



# Kareline

## Natural Fibre Reinforced Thermoplastic Composites

*“Legislation regarding responsibility of producers is being tightened, recycling of glass-reinforced plastics are problematic, we are unable to create high-quality, smooth surfaces without sink marks, workpieces break up when removed from the injection moulding machine, machines and moulds wear out, production in countries of cheap labour is walking all over us, there is a pressure to specialise...”* These are familiar problems for almost all users of plastic, injection moulders... But now there is a solution:

**Natural fibre reinforced thermoplastic composites manufactured by Kareline Oy Ltd are excellent for injection moulding and extrusion. These composites solve many problems with production and products as well as offer whole new possibilities in product design!**

At present, Kareline offers natural fibre composites based on PP, PE, ABS, PS and biodegradable PLA matrix.

We have chosen high-quality plastic raw materials best suited for each usage as our matrix plastic. The reinforcing fibres of the composites are mainly technical fibres; virgin, wood-based pulp fibres manufactured in an environmentally friendly manner.

The Kareline composites can be moulded with all injection moulding machines and with existing moulds. Methods used in post handling of plastic products, e.g. ultrasound welding, machining, various markings e.g. laser marking as well as additives and colouring agents, can also be used with the Kareline composites.

**The Kareline natural fibre reinforced composites are at their best when high-quality complex plastic pieces that can be recycled and produced by injection moulding and that have good characteristic strength are needed.**

### BIODEGRADABLE NATURAL FIBRE COMPOSITES

When necessary, a biodegradable polymer can be used as the matrix plastic. The reinforcing fibres of the Kareline composites notably improve the original characteristics of biopolymers, such as injection moulding capability and mechanical characteristics; the reinforcement also increases the temperature range under which the end products can be used.

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## Natural Fibre Reinforced Thermoplastic Composites

The unique Kareline natural fibre composites offer manufacturers of end products and injection moulders plenty of competitive advantage:

### 1 QUALITY

The Kareline composites enable manufacturing of straight injection moulding products with highly accurate dimensions and that are thus of excellent quality. There will be no internal stresses in the products, and there will be no sink marks.

### 2 STRENGTH

Excellent characteristic strength. The products will include all the characteristics of glass-reinforced plastics but none of the problems connected with using glass: no weld lines, no problems with recycling and no wear and tear of machinery and moulds.

### 3 STIFFNESS

Increased stiffness enables new applications.

### 4 PRODUCTION EFFICIENCY

Injection moulding production will be intensified when pieces come off the mould easily and duty cycle is shorter than normally.

### 5 TEMPERATURE RANGE

Compared to corresponding matrix plastic, the reinforcing fibres extend the temperature range under which end products can be used.

### 6 EASE OF DESIGN

Designing of products and moulds will be simpler due to, e.g., minimal shrinkage and absence of sink marks.

### 7 NEW POSSIBILITIES IN PRODUCT DESIGN

Products with extremely thick walls can be manufactured using Kareline composite. On the other hand, wall thickness can vary very much in a single injection moulded piece and thin walls can also be made.

### 8 VISUAL ASPECTS

Characteristics of the material's surface structure are: a varied surface and an impression of depth and warmth due to genuine natural raw materials.

### 9 RENEWABLE RAW MATERIALS

Environmental competitiveness of the end products will be improved when a notable part of fossil raw materials can be replaced with renewable raw materials.

### 10 RECYCLING

At the end of their life cycle, the end products can be easily destroyed by burning or recycling them into production.

### KARELINE – FREEDOM OF FORM

The end products can be designed from the viewpoint of usability and aesthetics – material no longer limits the designers' freedom! In addition, the natural outlook of the composite enables designing of plastic products that actually look good and different.

**Kareline**  
natural composites

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