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RAUKANTEX ABS

Technical information

REHAU
Interior Solutions

Materials for edgeband processing
REHAU uses the thermoplastic materials PVC (polyvinyl chloride), ABS (acrylonitrile-butadiene-styrene), PP (Polypropylene) and PMMA (polymethylmethacrylate) in its extensive RAUKANTEX edgeband product range. Thermoplastic materials are polymer materials which can be melted and therefore thermoformed, processed and recycled.

ABS as an edgeband material
ABS (Acrylonitrile-Butadiene-Styrene) is a widely-used thermoplastic material with excellent material and processing properties. The furniture industry has been using it since the 1980s. In particular the high impact strength and high mechanical and thermal resistance make ABS a widely-used material which meets the fire protection class B2 to DIN 4102.

ABS material (Acrylonitrile-Butadiene-Styrene)
ABS plastics are thermoplastics that, due to their chemical compo- sition, belong to the high-impact polystyrene group. As a result of the specific combination of the individual monomers a high-impact, mechanically resistant, high-quality, cadmium and lead-free polymer material is created. In addition to this, the REHAU material formulation demonstrates improved heat resistance, ageing resistance, mechanical stability, chemical resistance and surface gloss compared to impact resistant polystyrene.

1. Areas of application
The spectrum of applications for the RAUKANTEX ABS is almost limitless: From the office to the bathroom and kitchen, exhibition stand construction and shop fitting, the living area, and through to commercial construction. The processing-friendly RAUKANTEX ABS formulation affords both smooth continuous processing and easy application to free-form parts.

2. Disposal
Taking into account legal stipulations, RAUKANTEX ABS edgeband can be burned in units approved to do so. No by-products that are harmful to health are produced if it is burned in the correct way. Even wood based boards with ABS edgeband applied can be disposed of easily.

Recycling
In principle, the ABS material (unprocessed) can be recycled as long as it is pure and not contaminated with foreign substances.

ReTurn service from REHAU
REHAU has introduced the ReTurn take-back concept. Customers can return unprocessed ABS edgebands to REHAU. These edgebands are then recycled and processed into new products. The aim is to keep edgebands in a raw material cycle over the long term. Should you be interested, please ask your contact person for more information and whether this service is already available in your area.

3. Characteristics/Properties
The properties of the RAUKANTEX ABS edgebands fulfil the requirements of the furniture industry. The ABS edgeband possesses the following properties:

- **Shore hardness D**
  RAUKANTEX ABS edgebands achieve good results with a Shore hardness D of 70 ± 4 in accordance with DIN ISO 7619-1.

- **Heat resistance / Vicat softening temperature**
  With a value of approx. 90 °C to ISO 306 / B50 RAUKANTEX ABS edgebands are suited for use in the furniture industry.

- **Abrasion resistance**
  The surface of RAUKANTEX decorative edgebands in ABS is protected against scratches with a UV lacquer, whereby the decorative designs demonstrate excellent scratch and abrasion resistance. In case of a strong contact pressure through rubbing, slight staining from intensive or dark colour shades cannot be excluded for technical reasons.

- **Chemical resistance**
  RAUKANTEX ABS edgebands are chemically resistant to all household cleaners to DIN 68861 Part 1 and fulfil stress group 1B.

- **Light fastness**
  RAUKANTEX ABS edgebands are regularly tested in an accredited laboratory in line with EN ISO 4892-2 regarding light fastness. An analysis of the colour deviation is then carried out along the lines of EN ISO 105-A02 using the grey scale. With a light fastness of ≥ 6 on the blue scale these edgebands are ideally suited for interior application.

- **Cleaning**
  Special plastic cleaners are recommended for cleaning RAUKANTEX ABS edgebands. The use of substances containing solvents or alcohol is not recommended.

	PVC	ABS	PP	PMMA
Light fastness In accordance with EN ISO 4892-2	≥ 6	**≥ 6**	≥ 6	≥ 6
Edgeband shrinkage, 3 mm, after 1 h at 90 °C	≤ 1.7 %	**≤ 1.7 %**	≤ 0.2 %	≤ 1.0 %
Vicat softening point to ISO 306, Method B/50	approx. 67 °C	**approx. 90 °C**	approx. 100 °C	approx. 80 °C
Hardness Shore D to ISO 7619-1	79 ± 4	**70 ± 4**	75 ± 4	80 ± 3
Chemical resistance to DIN 68861-1	Very good – 1B	**Good – 1B**	Very good – 1B	Good – 1B*
Thermal conductivity to DIN 52612	0.16 W/(m·K)	**0.18 W/(m·K)**	0.41 W/(m·K)	0.18 W/(m·K)

* Limited resistance against solvents and alcohols.

4. Storage

If stored properly, RAUKANTEX edgebands can be stored for min. 12 months. For edgebands older than 12 months, however, a processing trial should always be carried out prior to series processing.

Recommended storage conditions are:

- room temperature (approx. 18 °C to 25 °C)
- dry
- clean
- no solvent vapours
- protected from light

5. Standard tolerances

RAUKANTEX pure ABS edgebands are subjected to regular quality checks in order to guarantee the high quality of every production run. In addition to this we are constantly working to improve the raw material properties. The production tolerances for edgebands are defined exactly and are checked throughout every production run. The standard tolerances for RAUKANTEX edgebands can be obtained from your contact person on request or you can find them on the internet.

6. Processing

Manual processing

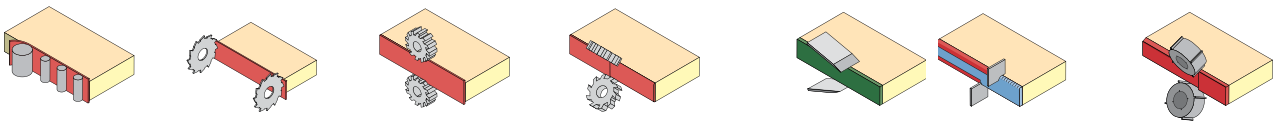
It is possible to process RAUKANTEX pure ABS edgebands manually using edge clamps. Special lacquer adhesives, solvent-based adhesives and cartridge adhesives. Processing trials should be carried out to determine suitability for the respective application.

Machine processing

RAUKANTEX pure ABS edgebands can be processed on all edgebanders (throughfeed edgebanders and CNC processing centres) using a hot-melt adhesive. The various processing steps such as gluing, cutting, milling, scraping and also reworking with buffing wheels and hot air are possible without any problems.

To achieve a high-quality and durable edgeband application several important processing parameters have to be considered. These include the components used (edgeband, glue and boards), the edgebander and the ambient temperature. In order to identify the ideal conditions it is recommended that trials are carried out and that the reference values specified by the relevant manufacturer are observed.

Process steps of machine processing:



Gluing | Capping | Pre-milling | Radius milling | Scraping | Buffing

Adhesive
RAUKANTEX ABS edgebands can be processed with all commercially available hot-melt adhesives (EVA, PA, APAO and PUR). These highly heat-stable adhesives together with the RAUKANTEX ABS edgebands guarantee a secure bond.
For products exposed to high ambient temperatures (e.g. containerised transportation) hot-melt adhesives with a high softening temperature are recommended. Due to the high heat resistance of the ABS edgebands of approx. 90 °C material softening during general applications does not occur. During adhesion ensure that the adhesive is applied consistently, and that the glue spreading rollers do not extend too far into the line of the board.
The processing temperature of the adhesive varies depending on the type of adhesive. Be aware that the thermostats in melt containers are often inaccurate and the temperature of the applicator roller can vary by up to 30 °C.

Processing temperature
To achieve the best possible results during edgeband application the boards and edgebands should be processed at a room temperature of > 18 °C otherwise the adhesive sets too quickly. Draughts should also be avoided for this reason.

Board moisture content
The optimum board moisture content of the board material is between 7 and 10%.

Feed rate
RAUKANTEX ABS edgebands are suitable for the feed rates commonly used in both the commercial and industrial sectors.

Adhesive application
To achieve ideal processing the information provided by the adhesive manufacturer should be observed. The adhesive application should be calculated in such a way that small beads of adhesive are pressed out from the edges of the freshly glued edgebands and the voids between the substrate particles are filled. The amount of adhesive in each case depends on the type of board, the particleboard density, the edgeband material, the feed rate and the type of adhesive.

Milling
If possible use a 3 to 6 tooth milling tool with a diameter of 70 mm and a rotational speed of 12,000 to 18,000 rpm counter to board travel (up-cutting). Unsuitable rotational speeds or blunt tools can damage the edgebands. If a smear effect occurs the rotational speed of the milling tool or the number of teeth should be reduced. The quality of the milled surface (e.g. chatter marks) can be improved by adjusting the feed rate, rotational speed and number of cutting edges.

Scraping
The ABS material tends to become slightly lighter after scraping, therefore the chip produced by the scraper should be a maximum of 0.1–0.15 mm. To obtain a high-quality surface after scraping, aim for milling finish with as few chatter marks as possible.

Buffing
RAUKANTEX ABS edgebands can be buffed to generate a high quality edge radius. Colour deviation (stress whitening) caused during scraping of the edge radius can be eliminated to achieve a consistent finish by using a down-cutting buffing wheel set-up i.e. the wheels rotate with the travel of the board. Additionally, if release and cleaning agents are used during board processing, the buffing wheels will remove any unwanted glue residue.

Processing using Zero-Joint technology
RAUKANTEX pro/plus ABS edgebands are designed to be processed on edgebanding machines working with CO_2 or diode laser, hot air or NIR processes. Please refer to the technical information for Zero-Joint edgebands regarding special information (print number M01675).

Processing properties		PVC	ABS	PP	PMMA
Capping		good	**good**	good	good
Milling direction	Throughfeed processing	Up-cutting	**Up-cutting**	Up-cutting	Up-cutting
	CNC processing centre	Down-cutting/ Up-cutting	**Down-cutting/ Up-cutting**	Up-cutting	Down-cutting/ Up-cutting
Pre-milling		good	**good**	good	good
Radius milling		good	**good**	good	good
Contour milling		good	**good**	good	good
Scraping		very good	**good**	good	good
Buffing		very good	**good**	good	good
Gluing		Commercially available hot-melt adhesives	**Commercially available hot-melt adhesives**	Commercially available hot-melt adhesives	Commercially available hot-melt adhesives
Polishability		good	**good**	average	very good
Stress whitening tendency		low	**average**	low	low
CNC processing capability		very good	**good**	very good	demanding

Problem	Diagnosis of the problem
1 The edgeband can easily be removed by hand. The hot-melt adhesive remains on the chipboard (straight line) or on the edgeband (processing centre). It is possible to see the marking made by the adhesive application roller.	▪ Adhesive application not sufficient ▪ Room, edgeband or hot-melt adhesive temperature too low ▪ Draughty environment ▪ Feed rate too low ▪ Contact pressure of the pressure roller too low
2 The edgeband can easily be removed by hand. hot-melt adhesive remains on the chipboard (straight line). The hot-melt adhesive surface is completely smooth.	▪ Board and/or edgeband is too cold. ▪ Check hot-melt adhesive type ▪ Check primer application
3a Glue joint is not sealed (straight line).	▪ Adhesive too cold ▪ Adhesive application too low ▪ Contact pressure too low ▪ Edgeband pre-tension is incorrect ▪ Scoring saw alignment is off-center ▪ Contact between the adhesive application roller and board ▪ Debris not removed from board cross-section
3b Glue joint is not sealed (processing centre).	▪ Contact pressure too low ▪ The restoring force of the edgeband is too high **Measure/Proposal:** Application of external heat ▪ Check hot-melt adhesive type (insufficient heat tack) ▪ Edgeband pre-tension is incorrect ▪ Adhesive does not set in good time **Measure/Proposal:** Reduce the adhesive temperature
4 The glued edgeband does not show sufficient adhesion at the start.	▪ Adhesive application roller is not positioned correctly ▪ Increase the amount of adhesive
5 Milling lines are visible.	▪ Feed rate too high ▪ Number of blades too low ▪ Rotational speed too low **Measure/Proposal:** Rework with scraper and buffing station
6 The edgeband shatters during milling.	▪ Edgeband vibrates during the milling process ▪ Adhesion insufficient ▪ Edgeband projection too large **Measure/Proposal:** Check adhesion parameters **Measure/Proposal:** Check adhesive type
7 Stress whitening of the edgeband in the milled area, principally after scraping.	▪ Chip of the scraper too thick ▪ Scraper set up incorrectly **Measure/Proposal:** Blunt the scraper blade. **Measure/Proposal:** Rework with buffing station
8 Stress whitening occurs during processing in CNC processing centres	▪ Micro-cracks occur in the radius area due to processing temperature being too cold **Measure/Proposal:** Application of external heat in the radius area **Measure/Proposal:** Use larger radii or thinner edgebands

Notes

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