

Three companies work on the G-Iron project in perfect synergy.

G-iron System

Arezzo, Italy
www.g-iron.it

G-iron System specializes in rolled and drawn iron with a very low carbon content (C=0.002% - C=0.005%) that is used in the mechanical and goldsmith industries. The company was founded in 2001 as MarcoMetalli and, following an accurate study in cooperation with Centro Sviluppo Materiali S.p.A. that ended in May 2005, developed G-iron, a metal able to absorb Extremely Low Frequency magnetic fields. In January 2007 the production of G-iron became the core business of the company that changed its name to G-iron System. G-iron System is the project leader and it coordinates the other two Partners.

Founder: Marco Alvelli

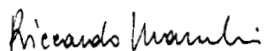


Texe s.r.l. - INNTEX Div.

Firenze, Italy
www.inntex.com

Texe srl has more than 50 years expertise in textiles. In 2003 the company started producing technical textiles under the brand INNTEX - Innovative Textiles. Today INNTEX produces fabrics for electromagnetic shielding, metal textiles for interior design and other specialty textiles. INNTEX produces the G-iron metal shielding elements with a proprietary technology.

Managing Director: Riccardo Marchesi



Sintesy ingegneria architettura

Foiano della Chiana, Arezzo, Italy
www.sintesy.org

Sintesy develops architectural, structural and plant design projects for residential, industrial and public construction. In the G-iron project Sintesy is in charge of structural data acquisition, for the mechanical executive project and for the direction of works.

Founder: Paolo Alvelli



R&D

Centro Sviluppo Materiali s.p.a.

Roma, Italy
www.c-s-m.it

Centro Sviluppo Materiali performs the continuous mechanical and magnetic improvements of the G-iron range of products. Centro Sviluppo Materiali is known worldwide as a research company with competence in magnetic materials and in related production.

G-iron H.I.F. (High Intensity Field)

G-iron H.I.F. is a high-permeability soft magnetic material with a high permeability and high saturation level ($B_s=2,12$ Wb/sq.m) able to shield magnetic fields from 0 to 1.000 Hz. This material is made of 99,85% (minimum) pure iron (Fe). Other elements in the alloy, combined with a particular production process, give G-iron H.I.F. the following characteristics:

- Not subject to aging
- Isotropic
- Narrow hysteresis cycle
- Magnetic properties are not affected by severe mechanical deformation

G-iron H.I.F. is particularly indicated when the shield is very close to the source of a high intensity magnetic field and when the magnetic field is generated along multiple directions.

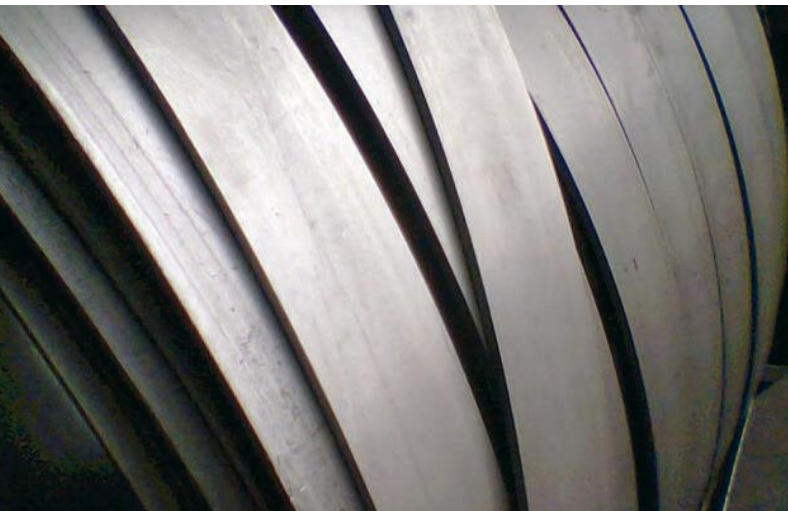
G-iron L.I.F. (Low Intensity Field)

G-iron L.I.F. is a high-permeability magnetic alloy with a high saturation level ($B_s=2,0$ Wb/sq.m) able to shield magnetic fields from 0 to 1.000 Hz. This material is made of 97% iron (Fe). Other elements in the alloy, combined with a particular production process, give G-iron L.I.F. the following characteristics:

- Not subject to aging
- Non Isotropic
- Narrow hysteresis cycle
- Magnetic properties are not affected by small mechanical deformation

G-iron L.I.F. is ideal for magnetic shielding when magnetic field has a low level (lower than $10 \mu T$) and when the shield covers a large area.

In some cases it is convenient to use a combination of the two materials.



G-iron H.I.F. Technical Characteristics

Shielding mode: absorption
Initial permeability: 150
Relative permeability: 5000
Saturation induction: 2,12 T
Curie Temp.: 770 °C (1418 °F)
Attenuation @ 50 Hz 100 μT : 11 dB (72%)
with shield completely closed
Attenuation @ 50 Hz 100 μT : 20 dB (90%)
with low reluctance magnetic shunt
*Loss due to mechanical deformation**: 0.3 dB (< 4%)*

G-iron L.I.F. Technical Characteristics

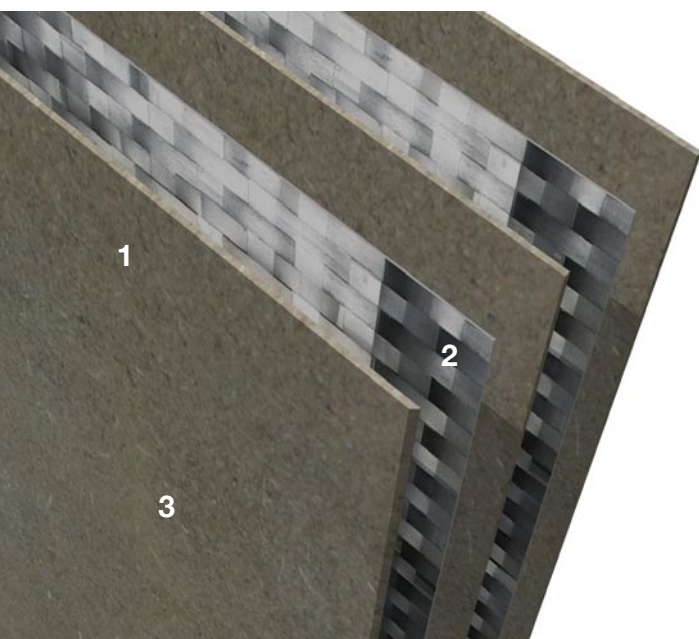
Shielding mode: absorption
Initial permeability: 500
Relative permeability: 7000
Saturation induction: 2,0 T
Curie Temp.: 740 °C (1364 °F)
Attenuation @ 50 Hz 100 μT : 14 dB (80%)
with shield completely closed
Attenuation @ 50 Hz 100 μT : 26 dB (95%)
with low reluctance magnetic shunt
*Loss due to mechanical deformation**: 2 dB (21%)*

*Tested according to A.M.T. (Three-axial Magnetic Analyzer).

** Both sides of the specimen are bent in both directions, along the orthogonal and longitudinal axis.

Shielding panels

Shielding panels are produced with one or two layers of G-iron H.I.F. or G-iron L.I.F. and MDF layers. MDF layers have a thickness of 3 mm (.12 in). Standard sizes are 600 mm x 3000 mm (23.6 in. x 118.1 in.) or 700 mm x 3000 mm (27.5 in. x 118.1 in.). The maximum thickness is 11 mm (0.43 in.). Surfaces are ready to be painted with beveled edges to allow for plastering their junctions. On request panels can be supplied with assembling holes. G-iron panels installation requires the same techniques used in plasterboard panels installation. Surface finishing can be personalized on request with a variety of different materials: white masonite, stainless steel, melamine finishing.



1. MDF panel, thickness 3 mm (0.12 in.)
2. G-iron H.I.F. or G-iron L.I.F. shield
3. Standard surface ready to be painted

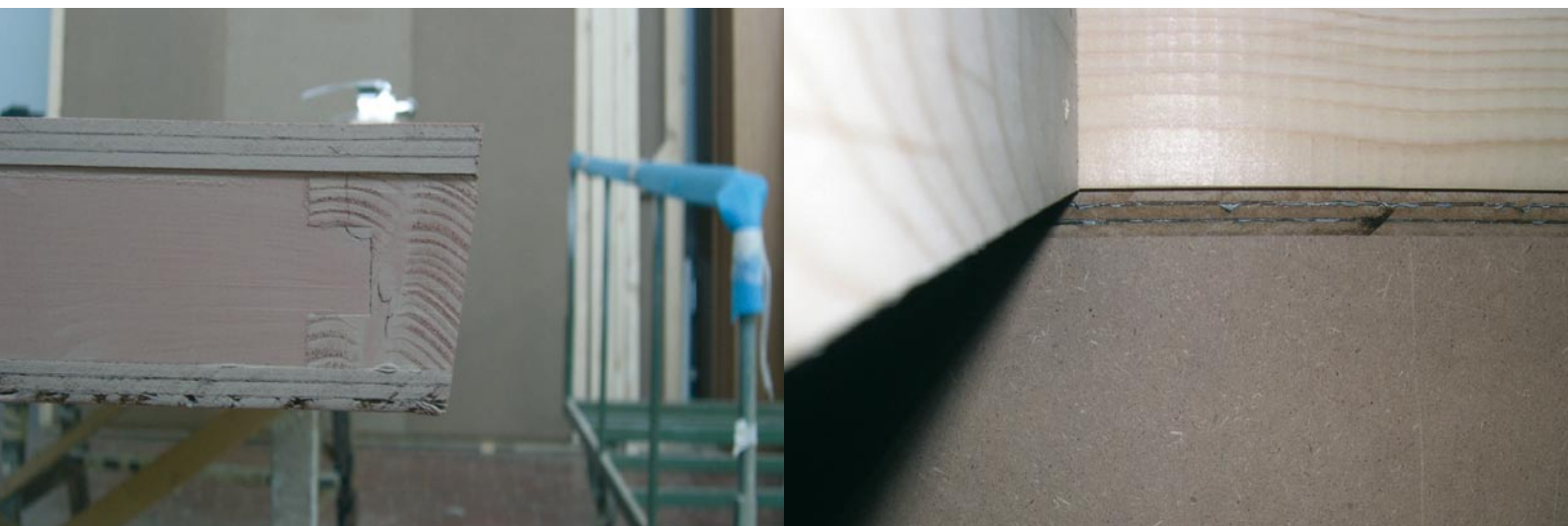
Standard sizes:

One layer

600 mm x 3000 mm x 7 mm thickness
(23.6 in. x 118.1 in. x 0.27 in. thickness)
700 mm x 3000 mm x 7 mm thickness
(27.5 in. x 118.1 in. x 0.27 in. thickness)

Two layers

600 mm x 3000 mm x 11 mm thickness
(23.6 in. x 118.1 in. x 0.43 in. thickness)
700 mm x 3000 mm x 11 mm thickness
(27.5 in. x 118.1 in. x 0.43 in. thickness)



G-iron Flex

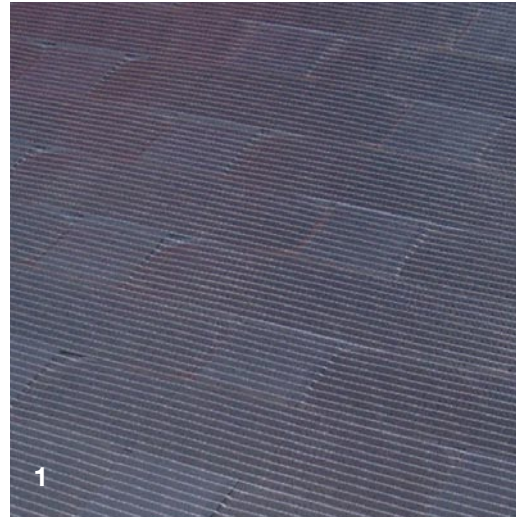
G-iron Flex is the most innovative and versatile product of G-Iron System. It is a flexible fabric made of G-Iron L.I.F. and laminated with a 0.14 mm (.005 in.) glass reinforced polypropylene tape. This tape is tested under the ASTM (D3330, D3759, D3652).

The result is a very flexible product, protected against corrosion and usable in humid places i.e. when it is necessary to lay G-Iron inside concrete.

Standard size:

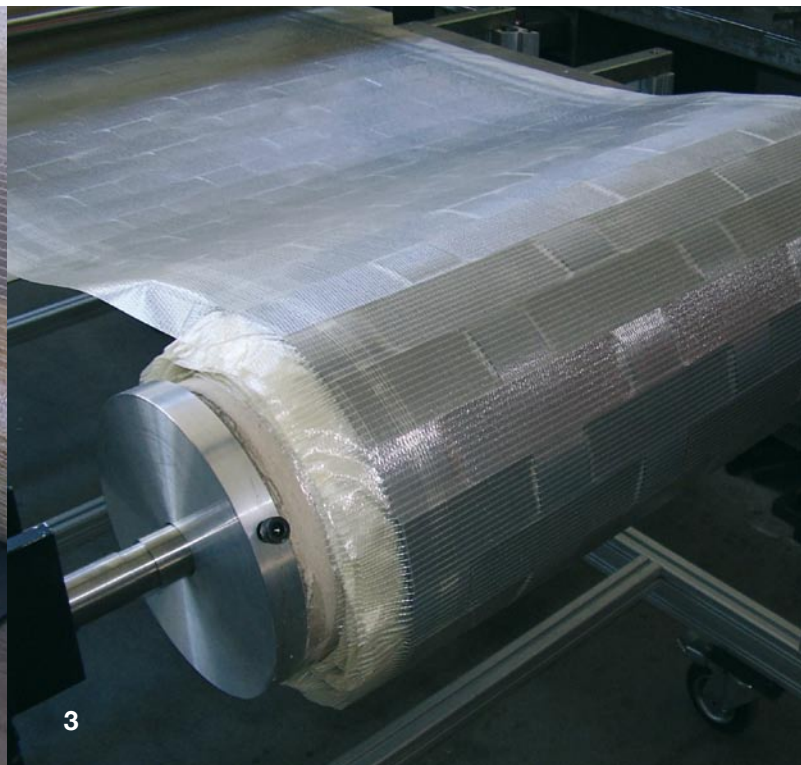
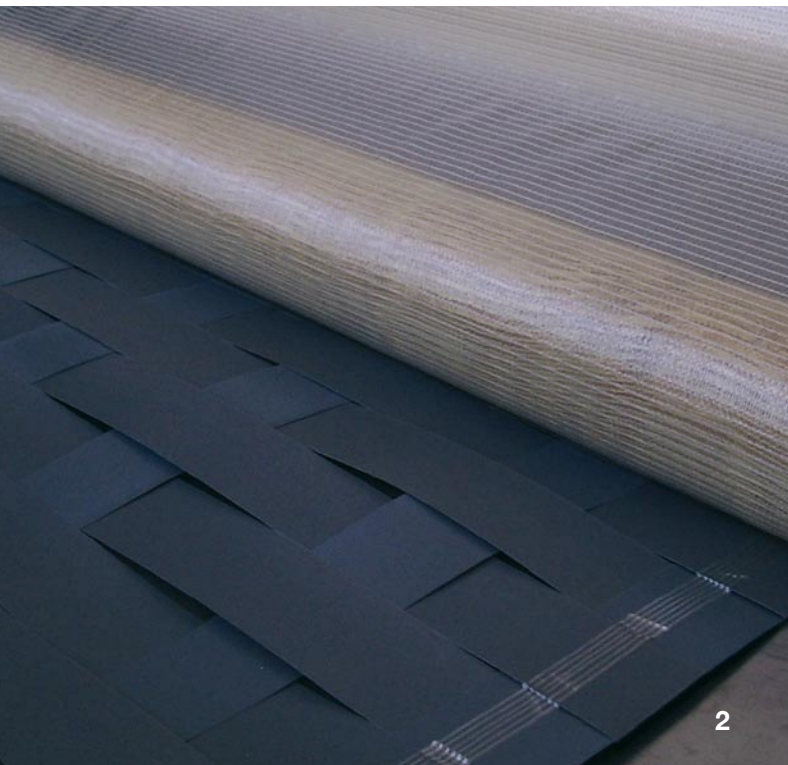
Rolls 650 mm (25.6 in.) wide,
25 m (75.7 feet) long.

Narrower widths and different roll lengths
on request.



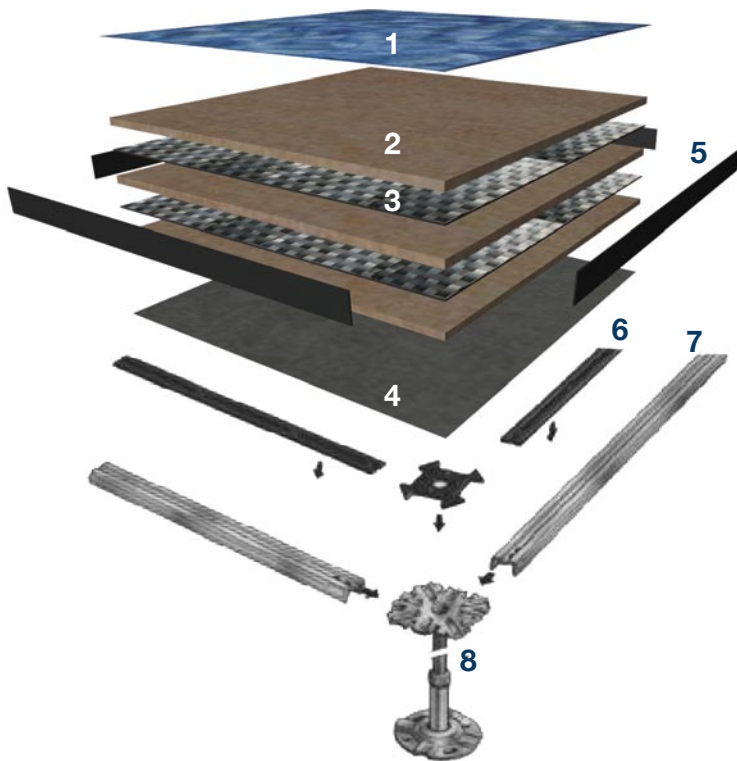
G-Iron Flex Production

1. G-Iron Flex close-up
2. Lamination process
3. Finished product being rolled



Shielding floating floor

Floating floor panels are produced with two layers of G-Iron L.I.F. or G-Iron H.I.F. interposed with fire resistant Calcium Sulfate panels. On the bottom side panels are laminated with a 0.05 mm (.002 in.) aluminum layer; this layer helps discharging electrostatic energy to ground and limits the effect of humidity that eventually might be present under the floating floor. The standard upper surface is made of 1 mm (.04 in.) antistatic laminate. Other materials for the upper side are available on request as well as the mechanical structure to assemble the floating floor. All panels are 600 mm x 600 mm x 38 mm (23.6 in. x 23.6 in. x 1.49 in.) and their sides are covered with a 0.5 mm (.02 in.) ABS tape.



1. Top layer
1 mm (.04 in.) antistatic laminate
2. Panel
fire resistant Calcium Sulfate core
3. Shield
G-Iron H.I.F. or G-Iron L.I.F.
4. Bottom layer
0.05 mm (.002 in.) aluminum layer
5. Sides
0.5 mm (.02 in.) ABS tape
6. Gaskets
Polyethylene Gaskets for air and dust
7. Crosspieces
Zinc plated Structural crosspiece
8. Columns
Top made of zinc plated steel with joint for crosspieces

Standard size:

600 mm x 600 mm x 38 mm
(23.6 in. x 23.6 in. x 1.49 in.)



Industries

Energy

Shielding of transformers, solenoids, electric grids, electric panels, electric motors.

Medical physics

MRI rooms shielding.

Building

Reclamation of buildings near electric lines, substations, electric lines in walls.

Electronics

Shielded cases, shields, microshields for electronic boards.

Industry

Shielded rooms, shielded emplacements, shielding of areas with high electrical power machines.



Service offered

Risk Analysis and final test

On request G-Iron System can offer a full service of risk analysis and final test, in cooperation with certified laboratories. G-Iron System will measure magnetic field before the installation of the shield, will suggest which material will give the best results, and will measure magnetic field again after the installation of the shield, certifying the results.

Executive project

In cooperation with Sintesy, G-Iron System offers turnkey projects. Sintesy will measure the space to shield and will prepare the executive drawings for the materials. This preliminary operation will allow the panels to be cut to measure, ready for installation.

Installation

In cooperation with Sintesy and other selected partners G-Iron System also offers installation services.

Shielded room 2500 mm x 2500 mm x 3000 mm h (98.4 in. x 98.4 x 118.1 in.) with a total of 6 layers of G-Iron H.I.F. and G-Iron L.I.F. used to shield a 2T cryomagnet installed in Naples for CNR I.N.F.M. (The Italian National Institute for the Physics of Matter), January 2006