



FUSION-EDGE

Processing Information

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1. FUSION-EDGE Characteristics

FUSION-EDGE is a plastic edge with an intelligent extra functional layer that takes over gluing as well as a portion of the application features, such as millability. Using a heat source such as laser*, Hot-Air or NIR, the approximately 200 µm-thin functional layer melts to bond seamlessly with the wood panel.

The colour of the functional layer is the same as the edge itself, making visible glue joints a thing of the past. Ageing of the hidden glue joint is practically unknown. This additional intelligent layer can be processed into an aesthetic and permanently functioning component using any common modern joining technology. In processing, you can completely forgo the well-known additional melt adhesives. This facilitates processing for the user.

2. FUSION-EDGE Material Characteristics

a) ABS (acrylonitrile butadiene styrene) is an impact-proof, mechanically and thermally resilient, high-quality thermoplastic with a positive ecological balance. For over 30 years, this chlorine-free plastic has been used successfully in the furniture industry. The outstanding application, processing and disposal properties of ABS have contributed strongly to its broad market penetration in the furniture manufacturing sector.

The functional layer of ABS FUSION-EDGE consists of TPU (thermoplastic polyurethane) that is tightly bonded to the edge body through co-extrusion. The special layer combines gluing and edge band properties. This high-quality premium functional layer is stable against UV rays, heat-resistant and able to be processed by all modern joining technologies including laser*, Hot-Air and NIR.

b) PP (polypropylene) is a semi-crystalline plastic used in many areas of daily life. This chlorine-free material has been used for over 20 years in the furniture industry as an alternative to the well-established ABS and PVC. Especially impressive is polypropylene's easy waste disposal, which must be processed at an optimal machine setting to take advantage of the excellent application features.

The PP FUSION-EDGE functional layer consists of PO (polyolefin) that is tightly bonded to the edge body through co-extrusion. The special layer combines gluing and edge band properties. This high-quality premium functional layer is stable against UV rays, heat-resistant and able to be processed by all modern joining technologies such as laser*, Hot-Air or NIR.

c) Through a completely novel and innovative procedure, 3D edges are produced that represent a new generation of edges for the furniture manufacturing industry. 3D FUSION-EDGE is made of highly transparent acrylic. Acrylic or poly(methyl methacrylate) (PMMA) is an extremely high-quality and well-established thermoplastic that is setting new technical and aesthetic standards

for furniture edges in the form of 3D FUSION-EDGE. Moreover, acrylic's transparency is superior to that of glass. The edge achieves its special three-dimensional effect through the decor affixed to the reverse side. Because the decor is located on the reverse side of the edge, it is also completely contained within the milled radius, offering an all-round enclosed appearance without framing effect. The edge's semi-gloss surface can be polished to virtually any desired gloss level. The polishing feature is absent from the premium variants of 3D FUSION-EDGE since these already feature a painted finish.

Because it is applied to the reverse side, the decor itself can never wear off or become damaged even under heavy use. Physical damage to the acrylic surface such as scratches or pressure marks can be easily polished off. The 3D FUSION-EDGE is impact-proof, hygienic and resistant to all common household cleaners.

The 3D FUSION-EDGE functional layer consists of TPU (thermoplastic polyurethane) that is tightly bonded to the edge body through extrusion coating. The special layer combines both gluing and edge band properties. This high-quality premium functional layer is stable against UV rays, heat-resistant and able to be processed by all modern joining technologies including laser*, Hot-Air or NIR.

3. FUSION-EDGE Areas of Application

The range of usage areas for FUSION-EDGE is virtually unlimited: from office to bath and kitchen, in exhibition constructions and shopfitting, from living quarters to commercial outfitting. As especially processing-friendly raw material formulations, PP and ABS facilitate both straight processing and ease of use with all curved furniture geometries no matter whether these require an inside or outside radius. Because of their impressive waste disposal properties, PP and ABS edges are often prescribed today in public and private tenders.

The 3D FUSION-EDGE achieves its special three-dimensional effect through the decor affixed to the reverse side. Because the decor is located on the reverse side of the edge, it is also completely contained within the milled radius, offering an all-round enclosed appearance without framing effect for decor edges. The 3D FUSION-EDGE is known for its distinctive appearance in exclusive applications.

4. Machine Processing

FUSION-EDGE can be processed on all edge band machines (KAM and BAZ) using laser*, Hot-Air or NIR technology. Activation of the functional layer with its technology, capping, milling, processing with the scraper followed by processing with polishing discs and Hot-Air dryers for top-quality surfaces on the milling radius – all these tasks are handled easily. For clean and

permanent edge processing, certain main parameters must be met that sometimes depend on the materials used (edges, activation technology, particle boards), the edge band gluing machine and the surrounding temperatures. It is therefore recommendable that optimal settings always be determined by testing. In doing so, the manufacturers' recommended settings for the respective operations should be followed.

Panel sizing

To achieve a jointless appearance, clean joint milling is mandatory.

Gluing

FUSION-EDGE cannot be processed using conventional hot-melts. Processing requires one of the technologies mentioned above to activate the FUSION-EDGE functional layer as heat is introduced.

Laser power

The FUSION-EDGE is classified by colour group into ten performance groups for laser processing. You will find the information on each respective laser performance (LP) group on the FUSION-EDGE packaging and label. The overview facilitates setting the machine's laser output level for each FUSION-EDGE. You can receive an overview from us upon request. The information consists of empirical values that can vary from one system to another. We will be pleased to provide further assistance.

Hot-Air power

FUSION-EDGE can be processed with Hot-Air technology offered by various manufacturers. You can obtain information on precise settings from the manufacturer. Alternatively, we have both reference and empirical values for setting the machines' output levels. These can likewise be requested from SURTECO GmbH.

Working temperature

To achieve best possible results in edge coating, boards and edgebands should be at room temperature (not below 18° C). When material is stored outside, it should be warmed up overnight. When temperatures are too low, the hot-melt adhesive applied sets before the edge strip is applied. Draughts should also be prevented for this reason.

Wood moisture

The optimum wood moisture of the board material for processing is between 7 and 10 %.

Feed rate

The feed rate depends primarily on the system output and workpiece height. In principle, the processing-friendly formulation allows the customer to achieve a performance increase of approximately 10 - 15 % compared to similar edges.

Pressure rollers

The edge pressure should be determined according to the board and pressure zone, but as a basic guideline, the setting

should be no higher than 2.5 - 3 bar; otherwise, the panel can be pushed onto the chain conveyor or the panel coating is pushed up.

Milling

Use 3-bladed to 6-bladed milling cutters rotating at between 12,000 and 18,000 rpm. Incorrect speeds or dull tools can damage the edges. If a lubrication effect occurs, either reduce the rotation of the milling cutter or mill in the opposite direction (where necessary, increase the feed rate). The PP FUSION-EDGE edges must be milled on the edge band gluing machine in the opposite direction.

Scraping

Since the ABS and PP materials tend to fade in colour following the scraping process, the thickness of the scraping should be a maximum of 0.1 to 0.2 mm. The highly chatter-mark-free milling required for this is assured by high-concentricity milling tools. The use of DIA tools is beneficial. For critical colours and PP, it may be necessary to use post-processing units (such ball indentation units or special scrapers).

Buffing

In the buffing of the edge/polishing, it can occur that the joint becomes slightly soiled from a dirty buffing wheel. Buffing should be avoided wherever possible.

Extraction

Depending on the design and machine type, thermoplastic edges require a stronger suction (around 2.5 m³/s) than Duroplast edges. PP chips tend to have a higher electrostatic charge during milling. With respect to improved removal of shavings, the use of tools with interior suction is recommended in such cases.

5. Manual Processing

The manual processing of FUSION-EDGE is easy through the use of mobile hand devices featuring Hot-Air technology. We are happy to make recommendations concerning these upon request.

6. Stationary Processing

FUSION-EDGE can be brilliantly processed at a processing centre. When certain crucial factors are taken into account, even narrow radii can be achieved.

A significant impact on processing operations is made by:

- edge design (dimensions, colour, material ...)
- ambient and material temperatures (the warmer the plastic, the more supple it becomes, allowing narrow radii to be achieved)
- processing output parameters such as Hot-Air temperature or laser output, pre-heating of the workpiece
- processing speeds such as feed rate, contact pressure and offset angle of the glue portion

- board material
- edge pre-heating (infra-red lamp for edge tempering and Hot-Air dryer for the functional layer)

With printed edge bands, it is generally possible to achieve narrower radii without stress whitening than with UNI edges, since any stress whitening from the print colours is overlaid up to a certain point. We will gladly provide further information upon request.

7. Seam appearance

Since FUSION-EDGE always comes from the factory with a perfectly colour-matched functional layer, a defined light concavity and an exactly parallel arrangement, you always receive a sealed, visually perfect seam appearance. A clean joint milling of all sides of the board is mandatory.

	EVA	PUR	FUSION-EDGE
Jointless visual effect	-	0	+
Process stability	+	-	+
Joint soiling	-	0	+
Resistance	0	+	+

8. Mechanical Properties

The functional layers are distinguished by excellent mechanical workability. They were developed to adapt perfectly to the edge material and to permit post-processing without problems or lubrication. Optimal results are achieved by milling in the opposite direction.

9. Thermal Properties

This means that the thermal resistance of the functional layers, far beyond generally accepted requirements, is best suited for use in furniture construction. TPU functional layers made of ABS and 3D FUSION-EDGE achieve a temperature resistance of > 120°C. PP/PO functional layers reach a slightly higher temperature resistance of > 130°C. Both functional layers and wood materials are flammable.

10. Chemical Properties

In accordance with DIN 68861, FUSION-EDGE is resistant against all common household cleansers and substances (such as food acid). Moreover, following testing of the ABS, PP and 3D edges by the Bavarian State Testing Service (LGA) in Nuremberg, these have been classified within stress group 1B.

11. Paintwork

ABS FUSION-EDGE in single colours can be easily painted in your choice of colour without pre-treatment. Use PUR paint or acrylic-based paint. Nitro-cellulose paint should be avoided. More information on the most suitable paint types can be obtained from your paint dealer.

PP FUSION-EDGE edges should be painted only with special paints or by first applying a special primer to the edge. For a satisfactory painting result, the board material must be precisely glued when the primer is applied to avoid damage to the appearance of the surface. For optimal paint adhesion, the primer must be evenly spread even within the milled radius. You can obtain paints for this purpose from your paint dealer.

PP FUSION-EDGE cannot be painted after delivery. Due to its special materials and innovative manufacturing process, its gloss level can only be adjusted through polishing. Because the decor is located on the reverse side of the edge, it is also completely contained within the milled radius, offering an all-round enclosed appearance without framing effect. The edge's semi-gloss surface can be polished to virtually any desired gloss level. The polishing feature is not available for the premium variants of the 3D edges since these already feature a painted finish.

12. Colour Fastness

The colour fastness of FUSION-EDGE is constantly tested in a special procedure in the SURTECO Technology Centre. With a wool colour scale light exposure rating of 6-7 for ABS and 7 for PP and 3D, these options are best suited for inside use (DIN EN 15187). Particular attention was paid to the functional layer. Special formulations prevent discolouration of the remaining layer following the application. The quality of the joint remains extremely high.

13. Surface Quality

FUSION-EDGE is available in a gloss level from extra-flat to high gloss. Moreover, a wide variety of different surfaces is available that can be combined with the desired gloss level, colour or decor. Product availability is comparable to standard edges.

14. Cleaning

Use of special plastic cleansers is recommended for the cleaning of FUSION-EDGE. Strong substances containing solvents or alcohol should not be used. This is especially important for PMMA material (3D FUSION-EDGE).

15. Storage

FUSION-EDGE is resistant against decay and can therefore be stored in a weatherproof environment at room temperature for an almost unlimited period of time. The responsiveness of the functional layer is assured even after lengthy storage. We recommend treating the edges at least every 2 years.

16. Disposal

FUSION-EDGE waste can be easily incinerated together with leftover shavings using the systems approved for this purpose. SURTECO has also ensured that no chlorine compounds are used in either the layer materials or aggregates. The strict TA Luft 1 standards for air quality are observed. Particle board on which FUSION-EDGE processing has been started can also be disposed of by your particle board manufacturer. No burdensome sorting of waste or separation of edge and board is required.

TA Luft 1 (Technical Instructions on Air Quality Control) is the German Federal Government's "primary general administrative regulation of the Federal Pollution Control Act". It creates uniform mandated federal requirements for systems subject to licensing under the Fourth Federal Pollution Control Directive.

17. Quality/Tolerances

FUSION-EDGE width tolerances

Width	ABS and 3D FUSION-EDGE	PP FUSION-EDGE
0 - 30 mm	+/-0.5 mm	+/-0.2 mm
> 30 mm	+/-0.5 mm	+/-0.2 mm

FUSION-EDGE wall thickness tolerances

Wall thickness	ABS and 3D FUSION-EDGE	PP FUSION-EDGE
0 - 1.0 mm	+0.10 mm -0.15 mm	+0.10 mm -0.10 mm
1.1 - 2.0 mm	+0.10 mm -0.20 mm	+0.10 mm -0.10 mm
2.1 - 4.0 mm	+0.15 mm -0.25 mm	+0.10 mm -0.10 mm

FUSION-EDGE functional layer thickness tolerances

Wall thickness Functional layer	ABS and PP FUSION-EDGE	3D FUSION-EDGE
0.2 mm	-20 µm/+50 µm	
0.28 mm		-30 µm/+50 µm

In our communication and business documentation, the FUSION-EDGE wall thicknesses always refer to the wall thickness of the actual edge, excluding the wall thickness of the functional layer. The functional layer plus the 0.2 mm wall thickness must be summed together (example: 1.5 + 0.2 mm = 1.7 mm actual wall thickness). The advantage to the customer is that the familiar standard edge system can be carried over. The functional layer corresponds to the glue thickness.

FUSION-EDGE parallel arrangement

Wall thickness	ABS and 3D FUSION-EDGE	PP FUSION-EDGE
0 - 1.0 mm	max. 0.10 mm	max. 0.05 mm
1.1 - 2.0 mm	max. 0.10 mm	max. 0.05 mm
2.1 - 4.0 mm	max. 0.15 mm	max. 0.05 mm

18. Technical Data Overview

See processing instruction item 17 for individual ABS and PP materials and item 16 for 3D. We will gladly provide you with the overview of parts specifications upon request.

19. Diagnosis of Problems

Problem	Diagnosis of problems and suggested solutions
Edge is easily pulled away by hand	<ul style="list-style-type: none"> • Insufficient capacity • Insufficient edge pressure • Feed rate too rapid • Edge/board too cold
The edge joint is open at the start or end of the board	<ul style="list-style-type: none"> • Pressure in contact roller conduit too great • Front/rear edge overhang too small • Hot-Air/laser output too high
No jointless visual effect	<ul style="list-style-type: none"> • Format area no longer cuts cleanly enough • Post-processing penetrates the board too deeply • Post-processing is too far removed from the board
Edge splinters when processed	<ul style="list-style-type: none"> • Edge too cold • Milling cutters are dull or non-circular • Feed rate too high • Mitre saw blade has no alternating teeth
Edge/joint smears when processed	<ul style="list-style-type: none"> • Energy input onto the edge too great • Wrong tool rotation direction (reverse rotation recommended) • Buffing wheel presses too hard onto the edge or rotates too rapidly
Edge joint open along the entire length	<ul style="list-style-type: none"> • Contact pressure is too low • Joint milling on the concave side of the panel • Edge pre-load too great
The functional layer forms a fringe	<ul style="list-style-type: none"> • Radius scraper is too far removed from the board • Radius scraper is too dull • Too much energy input when affixing the edge
The printed image of the 3D PMMA edge becomes scratched	<ul style="list-style-type: none"> • Temperature input onto functional layer too high • Shavings are formed when the format area is not sharp enough • Edge pressure too great • Wrong rollers for edge transport (rubber rollers required)

20. FUSION-EDGE Product Variants

- PP FUSION-EDGE
- ABS FUSION-EDGE
- 3D FUSION-EDGE

The information specified, as well as application-related advice in verbal and written form, and obtained through testing, are provided in good faith but are not applicable as binding instructions, neither in relation to any property rights claims on the part of third parties. The advice provided does not release you from checking our current advice, our safety data sheets and technical information in particular, nor from checking our products as regards suitability for the procedures and purposes intended. Application of, use of and working with our products, and the products made by yourself on the basis of our application-specific advice, are beyond our control and so exclusively within your area of responsibility. Our products are sold in line with our applicable general terms of delivery and payment.

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