

## Stainless steel filler materials for plastics



Shielding and conductivity in any shape and color you like

## Bekaert in a nutshell

Bekaert is a world market and technology leader in steel wire transformation and coatings and the world's largest independent manufacturer of drawn steel wire products.

Bekaert produces steel wires and fibers for a wide variety of industries:

- automotive: steel cord for tire reinforcement, wiper components
- medical: surgical needle wire, control cable
- plastics: filtration of polymers, wire for flexible ducts, reinforcement for plastics
- and many more

With more than 30 years of experience, Bekaert is a leading producer of a wide range of products containing very thin stainless steel or other alloy metal fibers:

- Bekinox®: electro-conductive, antistatic and heat resistant textiles
- Bekipor®: filtration media
- fillers for conductive plastics
- and many more

Working with us means you can count on local contacts that speak your language and are close to your business. Our presence in just about every sector is a unique strength, both for Bekaert and for our customers.



## Stainless steel fibers for plastic components

Did you know our stainless steel fibers offer reliable protection for many plastic components against electromagnetic interference, electrostatic discharge or electrostatic charging? Whether you are a compound producer, an injection molder or OEM, we would like to play a part in your production process.

As one of the first and leading suppliers of steel fibers in the conductive plastic market we have the right technological know-how and skills to engineer a solution to strengthen your market position.

### **Working with you**

Co-creation is an important part of our way of working. Our in-house development teams will not simply give you a 'one size fits all' product. We like to think along with you to take your ideas from a thought to a product, discovering new ways in which our fibers can be used.

### **Your partner in innovation**

Bekaert's control over the entire production process means that your filler material can be developed with the product properties you need. We can draw wire to ultra-fine diameters and have the ability to tailor our fine bundles and grains to offer you the specific characteristics you need. Your result is protected or charge-free plastics, even for complex 3D designs.

# Stainless steel filler material: protection in shape

Bekaert's stainless steel fibers are an ideal filler solution for electrically conductive or shielding plastics. Added to the plastic compound, they will create an electrically conductive network for electrostatic discharge or provide shielding against electromagnetic interference.

This technology simplifies the processing of plastics allowing you to obtain a quality end-product in one step, without unnecessary operations.

## Stainless steel fibers: a smart solution

### One-step color

Thanks to the low fiber concentrations, the coloring of the compound is hardly affected. Most colors can be matched, which reduces or eliminates the need for a secondary painting operation. Bekaert's fibers are a one-step technology: they are easy to process.

### Freedom of design

Plastic compounds with Bekaert's steel fibers are easy to mold using standard mold designs. The fibers have a very limited influence on the shrinkage characteristics of the plastic parts and they do not cause extra wear to the molding machine. As a result the product allows any shape or design, even complex 3D designs.

### Highly efficient

Bekaert's steel fibers guarantee high efficiency in EMI shielding and ESD protection. Low volumes of the highly conductive fibers suffice, which make them a very cost-effective solution.

### Durable surface

Bekaert's steel fibers form a durable matrix throughout the polymer. Color, conductivity and EMI shielding properties are durable and scratch resistant. The low volume ensures that the mechanical properties of the virgin plastic remain unchanged.

### Green technology

Thanks to the low required volume percentage, Bekaert's fibers have a low ecological footprint. Moreover, up to 20% of regrind materials can be mixed with 80% of new conductive compounds. Bekaert's stainless fibers are a safe solution and pose no health risks to operators or factory workers whatsoever.

## EMI shielding and ESD protection efficiency

volume % fibers	weight % fibers*	volume resistivity (ohm.cm)	performance (30-1000 MHz range of shielding)
0,25 - 0,5	4	< 10 <sup>2</sup>	ESD protection
1	8	0,5 - 2	30 - 50 dB EMI shielding
1,5	12	0,1 - 0,5	50 - 60 dB EMI shielding
> 1,5	15	< 0,1	> 60 dB EMI shielding

\* supposed density plastic = 1



# Discover the benefits of stainless steel fibers for plastic components

## Protecting electronics against electrostatic discharge (ESD)

Adding very small amounts of Bekaert's steel fibers (typically 2 to 8% of the total weight of the compound) is very effective to protect against electrostatic (dis)charges. Electrostatic charges on an enclosure containing Bekaert fibers are carefully drained by the stainless steel fibers through the surface or mass.



## Preventing plastics from charging

Adding 4 to 8% Bekaert fibers of the total compound weight will prevent plastic parts from charging. Charges will bleed off continuously across the fiber network towards the grounding.



## Shielding against electro-magnetic interference (EMI)

Plastics filled with Bekaert's steel fibers will prevent electro-magnetic interference. Shielding levels of 30 to 70 dB can be achieved. Shielding effectiveness depends on weight percentage, aspect ratio and wall thickness. As a result it will vary for every other application. Bekaert offers technical support in determining the best suitable configuration for your specific application.



## Why customers choose Bekaert as their preferred supplier of plastic filler materials

- 1 Enables a smooth and economic production process:** what looks good in design, does not always work in the field. Some plastics are susceptible for ESD or EMI. This often poses serious problems for the application. This is why many major plastic molders prefer to work with Bekaert's stainless steel fibers. It provides excellent shielding and conductivity without significant repercussions for the production process, the creative design or your wallet.
- 2 Includes our full-service: from advice to creating a customized solution:** the product requirements for plastic injection molded components used in automotive fuel systems are very strict, very crucial and very design-specific. The unique shielding properties and the excellent moldability of Bekaert stainless steel fibers are of course important benefits for this particular application, but knowing the right proportions for your application is equally important. This is why Bekaert offers advice and support to create a solution tailored to our specific needs.
- 3 Increases the efficiency and reduces environmental impact of your product:** using metal solutions for thermoplastic materials has a few drawbacks. There are more design restrictions and it makes the product a lot heavier. It also usually implies costly secondary operations that increase the negative impact on the environment. In contrast, compounds filled with Bekaert's stainless steel fibers solve all these issues.

## Global presence to support your business

Bekaert's global presence ensures reliable support close to you.

The close proximity of our warehouses and plants to your production sites results in a constant supply of stainless steel fiber filler materials, fast deliveries and minimal inventory held at your sites. Our strategic presence in different regions guarantees a flexible and just-in-time supply.

Furthermore, you can count on our local sales and service teams for technical and commercial support. Dedicated account managers work closely with you on your project and can advise you about how our stainless steel fiber filler materials can fulfill your needs.

## Developing for tomorrow

Bekaert prides itself in keeping ahead in technological evolution.

We attach particular importance to co-creation. Starting from specific problems or business situations we aim to develop new products and solutions together with our customers.

Our technology centers are equipped with lab facilities for both fundamental and applied research. This allows us to develop solutions that are customized to your business. This way you can benefit from shorter development cycles and a consistently reliable product quality.

At Bekaert, R&D goes beyond product development. We can assist you to reach new markets with products in innovative applications.



## Product portfolio based on your needs

In addition to the applications listed, Bekaert can work with you to develop new solutions for your company. We are willing and able to explore your previously uncharted markets. We have the know-how to think along with you and skills to make it work. Our experience in advanced metal transformations and advanced coatings enables us to tailor a solution that meets the balance between ease of manufacturing, quality and appearance. Be it for electro-conductivity, electro-magnetic interference or electrostatic discharge, Bekaert can partner with you to develop innovative products that will enable you to serve new markets and customers.

### **Bekaert's stainless steel fibers are available in 2 variants:**

- in continuous bundles
- in grains: chopped fibers bound together with polymeric binders, easily dispersing into the polymer matrix.

Bundles and grains are available starting from ultra-fine fiber diameters onwards and with unique coatings.

### **Total Quality Management**

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Maintaining a high level of quality is a continuous process. That is why our quality procedures are regularly evaluated based on the feedback we receive from our customers.

Our extensive quality control and defect filtering guarantees a consistent input to your process, thus eliminating excessive waste and safeguarding the quality of your end-product.

Choosing Bekaert is choosing for a high performance product supported by Total Quality Management.



Bundle of stainless steel fiber filler material



Grains of stainless steel fiber filler material

## Discover how your products can benefit from Bekaert steel fibers to obtain shielding and conductivity

**Working closely with our customers is an important aspect of the Bekaert policy. That's why you can always count on a local Bekaert specialist. We speak your language and we know your business.**

**If you want to find out what Bekaert steel fibers for plastics can do for you, make sure to contact one of our experts in your area:**

### EUROPE, MIDDLE EAST & AFRICA HEADQUARTERS

Bekaert Fibre Technologies  
Bekaertstraat 2  
8550 Zwevegem  
Belgium  
T +32 56 76 65 37  
F +32 56 76 79 66

### THE AMERICAS

Bekaert Stainless Technologies  
1395 South Marietta Parkway  
Building 700, Suite 708  
Marietta, Georgia 30067,  
USA  
T +1 770 514 2209  
F +1 770 432 9181

Bekaert do Brasil Ltda  
Av. Marechal Rondon, 1215,  
Prédio Administrativo 2º Andar  
CEP 06093-900 Osasco - São Paulo  
Brazil  
T +55 11 2147 8772  
F +55 11 2147 8758

### ASIA + SOUTH EAST ASIA

Bekaert Management  
(Shanghai) Co., Ltd  
17F, Block E, Waterfront Place  
No. 31, Lane 168, Daduhe Road  
200062 Shanghai,  
China  
T +86 21 2219 7000  
F +86 21 2219 7399

Bekaert Industries Pvt Ltd  
Amar Paradigm, S. No. 110/113  
Baner Road, Baner, Pune  
District Pune  
411045, Maharashtra State  
India  
T +91 20 6627 6600  
F +91 20 6627 6601

Bekaert Japan Co Ltd  
4F, 1-2-5, Kyobashi, Chuo-ku  
Tokyo 104-0031  
Japan  
T +81 3 3243 2543  
F +81 3 3243 2521

Bekaert Korea Ltd  
3F Changwoo Bldg.,  
#553 Dogok-Dong  
Gangnam-gu  
Seoul 135-270  
South Korea  
T +82 2 539 8760  
F +82 2 539 8780

[conductiveplastics.bekaert.com](http://conductiveplastics.bekaert.com)