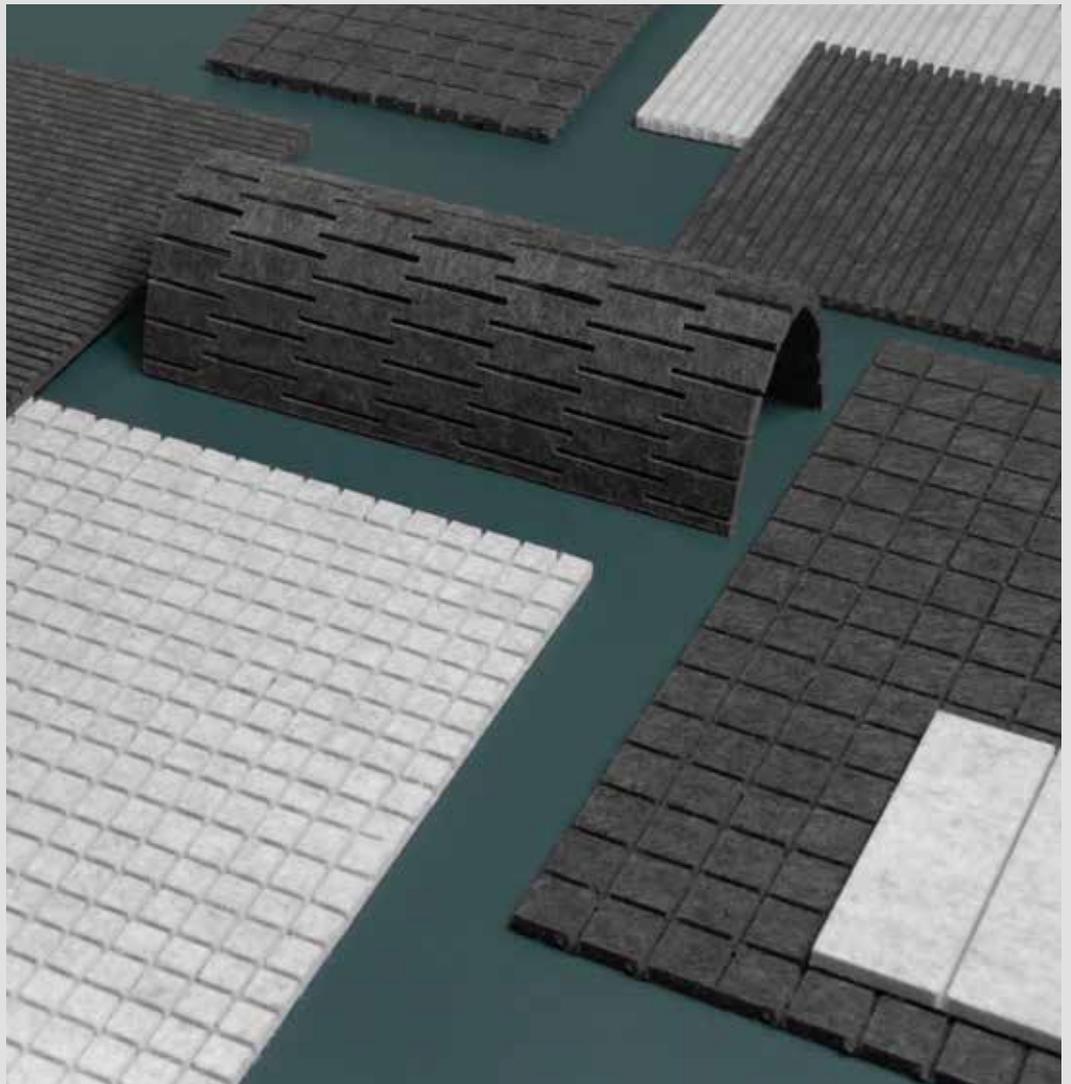


REFELT

PROCESSING MANUAL



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ReFelt provides acoustic PET Felt panels that are made from recycled plastic bottles. It is a soft yet strong and durable material. Offering incredible sound-dampening qualities and aesthetically many possibilities.

SPECIFICATIONS

Material

PET Felt

Flammability class

B1

Acoustic properties

NRC : 0.80 with 100 mm cavity

NRC : 0.65 with 50 mm cavity

ISO Certificate

345-2003

Density

1,9 kg/m²

PET FELT

A PET Felt panel is made from a heated and compressed PET blanket. A PET blanket consists of thousands of needle-bonded and entangled microfibers compacted into a porous and fibrous structure. Each PET fibre is a thin extruded plastic wire extracted from recycled PET bottles. Due to the fibrous structure and thermoplastic properties of the material, it is important to use very sharp tools during its processing. This prevents the fibers from being teared and minimizes fraying. The excess friction, caused by using blunt tools, may lead to melting of the material.

COLOURS

Slight colour deviations can occur since the PET Felt panels are made from recycled fibers. The panels have a frontside and a backside because the fibers are differently orientated on both sides, the nap direction. Keep in mind to process the panels in the same direction and use the same sides.

COLOURS

Available in 28 colours

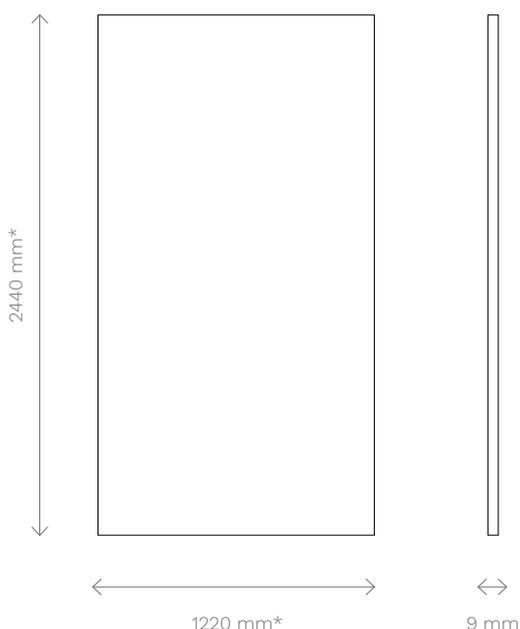


MEASUREMENTS

All panels are delivered in the uncut gross size of 2440mm x 1220mm x 9mm.

Weight – 5,7 kg

*Gross size



INTRODUCTION

In order to best utilize ReFelt PET felt panels it is recommended to review the different ways that they are processed and fabricated. This document provides you with such guidelines. Please note that any methods or techniques not listed in this document are not ruled out.

CONTENTS

PROCESSING OVERVIEW	3
CUTTING METHODS	4
SAWING	7
CONNECTIONS	8
FOLDING AND BENDING	9

PROCESSING OVERVIEW

*Form indicates the degree of shape freedom and shape complexity

*Volume indicates the ideal amount of product application

Method	Form	Volume	Comment
Digital cutting	High	Any	Longer production time for small details
Waterjet cutting	Very high	Medium	Expensive, drying time after processing
Laser cutting	Medium	Low	Melted and discolored edges may occur
Die cutting	Medium to high	High	Expensive for small volumes (requires a mould)
Manual cutting	Medium	Low	Inaccurate, suitable for adjustments on site
Circular saw	Limited	Medium	Suitable for straight lines only
Jigsaw	Medium	Low	Highly depends on skills / experience

CUTTING METHODS

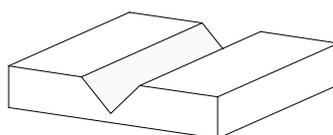
The following methods are common for cutting the PET Felt panels.

Digital cutting

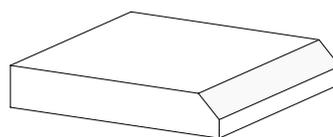
Computer-controlled cutting enables you to cut highly detailed shapes and patterns. There is no material loss and different components can seamlessly connect. This technique also provides the option to cut at different angles, as required for v-grooved or bevelled edges. The diversity of options this technique has to offer provides you with endless possibilities for design and form.



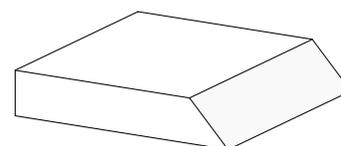
Straight cut Curved cut Cut-out Pattern cut



V-groove, two times 45° cut



Chamfer 45°



Bevel cut 45°

CUTTING METHODS

Waterjet cutting

Waterjet cutting is a precise processing method that enables the smallest of details to be cut. Similar to the digital cutting process the cutting path can be applied almost invisibly. Highly detailed, seamless cut outs can be created. Only pure waterjet cutting is suitable for cutting Pet Felt panels. This is a type of waterjet cutting without the addition of abrasive particles.



Straight cut



Curved cut



Cut-out



Pattern cut

Laser cutting

Laser cutting is precise, but it has the disadvantage of using heat for the cutting process. Due to the thermoplastic properties of the material if using a hot laser beam, it can burn, harden and discolor the edges of the PET Felt Panel. For this reason we do not recommend this method. However, it could be suitable to use for projects where the PET Felt panel are framed.



Straight cut



Curved cut



Cut-out



Pattern cut

Die cutting

Die cutting is suitable for a high volume production of equal sectioned panels. It is an accurate and fast production method that requires a cutting mould. These moulds need to be custom made. Production costs are therefore high for low volume production.



Cut-out



Pattern cut



Manual cutting

When cutting the PET Felt manually we recommend using a sharp knife combined with a ruler for the best possible result. A utility knife or precision knife will be sufficient. Cut the PET Felt step by step and follow the same cutting path several times for a better result.



Straight cut



Curved cut



Cut-out



USE OF POWER TOOLS

The majority of woodworking tools are also suitable for processing PET Felt. Note however that the composition of the PET Felt is dissimilar to wood-based panels. PET Felt does not have a grain direction because the fibers are intermingled randomly. When machining PET Felt rough shavings can occur, causing the dust extractor of the machine to get clogged. If the machine becomes too hot, these remnants can smolder and this will result in traces of melting and the smell of burnt plastic. For the best result use sharpened tools, as these are also efficient at removing any swarf.

SAWING

The following power tools are suitable for PET-felt panels:

Circular saw

Track saws (plunge cut), table saws (pull push saw), miter saws are generally suitable for use with PET felt panels and often a quick way to create custom sized PET Felt as needed. It is recommended test the required speed of the saw with a piece of the material, since some saws can be set to a different speed and blade. Our advice is to experiment with the material in order to find the right machine settings for the preferable result. Note: circular saws can also be used to create chamfered edges.



Straight cut

SAWING

Jigsaw

Jigsaws are ideal for decorative and freeform curves, shapes and cutouts. It is less likely a tool to use when precise shapes and dimensions are required. With this method you are less flexible because the material can only be sawn closely to a stable surface. When using a jigsaw, the material should be treated as a thin wood panel material, as this is equivalent in flexibility.



Straight cut Curved cut Cut-out



CONNECTIONS

Interlocking

By making recesses in the material of 9 mm (which is the sheet thickness), two shapes can be connected. This connection is ideal for making 3D acoustic sculptures. Interlocking 2D shapes or tessellating patterns can be used decoratively and for simplifying the positioning and installation of a tile pattern.



FOLDING AND BENDING

The flexibility of the PET Felt panel can be increased by adding grooves to the surface. These grooves whether sawn or cut have different effects.

CNC V-groove cutting

The digital cutting process enables V-grooves. A V-groove creates a hinge in the material which allows it to be folded seamlessly into an angle or shape. Unlike kerf cutting, this method will result in an angular-shaped lines instead of smooth curving lines. There is a maximum cutting depth in order to maintain the strength of the material and the hinge. For example PET-felts can be folded seamlessly at v-grooves of 45° with cutting depths of 7mm.



Kerf Cutting

Kerf cutting the PET Felt makes it possible to form the material into a curve. A kerf is a narrow channel that is left behind by the saw blade. The width combined with the depth and spacing of the kerfs determines the flexibility of the panel. Keeping the kerfs close together and regularly spaced will result in a smooth bend. It is recommended to leave at least a remaining thickness of 2 mm (equivalent to a cutting depth of not more than 7 mm) in order to maintain sufficient strength of the panel after sawing. The kerf cutting process is laborious, using a table saw or radial arm saw are more efficient options. Our advice is to experiment with the material in order to find the right machine settings for the preferable result. Bending the panels with kerfs on the outside is also an option but weakens the curve, over-bending the material can result in creasing it.

Crossed kerf cutting on one side of the panel creates a flexible surface with multiple bending directions.

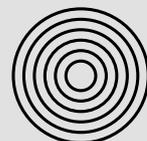
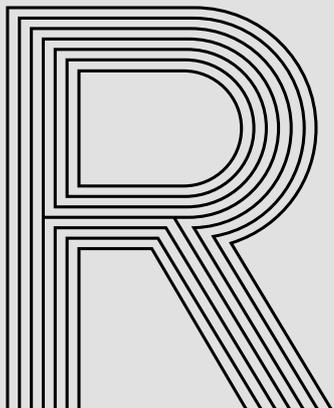
Crossed kerf cutting on two sides of the panel provides a partially open and flexible grid structure.



Pattern cutting

There are many cutting patterns that can be used to increase the flexibility of the PET Felt. Incisions make the material more flexible and easy to shape. Different patterns and the scale to which they are applied have different effects on the flexibility and firmness of the PET Felt panel.





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