

The FX SMARTBASE® - Technology



Description of the Technology

The FX SMARTBASE® - Technology is a new material technology developed for the application as a gliding sole for winter sport products like skis and snowboards. The FX SMARTBASE® - Technology combines the latest know how of different fields in nanotechnology with the state of the art in thermoplastic material science. The FX SMARTBASE® - Technology can roughly be described as a new thermoplastic nanocomposite, using a thermoplastic copolymer for the matrix, which embeds special nanoparticles who are molecular bonded to the matrix. Furthermore with the matrix and the nanoparticles a nanotechnology called “self assembling molecules” is included. All the components are coordinated to create the outstanding properties of the FX SMARTBASE® - Technology. To picture the functional principle for a better understanding each above mentioned component is described in its basics:

The Matrix

A thermoplastic polymer is a material, which consists in large molecules who are build by small molecules bounded together, where every single small molecule is exactly the same and here in the following called sequence. The large molecules are also bound together, but by stressing them with heat and pressure their bonds open and the large molecules are able to move, so that the material is able to flow and to be formed. The thermoplastic polymer used for FX SMARTBASE® -matrix is a new copolymer, created by joining the specific molecules sequence of many different thermoplastic polymers by the use of a special reactor. The composition of the specific sequences was elected regarding to the application by winter sport gliding products.

The Nanoparticles

Nanoparticles are particles in the size of some nanometers. Many materials are today available as nanoparticles. To give an impression of a nanoparticle size you may say that the size of a nanoparticle compared to a football is like the size of a football compared to the earth.



One advantage of nanoparticles regarding to its combination with thermoplastic polymers is, that certain material properties, like for example scratch resistance, can be tuned or added

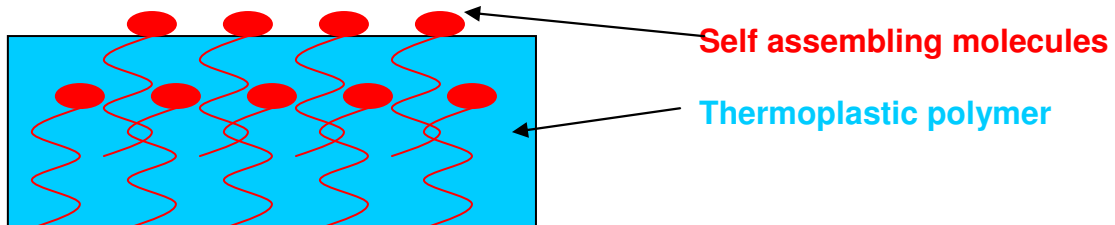
without the reduction of other material properties, like for example the materials flex behaviour.

The Nanoparticles used for the FX SMARTBASE[®] - Technology are elected to fit best in the molecular construction as a whole and support different properties like for example the scratch resistance, the surface hardness and the gliding properties.

Furthermore, unlike to other nanocomposites, the nanoparticles in the FX SMARTBASE[®] - Technology are molecular bond to the matrix by a unique technique which makes matrix and nanoparticles to a bonded unit acting as one single material.

The self assembling molecules

Self assembling molecules are single molecules which sterically orientate themselves by the use of their own electromagnetic properties. Self assembling molecules are used for some high tech applications in different ways to reach certain properties on materials surfaces, for example as controlled migrating components in thermoplastic polymers to reach electrical conductivity on the surface.



The self assembling molecules used for the FX SMARTBASE[®] - Technology are elected to fit best in the molecular construction as a whole and support different properties like scratch resistance and gliding properties.

Unlike common migrating additives, which completely migrate once out of the thermoplastic polymer and coat the surface of the polymer for a short time, the self assembling molecules used for the FX SMARTBASE[®] - Technology are deep seated in the matrix and replace themselves on the surface coordinated, when one molecule is destroyed the next one replaces it.

Technical abstract and resulting properties

The above briefly described components, which are the matrix, the nanoparticles and the self assembling molecules, are composed for a fine tuned interplay to reach the optimal properties for a gliding sole used on winter sport products.

These properties are:

- a dynamic changing surface hardness, which changes coordinated to the snow temperature.
- a good gliding behaviour in every snow conditions.
- a high graded scratch resistance
- a very high chemical and weather resistance
- a high dimension stability and good flex at low temperatures.

Furthermore the FX SMARTBASE[®] - Technology provides always an extremely plane surface without waxes unlike the common Polyethylene soles, which are porous and only get temporary plane by filling the porous holes with non - permanent waxes.

Benefits of the FX SMARTBASE®- Technology

The FX SMARTBASE® - Technology presents new gliding soles for winter sport products with the following technical innovations compared to common Polyethylene soles:

Unlike Polyethylene soles the FX SMARTBASE® - Technology is able to

- bring always good gliding properties in every snow conditions, even without waxes.
- always look new, because it never gets grey.
- give a very high scratch resistance.
- be repaired with the origin material.

Like Polyethylene soles the FX SMARTBASE® - Technology is able to

- be processed in common ways, so no constructions of the products have to be changed.
- be grinded with the most common machinery.
- be coloured in any colour.
- be waxed, preferably with the Holmenkol FX-waxes.

As a result the FX SMARTBASE® - Technology enables the winter sport consumer to improve the quality of his winter sport experience, on the one hand by reducing the care related effort to a minimum and on the other by providing an always good gliding gear.