# **INOSSIDABILE 176**

# **June 2009 Quarterly**



# Edited and published by Centro Inox Servizi S.r.l.

# Summary

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

# **COVER/PAGES 3/4**

# THE CENTRAL DAIRY OF VICENZA

(La Centrale del Latte di Vicenza) The Central Dairy of Vicenza, established in 1929, boasts an almost 80 year-long history and tradition. The new factory, planned to make the production of the Vicenza and Valdagno units converge into a single processing environment characterized by high-efficiency levels and absolutely safe sanitary conditions, is an advanced and modern plant. The Central Dairy does not only process fresh milk and cream, as its pro-duction includes also UHT milk, yoghurt, and an additional range of diversified products intended to meet the demand currently expressed by the market. As regards the process and service fluid distribution system, the choices made prove particularly farsighted and careful, based on the priority principle of using exclusively stainless steel. An unavoidable choice for hygies and sanitary reasons, but also a choice based on technical and economic grounds. The two tanks, each one of 100,000 lt capacity, where the drinking water coming from the aqueduct is temporarily stored are made of EN 1.4301 (AISI 304) stainless steel. EN 1.4404 (AISI 316 L) stainless steel has been used instead for the construction of the whole drinking water distribution network within the factory, as well as for the distribution network of sanitary warm water, low-pressure wash water and softened water, while EN 1.4307 (AISI 304 L) stainless steel has been chosen for the distribution network of icy water, heating warm water, and for glycol, refrigerated and defrosting waters. Tubes and pipes in diameters ranging from DN 100 and DN 200 have also been used and the connections of the stainless steel pipes have been made through TIG welding processes carried out in inert gas environment. In the different production departments, the sheets used to insulate warm and cold tubes are made of 0.6 mm thick EN 1.4301 (AISI 304) stainless steel and the wireways for electric power distribution are made of stainless steel grids. The structures supporting the pipes and the equipment of the process plants, too, consist essentially of tubular profiles of different sizes, all made of EN 1.4301 (AISI 304). The choice to use stainless steel has been also made for the sinks of the different departments, made of EN 1.4301 (AISI 304), and for outdoors elements, such as fences, parapets and handrails. A unique project of its kind, and perfectly integrated with the natural environment surrounding the works. *Customer:* Centrale del Latte di Vicenza /*Heat exchanger systems, ancillary equipment for* steam plants, and adjustment/control and pumping systems supplied by: Spirax Sarco Srl – Via per Cinisello 18 – 1-20054 Nova Milanese MI, phone +39 0362 49171, fax +39 0362 4917307, marketing@it.spiraxsarco.com, www.spiraxsarco. com/it / *Design and planning*: Dr. Ing. Antonio Dinardo – Forma Srl - Cernusco Sul Naviglio MI

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# STAINLESS STEEL IN THE SOUTH POLE - THE "PRINCESS ELISABETH" ANTARCTIC STATION (L'inox al Polo Sud - la stazione antartica Princess Elisabeth)

In 2004, the Federal Government of Belgium assigned the International Polar Foundation (IPF) the task to plan, build and manage a new research station in the Antarctic. The outcome of this project is a compound consisting in the research station, some hangars, and seven wind-power turbines for the provi-sion of electric power. Four steel pylons support the station unit "core", which is formed by a reticular structure of laminated timber beams conted by a return a student of ram-inated timber beams coated with a stainless steel plate "skin", for which 25 tons of 2B –finish, 1.5 mm thick, EN 1.4301 (AISI 304) have been used. EN 1.4301 (AISI 304) stainless steel, which is unaffected by embrittlement phenomena at low temperatures, resists to corrosion and offers excellent mechanical and friction resistance properties, is the ideal material for protecting the plywood structure in an environment character ized by a very dry atmosphere, by the erosive action carried out by snow accumulation, and by the high winds blowing in the region. Thanks to the environment-friendly materials that have been used, and to the electric power supplied by solar-and wind-power plants, Princess Elisabeth, which is currently set up on a granite ridge north of Utsteinen Nunatak in the Sar Rondane mountains, is the first "zero emission" research station ever built world wide. *Customer and project:* Interna-tional Polar Foundation, Bruxelles - *Project Manager:* Alain Hubert / «Core and skin» construction: Samyn & Partners

Steel structures: lemants / Anchorage to the ground: Smet-Boring / Stainless steel supplied by: ArcelorMittal Stainless Europe / Photographs: © International Polar Foundation

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#### FROM OUR MEMBERS NICKEL INSTITUTE Knowledge for a Brighter Future (Nickel Institute – Conoscere per promuovere)

Knowledge for a Brighter Future is the claim placed under the logo of the Nickel Institute. These words reflect the aims of the Institute, established in 2004 through the merger of Nickel Development Institute (NiDI), Nickel Producers Environmental Association (NiPERA) and European Nickel Group (ENiG), which commits itself to spreading knowledge about materials containing nickel, in order to promote their responsible production, and their safe use and re-use. About two thirds of produced nickel are used in stainless steel manufacturing, and about two thirds of produced stainless steels contain nickel. Nickel provides these stainless steels with spe-cific properties, such as ductility, toughness, and resistance to corrosion. Austenitic stainless steels are used in a wide range of temperatures. The specific properties of nickel have been clearly described in the lately published book "The Nickel Advantage - NICKEL IN STAINLESS STEEL", which explains the particular contribution provided by nickel to these stainless steel types. To ensure a long-term vision in the choice of materials, the Nickel Institute promotes an approach based, at the same time, on an economic and on an environmental evaluation of the whole stainless steel application lifecycle. The Nickel Institute is one of the promoting partners of Centro Inox and works in close connection with other institutions. particularly those related to the manufacturing and processing industry. Thanks to its global connections, the Institute is in a position to quickly spread information and news concerning new applications all over the world. A growing awareness of the need to know how materials can impact on men's health and on the environment has always driven NiPERA, which has been incorporated as an independent division of the Nickel Institute. *The point of reference of the Nickel Institute in Italy is:* Dr. Luciano Fassina, phone/fax +39 02 29531073, luciano.fassina@libero.it, www.nickelinstitute.org

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# CORROSION TESTS ON STAINLESS STEELS: A VALUABLE SUPPORT TO PLANNING AND DESIGN (Prove di corrosione su acciai inox: un valido supporto per la progettazione)

Even the large family of stainless steels may be subject to cor rosion, an electrochemical phenomenon, which reveals itself in different ways and times, but proceeds relentlessly. Stainless steels are usually submitted to different kinds of corrosion tests in wet environments depending on the properties to be tested. Among the numberless kind of tests required by the different standards in force, we report and describe in the following table, three of the most commonly performed tests.

Analyzed phenomenon	Test reference standard	Description
Pitting	ASTM G 48 method A	The standard provides for dipping the sample into an iron chloride solution. This method shows clearly whether the stainless steel to be exam- ined shows a tendency to reveal pitting phenomena.
Crevice Corrosion	ASTM G 48 method B	Iron chloride, which repro- duces the aggressiveness of a sea environment, is also used to check stainless steel tend- ency to be subject to crevice corrosion phenomena.
Intergranular corrosion	ASTM A 262 practice E, (Strauss test)	Through a bending test per- formed after having dipped the sample into a 16% solu- tion of sulphuric acid, copper sulphate and metallic copper, stainless steel susceptibility to the occurrence of this cor- rosion phenomenon can be checked.

Stress-corrosion-cracking tests (for instance, according to ASTM G 36) and Huey tests (according to ASTM A 262 practice C) are examples of a set of tests developed by extrapolation from other tests usually performed in other contexts and circumstances or depending on the kind of alloy or application environment to be tested. Today, when a typically qualitative indication on the behaviour of an alloy in presence of corrosion in a wet environment is required, the most commonly fol-lowed testing method consists in the use of climatic rooms, devised for performing tests on painted materials, in which an aggressive environment is recreated. If it is necessary to simulate an industrial environment, the Kesternich test is instead used, in which the samples are exposed to the atmosphere of a static wet room. In addition, electrochemistry is becoming more and more relevant in material characterization. Polarization curves are increasingly demanded to character-

ize one or more materials in a specific corrosive environment. Finally, it is useful to remind that corrosion is a phenomenon, which quite often is submitted to "a posterior" investigations and tests, that is to say, as soon as it reveals itself. For this purpose some specific "instruments" have been developed (for example, EDX probe, metallographic analysis, etc.), which determine the ways in which corrosion spreads, the corrosion product nature, the extent of this phenomenon, and so on. This article was written in collaboration with Dr. Stella, Dr. Astori and p.i. Sala of RTM Breda (www.rtmbreda.it).

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NOT ALL THAT GLITTERS IS... STAINLESS STEEL! AN EXAMPLE OF MATERIALS SYNERGY FROM THE FLUE INDUSTRY

### (Non è solo inox ciò che luccica! Un esempio di sinergia di materiali dal mondo delle canne fumarie)

The coming of condensing boilers has offered an opportu-nity to devise some innovative solutions aimed at exhausting and clearing out smokes at lower temperatures (generally not exceeding 90°C), such as, for example, polypropylene ducts. Though this solution is technically and economically viable, we should not however disregard considering two important problems. The first one, consists in a direct exposure to UVA rays and to sudden changes of temperature in the case of outdoor applications. The second problem concerns safety in fact, in a duct made exclusively of polypropylene, should the smoke reach unusually high temperatures, this occurrence might involve serious deteriorations or damages (Pict. 1) that, in some cases, would even prejudice duct tightness to carbon monoxide (CO) leakage. That is the reason why the most appropriate solution consists in a synergistic use of polypropylene and stainless steel. The ducts and related fittings shown in these pictures (**Pict. 2-3**) are supplied with an outside wall of stainless steel (EN 1.4301 – AISI 304, thickness 0.4 mm) of stainless steel (EN 1.4301 – AISI 304, thickness 0.4 mm) and an internal wall of polypropylene. An excellent example of material synergy put in service of product performance, reliability and safety. *Manufacturer:* Expo Inox S.p.A – Viale Artigianato 6 – 1-27020 Borgo San Siro PV, info@expoinox. com, www.expoinox.com / *Stainless steel supplied by:* Arce-lorMittal Stainless Service Italy S.r.L. – Centro di Servizi – Località Priora 4 – Massalengo LO, phone +39 0371 490439, fax +39 0371 490475

### HIGH-ENGINEERING STAINLESS STEEL ROLLER SHUTTERS

(Serrande ad elevata industrializzazione in acciaio inox) Entirely made of EN. 1.4301 (AISI 304) or EN 1.4404 (AISI 316L), the open-frame roller grill shutter presented in this article combines quality, strength, and aesthetical properties. Manufactured through an on-line process, it is up to now the only existing model on the market produced in this way, and has an exclusive profile, expressly designed and developed for the purpose of increasing its resistance and reducing noise during opening and closing operations. Corrosion-proof, these roller shutters are perfectly suited to be installed in any application in which particular sanitary or climatic conditions are required. These roller shutters are available in three different models: screen (with smooth or ruled elements), open frame (grills) and micro-perforated, which are can be obtained through a "universal" production system based on a single stave profile.

Manufacturer: ISEA S.r.l. – Via Galletti 9 – 40050 Funo di Argelato BO, phone +39 051 862004, fax +39 051 861404, info@iseaitaly.com, www.iseaitaly.com

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## STREET FURNITURE IN TERNI

(Arredo urbano a Terni) Piazza Dante, a square that is considered the very heart of the vehicle traffic in the town of Terni, has been lately supplemented with a large sheltered platform for the passengers coming from the neighbouring railways station, and for the persons waiting for the city buses. This shelter is almost entirely made of polished and/or satin-finished EN 1.4401 (AISI 316) stainless steel. It consists of a 40 mt long main wing, which runs parallel to the front side of the railway station, and of a central perpendicular wing, which is about 21 mt long and is aligned to the huge press placed on the opposite side of the railway station front. This second wing is reserved for the transit of pedestrians' traffic to the opposite side of the square. An about 12 mt high central body with a square base supports, through EN 1.4401 (AISI 316) round-section guys, the two wings of the lower platform, which is 40 mt long. The pillars of the central body, the guys, and all the frames destined to support the sheets of glass forming the shelter cover, are made of stainless steel, as well as the round-section guys in diameters ranging from 24 to 30 mm, the turnbuckles and the pillar concections. The cross wing, which is 4 mt wide and cantilevers by 12 mt on one side, and by 9 mt on the opposite side, is formed by two laser-cut shaped beams. Beams, in turn, consist of a carbon steel plate, 12 mm thick, base with a 20/10 thick stainless steel plating, stuck together with the external front by means of an epoxy resin. Stainless steel finish is the standard one obtained through a hot rolling process, which is then submitted to another cold-finishing process in the steel mill. Realization: Studio Corradi - Ingegneria e Ricerca - Via del Teatro Romano 24/26 – I-05100 Terrii, phone +39 0744 402303, fax +39 0744 437301, www.studiocorradi.it; ThyssenKrupp Acciai Speciali Terni SpA - Viale B. Brin 218 -1-05100 Terni, www.acciaiterni.it – Marketing: Dr. F. Ricci Feliziani, phone +39 0744 490275, fax +36 0744 490879, fabrizio.ricci-feliziani@thyssenkrupp.com

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#### STAINLESS STEEL MAKES HISTORY (L'acciaio inossidabile fa storia)

The two Buddhas of Bamiyan, carved out of a calcareous rock face in the central part of Afghanistan, are the largest Buddhist statues all over the world. They rise respectively to more than 50 mt (Great Buddha) and 35 mt (Little Buddha) height and were almost completely destroyed in March 2001 during the recent war burst in the Afghan territory. In order to restore the rock face, deteriorated by bad weather and other natural causes, and seriously damaged by the explosions, several urgent interventions aimed at reinforcing the rock face are being carried out. The reinforcement work has consisted in the installation of a system intended to monitor the major clefts, in the installation of permanent ground anchors and soil nails through a continuous-threading stainless steel bar system, Geodinox QT 850-20, and in temporarily fixing some blocks of rock through a network formed by steel cables and metal shoring beams. For the reconstruction and the protection/safety of these two famous statues, stainless steel anchor bars SG Geodinox Qt 850-20 have been used. These 20 mm diameter anchor bars have a length ranging from 2 to 3 mt, and include plates and nuts, for a total length of 240 mt. Some bars have been equipped with special "strain gauge" sensors for the purpose of continuously keeping the most unstable areas of the rock plates under control. *Customer:* Icomos UNESCO / Planner: Prof. C. Margottini – CNR, consultant UNESCO / Subcontractor: Rodio – Trevi Group SpA – Dr. Geol, C. Crippa / Reinforcement system manufacturer and supplier: GeodaG Sistemi Srl– Via G. Donizetti 24 – I-24020 Gorle BG, phone +39 035 340771, fax +39 035 4534901, www.geodagsistemi.eu – Dr. Fulvio Carrubba / *Stainless steel supplied by:* Cogne Acciai Speciali SpA – Via Paravera 16 – I-11100 Aosta, phone +39 0165 3021, fax +39 0165 43779, info@cogne.com, www.cogne.com

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#### ON THE THRESHOLD OF ANCIENT WALLS: THE PEDESTRIAN BRIDGE OF SCHEGGINO (Al limitare di antiche mura: il ponte pedonale di Scheggino)

Situated in the south-east part of Umbria. Scheggino is a small town of the Valnerina, which spreads out in the valley along the banks of the river Nera. A pedestrian bridge connects the old town centre with the new car park situated close to the torrent Valcasana, in order to relieve from car traffic congestion the historic part of the town. The bridge covers a distance of 14.39 mt, including the two vertical posts supporting the steel cables, while the bridge scaffolding is 1.60 mt wide. All ele-ments most subject to wear and tear have been made of EN 1.4301 (AISI 304) stainless steel. Therefore, the higher costs for this structure born at the beginning will allow considerably reducing maintenance costs. The whole structure has been made of stainless steel, as this material ensures high structural performances and resists to corrosion. The visual impact of this bridge is minimal, since it does neither show any relevant section in terms of visible mass, nor require anti-corrosion protective coatings and invasive treatments to be periodically repeated. This is an essential characteristic for a pedestrian bridge situated in a natural environment that has to be preserved. Project: Arch. Alessandro Balucani, alessandro.balucani@ libero.it / Structures: Ing. Giorgio Assenza / Manufacturer:

Varian Srl. Gualdo Cattaneo PG / Timotei Officine Meccaniche Srl, Sant'Anatolia di Narco PG / Stainless steel supplied by: ThysenKrupp Acciai Speciali Terni SpA – Viale B. Brin 218 – 1-05100 Terni, www.acciaiterni.it – *Marketing:* Dr. F. Ricci Feliziani, phone +39 0744 490275, fax +39 0744 490879, fabrizio.ricci-feliziani@thyssenkrupp.com

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# EN 10088 PARTS 4 AND 5: STAINLESS STEEL SEMI-FINISHED PRODUCTS FOR CONSTRUCTION PURPOSES

### (EN 10088 parte 4 e 5: semilavorati inox per impieghi . strutturali)

The new standards En 10088 parts 4 and 5: "Stainless steels Part 4: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes" and "Stainless steels – Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes" have been published on April 2009.

### RADIOACTIVITY CONTROL: LAW DECREE Nº 23, **FEBRUARY 20, 2009**

(Controllo della radioattività: DL 20 febbraio 2009, n. 23) The Italian Official Gazette n° 68 of March 23, 2009 published the text of Law Decree n° 23 of February 20, 2009, "Implementation of Directive 2006/117/Euratom, on the supervision and control of shipments of radioactive waste and spent fuel" This Law Decree introduces an important amendment con-cerning radioactivity controls, since, in addition to scraps, it extends the obligation to carry them out also as regards iron and steel products, that is to say, semi-finished products.

#### **IDENTIK INOX: 3 ISTRUMENTS ALL IN 1** (Identik Inox: 3 strumenti in 1)

This tester has been planned and developed for the purpose to identify stainless steel typology through:

- -) Manganese reagent test, capable to identify Cr-Mn stainless steels
- -) Molybdenum reagent test: capable to distinguish an AISI 304 from an AISI 316 stainless steel

-) Magnetic test, capable to distinguish ferromagnetic stainless steels from paramagnetic ones

The identification of the material family by means of a reagent can be made through a simple electrochemical test. In the case of a manganese reagent, it is sufficient to place a blotting paper leaflet (supplied with the kit) on the material to be tested, lean the tester and press it down until the refill touches the blotting paper. When instead it is necessary to distinguish an AISI 316 from an AISI 304, the process is similar, but in addition the blotting paper must be drenched with an appropriate reagent (supplied with the kit) before putting the tester on it. Finally, a magnet included in the tester, allows distinguishing ferromagnetic stainless steel with a feritic, martensitic or austeniticferritic structure, from those with a totally austenitic structure (Series 300). *"Identik Inox" tester produced by:* Ricerca Chimica Group – Via E. Fermi 15 – I-35040 Vighizzolo D'Este PD, info@ricercachimica.it, www.ricercachimica.it

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#### WATER AND STAINLESS STEEL: A WINNING UNION

# (Acqua e acciaio inossidabile: un connubio vincente)

Hydrica - Padova Fiere – Padua (Italy) Thursday, June 25, 2009 – 9h00 a.m ÷ 1h00 p.m. - Hall 8B In conjunction with HYDRICA, the international exhibition of water technologies. Centro Inox in partnership with the European branch of the Nickel Institute, based in Brussels, and IMOA (International Molybdenum Association), based in Brussels as well, presents itself to all operators of this sector to illustrate the main characteristics of stainless steels in the water" industry. This meeting has been organized for the purpose of underlining the advantages offered by stainless steel in all applications in the area of water integrated cycles and water purification and desalination, both in terms hygiene, and in terms of stainless steel mechanical characteristics and low operating costs (the so-called "LCC" concept). Free participa-tion and entry until all available seats in the hall are taken. The meeting foresees the following programme Participants' Registration

Welcome address to participants (Fausto Capelli, Centro Inox Peter Cutler, Nickel Institute – Nicole Kinsman, IMOA) Introduction: Remarks and comments on Ministerial Decree 174

(Massimo Ottaviani - Istituto Superiore di Sanità, Dipartimento Ambiente, Igiene delle Acque Interne, Rome) The role of nickel in stainless steels used in the water cycle

(Luciano Fassina – Nickel Institute, Toronto/Brussels/Milan Stainless steel in water purification plants. The "Life Cycle Cost" concept

(Enrico Gallarati - Consultant - Idro-tigullio Spa, Chiavari GE) Drinking water and stainless steel. The integrated cycle (Riccardo Savarino – C.d.I. Consulenze di Ingegneria, Pavia) Stainless steel use in the hydraulic systems of the lagoon of Venice

(Ivano Turlon - Insula Spa, Venezia)

The role of stainless steels in desalination plants ArcelorMittal Industeel Group (Pierre Soulignac

Charleroi, Belgium)

Debate

For additional information: Centro Inox - Piazza Velasca 10-I-20122 Milan, phone +39 02 86450559 / 69, fax +39 02 860986, eventi@centroinox.it, www.centroinox.it

### STAINLESS STEEL: ONE WORLD - ONE MARKET 3rd International Stainless Steel Symposium - Stresa, October 7-8, 2009

The Grand Hotel des Iles Borromées of Stresa, on the Lake Maggiore, will be the charming setting of the "3rd International Stainless Steel Symposium" organized by Focus Rostfrei and Stainless Steel Focus, in cooperation with Centro Inox. An updated survey of the stainless steel market world wide. of the current trends, the developments in Europe, and the present Near- and Far-East market situation, along with the movements occurring in the global market of raw materials, are only some of the extremely interesting themes that will be dealt with during this international event, which will be held on October 7-8, 2009. This symposium, dedicated to stain-less steel manufacturers, traders, end users and to market and purchase specialists, will begin on Wednesday with a buffet-lunch and will end on Thursday in the early afternoon, following this programme

Wednesday afternoon, October 7 - First session - Welcome buffet lunch

- Coffee break - Second session - Dinner

#### Thursday morning, October 8 - First session - Coffee break

- Second session - Lunch

The official language of the symposium is English. Up to now, the following companies have confirmed their participanow, the following companies have confirmed their participa-tion in this event as speakers: ArcelorMittal, Cogne Acciai Speciali, H. Pariser Alloy Metals & Steel Market Research, Nickel Institute, Siderval, ThyssenKrupp Acciai Speciali Terni, and TW Metals Ltd. Additional information on titles and subjects of the reports and on the speakers is available on website www.Stainless-Symposium-2009.com, which is continuously kept up to date by the promoters. The all-inclusive participation fee is 295,00 Euros/person (195,00 Euros for the members of Centro Inox and affiliated companies)

## STAINLESS STEELS STANDARDS AND DIRECTIVES MILAN, NOVEMBER 18, 2009

(La normativa e gli acciai inossidabili - Milano, 18 novembre 2009)

Centro Inox, in cooperation with UNISIDER, the Italian Iron and Steel Standardization Authority, will organize on November 18, 2009 a meeting focused on the theme of "standardization". This event will concern in particular all updates brought to the existing standards referring to flat and long iron and steel products, tubes and pipes, their role and evolution in the stain-less steel industry. We shall publish the complete programme of the meeting in the next issue. For additional information: Centro Inox – Piazza Velasca 10 – I-20122 Milan, phone +39 02 86450559 / 69, fax +39 02 860986, eventi@centroinox.it, www.centroinox.it

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WHEN A MATERIAL IS CAPABLE TO BEND TO AN ARTIST'S WILL

(Quando il materiale si sa piegare al volere dell'artista) One of the numerous intrinsic and valuable characteristics of stainless steel consists in its being an extremely flexible mater-ial, which perfectly adapts itself to the artistic inspiration of a sculptor wishing to turn into three-dimensional elements the images that form in his mind, and conforms to the results the sculptor wants to attain in representing a pre-established subject. We present in this page two examples of stainless steel used for real sculptures and to produce artistic elements conceived for functional purposes. The first example presents some works of an artist, Sophie Raine (Pict. 1-2-3), who by using simple bent and welded stainless steel strips, sheets and wire, is able to convey, through her ballerinas and her flowers, a sense of extreme dynamism and gracefulness. The second example presents a sculptor, Andrea Forges Davanzati (Pict. 4**5-6**), who conceived and made the lamps installed in a hotel in Sardinia. Each lamp is a real sculpture obtained from stain-Quai de la Seine – F-75019 Paris, http://sraine.free.fr/, sraine.inox@gmail.com / Sculptor 2: Arch. Andrea Forges Davanzati – Via Carlo Buragna 22 – I-09124 Cagliari, andrea@forgesdavanzati.com, www.forgesdavanzati.com Made for: Sidertecnica – Via Segrè – I-09030 Elmas CA- Installed at: Holtel Flamingo Resort - Santa Margherita di Pula CA

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