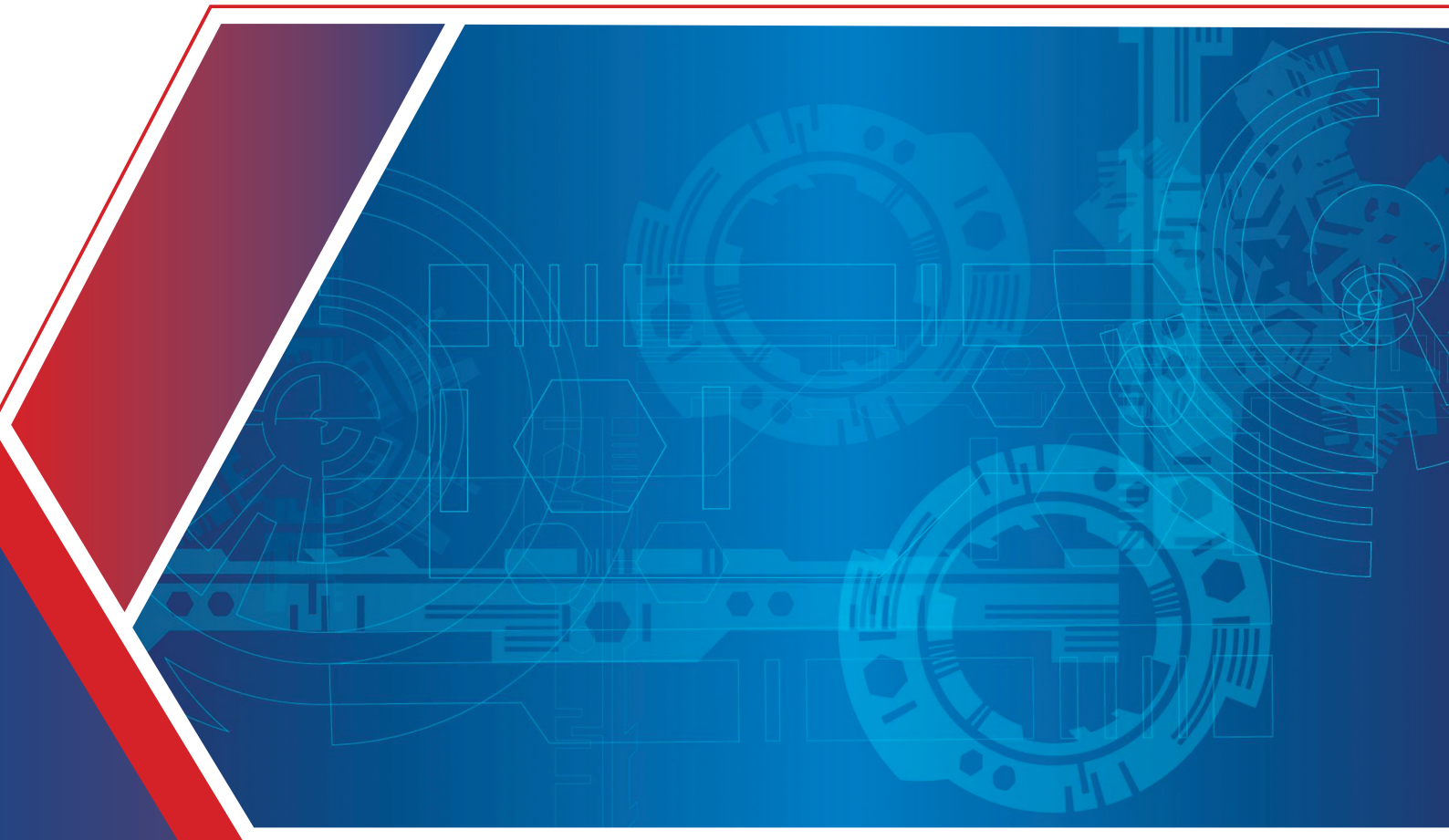
BESHIELDING

BUSBAR | ENGINEERING | SHIELDING



www.beshielding.com

BEShielding is a company that deals with the engineering, manufacture and installation of solutions and products to mitigate low-frequency electromagnetic interference.

Through a process of transformation and growth, the company established more than 15 years ago in the province of Turin, Italy is now present on both the national and international markets, recognized as sector leader by major national and multinational companies in various product sectors.

The operational headquarters with offices, warehouse and laboratory are located in Rivoli in the province of Turin.

For market identification, **BEShielding** marketing also uses the acronym BES, summarizing the 3 competencies and the main objectives of its activity:

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BUSBAR – ENGINEERING – SHIELDING

During its strategic, organizational development, BEShielding has gone through a series of profound transformations:

- the activity founded in **2007** simply as a commercial branch of **Sati Italia spa**, historical Italian company in the electrical industry sector;
- it was then transformed, in **2009**, into **No Field s.r.l.**, a technical start-up conceived in the I3P incubator of the Polytechnic University of Turin, which began offering solutions and products derived from its own know-how.
- then took on the company name **Sati Shielding s.r.l.** in **2015**, with a new brand;
- finally, came its latest configuration, **BEShielding s.r.l.**, in **2019**, changing the company name and brand to what is used today.
- in late 2020, the entire controlling share in the company passed to the current ownership structure.

Milestones

2007

2009

2015

2019

Flat shielding solutions

As regards shielding against low-frequency magnetic fields, the products and solutions BEShielding offers differ according to customer needs.

With its pool of engineers, BEShielding tackles the issue of electromagnetic interference starting with an environmental impact study, analysing the various sources of magnetic fields; this is done using its proprietary MAGIC software, current version 1.8.05, and proposing its own solution for mitigation.

The image above shows a BEShielding ceiling installation in a Cabin room, while the image below shows the floor installation in a Data Center.

The first shielding solution reduces the electromagnetic interference produced by the transformer substation (rooms in a student dormitory) while the second solution protects the Data Center from the electromagnetic pollution generated by the electrical infrastructure outside the Data Center itself. In this specific application, the Data Center is considered as a room containing sensitive electronic equipment (CEI EN 61000-4:8).

The shielding solution can also be installed directly by the customer, however, in the most complex cases, BEShielding prefers to have installation performed by its own team or with its technicians supervising installation.

Shielded Underground Ducts and Jointing Pits

BEShielding proposes other, highly interesting product lines which are becoming increasingly important each year for the interment of overhead high voltage lines.

The first solution proposed is a shielded underground duct designed to contain the magnetic field generated by power lines that need to be interred.

For a more in-depth look at the shielded “Jointing Pits” solution, it is important to note that in connecting the high-voltage (HV) cable — where the maximum cable length is 500 meters — HV cable manufacturers are required to install special joints to join cable sections.

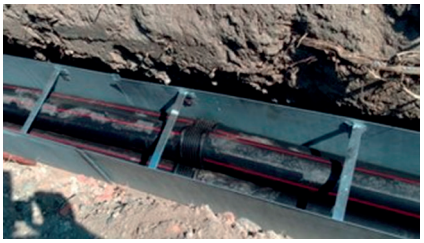
To make the joint, the HV cables need to be spread far apart from one another, thus increasing the magnetic field generated.

BEShielding offers a shielding solution dedicated to mitigating the magnetic field generated by such jointing pits.

Covered by BEShielding patent for several years now, this solution is defined as shielding through a system of High Magnetic Coupling Passive Loops and hence its product name: HMCPL.

A brief technical summary: “a series of short-circuited, low-voltage cables — highly coupled to the high-voltage cable via a ferromagnetic core — is used. In passive loops, a current is generated that matches the current flowing in the HV cable but with opposite phase. This current, in turn, creates a magnetic field of equal intensity to the source current, but of opposite polarity thus creating a nearly null magnetic field.”

Shielded Ducts



Over the years, starting from the principle that flat shielding can always be adopted — even if, in some cases, this solution is more costly — a number of specific products have been created, such as: :

- closed, shielded metal ducts (the SCTS and SCTF lines), suitable for both indoor and outdoor use.
- Underground metal ducts (SCU and SCU Plus lines) suitable for interring ducts.

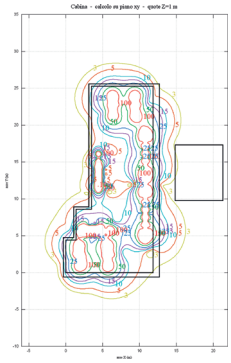
Software Magic ®

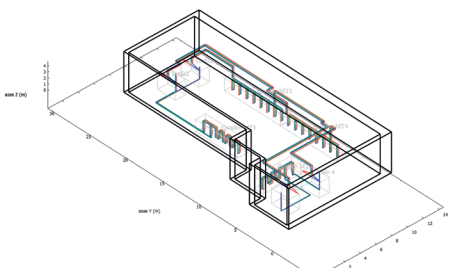
BEShielding is the only sector company that uses and markets its own software to simulate the magnetic fields induced by low-frequency electrical sources.

The Software is called **MAGIC**, derived from the acronym of the words **MAG**netic **I**nduction **C**alculation.

Over the years, it has been constantly revised and updated so as to both adapt to increasingly complex problems and provide increasingly comprehensive support to the many technical design firms that use it.

The software was validated by the Polytechnic University of Turin, through theoretical comparisons with other simulation software and through laboratory testing.

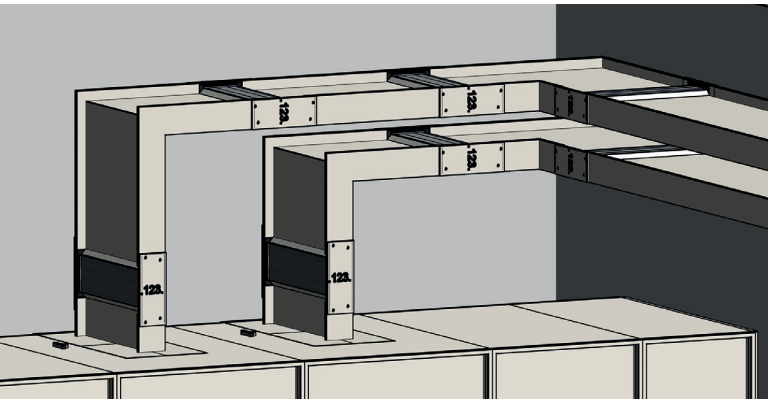




It enables the analysis of the 2D and 3D configurations of power lines, transformer substations and overhead power lines.

The latest update also incorporated BEShielding's medium and high power busways, in both standard and shielded configurations.

BIM BUSBAR Engineering



BIM is now an instrument widely used in Italy, thanks to the global thrust toward standardization of new working methods that increasingly require a more practical, more highly evolved design standard.

The image underscores the degree of three-dimensional detail that can currently be achieved using BIM design (**Revit Software**).

BIM or **"Building Information Modelling"** is performed using MEP (Mechanical - Electrical - Plumbing) components that make it possible to build a digital model for every type of system that can be designed and built.

With its own internal structure, BEShielding has created a **"Constructive BIM"** library, where the highly detailed information and definition — LOD 400 = Level of Development — makes it possible to simulate a project from the very outset at the bidding stage.

Therefore, as the BEShielding technical department (at the Brescia site) — that specifically handles the Busbar line — continues to implement the libraries of products to be included in the technical layouts, it can offer its clients increasingly detailed technical and commercial solutions.

The peculiarity of this **truly unique**, highly versatile technical service is that it is not only useful in system study and design but also during system installation.

The customization of each "individual family" makes it possible to enter into the most minute detail, indicating the route, dimensions and anything else that can help keep tabs on the state of progress in a project or installation.

BEShielding, now a partner of all the largest design firms, has become a benchmark company, an expert for the **BIM presentation of busbars**.

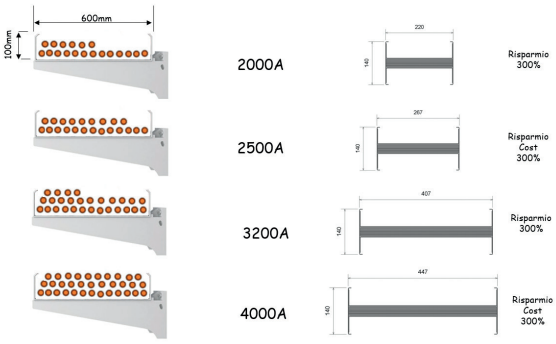
Thanks to the skills of its in-house technical staff, BEShielding can manage all phases of the product through the BIM method: from bidding to product shipment, customizing specific solutions to meet each need.

Metal ducts and busbar trunking

But when and why use busbar trunking in lieu of more conventional cable trays?

There are three main technical reasons for this.

- Installation process: such busways are simpler and faster to install, while the installation process for cable trays is more time-consuming.
- Flexibility: busways offer greater flexibility and their system management is more modular; instead, cable trays are more complex when making system changes.



- Material costs: the production and installation costs are lower for busways, while cable trays are more costly not only for installation but also in terms of product, because **the cost of the cable must also be factored in.**

Shielded Busbar Trunking

BEShielding offers a complete line of busways (range 25 A 6300 A). Based on in-field experience indicating that any power busway can be a major source of electromagnetic interference for the areas surrounding the installation — which may hold people or sensitive, sophisticated machinery (n.b.: data centres, laboratories, electronic microscopes, electromedical devices, precision electronic equipment in general, just to name a few) — BEShielding has conceived a specific **patented line** of **Shielded Busbar Trunking.**

BEShielding's patented Shielded Busbar Trunking system makes it possible to integrate both the engineering solution for electrical distribution and protection against electromagnetic interference — even that generated by the busway itself — into a 'single installation'. In fact, it must be considered that, no matter what the type and brand, every standard version generates a great deal of electromagnetic pollution within certain distances (buffer zone).

Given that most technical specifications — today around 80% — require the use of busways that take into account solutions linked to shielding-related problems, BEShielding proposes a single solution that combines the two technical requirements: a product that is identical to its standard version, both in size and performance, but already shielded at the origin (**international patent application no. WO2020/234660**).

Basically, it is a solution that, as the system develops, can be transformed into modular shielding that can be modified in time..

Technical and commercial documentation

BEShielding has extensive technical and commercial documentation that presents all solutions and products in a series of catalogues.

Electromagnetic shielding has its own dedicated documentation while 3 other catalogues cover the 3 ranges of busbar lines.

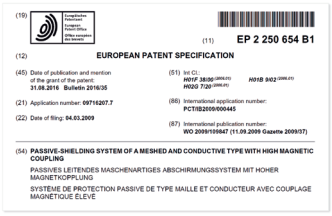
This shows the wide range of configurations available for the special version of shielded busbar trunking in the CHS line (range 800 A to 6300 A).

All solutions and products can be consulted on the website, both in Italian and in English.

Patents

BEShielding holds two patents.

- **Shielding for Jointing Pits:** international patent no. 2250654 covering a 'highly coupled passive loop' solution that can be used exclusively in a highly specific application: high voltage cable jointing.
- **Shielded Busbar Trunking:** international patent no. WO2020/234660 which was confirmed in late 2022 for the United States and more recently also for the Russian market; this patent covers the product line for applications involving high power (800 A to 6300 A) but very low magnetic impact. This patent is also pending confirmation by the European Union.


(19) Europäisches Patentamt
European Patent Office
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(11) EP 2 250 654 B1

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(86) International application number: PCT/IB2009/000445

(22) Date of filing: 04.03.2009

(87) International publication number: WO 2009/109847 (11.09.2009 Gazette 2009/37)

(54) PASSIVE-SHIELDING SYSTEM OF A MESHED AND CONDUCTIVE TYPE WITH HIGH MAGNETIC COUPLING

PASSIVES LEITENDES MASCHENARTIGES ABSCHIRMUNGSSYSTEM MIT HOHER MAGNETKOPPLUNG

SYSTÈME DE PROTECTION PASSIVE DE TYPE MAILLE ET CONDUCTEUR AVEC COUPLAGE MAGNÉTIQUE ÉLEVÉ


(12) United States Patent
Canova

(10) Patent No.: US 11,451,037 B2
(45) Date of Patent: Sep. 20, 2022

(54) SHIELDED BUSBAR

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(73) Assignee: BESHIELDING S.R.L., Rivoli (IT)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(86) PCT No.: PCT/IB2020/053651
§ 371 (c)(1),
(2) Date: May 4, 2021

(87) PCT Pub. No.: WO2020/234660

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U.S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

OTHER PUBLICATIONS

Don't worry, BEShielding!

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