

# INOSSIDABILE

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## Summary

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

### COVER/PAGES 3/4

#### STAINLESS STEEL FILTERS: ONLY PURENESS GETS THROUGH

(Con l'inox passa solo la purezza: filtri per pozzi)

Whether destined to people's consumption, irrigation, or health centres and spas, whether originating from desalination processes, or used for industrial or research applications, water requires an essential processing stage: filtration. As well as being a kind of products used all over the world, filters are a real concentration of technology consisting of all kinds of metal semi-finished products: metal sheets, tubes and pipes, wire rods and wire. Spiral filters, slotted filters, spiral filters with loading column inside, bridge slotted filters: these are the different available options in which stainless steel (AISI 304, 304L, 316, 316L, 430) plays an essential role every time operating conditions become prohibitive for other alloys, or more simply, to guarantee the pureness of the filtered fluid. **Simple slotted filters** - To be used in case of rocky or stony grounds, these filters are made of steel sheets, which are first punched, calendered, and then welded longitudinally and on the head side to obtain the required length. **Spiral filters** - Available diameters range between 34 and 1000 mm, and their length can reach 12 m. The thread shape and position allow filtering most of the grains, so as to allow the passage of only the thinner ones, which can slip inside the filter without obstructing the slots. **Spiral filters with loading column inside** - This kind of filters is suggested in case of in-depth installations or in grounds with particular characteristics. **Bridge slotted filters** - They are called in this way due to the particular shape of their filter sections, and are currently the most used filter types, along with spiral filters. Bridge slotted filters ensure a good percentage of open area and are particularly suggested for medium-large granulometry grounds. **Manufacturer:** Paparelli Alessandro e Figlio Srl - Via Molino Geretto 8 - I-22060 Carimate CO, phone +39 031 790601, fax +39 031 791460, info@paparelli.it, www.paparelli.it

### PAGE 5

#### A CART FOR TRANSPORTING PLEASURE BOATS COMPLETELY MADE OF AISI 316L

(Un carrello per il trasporto di barche da diporto completamente in AISI 316L)

A maintenance and repair dockyard for pleasure boats, located in the Liguria Riviera (Italy), though enjoying a lot of room in height, is however placed too close to the sea. The owner, with a great deal of forward thinking, equipped the interior of the dockyard with a boat handling system, which includes transport carts and fixed or jib cranes. In addition, to allow the boats covering the few metres which divide them from the sea, the dockyard owner makes use of a tractor to handle a transport cart entirely made of EN 1.4404 (AISI 316L) stainless steel. This cart consists of a large platform made of perforated plate with holes of about 32 mm diameter to allow sea water leakage. The area the boat rests on, is supported by a solid structure of interlaced beams made of EN 1.4404 (AISI 316L), and is moved by idle wheels, which rotate when the tractor is operated. In case longer boats (up to 10 m length) have to be launched, the keel end rests on the articulated front side of the cart (which in turn rests on a 50 mm diameter bar and is tightened to two solid spiral supports made of the same stainless steel grade). The coupling part consists instead of a "counter-parallel" rubber device housed within an EN 1.4404 (AISI 316L) stainless steel tube.

**Pleasure boats maintenance dockyard:** Nautica Star Due - Via Mulinetti 3 - 16036 Recco GE, phone +39 0185 720331, fax +39 0185 730543, www.nauticastardue.com / **Manufacturer and project:** River di Verdi Aldo & C. snc - Str. Prov. 46 km 0,850 - 27040 Cigognola PV, phone +39 0385 52756, fax +39 0385 259700, river.snc@gmail.com, www.riversnc.it

### PAGES 6-7

#### FROM OUR MEMBERS

#### THYSSENKRUPP ACCIAI SPECIALI TERNI GROUP - TUBIFICIO DI TERNI (Gruppo ThyssenKrupp Acciai Speciali Terni - Tubificio di Terni)

Tubificio di Terni is a continuously growing company, which originally started off as an integration of Terni steel works, and has become the leader in the industry, especially as a manufacturer of muffler tubes. The Company's core production is focused on electro-welded stainless steel tubes for catalytic mufflers and for decorative use. High quality standards are constantly guaranteed thanks to a direct link with ThyssenKrupp Acciai Speciali Terni. **Products:** the production lines weld steel from the austenitic and ferritic series, in a variety of thicknesses and diameters, offering a complete range of over 1,200 products, which includes also square and rectangular tubes with brush, satin or polish finish for any kind of structural and ornamental application. **Production:** the coils are marked with a code that accompanies the material along each subsequent processing stage, so as to guarantee the traceability of the material at any time. Coils are sheared into strips to obtain welded tubes, by means of moulding and welding (TIG, LASER and HF high-frequency welding) processes. After having been welded, the tubes are brushed, marked, cut to the required length, and finally packed. The high-frequency welding process is completed by blowing and then removing the swarf from the inside seam, and by smoothing the ends of the tubes.

**Systems and Equipment:** 1 slitter; 1 tubing line equipped with TIG welding process; 3 tubing lines with HF welding process; 2 tubing lines with LASER welding process; 1 rolling press; 16 cutting machines (within TCT premises). **Quality process control:** quality tests and checks are performed on the line. For structural tubes, these checks are aimed at ensuring full compliance with the strictest tolerances in terms of dimensions and shape. Additional surface checks concerning welding quality are subsequently carried out, such as non-destructive (Eddy Current) tests on 100% appearance. For mufflers, in addition to the above-mentioned dimensional checks, further destructive tests (flattening and expanding) are carried out on product samples. **Laboratory:** Tubificio di Terni has its own efficient laboratory, staffed by highly qualified experts and provided with modern equipment to determine the mechanical and metallographic characteristics of both raw materials and finished products. ISO TS 16949 Certification ed. 2002 and ISO 9001 Certification ed. 2008. **Company details:** 97% SL-AST - 3% Nisshin Steel - 170 employees - Turnover: ~ 170 million € as at fiscal year 2010/2011 - Site area 40,000 m<sup>2</sup> - Floor area: 22,000 m<sup>2</sup> - Production capacity approx. 86,000 t/year

**TUBIFICIO DI TERNI - Registered office, offices and plant:** Strada di Sabbione 91/A - I-05100 Terni, phone +39 0744 808251, fax +39 0744 808266, info@tubificio.it

#### THYSSENKRUPP ACCIAI SPECIALI TERNI GROUP - SOCIETA' DELLE FUCINE

(Gruppo ThyssenKrupp Acciai Speciali Terni - Società delle Fucine)

Società delle Fucine Srl, established in 1990, is now a wholly-owned subsidiary of ThyssenKrupp Acciai Speciali Terni and is ranked among the world leaders for the manufacture of large and medium size forged parts. As far back as 1884, the great iron and steel plant, Terni Co. was founded to meet the needs that had arisen because of the war. At the end of WWII, the iron and steel industry in Italy was completely reorganized, and the plant specialized in the production and processing of high-quality steels. Today, it covers a surface area of approximately 120,000 m<sup>2</sup> and is sized for the manufacture of large and medium size forged parts made of carbon steel, medium-alloy steel and stainless steel.

**Products:** forged parts are mainly intended for electricity generating plants, the mechanical industry, the chemical and petrochemical, offshore and aerospace industry, and for all industrial areas in which maximum safety is required along

with service continuity. Società delle Fucine is equipped with cutting-edge plants for the production of steel, casting of ingots, forging, heat treatment, mechanical processing as well as destructive and non-destructive testing. **Certifications:** ASME approval (since 1975) of the Quality Management System and IGQ certification (Italian Quality Mark Association) as compliant with UNI EN ISO 9001:2008 (ISO 9001:2008) - Approval by Lloyd's Register as manufacturer of forged parts made of carbon steel, carbon-manganese steel and austenitic stainless steel in compliance with the "Rules for the Manufacture, Testing and Certification of Materials" - Approval of products issued by TÜV Sud according to the technical rules established by AD/2000 Merkblatt W2, W7, W10, W12 and W13 and associated Materials Specifications.

**Research & Development:** the ongoing research activities aim at continuously improving and rationalizing the Company's consolidated technology, as well as at optimizing the forging cycles and the heat treatment processes, or studying the solidification of heavy ingots through mathematical models. When specific studies or research activities are required, Società delle Fucine is efficiently supported by Centro Sviluppo Materiali (CSM), based both in Rome and Terni operating premises. **Products - Electricity:** low-pressure, high-pressure, low- and medium-pressure unitary rotors; shafts, compressor shafts and disks for combined rotors; rings for hydraulic turbines - **Industrial, naval and aerospace industry:** forging presses; shipbuilding; aerospace projects - **Chemical, petrochemical and nuclear industry:** forged ferrules, tube plates; pumps and valves; components for nuclear reactors; containers for nuclear waste storage - **Rolling cylinders:** working cylinders for flat and shaped products and supporting cylinders - **Steel for tools:** blocks for moulding plastic, hot forming steel, chill casting, hot extrusion of light alloys and for auxiliary components.

**SOCIETA' DELLE FUCINE - Office and plant:** Viale B. Brin 218 - I-05100 Terni, phone +39 0744 4881, fax +39 0744 470912, info.sdf@thyssenkrupp.com / **Sales Direction:** V.le B. Brin 218 - I-05100 Terni, phone +39 0744 488310, fax +39 0744 470913, info.sdf@thyssenkrupp.com

### PAGES 8-9

#### FIRE RESISTANCE: A FEW GENERAL AND SPECIFIC REMARKS CONCERNING STAINLESS STEEL

(Resistenza al fuoco: generalità e approfondimento sull'acciaio inox)

**Fire Resistance. REI: Meaning and comments** - Fire resistance can be defined as the capacity of a building element, part, or structure to keep, according to a pre-established thermal pattern and for a certain period of time, the following characteristics:

**R: stability or bearing capacity.** It is the capacity of a structure, or of one of its frames, to bear specific actions during their exposure to fire.

**E: tightness or integrity.** It is the capacity of division frames to prevent the passage of hot gases or ignition beyond the exposed surface during its exposure to fire.

**I: thermal insulation.** It is the capacity of a division frame to prevent excessive heat transmission.

Therefore, it becomes obviously meaningless to determine which is the REI or R value of an unspecific material (whether metallic or not). It is instead much more important to consider the REI, RE or R value of a finished element produced with one or more materials, the characteristics of which contribute to determine its behaviour and performance, thereby making the choice of a correct mix of these characteristics advantageous in the production stage. **Reaction to fire** - The Ministerial Decree dated June 26, 1984, and its subsequent 2001 update, defines the classification of materials basing on their reaction to fire, an aspect resumed by the EN 13501-1 standard. A reaction class "0" is attributed to stainless steel, which corresponds to the A1, A1<sub>FL</sub>, A1<sub>FL</sub> classes included in the European standards, as per the Ministerial Decree dated March 15, 2001, since this material is not combustible. **Stainless steel behaviour in case of fire** - Concerning stainless steels,

Eurocode 3 and especially the EN 1993-1-2 standard, devote a specific Appendix to these alloys, thus providing planners and designers with the essential data which allow them predicting the "life", or duration, of the construction elements made of stainless steel included in an assembly. Eurocode 3 data (resulting from a specific testing activity and resumed also by the Italian UNI 9503 standard) point out that even at very high temperatures, stainless steels ensure a slow decaying of their structural characteristics (yield strength, tensile strength, and elastic modulus). As well as the Eurocode data, experimental tests supported by simulations carried out on finished parts have suggested actual solutions - which provide for the use of stainless steels - to experts and operators. Among them, we wish to mention the solutions found in 1999 after the great fire in the Mont Blanc tunnel.

#### PAGES 10-11

### THE NEW GENERATION OF FERRITIC STAINLESS STEELS: A NEED WHICH HAS BECOME AN OPPORTUNITY

**(Acciai inossidabili ferritici di nuova generazione: una necessità divenuta opportunità)**

21 per cent ferritic stainless steel (EN 1.4611, EN 1.4621) and stainless steels with 24 per cent Chrome content (EN 1.4613), stabilized with Titanium and Niobium, and with a low content of interstitial elements (carbon and nitrogen) are the final result of a process which has traditional ferritic steels with 17 per cent Chrome content (e.g. EN 1.4510 - AISI 439) as starting point. Ferritic stainless steels have had in any case the merit of making up, so far, for emergency market situations. The technological efforts lavished by the steel mills engaged in research activities prove to be quite important and represent a further evidence of the responsiveness and technical competence of the European stainless steel industry faced with the current ups and downs of the economic situation. Though the standards and regulations in force (such as, for example, the EN 10088 standards and the Ministerial Decree issued on March 21, 1973) have quickly included also the "newborn" grades, the inclusion process within the setting of the new-generation ferritic stainless steels has only entered its starting phase. It is however worth mentioning some elements which underline their advisability as well as the need for using them: considerable economic advantages, price stability, and technological characteristics. To conclude, a remark of paramount importance. It would be absolutely wrong to consider the new generation of ferritic stainless steels a mere alternative to traditional austenitic steels, which in any case, will continue to remain a reference point for end users. It is instead more correct to talk about their complementarity, and to consider that these new alloys can represent an alternative option offered to end users to allow them "staying with stainless steel" and its unmistakable characteristics and peculiarities.

### THE IMPORTANCE OF FITTINGS

**(L'importanza dei fittings)**

There is a large range of available connecting and fastening elements on the market, depending on application requirements: stamped, rolled and turned fasteners.

We present in this article a set of products entirely made of stainless steel, which are manufactured exclusively through machining. The range of products includes special customized screws, safety screws, spacers, studs, etc., made of EN 1.4305 (AISI 303), EN 1.4401 (AISI 316), and EN 1.4301 (AISI 304) stainless steel. It often happens that, along with physical and mechanical performances and corrosion resistance, aesthetical properties are required, and in this case, too, stainless steels succeed in perfectly meeting any application requirement. Finally, we can note that in some particular assemblies and applications, stainless steels can be used also for merely decorative purposes.

**Production:** F.L.Z. Fasteners Srl - Via Lavoratori Autobianchi n. 1/Pad. 22/E - I-20832 Desio MB, phone +39 0362 306749, fax +39 0362 621036, www.flzfasteners.com

#### PAGES 12-13

### THE NEW CLT RECREATION GROUND UNDER THE SIGN OF STAINLESS STEEL

**(Il nuovo parco giochi del CLT all'insegna dell'inox)**

The new CLT (Circolo Lavoratori Terni - Terni Workers' Club) recreation ground was opened on September 10, 2011.

The new outdoor game equipment installed on the recreation ground consists of an arrangement of three swings, four little ladders and four baskets, all made of stainless steel tubes. In particular, EN 1.4571 (AISI 316Ti) tubes were used to build the swings, while for the other games EN 1.4401 (AISI 316) tubes were used. The choice of design and materials was determined by the designer's intention to build a different kind of games from those currently available on the market. The successful performance of AISI 316 stainless steel in the construction of this recreation ground mainly depends on the intrinsic characteristics of this material, such as its easy workability and weldability, as well as on its high durability - which reveal themselves in particular in the corrosion resistance of this kind of stainless steel in a variety of environmental conditions, especially those depending on weather and pollution, and in its mechanical and resistance to scratches - its considerable aesthetical impact, and low cost. The idea of using tubes was also motivated by the need to ensure maximum safety to these games by eliminating all corners capable to cause injuries or traumas to the children. In addition, the architect who designed the structure considered it important to create details of different colours which had the capacity for further emphasizing the gloss of the base material. In the design of the swings, in particular, the novelty consists in their arched shape, which lies outside all current construction standards, and could be obtained thanks to the particular strength and workability of all used materials. This arched shape has a dual function, since it acts not only as a game, but also as a lighting body, being provided of a built-in thin strip of LEDs, which ensure a good lighting capacity and considerable energy savings.

**Work:** CLT - Circolo Lavoratori Terni - Via dei Muratori 3 - 05100 Terni / **Designer:** Arch. Donatella Taddei / **Manufacturing company:** Garofoli Spa - Divisione Aginox - **Production plant and offices:** Str. Maratta Km. 8.700 - I-05036 Narni Scalo TR, phone +39 0744 750160, fax +39 0744 751478, info@aginox.it - **Registered office:** Str. di Pantano 15/13 - I-05100 Terni, phone +39 0744 803511, fax +39 0744 811808 / **Stainless steel produced by:** ThyssenKrupp Acciai Speciali Terni S.p.A. - Viale B. Brin 218 - I-05100 Terni, phone +39 0744 490282, fax +39 0744 490879, marketing.ast@thyssenkrupp.com, www acciaiterni.it

#### PAGE 14

### A STAINLESS STEEL PLANT FOR INDUSTRIAL LIQUID WASTE TREATMENT

**(Un impianto inox per il trattamento dei rifiuti liquidi industriali)**

This plant was designed and built for the main purpose of offering a reliable solution to industrial liquid waste treatment. Consequently, a plant capable to ensure that all related activities were not only managed in full compliance with the law in force and in the interest of the community, but also capable to grant financial resources to the company. Industrial liquid waste is preliminarily treated through a series of chemical and physical processes aimed at removing all pollution agents through neutralization and oxide-reducing reactions, before conveying them to biological treatment.

This plant for the treatment of industrial liquid waste (ITR) basically consists of: a liquid waste reception station, which collects the waste unloaded from the collecting tank trucks, and removes coarse materials and sands; two loading tanks; a series of tanks of approximately 800 m<sup>3</sup> capacity designed to stock non-dangerous industrial liquid waste; a series of tanks designed to stock reactants (such as sulphuric acid, iron sulphate, caustic soda, lime and polyelectrolyte); 7 stainless steel reactors of different sizes equipped with stirrers for chemical-physical treatment; a static thickener; a circular decanter; a plate filter press; and finally, two lifting tanks to convey the waste to the biological treatment system. All metal parts (including the conveying pipes for evil-smelling emissions to the centrifugal fan of the deodorizer) are made of EN 1.4404 (AISI 316L) stainless steel, while the waste reception station is made of EN 1.4301 (AISI 304). At the beginning, the maximum potentiality this plant was authorized to reclaim and purify was 55,000 tons of liquid waste (year, and in 2009, the ITR plant treated 54,989 tons (corresponding to over 4,000 collecting tank trucks). Later on, the plant was authorized to increase its treatment capacity, and in 2010, it treated about 76,000 tons of waste. This ITR plant is included the programme of plants subject to IPPC (Integrated Prevention Pollution Control).

**Plant:** Consorzio per la Depurazione delle Acque di Scarico del Savonese SpA - Via Caravaggio 1 - I-17100 Savona, phone +39 019 230101, fax +39 019 23010260, info@depuratore.sv.it, www.depuratore.sv.it

#### PAGE 15

### CENTRO INOX SERVIZI SRL: SPECIFIC CONSULTING SERVICES AND TRAINING COURSES FOCUSED ON STAINLESS STEELS

**(Centro Inox Servizi srl: consulenze specifiche e corsi di formazione sugli acciai inossidabili)**

Centro Inox Servizi S.r.l. is an organization established in January 1995 for the purpose of integrating some of the activities which had been previously carried out by Centro Inox (The Italian Association for the Development of Stainless Steels), active in the Italian market since 1962.

Centro Inox Servizi offers companies and professionals its expertise and is prepared to supply, on demand and with a fee, the following services: **"Tailor-made" and specific consulting services (also off site); Training and refresher courses; Study seminars.** Specific consulting services can be focused on different issues and problems, as, for example: the choice of the most suitable materials depending on their intended use; stainless steel mechanical and physical characteristics, corrosion resistance, identification of the causes of corrosion onset in stainless steels; mechanical processes; welding and filler materials; heat treatments; surface coatings; surface finishing, non-destructive inspections and tests; standards and specifications, etc.

Centro Inox Servizi offers the companies that intend to make use of its consulting services throughout the year on a continuous basis, the possibility of a YEARLY REGISTRATION, which includes a package of services and special discounts for the activities entirely organized and carried out with a fee by Centro Inox Servizi (i.e. meetings, seminars, etc.), for training and refresher courses and seminars, or for specific consulting services.

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#### PAGE 16

### THE GREEN THUMB OF STAINLESS STEEL (Il pollice verde dell'acciaio inossidabile)

The collection described in this article has been designed for the care and display of plants. This collection is composed of a series of flowerpots/cachehots, and a very particular room divider conceived to host climbing plants or other flowerpots so as to create an attractive ornamental effect. The dividing wall "Greenwall" looks like a real wall, as its structure reproduces the graphic shapes of the bricks of a wall! "Greenwall" is also a dividing screen, which can serve either as a flowerpot (since the potting compost can be directly put into it) or as a cachepot (when it is filled with other flowerpots). Green and scented, "Greenwall" is an ideal solution for hosting and arranging evergreen climbing plants, such as jasmine. Transparency depends on how plants are arranged on it. This collection includes also the plant container "Greenpot". The original structure of this container recalls the shape of an oversized flowerpot. All these products are made of EN 1.4301 (AISI 304) stainless steel square welded tubes.

**Manufacturer:** Nautinox Living Srl - Via Meucci 14/16 - I-20080 Casarile MI, phone +39 02 90093718, fax +39 02 9054631, info@nautinoxliving.it, www.nautinoxliving.it / **Design:** Luca Pegolo

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