Commissione europea

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QUADERNO 3

Endless Use

1. GREEN PACKAGING FROM RECYCLED PAPER, CORN AND WATER

Green packaging from recycled paper, corn and water.

Environmentally friendly packaging solution derived from renewable resources. It can be recycled as paper or composted.

It is made from starch, cellulose and water. It is biodegradable according to European regulations EN13432; the LCA values of this packaging are extremely attractive when compared with traditional polystyrene packaging, because the values of CO_2 emissions are significantly reduced.

This packaging is also very light and allows for reduced shipping costs. Available in many colours, it can be glued to cardboard using standard adhesives used in the paper industry. It is characterized by a sandwich structure with a compact skin which gives its final aesthetic look, and a foamed core. It is moulded with standard 2.5 mm thickness.

Currently some standard products are available, such as containers for eggs, CD trays or DVD trays, otherwise customer specific packaging is also produced with great design versatility. (SC5050)

PROPERTIES

Biodegradable
Bio-Based
Reduced Emissions
Recycled
Compostable
Recyclable
Thermal Insulating
Impact Resistant

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2. RECYCLED FIBREBOARD WITH WHITE MINERAL PRINTABLE COATING

100% recycled ‘eco’ fibreboard with a mineral surface treatment that makes the material white, glossy and well-printable.

Its low environmental impact is due to the base material which is recycled (more than 35% is post-consumer) and also because the white mineral coating does not use chemical whitening agents, often applied in the paper industry which also leads to a more expensive product.

The mineral coating makes the surface waterproof and also gives it good barrier properties against moisture, oils and fatty acids.

This fibreboard can be die-cut, glued and folded using existing machinery and printed using standard offset, flexographic, digital and roto-gravure printing techniques.

The surface treatment allows for photo-quality graphics and images comparable to non-recycled virgin material. This product is applied in packaging industry to make boxes and custom packaging. (CP2137)

PROPERTIES

Waterproof
Reduced Emissions
Recyclable
Energy Saving
Recycled

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3. NATURAL FOAM MADE OF RECYCLED PAPER AND STARCH

Natural foam made of recycled paper and starch. This product is made of recyclable materials and is steam-processed without any kind of chemical ligand or solvent; on an environmental level it is a valid alternative to polymeric foams obtained through chemical processes.

It is not only 100% recyclable but is also compostable, allowing for better waste management at end-of-life as separation from the container it is associated to (normally paperboard) is not necessary. It is not electrostatically charged, is pH neutral and does not contain dust.

It is water-absorbent (10 g of product can absorb 60 g of water), light and can be disposed of economically.

Humidity tests demonstrate that this product is comparable to those made of synthetic polymers.

When used to package consumer goods, it offers excellent properties of vibration-absorption, significantly helping to protect against the impacts and shocks that can occur during transport and movement. (NT6028)

PROPERTIES

Absorbent
Electrical Insulating
Vibro-Absorbent
Viscoelastic
Hydrophilic
Recyclable
Compostable
Recycled
Bio-Based

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4. 100% RECYCLED AND 100% RECYCLABLE WOOD COMPOSITE MATERIAL

100% recycled and 100% recyclable wood composite material. It is made of polyethylene (HDPE, LDPE) and polypropylene added with wood in specific shapes, not powder.

These additives create a sort of cross-linked net in the mixture that allows for an increase in the structural mechanical properties of the final product.

The polymer, in percentages of 50-55%, derives from recycling waste from detergent containers, cosmetics and the food industry and is washed and machined. The wood, which is crushed and dried, is added in percentages of 45-50%, and comes from discards from machining or fibre panel manufacturing. The combination of these two recycled materials gives a composite product with unique characteristics, different from plastic, wood and other types of wood composites.

This material is a good replacement for MDF panels because it offers higher vibration and sound absorption properties, lower thermal conductivity (0.1459 W/mK), good water resistance and high resistance to sudden temperature changes.

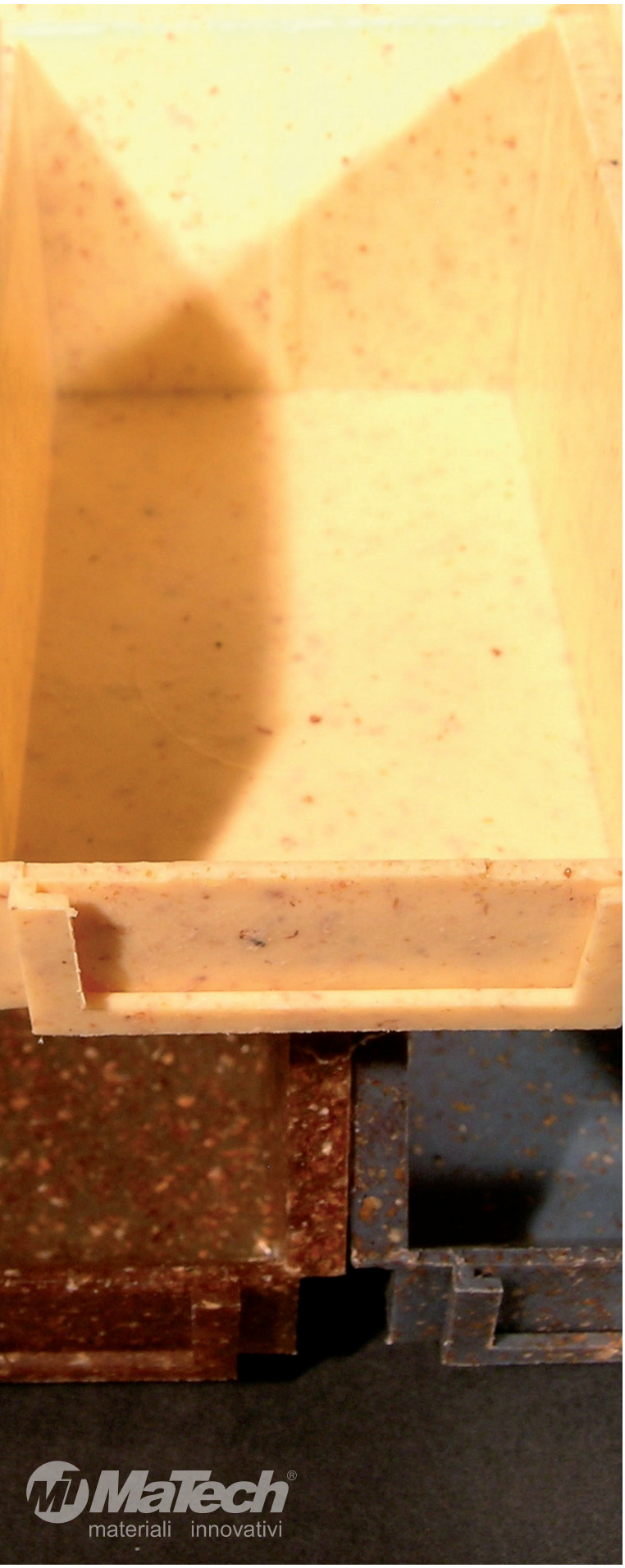
The final product can be subjected to further finishing and working. It can be planed, milled and painted using the same equipment and tools for wood. This recycled composite is suitable for applications that require a high mechanical resistance, such as flooring tiles, seats, backs and frames for home and office chairs, acoustic and thermal insulating walls, benches, fences and wind-stopping barriers. (CP2112)

PROPERTIES

Recyclable
Reduced Emissions
Recycled
Elastic
Vibro-Absorbent
Electrical Insulating
Waterproof
Soundproof

WORKING PROCESSES

Machining



5. THERMOPLASTIC COMPOSITE MADE OF AGRICULTURAL WASTE

Thermoplastic composite made of polypropylene or polyethylene and fillers (up to 50%) obtained from local agriculture discards.

This material has been developed to partially replace polymers derived from petroleum with others obtained from renewable resources. The fillers are fruit peels, grain, wood, straw or natural fibres, resulting from agricultural processes.

The granules are low density (1 gr/cm^3) and can be processed by injection moulding.

Besides the primary components (fibre and polymer), it is also possible to add small concentrations of additives to the granule mix, such as pigments, in order to obtain the desired colouring depending on production needs.

The environmental impact of the final injected products is reduced thanks to the use of renewable resources and its entirely recyclable features. It finds applications in the manufacture of every-day objects such as home containers and pots for gardening. (CP2145)

PROPERTIES

Electrical Insulating
Recyclable
Bio-Based
Recycled
Elastic
UV Resistant

WORKING PROCESSES

Injection Moulding

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6. NON-PERMANENT ADHESIVE CLOSURE SYSTEM

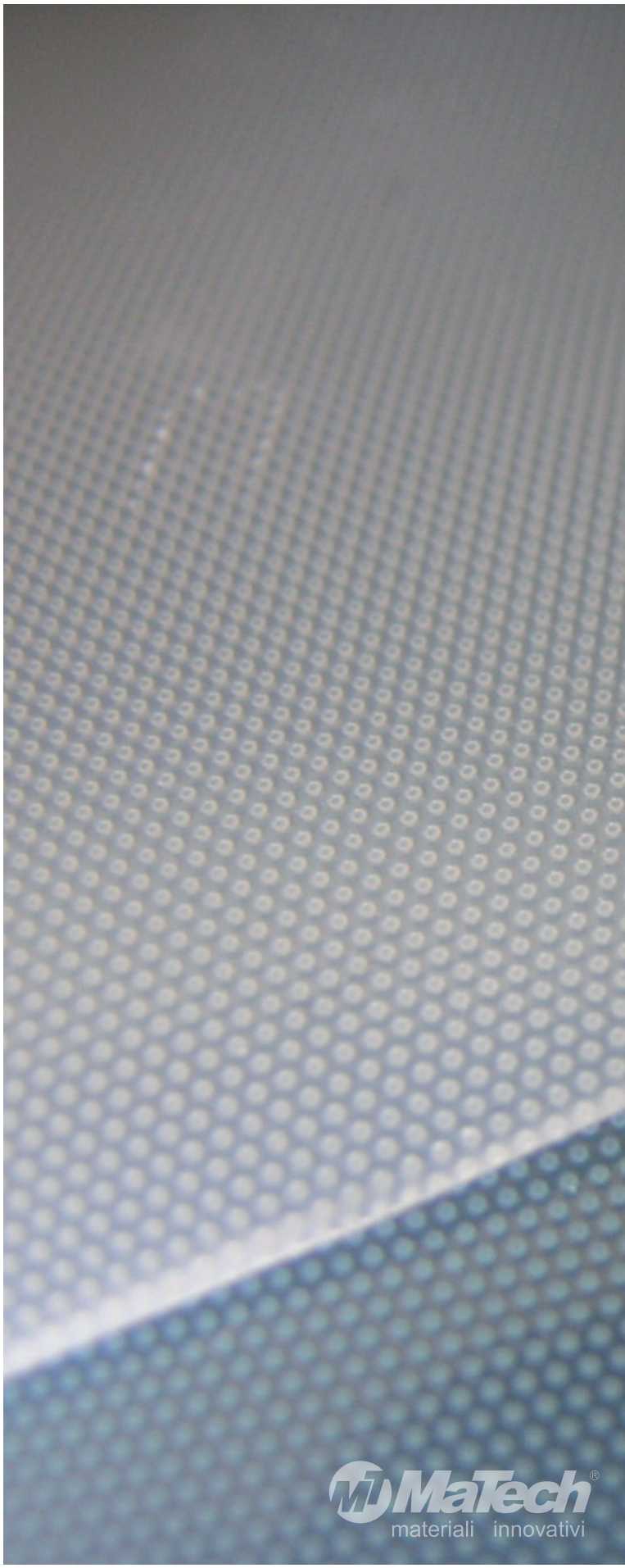
Polymeric tapes with an efficient but removable closure system. This property is due to their surface that has only a slightly rough feel to the touch but is actually made of very small hexagonal knobs with shapes similar to microscopic squashed mushrooms.

This structure permits it to fasten onto other materials, such as woven and non-woven fabrics. It allows for easy removal, with many fastening and unfastening cycles so buttons, clips or chemical closure systems (adhesives) are not necessary.

Polypropylene (PP) or polyamide (PA) based, it differs from other mushroom-shaped fasteners in its minimum thickness (as low as 0.35 mm), reduced weight (only 130 g/m²) and high flexibility.

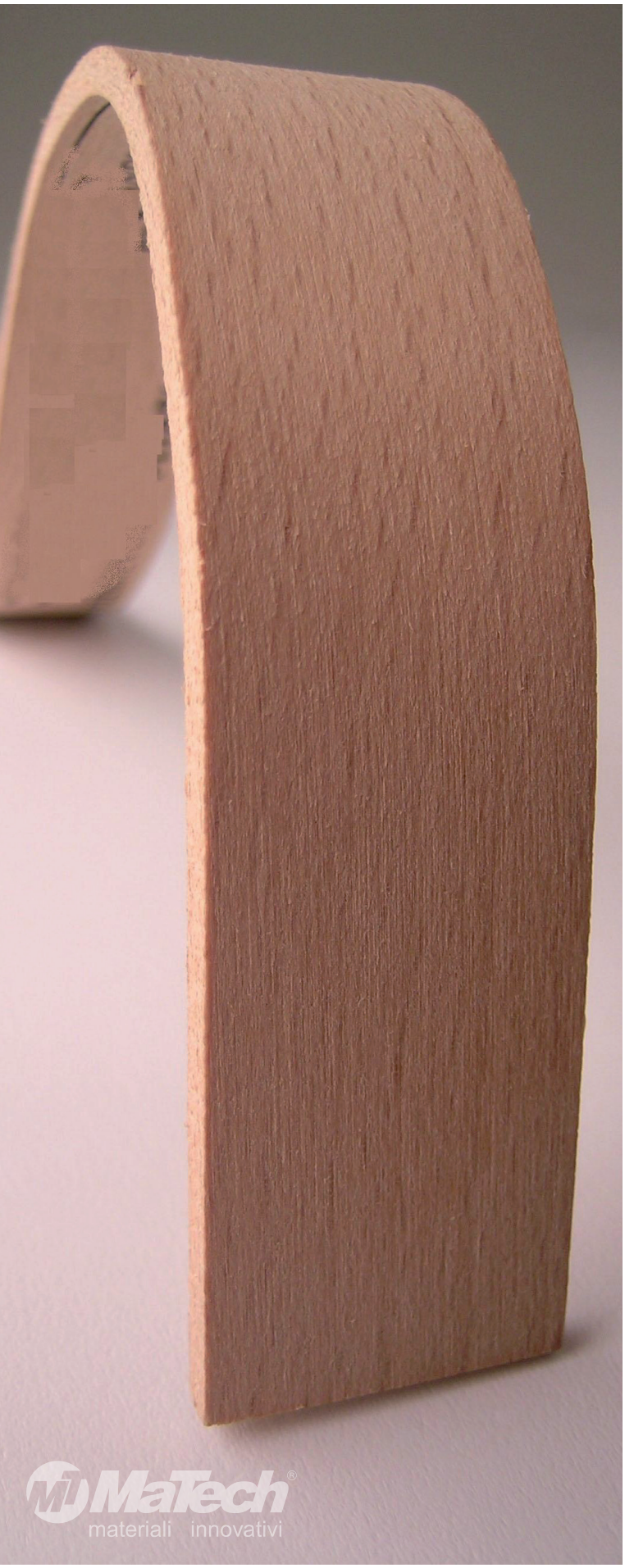
If made of polypropylene, these tapes can be used within a temperature range of -30°C and +90°C while, if made of polyamide, it can withstand up to +130°C.

They are applied in the automotive industry, sanitation (for fastening baby nappies), electrical (cable fixing) and for abrasive discs. (AD4516)



PROPERTIES

Waterproof
Thermal Insulating
Anti-Slip
Electrical Insulating
Transparent
Recyclable



7. FLEXIBLE WOOD SUITABLE FOR COLD BENDING

Flexible wood suitable for cold bending. Developed through a new working-technology, this material can be easily bent in any direction, maintaining the advantages and the aesthetic appeal of the wood structure unchanged (the maximum bending radius can reach ten times the radius of the product). The production process is characterized by five working steps: wood choice, material squaring, evaporation, dry step and trimming. Once any defective piece of wood with knots, cracks and wormholes has been removed, it is possible to proceed to squaring: the wood is cut and shaped in large parallelepipeds in order to move to evaporation. In this phase, the wood pieces are introduced into an autoclave in order to moisten and soften the chemical bond between the wood fibres. Then blocks are compressed along the longitudinal direction of fibres up to 80% of starting length.

At this time, maintaining longitudinal compression, the wood is dried and then cut into the sections and geometries required. Thanks to this new fibre disposition, wood profiles can be bent very easily. The most common types of wood which are suitable for this treatment are beech, fraxinus, durmast and maple. From an application point of view, shapes with sections inferior to 10mm can be manually bent, instead it is possible to use standard rolling presses or any standard machinery usually applied in cold bending of metallic profiles for superior sections. With these machines it is possible to bend maximum admitted sections of 100mmx120mm. This value is not due to technological limits, but rather to the natural limitations imposed by the maximum dimensions of plants. Maximum length, however, can reach 2200 mm; with the appropriate joints it is possible to achieve indefinite measurements. The shape sections which are produced are circular, rectangular and ogival. In terms of finishing, this wood is no different from traditional wood. The main applications are in furniture for handrails, curved baseboards, edging for tables and profiles for bent parts such as skirting boards and jambs. (NT6032)

PROPERTIES

Viscoelastic
Impact Resistant
Waterproof
Biocompatible
Antibacterial
Electrical Insulating
Thermal Insulating
Soundproof
Biodegradable
Recyclable

8. PAPER MADE OF MINERAL DUST

High quality inkjet paper, entirely made of inorganic mineral powders, produced by milling natural stones. Compared to traditional paper, this product does not use water or any chemical ligand, which are generally toxic.

Moreover, it does not need further processing to enhance its quality.

As a result, this product does not contain any organic material (from trees) and is wood-free, thus preventing the waste of natural resources and avoiding pollution. It is chlorine free and has superior performance, features and aesthetics in comparison to standard paper.

The brilliant white colour is not the result of processing but is due to the naturally mixing of stones. It is completely recyclable and highly absorbent, which guarantees very rapid ink drying. It is more resistant to stain and tears, and is resistant to image fading.

The finished product is available in two different types: double-sided or single-sided printable paper. The main sector of application is in photography and high-performance printing. (NT6024)

PROPERTIES

Absorbent
Stain Resistant
UV Resistant
Electrical Insulating
Biodegradable
Recyclable

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9. RECYCLED POLYESTER YARN

Yarn produced from environmentally friendly post-consumer recycling and made with recycled plastics.

The material is part of a sustainable development program to minimize the impact of production activities and to help the ecosystem by reducing environmental waste.

The resulting yarn is a polyester product that maintains the appearance and performance typical of traditional polyester yarns and is suitable for weaving garments for the clothing industry as well as fabrics for the furniture and automotive industry; the yarn is available in smooth, textured and textured air, and can be supplied raw, dyed in yarn or dyed in paste. (FT1148)

PROPERTIES

Reduced Emissions
Recycled
Recyclable
UV Resistant

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10. POLYETHYLENE/EVA FOAM

Polyethylene/EVA foam with closed-cell structure.

An excellent thermal insulator, it offers good elasticity, flexibility, resiliency, UV resistance and dielectric properties.

It can be coloured, printed on, and thermoformed repeatedly. It is available in rolls or sheets.

This material is also distinctive for its unique lightness.

It is applied in the boating, automotive, transport, orthopaedic (including footwear) and sporting fields, as well in the packaging industry, in gym facilities and in camping. (SC5003)

PROPERTIES

Impact Resistant
Elastic
UV Resistant
Thermal Insulating
Recyclable
Energy Saving
Dielectric
Electrical Insulating

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