



**Product Data Sheet**  
**RE-Y-STONE®**  
**Bio Composite Panel**

This information describes the composition of RE-Y-STONE® panels and offers advice for their handling, processing, use and disposal. RE-Y-STONE® panels are not classified as hazardous substances and therefore they do not require a special marking or a description by a safety data sheet.

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## 1 Materials description and composition

RE-Y-STONE® is a bio composite panel made of recycled kraft paper and bio-resin. This new composite material is made up of renewable resources to almost 100%. Both the fibre material and the resin matrix are produced from renewable biological resources. Therefore, there is no direct dependence on fossil, non-renewable resources (petroleum, natural gas).

The recycled paper is "FSC Recycled credit" classified and is produced from 100% post consumer waste paper. Post consumer waste paper is paper, cardboard and/or wood fibre collected for the purpose of re-use after the respective product was used as intended.

The caramel-coloured bio-resin is sugar cane resin. It is produced from plant waste occurring during sugar production, called bagasse. After curing, the bio resin has thermosetting features and forms with the natural fibres a hard, mechanically resilient composite material with stable dimensions. The material characteristics of RE-Y-STONE® are similar to the characteristics of solid wood.

RE-Y-STONE® are large-sized panels with decorative surfaces and homogeneous, closed trimmed edges. The bio composite panel in thicknesses of less than 3 mm can be glued to substrate materials. In larger material thicknesses, i.e. above 5 mm, they are dimensionally very stable and therefore self-supporting. With their high modulus of elasticity, this material also has the advantage of high bending strength.

More than 60 % of the RE-Y-STONE® panel is made of recycled paper; the other 30 to 40 % consist of bio-based resin.

RE-Y-STONE® is delivered in many different dimensions, thicknesses and surface structures.

## 2 Technical application information

RE-Y-STONE® is a bio composite board made of recycled kraft paper and bio-resin.

This material composition should be kept in mind while using RE-Y-STONE, since there are some recognizable parallels between RE-Y-STONE and solid wood.

Colour- and surface-structure differences within a RE-Y-STONE board are normal and underline the unique character of the product. These individual properties are due to the raw material composition. The raw material are to nearly 100% from renewable sources.

Color changes and discolorations due to varying exposure to artificial light and sunlight, as well as differences in the intensity of use, are distinctive of the product and absolutely normal. All these features show the sustainable nature and the high quality of the material and are characteristic. In no case are these product properties to be seen or valued as deficiencies.

RE-Y-STONE® is a very sustainable product. The following details should be noted, when RE-Y-STONE® is used as horizontal furniture surface material:

1. Prolonged exposure to moisture and water (i.e: wet sponge, plate, cup and other moist objects etc.) is to be avoided.
2. Liquid contaminants (i.e: alcohol, vinegar, fruit juices, coffee, tea, sauces etc.) can lead to staining on the surface of the material. These contaminants must therefore be wiped instantly from the surface and the surface has to be cleaned.
3. Objects, that can cause scratches on the surface should not be moved or pulled on the surface. For cutting and handling it is recommended to use special coasters (i.e.: cutting boards).

### 3 Storage and transport

Storage and transport should be according to our recommendations; special safety measures are not required. RE-Y-STONE® panels are no hazardous materials in the sense of the transport provisions, so that marking is not required.

### 4 Handling and processing of RE-Y-STONE®

The usual safety provisions regarding de-dusting, dust-collection and fire-protection must be complied with for processing and finishing RE-Y-STONE®.

Due to possible sharp edges, always wear protective gloves when handling RE-Y-STONE® panels. The contact to RE-Y-STONE® dust does not cause any special problems; however, there is a limited number of people who may be sensitive or have an allergic reaction to processing dusts of all kinds.

### 5 Environmental and health aspects for use

RE-Y-STONE® is a cured and thus inert thermosetting bio-plastics material.

RE-Y-STONE® panels are articles rather than chemical substances, so that the REACH directive is not applicable.

#### LGA-schadstoffgeprüft

RE-Y-STONE® was certified by TÜV Rheinland LGA with the "LGA-schadstoffgeprüft" certificate. This certificate is only given to products with a very low emission of hazardous substances; they are often clearly below the statutory limits.

Assessment of test results of the emission test:

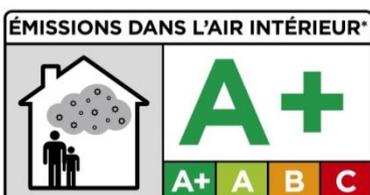


- The sum of emissions of volatile organic compounds (TVOC) after 28 days was far below the evaluation limits
- The sum of emissions of volatile organic compounds (STVOC) after 28 days was far below the evaluation limits
- No CMR materials could be determined after 3 and 28 days
- Emission of formaldehyde and higher aldehydes after 28 days was far below the evaluation limit

#### French VOC-Regulation

All building products as well as interior decoration and fitting materials that are new to the French market have to be classified regarding their emissions. This classification is documented by the new French label (ÉMISSIONS DANS L'AIR INTÉRIEUR).

RE-Y-STONE® was tested by the TÜV Rheinland LGA according to this French regulation and was awarded the label "A+". The label A+ is awarded to materials that show the lowest VOC emissions.



### DIN-geprüft Biobased – for more Sustainability

Sustainability means, for instance, minimizing CO<sub>2</sub> emissions and protecting resources, and making only minimal use of finite raw materials. Bio-based products based on renewable raw materials are indispensable components of environmentally sound recycling management. Bio-based products are made from raw materials that have absorbed as much CO<sub>2</sub> during their growth as they emit when they are disposed of and/or burned.

RE-Y-STONE® was examined by the TÜV Rheinland Agroisolab on the basis of the ASTM D6866 standard and was certified by DIN CERTCO with the "DIN-geprüft Biobased > 85%" certificate. This is the best classification, which biobased products can reach.

Certification of biobased products:



- DIN CERTCO certifies biobased products on basis of the organic portion and the biobased carbon portion
- The "DIN-Geprüft (=DIN tested)" symbol is assigned on the content on renewable raw materials. This percentage is indicated also in the appendix of the certificate and describes the portion of used bio-based raw materials regarding to the total content of organic carbon.
- The reference of the biobased portion to the carbon portion is a standardized, approved analysis method. This value can be confirmed independently and at any time by a test.

## 6 Maintenance, care and cleaning

RE-Y-STONE® surfaces are not subject to corrosion or oxidation. They do not require any special care. Lightly soiled panels are cleaned with water, heavier stains can be removed with by using mild household cleaners, dissolved in warm water. Cleaners containing abrasive substances, strong acids (i.e.: declares, sanitary cleaners) or solvents ( i.e.: alcohol, acetone, etc.) must not be used.

Further information regarding cleaning and care of RE-Y-STONE® can be found in the data sheet "Cleaning and Care of RE-Y-STONE®"

## 7 RE-Y-STONE® panels in case of fire

The bio-composite panels are difficult to ignite and delay spreading of flames, so that the escape time is extended. Incomplete burning may – as with any other organic material – lead to toxic substances in the smoke.

In dealing with fires involving RE-Y-STONE® the same fire fighting techniques should be employed as with any other wood based building materials.

## 8 Energy recovery

Due to the high calorific value (18 - 20 MJ/kg<sup>\*\*</sup>), RE-Y-STONE® panels are particularly well suitable for energy recovery. They burn completely to water and carbon dioxide at 700°C.

RE-Y-STONE® panels burn CO<sub>2</sub>-neutrally. At the end of the life-cycle of RE-Y-STONE, no more carbon dioxide (CO<sub>2</sub>) is released than was taken from the atmosphere by its plant components during their growth periods. The material and energy cycle is closed.

RE-Y-STONE® panels therefore not only offer all prerequisites for energy recovery according to § 6 of the law on waste management (Kreislaufwirtschaftsgesetz). Burning offers the additional benefit of being able to save non-renewable energy carriers such as petroleum or natural gas. The conditions for good combustion processes are warranted in state of the art, authority-approved industrial incinerators. The ash from this process can be put on controlled landfills.

## 9 Waste disposal

RE-Y-STONE® bio composite panels can be put on controlled landfills according to the current national and/or regional regulations.

## 10 Recycling

After shredding, RE-Y-STONE® bio composite panels can be used as filling materials in other plastics. They are particularly well suitable for producing wood-plastic composites (WPC). The name of wood-plastic composite (WPC) is usually used to describe materials or products that were made from natural fibres and a polymer.

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\* For comparison: calorific value of fuel oil = 37 - 41 MJ/kg or of hard coal = 28 - 31 MJ/kg.

## 11 Technical data

### 11.1 Physical and Chemical Features

11.1.1	Physical condition	solid
11.1.2	Gross density	≥ 1.4 g/cm <sup>3</sup>
11.1.3	Solubility	Insoluble in water, oil, methanol, diethyl ether, n-octanol.
11.1.4	Boiling point	none
11.1.5	Evaporation rate	none
11.1.6	Melting point	RE-Y-STONE® - bio-composite panels do not melt.
11.1.7	Calorific value	18 - 20 MJ/kg
11.1.8	Heavy metals	RE-Y-STONE® - bio-composite panels do not contain any toxic compounds based on antimony, barium, cadmium, chrome <sup>III</sup> , chrome <sup>VI</sup> , lead, mercury, selenium.

### 11.2 Stability and reactivity data

11.2.1	Stability	RE-Y-STONE® - bio-composite panels are stable and resistant; they are neither reactive nor corrosive.
11.2.2	Hazardous reactions	none
11.2.3	Material incompatibility	Strong acids or alkaline solutions will stain the surface.

### 11.3 Fire and Explosion Protection Data

11.3.1	Ignition temperature	approx. 400 °C
11.3.2	Flash point	none
11.3.3	Thermal decomposition	Possible above 250 °C. Toxic gases (e.g. carbon monoxide, carbon dioxide) may appear depending on fire conditions (temperature, oxygen content, etc.).
11.3.4	Smoke and toxicity	Incomplete burning may – as with any other organic material – lead to toxic substances in the smoke.
11.3.5	Flammability	Bio-composite panels are difficult to ignite. They only burn in real fires with open flames acting on them.
11.3.6	Extinguishing media	The bio-composite panels are considered as class A material (burning of solid organic materials) according to EN 2. Carbon dioxide, water jet, dry chemical foam may be used for extinguishing flames for class A material. Water suppresses and prevents repeated flaring. In case of a fire, persons should wear self breathing apparatus and fire-protection clothing.
11.3.7	Explosion hazards	Processing, sawing, sanding, milling of RE-Y-STONE® bio-composite panels leads to class ST-1 dust. Ensure usual safety provisions and sufficient ventilation to avoid airborne dust concentration.
11.3.8	Explosion threshold	The dust concentration should be kept below 30 mg/m <sup>3</sup> .
11.3.9	Protections against explosion and fire	In case of fire, bio-composite panels should be treated like wood based materials.

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| 11.4   | Electrostatic behavior  | It minimizes the generation of electrostatic charge by contact change or friction with other materials. It does not require any grounding connection. The surface resistance is $10^9 - 10^{12}$ Ohm and the charge capacity according to CEI IEC 1340-4-1 is $V \leq 2$ kV. Thus, RE-Y-STONE <sup>®</sup> is an antistatic. |
| 11.5   | Storage and transport   | RE-Y-STONE <sup>®</sup> - bio-composite panels are classified as non-hazardous for transportation purposes and there are no specific requirements.   |
| 11.6   | Processing              | Use gloves to protect from sharp edges and safety glasses to prevent eye injuries. No special working equipment is necessary, except protections to minimize dust exposure in case of sheet machining.   |
| 11.7   | Disposal considerations | Waste material should be handled according to local regulations. Burning is permitted in approved industrial incinerators.   |
| 11.8   | Health aspects          | RE-Y-STONE <sup>®</sup> bio-composite panels are not classified as hazardous for humans and animals. There is no proof for any toxic and ecotoxic effects originating from RE-Y-STONE <sup>®</sup> -bio-composite panels.  |
| 11.8.1 | Working areas           | The usual safety provisions for dedusting shall be applied.  |
| 11.8.2 | Miscellaneous           | RE-Y-STONE <sup>®</sup> bio-composite panels are no hazardous substance in the sense of the ordinance on hazardous substances (Gefahrstoffverordnung; GefStoffV).  |

All information is based on the current state of technical knowledge, but it does not constitute any form of guarantee. It is the personal responsibility of the user of the products described in this information leaflet to comply with the appropriate laws and regulations.