



IMPREGNATED TAPES: APPLICABLE STANDARDS AND PROPERTIES

TightVent Webinar 4th June

An **RPM** Company

Impregnated tapes: Applicable standards and properties

Content

- Tremco illbruck
- Technology Impregnated tapes
- DIN 18542:2009-07
- VOC Standards

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Tremco illbruck – At a Glance



Business Area:
Sealing and Bonding for Construction
and Industry

Strategic Segments:
Windows, Façades, Waterproofing,
Fire Protection, Distribution, Industry

International Presence:
1,000 Employees
25 sites in Europe, Africa & Middle East

Turnover:
290 million €

Structure:
Part of RPM International Inc., USA

Centres of Excellence

Where do our products come from?

Dijon, FR (IG)



Arkel, NL (Foams/Sealants)



Wigan, UK (Coatings/Fire Protection)



Bodenwöhr, DE (Tapes/Membranes)



Traunreut, DE (Adhesives)



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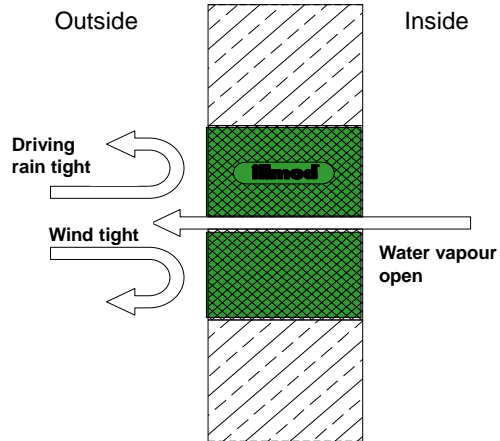
Impregnated tapes: Applicable standards and properties

Content

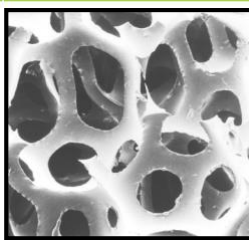
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The main principle of impregnated tapes

- Main components:**
- Water based Acrylic dispersion
 - PU Foam

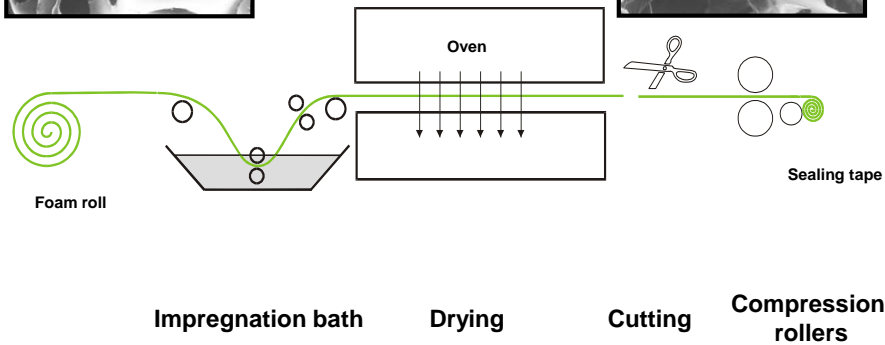
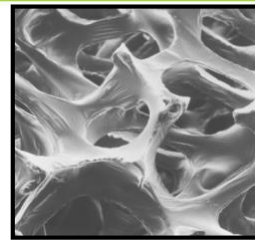


Impregnation process



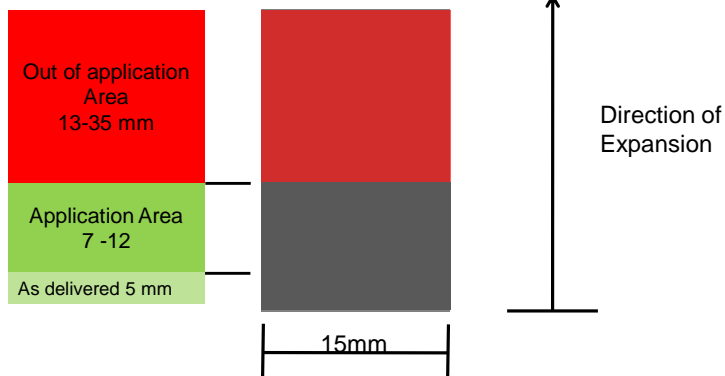
PU foam before impregnation

PU foam after impregnation



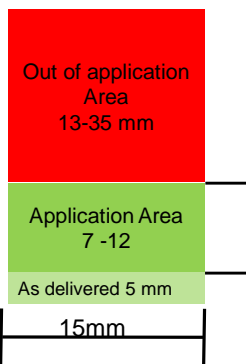
Once again how it works!

TP600 illmod 600
15 / 7-12 mm



Once again how it works!

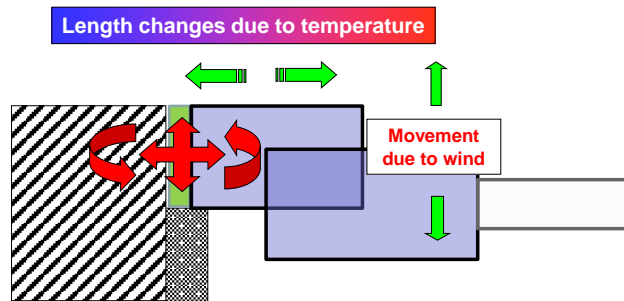
Illmod tape
15 / 7-12 mm



Dimensions illbruck illmod 600

Bestell-Nr.		Joint depth in mm	Application area in mm	m/box
anthrazit 450-3-	grau 451-2-			
8308	8308	8	2	462,50
8309	8309	10		375,00
8310	8310	15		250,00
8311	8311	20		187,00
8398	8398	8	3	370,00
8320	8326	10		300,00
8321	8321	15		200,00
8322	8322	20		150,00
8329	8329	12	3 - 7	200,00
8332	8332	15		160,00
8333	8333	20		120,00
8354	8354	15	5 - 10	112,00
8355	8355	20		84,00
8364	8364	15	7 - 12	86,00
8365	8365	20		64,50
8376	8376	20	8 - 15	49,50
8378	8378	30		33,00
8391	8391	20	10 - 18	97,50
8392	8392	25		78,00
8393	8393	30		65,00
9508	9508	30	13 - 24	52,00
9509	9509	40		36,40
9528	9528	35	17 - 32	32,00
9525	9525	40		28,00
9540	9540	40		18,90
9541	9541	50	28 - 40	16,20

Handling all Potential Stresses



Joint width recommendation

Impregnated Sealing Tapes

Anschlagart				
	Mindestfugenbreite für stumpfe Leibung b_{SR} in mm			
	Elementbreite			
Rahmenwerkstoff	bis 1,5	bis 2,5	bis 3,5	bis 4,5
PVC hart (weiß)	8	8	10	10
PVC hart und PMMA (dunkel) (farbig extrudiert)	8	10	10	12

Wet Sealants

Anschlagart				
	b_{S2a} für Dichtstoffe mit einer zulässigen Gesamtverformung von 25 % b_{S2b} für Dichtstoffe mit einer zulässigen Gesamtverformung von >15 % Mindestfugenbreite bei stumpfer Leibung b_{SR} in mm			
	Elementbreite			
Rahmenwerkstoff	bis 1,5	bis 2,5	bis 3,5	bis 4,5
PVC hart (weiß)	10	15	20	25
PVC hart und PMMA (dunkel, farbig extrudiert)	15	20	25	30

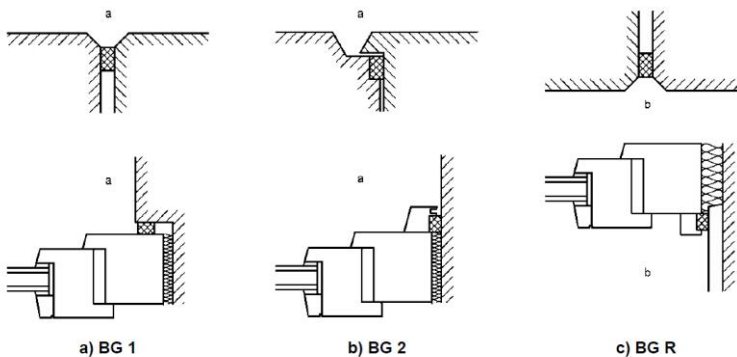
Impregnated tapes: Applicable standards and properties

Content

- Tremco illbruck
- Technology Impregnated tapes
- DIN 18542:2009-07
- VOC Standards

German Standard DIN 18542: 2009-07

DIN 18542 Sealing of outside wall joints with impregnated sealing tapes made of cellular plastics - Impregnated sealing tapes - Requirements and testing



Legende

- a Exterior
- b Interior

Impregnated Tapes – Stress Group Classification DIN 18542:2009-07

Table 2: Requirements

No.	Property	BG 1	BG 2	BG R
1	Joint leakage coefficient, a , at 10 a, in $m^3/(h \cdot m \cdot (daPa)^{2/3})$	$\leq 1,0$	$\leq 1,0$	$\leq 0,1$
2	Tightness to driving rain at Δp , in Pa	Not less than 600 Pa	Not less than 300 Pa	–
3	Imperviousness of joint intersections to driving rain at Δp , in Pa	Not less than 600 Pa	–	–
4	Resistance to temperature fluctuations	Between $-20\text{ }^{\circ}\text{C}$ and $+80\text{ }^{\circ}\text{C}$	Between $-20\text{ }^{\circ}\text{C}$ and $+60\text{ }^{\circ}\text{C}$	Between -20 and $+60\text{ }^{\circ}\text{C}$
5	Resistance to the effects of light and moisture	To be ensured.	–	–
6	Compatibility with adjacent materials	Up to $80\text{ }^{\circ}\text{C}$	Up to $60\text{ }^{\circ}\text{C}$	Up to $60\text{ }^{\circ}\text{C}$
7	Fire behaviour (building material class as in DIN 4102-1)	B1	B2	B2
8	s_p -Value, in m	$\leq 0,5$	$\leq 0,5$	Value to be measured

Impregnated Tapes – Stress Group Classification DIN 18542:2009-07

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No.	Property	BG 1	BG 2	BG R
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7	Fire behaviour (building material class as in DIN 4102-1)	B1	B2	B2
8	s_p -Value, in m	$\leq 0,5$	$\leq 0,5$	Value to be measured

illbruck TP600 illmod 600



Material: Open-cell flexible polyurethane foam, impregnated with an acrylic polymer (flame-retardant)

UV-resistant

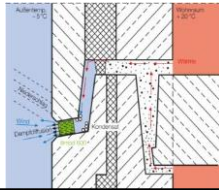
Colours: Anthracite / grey

Availability:

On pre-compressed rolls, self adhesive on one side

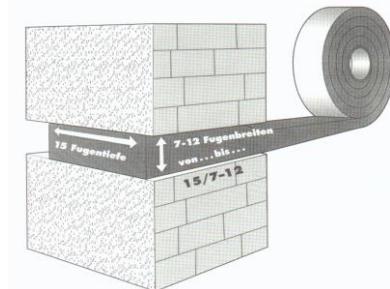
Storage: 2 years shelf life

Application area: For the outside driving rain resistant sealing in facade and windows connections



illbruck illmod 600 – Product advantages

- Independently monitored driving rain resistance over 600 Pa
- Open to water vapour diffusion
- Up to **40 mm** joint width
- No preparation with primer
- Easy installation, possible in any weather
- **Permanently elastic during movements**
- Test from outdoor tapes since 1995
- 10- year performance warranty*
- BG 1 tested



illbruck TP680 illmod 600 green



Material: An open cell polyurethane soft foam impregnated with an acrylic based resin. The tape contains a proven percentage of bio-based material.

- Contains bio-based material (certified by DIN CERTCO)
- BG1 following DIN 18542
- Low emission certified by EMICODE® EC1Plus



illbruck TP680 illmod 600 green is an impregnated tape for use in a wide variety of movement joints for window installation and façade sealing.

Impregnated Tapes – Stress Group Classification DIN 18542:2009-07

Table 2: Requirements

No.	Property	BG 1	BG 2	BG R
1	Joint leakage coefficient, a , at 10 a, in $m^2/(h \cdot m \cdot (daPa)^{2/3})$	$\leq 1,0$	$\leq 1,0$	$\leq 0,1$
2	Tightness to driving rain at Δp , in Pa	Not less than 600 Pa	Not less than 300 Pa	–
3	Imperviousness of joint intersections to driving rain at Δp , in Pa	Not less than 600 Pa	–	–
4	Resistance to temperature fluctuations	Between -20°C and $+80^\circ\text{C}$	Between -20°C and $+60^\circ\text{C}$	Between -20 and $+60^\circ\text{C}$
5	Resistance to the effects of light and moisture	To be ensured.	–	–
6	Compatibility with adjacent materials	Up to 80°C	Up to 60°C	Up to 60°C
7	Fire behaviour (building material class as in DIN 4102-1)	B1	B2	B2
8	s_p -Value, in m	$\leq 0,5$	$\leq 0,5$	Value to be measured

illbruck TP300 illac



Material: Open- cell flexible polyurethane foam, impregnated with an acrylic polymer

Not UV-resistant / 300 Pa

Colours: Anthracite / grey

Availability:
On pre-compressed rolls, self- adhesive on one side

Application area: For sealing against sound, driving Rain, dust, draught and heat loss

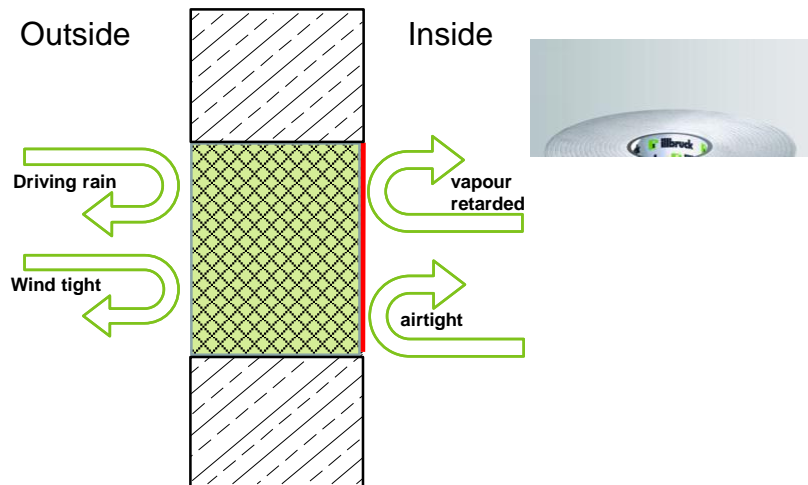
In covered joint constructions around windows and window couplings

Impregnated Tapes – Stress Group Classification DIN 18542:2009-07

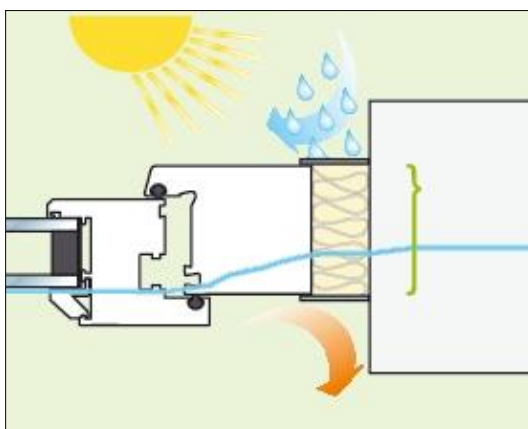
Table 2: Requirements

No.	Property	BG 1	BG 2	BG R
1	Joint leakage coefficient, a , at 10 a, in $m^3/(h \cdot m \cdot (daPa)^{2/3})$	$\leq 1,0$	$\leq 1,0$	$\leq 0,1$
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5	Resistance to the effects of light and moisture	To be ensured.	–	–
6	Compatibility with adjacent materials	Up to $80\text{ }^{\circ}\text{C}$	Up to $60\text{ }^{\circ}\text{C}$	Up to $60\text{ }^{\circ}\text{C}$
7	Fire behaviour (building material class as in DIN 4102-1)	B1	B2	B2
8	s_p -Value, in m	$\leq 0,5$	$\leq 0,5$	Value to be measured

Illmod Trio – The one that provides all 3 principles in one



Basic for the Connection Joint – Inside-Insulation-Outside



Outside:

- Driving rain tight
- No damage by weathering
- No cold wind pass through
- Water vapour open

Insulation:

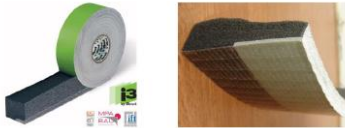
- Sound protection
- Thermal insulation
- No condensation

Inside:

- No warm/humid air pass through
- „inside more water vapour tight than outside

illbruck TP652 illmod trioplex+

Bild



Characteristics

- Fast and easy application 1min/m
- Application area from passive house, new buildings, renovation to insulation only

Description

Multi-functional Tape with side impregnation and additional compression tape for high requirements

ausen:
RAL-Zertifiziert

Application

3 Layer in one tape

DIN 18542

BG1/BGR

Degree of Compression [%]

14%-26%

Application time

1 min/m

Corner Solution

Butt-joint

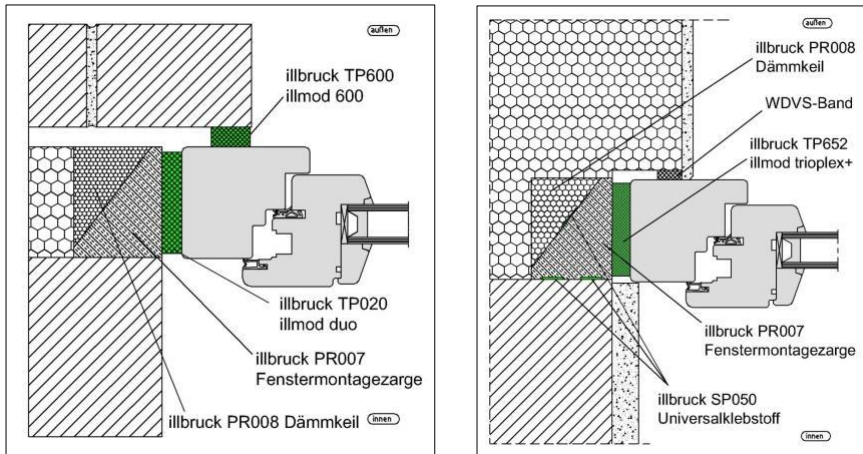


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Illmod Trio – The one that provides all 3 principles in one



Application with Illbruck Projecting window system



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Advantages for Tapes!

Driving rain:
Tight up to 600 Pa

Experience:
More than 30 years of experience
in production and application

UV-Resistant and Durable:
Weather test for aging running now
since 1995, tested by an
independent testing authority

Breathable:
Airtight but vapour open

U-Value:
Defined U-Value for the joint,
depending on the depth of the tape
e.g. Trio 56mm = 0,71 W/m²K; Trio
88 = 0,49 W/m²K

Application:
Independent from weather
conditions
No treatment of the substrates
necessary (no primer, etc.)
Fast and easy

Impregnated tapes: Applicable standards and properties

➤ Content

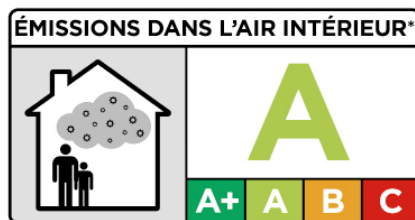
- Tremco illbruck
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VOC France

Obligation to label emissions in France

- The voluntary labeling of the conduct of emissions is compulsory since January 2012 for new building products
- Emission rating A+, A, B and C
- Transition period for existing products until September 2013
- Subject to certification are TVOCs, formaldehyde and further 9 single VOCs



VOC France

French VOC regulation / Arrêté du 19 avril 2011 (decree as of 19th April 2011)

Limit values

Additionally to the total of emissions of volatile organic compounds (TVOC) the list of the limit values focuses on the 10 following substances (in µg/m³):.

Substances/Emissions' class	A+	A	B	C
Formaldehyde	<10	<60	<120	>120
Acetaldehyde	<200	<300	<400	>400
Toluol	<300	<450	<600	>600
Tetrachlorethene	<250	<350	<500	>500
Xylene	<200	<300	<400	>400
1,2,4-Trimethylbenzene	<1000	<1500	<2000	>2000
1,4-Dichlorbenzene	<60	<90	<120	>120
Ethylbenzene	<750	<1000	<1500	>1500
2-Butoxyethanol	<1000	<1500	<2000	>2000
Styrene	<250	<350	<500	>500
TVOC	<1000	<1500	<2000	>2000



VOC France

French VOC regulation / Arrêté du 19 avril 2011 (decree as of 19th April 2011)

The following products are subject to marking:

- **Floor coverings, walls and ceilings:** carpets, parquets, laminate, linoleum, wallpapers, tapestries, wall claddings, paints, varnishes, oils, mordants, gypsum, crown moulding, etc.
- **Partition walls and intermediate ceilings:** wall panel, PVC, wood, gypsum, flexible partition walls, drop ceilings, skirting and wooden boards, etc.
- **Insulation materials:** every kind of insulation, interior insulation, thermic and acoustic insulation materials, etc.
- **Windows and doors:** interior doors, windows, doors, etc.
- **Products for installation or preparation:** adhesives, sealings, sealing compounds, etc.

Not subject to marking are:

- Furniture
- Furnishings such as rods, curtains, lamps, roller blinds
- Sanitary fittings and armatures
- Electrical appliances, cables, switches
- Detergents for floor coverings
- Metal goods (e.g. fitting) and glass
- Products for outdoor use



VOC France

French VOC regulation / Arrêté du 19 avril 2011 (decree as of 19th April 2011)

Products with certificate:

TP600
TP650
ME500
SP050
SP150
FA101
LD705
FM330
FM610
...
...



VOC in Germany

GEV – the Association for the Control of Emissions in Products for Flooring Installation, Adhesives and Building Materials – was founded in 1997. Through the EMICODE® it offers consumers, planners, architects and professional craftsmen guidance for the selection of flooring installation products, adhesives and building materials. It provides independent and impartial assessments designed to assure the highest level of consumer and environmental protection.



VOC in Germany

GEV classification criteria

The emissions must lie below stringent limits. Emitted VOCs are individually identified and their concentrations are summated. The resulting emission concentrations give the TVOC value (total volatile organic compounds) and TSVOC (total semi-volatile organic compounds) and are definitive for the EMICODE classification.

µg/m ³	TVOC after 3 days	TVOC / TSVOC after 28 days
EMICODE EC 1 ^{PLUS} - very low emission	≤ 750	≤ 60 / 40
EMICODE EC 1 - very low emission	≤ 1000	≤ 100 / 50
EMICODE EC 2 - low emission	≤ 3000	≤ 300 / 100



Tests performed to other specifications, e.g. during approval procedures for construction products by the German DIBt approval body, may also be submitted as supporting evidence, provided they demonstrate compliance with the GEV requirements.

VOC in Germany

GEV product matrix	EMICODE		
	EC 1 ^{PLUS}	EC 1	EC 2
TVOC/TSVOC _{28d} in µg/m ³			
1. Liquid products			
1.1 Primers			
1.2 Ready to use liquid fixations and adhesives (e.g. rolled fixations, spray adhesives)			
1.3 Damp proof primers			
1.4 Liquid sealants			
2. Powder based products			
2.1 Levelling compound based on cement or gypsum			
2.2 Tile mortars and joint fillers			
2.3 Waterproofing slurries based on cement	After 3 days	After 3 days	After 3 days
3. Pasty products with high content of organic binder	≤ 750 TVOC;	≤ 1000 TVOC;	≤ 3000 TVOC;
3.1 Adhesives for floor coverings, wood floorings and ceramic tiles	after 28 days	after 28 days	after 28 days
3.2 Fixations for floor coverings			
3.3 Levelling compounds (water based or reactive)	≤ 60 TVOC /	< 100 TVOC /	≤ 300 TVOC /
3.4 Powder based adhesives with high content of organic binder			
4. Ready to use products which do not require chemical curing or physical drying	≤ 40 TSVOC	≤ 50 TSVOC	≤ 100 TSVOC
4.1 Underlays for flooring installation			
4.2 Sound adsorbing underlays			
4.3 Self adhesive tapes and membranes			
4.4 Installation-/ decoupling boards			
5. Joint sealants, joint insulations, joint sealing tapes			
5.1 Joint sealants (water based or reactive)			
5.2 Joint insulations			
5.3 Pre-compressed joint sealing tapes			
5.4 Sealing membranes (for window or facade)			



VOC Germany

Products tested so far EC1+:

illbruck FM812 Pistolenschaum Öko
illbruck JF100 Fugenfüller
illbruck ME500 TwinAktiv
illbruck ME501 TwinAktiv HI
illbruck ME503 TwinAktiv VZ
illbruck ME904 Butyl- & Bitumenprimer Öko
illbruck SP150 Universalklebstoff Plus
illbruck TP600 illmod 600
illbruck TP610 illmod eco
illbruck TP650 illmod trioplex

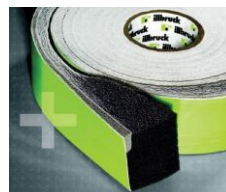
illbruck TP652 illmod trioplex+
illbruck TP680 illmod 600 green
Tremco FA870 Natursteinsilikon
illbruck FM230 Fensterschaum+
illbruck PU700 Steinkleber
illbruck SP025 Fenster-Folienkleber Öko
illbruck SP525 Hochbau- und
Anschlussfugen Dichtstoff

Perennator FA101 Fenster- und
Anschlussfugen-Silikon



Summary

Impregnated Tapes



Sealants



Foams

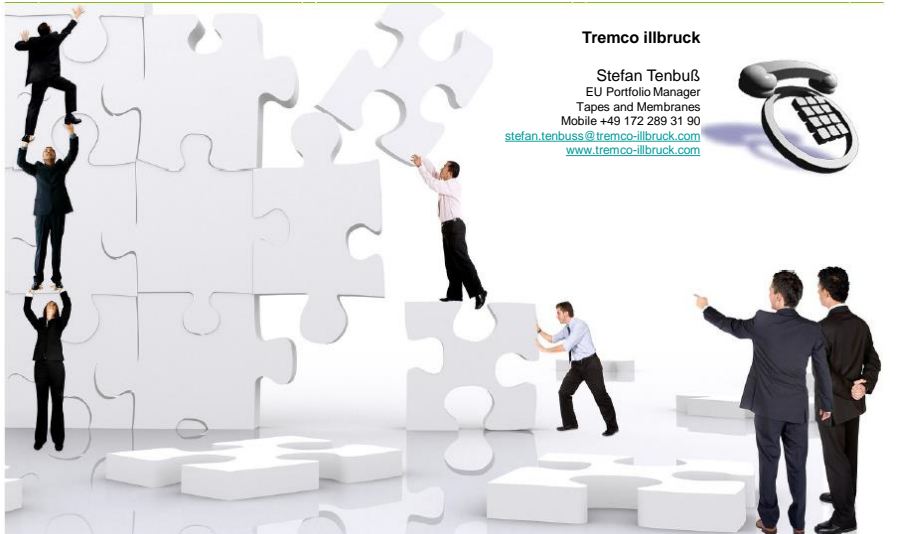


Membranes



Hybrids





Tremco illbruck

Stefan Tenbuß
EU Portfolio Manager
Tapes and Membranes
Mobile +49 172 289 31 90
stefan.tenbuss@tremco-illbruck.com
www.tremco-illbruck.com

