

INOSSIDABILE

Edited and published by Centro Inox



Summary

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

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46 KM OF SEAMLESS TUBE: ITALIAN STAINLESS STEEL FOR A CERN PROJECT (46 km di tubo senza saldatura: inox italiano per un progetto del CERN)

CERN (the European Organisation for Nuclear Research in Geneva) is conducting a very ambitious project: to recreate a miniature "big bang", attempting to reproduce and identify particles that no longer exist in nature.

In the '80s, a 27 km tunnel was dug 100 metres below ground level for installation of the first accelerator, the LEP (Large Electron Positron collider). A more powerful system, the LHC (Large Hadron Collider), will soon produce acceleration and collision of beams of 7TeV protons, 2,000 times heavier than LEP electrons and positrons. Two flows of protons will circulate in opposite directions at a speed of 300,000 km/s. Powerful computers will analyse the particles produced inside the detector by about a million collisions a second.

The LHC project is based on powerful superconductor magnets operating in a bath of 700,000 l of superfluid helium at a temperature of 1.9 K (-271°C).

Construction of the cylindrical cold cavity in the system requires a supply of a total of 3,542 seamless tubes of EN 1.4429 (AISI 316LN) austenitic stainless steel, amounting to a total length of about 46 km and a total weight of 89 tons.

The cold pipe circuit CBT (Cold Bore Tubes) that will form the seat for passage of the circulating beams of particles, is formed of round tubes about 15.6 m long, with an external diameter of 53 mm and a thickness of 1.5 mm, outside of which a 1 mm² cable is spooled, composed of 9,000 small hexagonal bars of superconductor material (NbTi) only a few microns thick.

The requirements for the supply of tubes included very strict tolerances for the wall thickness, the external diameter, the chemical composition, the magnetic permeability in a cold environment, and the content of impurities and inclusions.

An additional circuit, also 27 km long, will be made of EN 1.4307 (304L) stainless steel tube, serving only for carrying service bars.

Seamless tubes supplied by:

DMV Stainless Italia, Via Piò 30, I-24062 Costa Volpino BG, phone +39 035.975611, fax +39 035.975803, dmvtalia@dmv-stainless.com - www.dmv-stainless.com

Photo: Archive of CERN.

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STAINLESS STEEL CABINETS FOR MAXIMUM HYGIENE MARKED WITH THE NEW STAINLESS STEEL MARK

(Armadi inossidabili per la massima igiene. Un marchio con il nuovo marchio inox)

The EN 1.4301 (AISI 304) stainless steel and the construction method employed make these cabinets particularly suitable for use in those sectors requiring the utmost hygiene in all areas, including dressing rooms and storage areas. The roof is made of the same sheet of steel as the cabinet, to eliminate joints that can be a haven for dust and dirt. The strong slope of the roof makes cleaning easy and prevents people from resting objects on it.

Burr has been eliminated to guarantee perfect safety. The standard sheet thickness is 0.8 mm, but 1.0 and 1.2 mm are also available on request. Cabinets are supplied with a satin (Scotch Brite) or BA finish. Welds are made with MIG/MAG welders with wire of AISI 308L stainless steel. All accessories are made of stainless steel.

The manufacturer is the first company to use the new Centro Inox mark (shown in fig. 3) identifying "stainless steel", applied to a broom cabinet used in a food industry (see page 14 for more information on the mark).

Production:

Facilitas, Via Lazio 7, A/B/C, I-41050 Montale Rangone MO, phone +39 059.530570, fax +39 059.531206, facilitas@facilitas.it, www.facilitas.it

"LINER LOCK" FOLDING KNIFE (Coltello pieghevole "liner lock")

"Liner locks" are pocket knives employing a special system which locks the blade in position when opened.

The blade is made out of a special type of sintered stainless steel commonly used in knives of this type, with a high carbon content (1.0 %) to obtain the necessary hardness, and containing chrome (14%), molybdenum (3.5 %), manganese (0.4 %) and vanadium (0.4 %).

EN 1.4301 (AISI 304) stainless steel is used for the heads, the rotation pin and the case spacers. The scales on the handle, made of fossil mammoth ivory, add a particularly elegant touch to this handmade knife.

Production:

Flavio Ambrosioni, Via Campagna 3A, CH-6503 Bellinzona (TI Svizzera), phone +41 79.7229136, f.ambrosioni@bluewin.ch

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FROM OUR MEMBERS

ILTA INOX. 40 YEARS IN THE VANGUARD (Dalle Associate. Iltta Inox. 40 anni all'avanguardia)

The first company in the Arvedi Group, Iltta, went into business in 1963 producing welded carbon steel tubes. In 1970 it entered the world of stainless steel with three welding lines (a Mannesmann and two OMEs), an annealing oven and a pickling plant guaranteeing an annual production of 500 tons in the 21.3 to 114.3 mm range. The pilgrim process rolling line was particularly important, being unique at the time for welded tubes employed in the milk industry. The superlative finish on the internal surface created Iltta's image as a top quality producer ever since.

In the '80s Iltta purchased two of its biggest competitors at the time: Gilby (exchanger tubes) and Tubificio di Solbiate (seamless and centrifuged tubes).

In 1997 the production of welded stainless steel tubes was concentrated in the Robecco d'Oglio facilities, now one of Europe's most technologically advanced plants for that kind of production.

Tubes are welded by the TIG, plasma or laser methods for applications requiring particularly high weld quality, and high frequency for decorative/structural uses; the range of round tubes - the biggest in Europe in terms of number of dimensions - is extended with square and rectangular tubes (tab. 1).

In addition to the traditional austenitic stainless steels, 304, 304L, 316L, 316Ti and 321, the company produces refractory steels 309 and 310S and duplex steels 31803 (tab. 2).

The company's biggest area of investment is the laser technology: 12 laser plants, represent now over half of total production. This technology offers important advantages in production and/or metallurgy over conventional welding technologies (TIG, plasma and HF): very high thermal contributions (considerably increasing welding speed) and very limited laser beam size (0.8 mm) that reduces the heat affected zone and improves the quality of the final product.

As proof of the quality of laser welded tubes, Iltta has obtained the approval of a number of prominent testing organisations, including TÜV and Lloyds.

Iltta Inox, Strada Statale 45 bis, km 13, I-26010 Robecco d'Oglio CR, phone +39 0372.9801, fax +39 0372.921538, sales.iltta@arvedi.it, www.arvedi.it/iltta

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COLD FORMING OF STAINLESS STEEL. A TECHNOLOGY SERVING DESIGN (Deformazione plastica a freddo dell'acciaio inossidabile. Tecnologia al servizio del design)

Use of EN 1.4301 (AISI 304) austenitic stainless steel

in kitchenware is justified also for its excellent capacity for cold forming, allowing creation of objects in which shape plays an essential role.

The two important pairs to bear in mind are: "material-shape obtainable" and "shape-surface appearance". In the first case, we assess the feasibility of technological operations and the economic feasibility of the process. In the second case, the surface improves both the feel and the look of the object.

As an example, let us look at the concept for a new model of pot, the Olympia series by Serafino Zani, Lumezzane (Brescia) (fig. 1).

A preliminary analysis of the market and current trends revealed a preference for convex shapes. The company therefore chose to produce a convex form tapered at the top, composed of a set of curves of different radii. The pot has a glossy mirror-like surface which gives the shape a lighter appearance.

The technological cycle is as follows.

The starting element is, in this case, a disk with a diameter of 460 mm obtained by shearing off a coil of EN 1.4301 (AISI 304) austenitic stainless steel 1 mm thick (fig.2), with surface finish 2B minimising work on the final surface finish. The shearing operation must not leave burr on the edges, which, work hardened by the deformation imposed by shearing, could scratch and damage the moulds made of aluminium bronze (fig.3), which have a low friction coefficient and high thermal conductivity.

The result of the first drawing pass is a cylindrical can measuring 240 mm in diameter and 180 mm high. The effects of the severe deformation are eliminated by solution annealing at a temperature of about 1050 °C (fig.4).

An elongation pass, extends the diameter from 240 mm to 200 mm with a height of 189 mm, then a calibration obtains a diameter of 200 mm with a height of 212 mm (fig.5). The edge with a conical shape is levelled and trimmed. Steel moulds are used to coin it, crimping the edge of the pot (fig.6).

An openable mould is used to create the desired form (fig.7), making sure that there are no fissures on the closing planes, where they could form "crests". A punch is then created by layering disks of polymers of various appropriate compounds and thicknesses. The cylindrical body of the pot is placed in the open mould, with the open end facing downward and the punch inside it. The force exerted by the press is transformed by the polymer, which reacts to compression by expanding sideways until the steel is in contact with the walls of the mould. The different response to compression of the compounds employed permits creation of shapes which can be very different from the arc of circumference, creating also undercuts.

After the compression, the body of the pot retains the desired shape and is easily extracted, the polymer can be reused.

The heat diffusing base is created by brazing an aluminium disk enclosed in a base of ferritic stainless steel (fig.8). The magnetism of the ferritic steel allows the pot to be used on induction plates, something which is impossible with austenitic stainless steel (amagnetic) bases and, in addition, a greater thermal conductivity improves distribution of heat.

The lower thermal conductivity of austenitic steel is exploited in the handles, obtained by working a solid rod on the lathe.

The surface finishing process eliminates any burr and produces a mirror sheen which makes the most of the pot's shape (fig.9). The convex form appears more slender with a glossy finish, that reflecting the environment makes the product less outstanding. The inside of the pot is then polished to obtain an easier cleanable, corrosion resistant and a non-stick finish.

Taken from the doctoral dissertation of Mauro Petracco "Design con gli acciai inossidabili: applicazioni nel settore alimentare", Politecnico di Milano, Faculty of Engineering, Academic Year 2002/2003, Supervisor: Prof. Ing. M. Bonardi; Co-examiners: Ing. F. Capelli, Ing. V. Boneschi.



INAUGURATION OF ROME'S "DIVES IN MISERICORDIA" CHURCH: AN EXAMPLE OF USE OF STAINLESS STEEL REINFORCEMENT IN FINE ARCHITECTURE

(Inaugurazione della chiesa "Dives in Misericordia" a Roma. Un esempio di abbinamento tra architettura di alto livello e l'acciaio inox come armatura del calcestruzzo)

"Dives in Misericordia" church, designed by architect Richard Meier, opened in Rome on October 26 to mark the 25th anniversary of the Pontificate of Pope John Paul II. The building was constructed by combining traditional local materials, such as travertine, with innovative materials like sunlight sensitive white concrete and stainless steel for reinforcement of the concrete ashlar making up the three self supporting sails and the other walls bearing the weight of the entire building.

The high durability and improved safety, even in the event of an earthquake, provided by stainless steel reinforcements will ensure that future generations continue to enjoy the futuristic building in the centuries to come.

Stainless steel was chosen to prevent oxidation of the rebars with unacceptable consequences for the appearance and stability of the white concrete.

The problem was solved with stainless steel rebars from Cogne Acciai Speciali (CONCRINOX™), that not only resist corrosion but also possess unique mechanical properties, the most important of which is ductility, a quality that appears in a material when subjected to heavy loads, including abnormal loads such as those produced by seismic waves.

In such conditions, conventional carbon steel has limited capabilities as the correct balance between tensile strength and toughness, two opposite mechanical properties: as one increases, the other decreases.

Managing to increase both means producing a highly resistant structure which can be plastically deformed without breaking in the event of seismic stress.

Supplier of stainless steel rebars:

Cogne Acciai Speciali, Via Paravera 16, I-11100 Aosta AO, phone +39 0165.3021, fax +39 0165.43779, mailman@cogne.com, www.cogne.com, www.concrinox.com

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ALL STAINLESS STEEL FOR THE KAWASAKI Z 1000 EXHAUST SYSTEM

(Tutto inox il sistema di scarico della Kawasaki Z 1000)

Entirely made out of EN 1.4301 (AISI 304) stainless steel, the exhaust system of the powerful Kawasaki Z 1000 '03 offers yet another example of the growing trend toward use of stainless steel in a sector where brilliant performance and aesthetics are customers' primary needs.

The smallest tubes measure 40 mm in diameter and are 0.8 mm thick. They are bent by electronically controlled machines. TIG welding is used.

During processing tubes are protected by peel-off film, removed only to permit the final slightly satin surface finishing, created manually with abrasive "Scotch Brite" cloth.

Welding is made on a rotating platform.

Each piece is checked with a template, and the first prototypes are controlled once installed on the motorbike.

Production:

Termignoni, Via Case Sparse 80/4, I-15077 Predosa AL, phone +39 0131.71666, fax +39 0131.71696, info@termignoni.it

Stainless steel pipe supplier:

Ilta Inox, Strada Statale 45 bis, km 13, I-26010 Robecco d'Oglio CR, phone +39 0372.9801, fax +39 0372.921538, sales.ilta@arvedi.it, www.arvedi.it/ilta

STAINLESS STEEL EXPANDS SPACES

(L'acciaio inossidabile amplia gli spazi)

Vivinox®, the pre-painted stainless steel from ThyssenKrupp Acciai Speciali Terni, is used in construction work, especially roofing and panelling, in the coloured version Vernest® and in the new clear "Silver Ice®" version for interior renovation. The latter permits considerable savings and creates a new attractive look.

"Silver Ice®" is produced in "golden" and "clear" versions, depending on the type and diffusion of light preferred by the client; in any case, the effect is that of a pleasant well-lit clean room.

In the application shown, "Silver Ice®" has been used to manufacture staves for office ceilings (courtesy of C.i.p.r.o.s. of Saonara PD) creating a warm atmosphere yet perfectly suited to executive offices.

Another advantage offered by "Silver Ice®" is fire safety: stainless steel is the most heat-resistant of the materials commonly used in this application, offering the greatest heat resistance in continuous and cyclic tests.

Production of staves:

Atena Srl, Via De Gasperi 52, I-30020 Gruaro VE, phone +39 0421.75526

Material (Silver Ice®):

ThyssenKrupp Acciai Speciali Terni S.p.A. - I-05100 Terni, viale B. Brin, 218. Sales: Dr. D. Vella, phone +39 0744.809230, fax +39 0744.811220, dvella@csinox.it. Marketing: Dr.ssa V. Fontana, phone +39 0744.490867, fax +39 0744.490946, marketing@acciaiterni.it, www acciaiterni.it

EXPANDED METALS FROM PRECISION STRIP

(Reti stirate da nastro di precisione)

Process fluids in industrial plants are subject to contamination, and must be filtered to permit proper, economical use.

Starting with precision stainless steel strip, a stretching process is used to create the expanded metal used to manufacture the filters destined for this use.

Precision stainless steel strips are produced by Arinox srl by the exclusive SUT® (Surface Ultracleaning Treatment) method, which uses an electrochemical process to remove surface microparticles of material and obtain a perfectly clean surface free of all pollutants.

Productive processes can generate microscopic particles on strip surfaces which are particularly hard and create considerable difficulty in the processing of expanded metal, decreasing the average lifespan of the tools used.

In production of expanded metals, as in other stamping applications, innovative precision stainless steel strip permits:

- a significant increase in tool duration
- an considerable increase in process productivity.

In addition, stainless steel strip used in these applications is characterised by:

- controlled roughness and total absence of surface defects
- high edge quality, reducing friction against sliding guides

Precision stainless steel strip:

Arinox srl - I-16039 Sestri Levante GE, via Gramsci 41/A, phone +39 0185.36611, fax +39 0185.366320. Sales Manager: Ing. Massimiliano Sacco. Sales Manager Assistant: Ing. Luciano Frezza. Marketing: Dott. Luigi Ricci, sales@arinox.it, www.arinox.it

Expanded metal and filters:

Italfim S.p.A. - I-24066 Pedrengo BG, via Tonale 2 (angolo via Crocette - Zona Ind.1), phone +39 035.658111, fax +39 035.656050 (Nazional), fax +39 035.664151 (International). Sales Manager: Mr Gianfranco Martinelli. Marketing: Mr Pierluigi Passarella, italfim@italfim.it, www.italfim.it

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NEW MARK FOR STAINLESS STEEL

(Un nuovo marchio per l'acciaio inossidabile)

Centro Inox has created a new mark which can be used by all producers of items made entirely in stainless steel or in which in any case more stainless steel is used than other materials.

The initiative arose from the following needs: 1) to distinguish stainless steel clearly from other materials; 2) to make sure that end users can immediately recognise a material which is a byword for durability and hygiene 3) to make known the presence of stainless steel in emerging fields.

The sole purpose of the mark is to identify the nature of the material without any reference to its quality level. It is not therefore a mark of quality and does not represent any kind of guarantee as regards any performance shortcomings arising, for example, from inappropriate maintenance or cleaning, machining, installation or choice of type of stainless steel according to use.

The Regulation states that the mark can be accompanied only by wording containing the declaration that it has been issued by Centro Inox, that the material used is stainless steel which is a hygienic, non-toxic, strong, recyclable material etc.

The mark has been registered in Italy and is therefore protected throughout the country, while the registration process has also started for its protection to be enjoyed throughout the EC.

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NEWS

WELDING OF STAINLESS STEELS. A CLOSER LOOK

(La saldatura degli inossidabili. Aspetti specifici e approfondimenti)

Milan, 26 February 2004 - AIM - Piazzale R. Morandi 2 - 8:45 am

This event, organised by AIM's "Metals and Application Technologies" and "Welding" Study Centres with the collaboration of Centro Inox, takes a closer look at a number of themes and specific aspects of welding of stainless steels. The official language will be Italian.

Information and registration:

Associazione Italiana di Metallurgia (AIM) - Piazzale R. Morandi 2 - I-20121 Milano
phone +39 02.76021132 - fax +39 02.76020551
- aim@aimnet.it - www.aimnet.it

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STAINLESS STEEL FROM TRADITIONAL APPLICATIONS TO EMERGING MARKETS

(L'acciaio inossidabile dalle applicazioni tradizionali ai mercati emergenti)

Milan, 9 June 2004 - 9:00 am

Politecnico di Milano - Room S01 (Leonardo da Vinci Campus) - Piazza Leonardo da Vinci 32

The course, organised by the Mechanics Department of the Politecnico di Milano and Centro Inox, is intended for technical and commercial personnel in all sectors of industry using stainless steel and in the distribution, processing and sale of stainless steel primary products and components (dealers, service centres, etc.).

All registered participants will be provided with the proceedings and other technical documentation. Centro Inox members' brochures and catalogues will also be available.

The official language will be Italian.

The complete programme will be published in the next issue of "Inossidabile" (155 - March 2004).

For more information on registration fees and methods:

Sig.ra Michela Rodolico, Dipartimento di Meccanica, Politecnico di Milano; phone +39 02.23998242 - fax +39 02.23998202; michela.rodolico@cda.polimi.it
Sig.ra Giovanna Ferrario, Centro Inox, Milano; phone +39 02.86450559/69 - fax +39 02.860986; eventi@centroinox.it

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STREAMLINED FORM FOR THE NEW STAINLESS STEEL TAPS

(Linee essenziali per i nuovi rubinetti inox)

Picking up on the discussion begun in recent years in Inossidabile regarding innovative tap production, we would like to present another manufacturer who, alongside traditional chrome-plated brass taps, has started producing a line of taps made exclusively out of stainless steel, created by the "Cristina Inox" company branch.

The line includes models for the bathroom and kitchen which are highly innovative in both technical and aesthetic terms. This ambitious project aims to experiment with new materials in order to overcome the limits on creativity set by chrome-plated brass.

Taps may be created from bars or by casting, as the material is appropriate for working in various ways. The benefits are undeniable. Stainless steel is an extremely ductile material which is aesthetically attractive, requires no special protection, is not subject to corrosion, and is perfectly recyclable and hygienic.

Production:

Rubinerie Cristina SpA, Via Fava 56, I-28024 Gozzano NO, phone +39 0322.956340, fax +39 0322.956556, cristina@cristina.ch

CENTRO INOX

The Italian Stainless Steel Development Association

Piazza Velasca, 10 - 20122 Milano - Italy
Telephone 02.86.45.05.59 - 02.86.45.05.69
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