROTECTION SHIELDS WITH HIGH DESIGN LEVELS

(Protezioni con alto livello di design)

Thanks to the characteristics of stratified glass and EN 1.4401 (AISI 316) stainless steel, it is possible to build balustrades provided with only few (even four) anchorage points to the edge of the slab to be bounded, and it is not necessary to connect them with the adjacent modules. In the event that, due to aesthetical or functional reasons, the choice falls on leaving the slab front open, the stainless steel we can find in many glass-plate fixing solutions provides excellent safety guarantees even though very reduced steel sections are used. In fact, stratified crystal can be fastened with only four points, but also assembled with two vertical side supports with a diameter of few centimetres anchored to the walkable surface through a round base plate with four holes. Besides protections against the falling of objects, rain etc., horizontal weather-proof protections, such as cantilever roofs and shelters, are also available. These structures, too, are made of stratified glass and EN 1.4401 (AISI 316) stainless steel, and are produced in different forms and sections, which are all characterized by great aesthetical impact, both in the case of glass plates leaning on stainless steel supporting structures, and in the case of hanging platforms equipped with stainless steel turnbuckles to be anchored to the structure of a building.

Construction: Faraone Srl – Via Po 12 – I-64018 Tortoreto TE, phone +39 0861 784200, fax +39 0861 781035, faraone@faraone.it, www.faraone.it

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STAINLESS STEEL AND PUBLIC AREAS: THE ANCONA-FALCONARA AIRPORT

(Inox e spazio pubblico: l'aeroporto di Ancona - Falconara)

To deal effectively with an ever-growing traffic of arrivals and departures, the compound of the "Raffaello Sanzio" Airport of Ancona-Falconara has been recently enlarged. Two new twin terminals – one for the arrivals, and one for the departures – have been built. These new terminals are placed at both ends of the previously existing all-purpose building. The two new terminals have built as "containers" entirely surrounded by glass walls. Sun over-irradiation is controlled by sun-breaking elements. The internal glass walls are supported by stainless steel structures formed by vertical rods and transversal beams. Also the internal parts and fittings of the terminals, including door- and window-frames and the spiroid cables supporting the advertising and information panels, are made of EN 1.4401 (AISI 316) stainless steel.

Architectural project: GMP Von Gerkan, Marg & Partners, Hamburg / **Structural project:** Favero e Milan Ingegneria SpA – Via Belvedere 8/10 – I-30035 Mirano VE, phone +39 041 5785711, fax +39 041 4355933, fm@favero-milan.com, www.favero-milan.com

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ADVANCED MODULAR COURSE "STAINLESS STEELS" – 7th Edition

(Corso modulare avanzato: "Gli acciai inossidabili")

Organized by AIM (Italian Metallurgy Association) in cooperation with Centro Inox

Milan, FAST Building, Piazzale R. Morandi 2

2nd Module: machining, installation, selection and design criteria, stainless steel applications, 3-4-10-11-17-18 June 2009

The thirty-one lessons of the second module represent the natural complement of those held in the first module (February 2009), and have been programmed to include appropriate references to the basic notions, in order to give participants who were not able to attend the first module the opportunity to follow them fruitfully. A debate will take place at the end of each lesson. In this second module, an "information table" held by qualified operators from the stainless steel industry will be present again during the first two days of the course, i.e. on June 3rd and 4th 2009, and will be operating in parallel with the lessons.

Director and coordinator: Prof. Gabriele Di Caprio.

The official language is Italian.

For information and registration:

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HYDRICA: INTERNATIONAL EXHIBITION OF WATER TECHNOLOGIES

(HYDRICA: Salone Internazionale delle Tecnologie per l'Acqua)

Centro Inox will actively participate in this event with its own stand and will organize a meeting in partnership with IMO (Internationale Molybdenum Association) e NI (Nickel Institute). HYDRICA, the professional exhibition of water technologies, will be held at the Fair of Padua on June 23-25, 2009. This event is aimed at promoting, developing and enhancing a correct management of water resources, focusing on sustainability and environmental protection. Exhibitors, administrations and public managers will be all involved in a program of workshops focused on specific themes. The event is organized by PadovaFiere with the sponsorship of the Ministry for the Environment and the Protection of the Territory and the Sea. For additional information: www.hydrica.org – www.centroinox.it

PROCEEDINGS OF THE CONFERENCE: STAINLESS STEEL SERIES 300: IS THERE ANOTHER ALTERNATIVE?

– A comparison among series 300, 400 and 200 stainless steels –

(Atti del convegno: "Inox serie 300: esiste un'alternativa? Inossidabili della serie 300, 400 e 200 a confronto")

The proceedings of the conference organised by Centro Inox on 5 November 2008 in Milan are now available (in Italian only) under the followings titles: Welcome address and opening of the meeting – (E. Amenduni – President of Centro Inox) / **TECHNICAL-SCIENTIFIC SESSION** (Introductory notes on corrosion, performed tests and results): **A general survey of the Italian market: the reasons for change** (P. Viganò - Centro Inox), **Corrosion: General aspects** (P. Pedeferrì - Politecnico di Milano), **Performed test programme: Corrosion tests, materials and purposes** (G. Stella, G. Rivolta - RTM Breda), Test results (M. Boniardi, S. Cincera - Politecnico di Milano) / **APPLICATION SESSION** (From theory to practice: Users' experience): **Developments in regulations on food** (V. Boneschi - Centro Inox), Merloni TermoSanitari S.p.A. (A. Mancini) - **Università Politecnica delle Marche** (R. Fratini), **Vertical S.p.A.** (A. Cogo – R. Fornasa), **N&W Global Vending S.p.A.** (T. Rota), **Facilitas S.r.l.** (A. Albani), **Elica S.p.A.** (R. Del Basso).

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AISI 316 L FOR ASSEMBLING AN INNOVATIVE DOCK FENDER

(AISI 316 L per montare l'innovativo parabordo da banchina)

A well-established company operating since many years in the area of harbour equipment, has planned, developed and patented a special fender made of double hardness polyurethane with low coefficient of friction just in the area that comes into contact with incident water crafts. This fender ensures high reliability in the mooring stage and absolute visibility in case of fog. A fender of this kind has to be assembled exclusively with the best available structural work, that is to say, M33 threaded bars and stainless steel washers and nuts. Thanks to the oxidation resistance properties of EN 1.4404 (AISI 316 L), which does not corrode and therefore does not produce any volume increase depending on corrosion products, its tightness life is absolute. This is a priority element that ensures total reliability to the elastic reaction of the fender, which is intended to absorb impact forces ranging between 20 and 30 tons per meter, with elastic reactions in the range of 150 tons.

Manufacturer: TEGEA – Via Busca 5/A – I-12020 Tarantasca CN, phone +39 0171 931805, fax +39 0171 931019, info@tegeabusca.it, www.tegeabusca.it

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