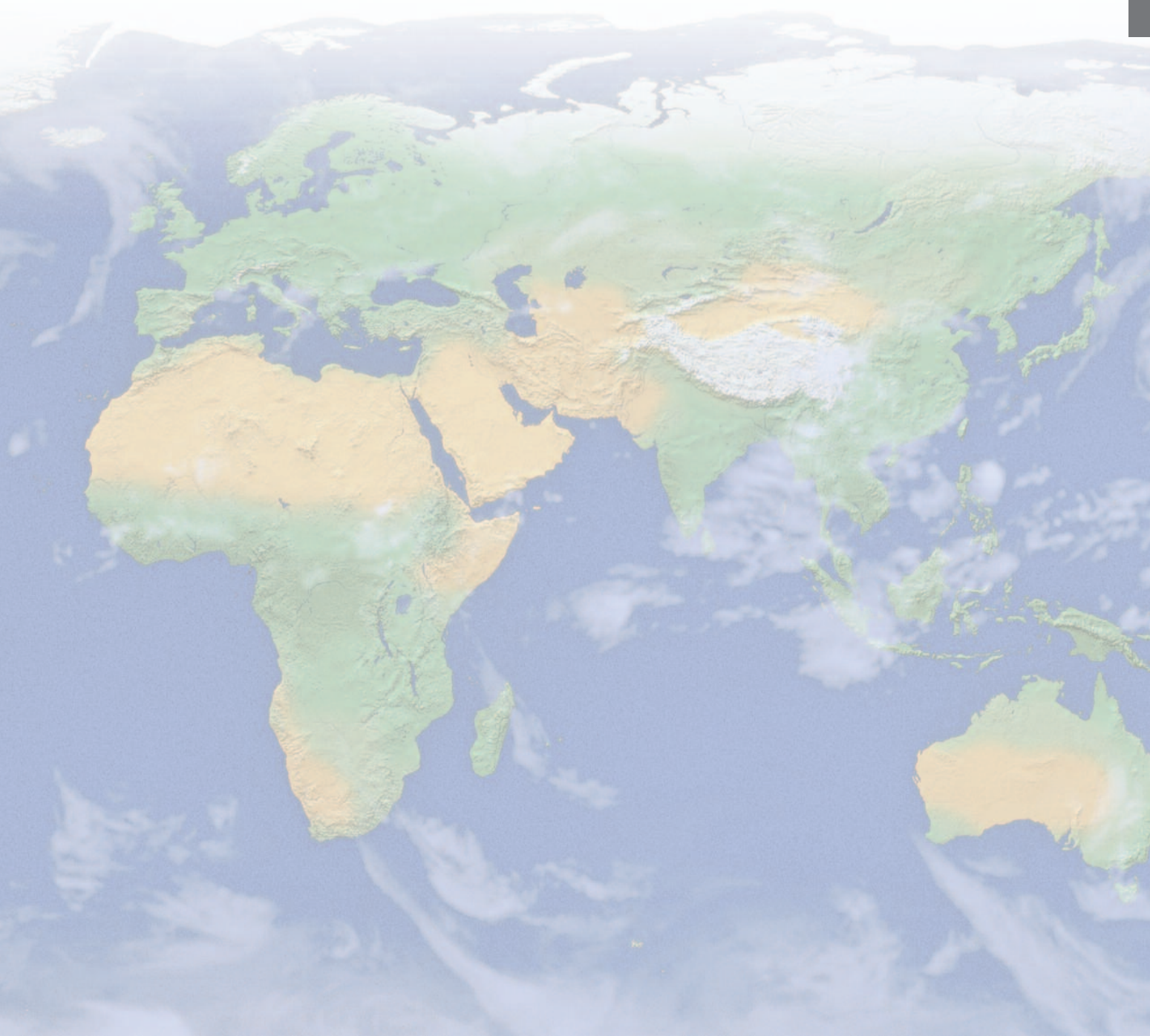


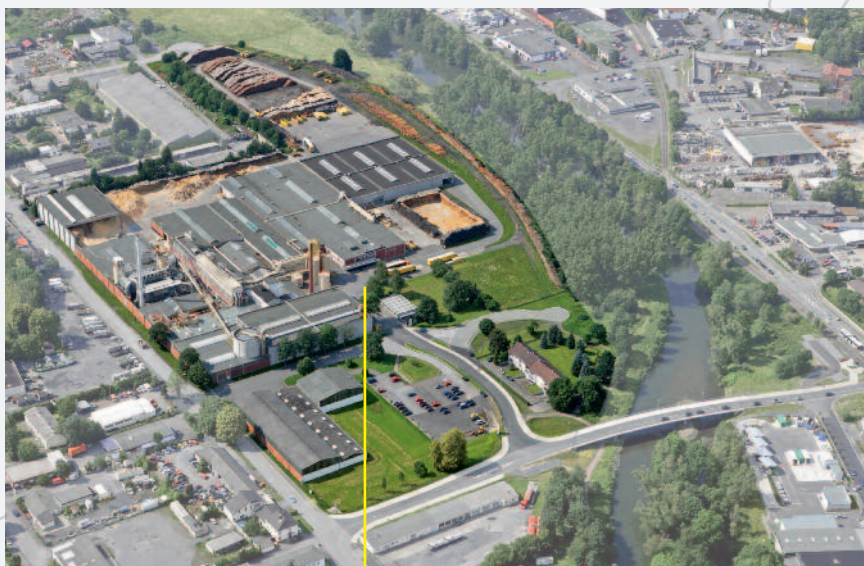


**Sauerland Spanplatte**

*...Solutions for the better door*

---





#### Arnsberg factory

The main factory is located in the centre of the wooded Sauerland region. The company was founded by the brothers Franz and Fritz Flötto.



#### **Natural raw materials**

Local residual wood and chips from saw mills in Sauerland and Thuringia form the basis for our product: SAUERLAND Board.

Approximately 1.3 million cubic metres of softwood are processed annually ensuring optimum and environmentally friendly raw material utilisation.

Qualified staff and a committed management team form the backbone of this family owned company, showing responsibility towards nature and the environment. The company employs approximately 300 workers.



#### Gotha factory

The company started production in Thuringia in 1992. The SAUERLAND Service Centre is located here.



# The Company

**SAUERLAND Spanplatte**



Hubertus Flötotto  
Managing Director



Thomas Flötotto  
Managing Director

## **Company History & Technology**

Since the founding of the company in Arnsberg in September 1951, SAUERLAND Spanplatte produces its chipboard with the extrusion-method, developed and patented by Otto Kreibbaum (OKAL) in 1949.

The increasing demand led to the purchase of the chipboard factory in Gotha in 1991. Production then started in 1992, after the plant had been converted to the proven extrusion technology.

This method is being developed successfully and continuously for over 60 years.

Currently, 37 modern presses produce about 600.000 cubic metres of tubular and solid extruded board in the most diverse varieties.

## **Innovation & Service**

SAUERLAND Spanplatte is firmly established in the international door industry.

Continuous development has created an outstanding

range of products covering almost all fields of modern interior door production.

Due to permanent improvement of the extrusion technology, innovative product development and continuous orientation towards the market needs, we have become a reliable supplier and competent partner for our customers.

SAUERLAND Spanplatte goes far beyond traditional customer service. We offer optimum conditions for joint product development and

its implementation into the construction of the door.

The Service Centre with its extensive range of services sets an example in the industry. Here our customers participate actively in all stages of development, testing and certification.

# The Extrusion Method

*High quality*





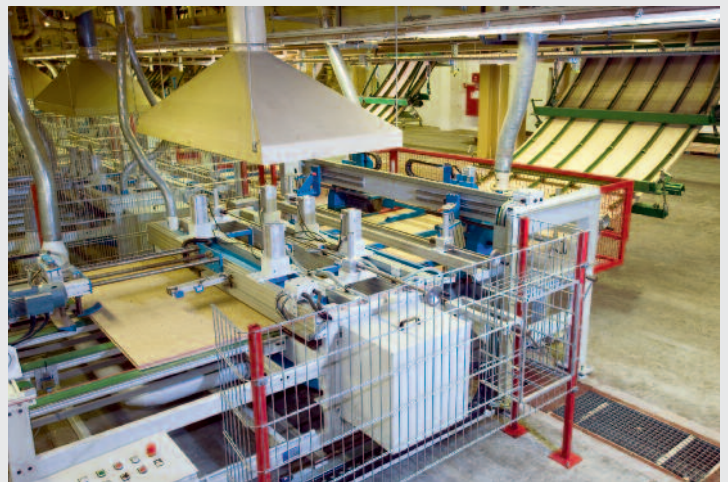
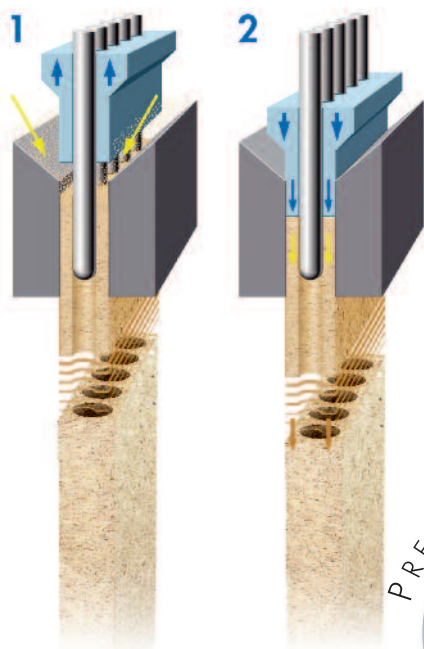
The chipped, dried and glued particles fall through a channel under the ram between the heating plates. (1)

The eccentric ram compresses the particles and continuously pushes the board downwards. (2)

The density of the board is defined by the sliding friction in the press channel. The glued particles harden under pressure and heat.

The continuous stream of board exits the presses vertically, is led to the crosscut saws by sliding bars, cut to the required fixed size and stacked.

After having acclimatised for several days the SAUERLAND Board is ready for dispatch.



# The Product

## The special material

### **Tubular structure – an established design principle**

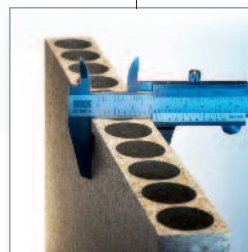
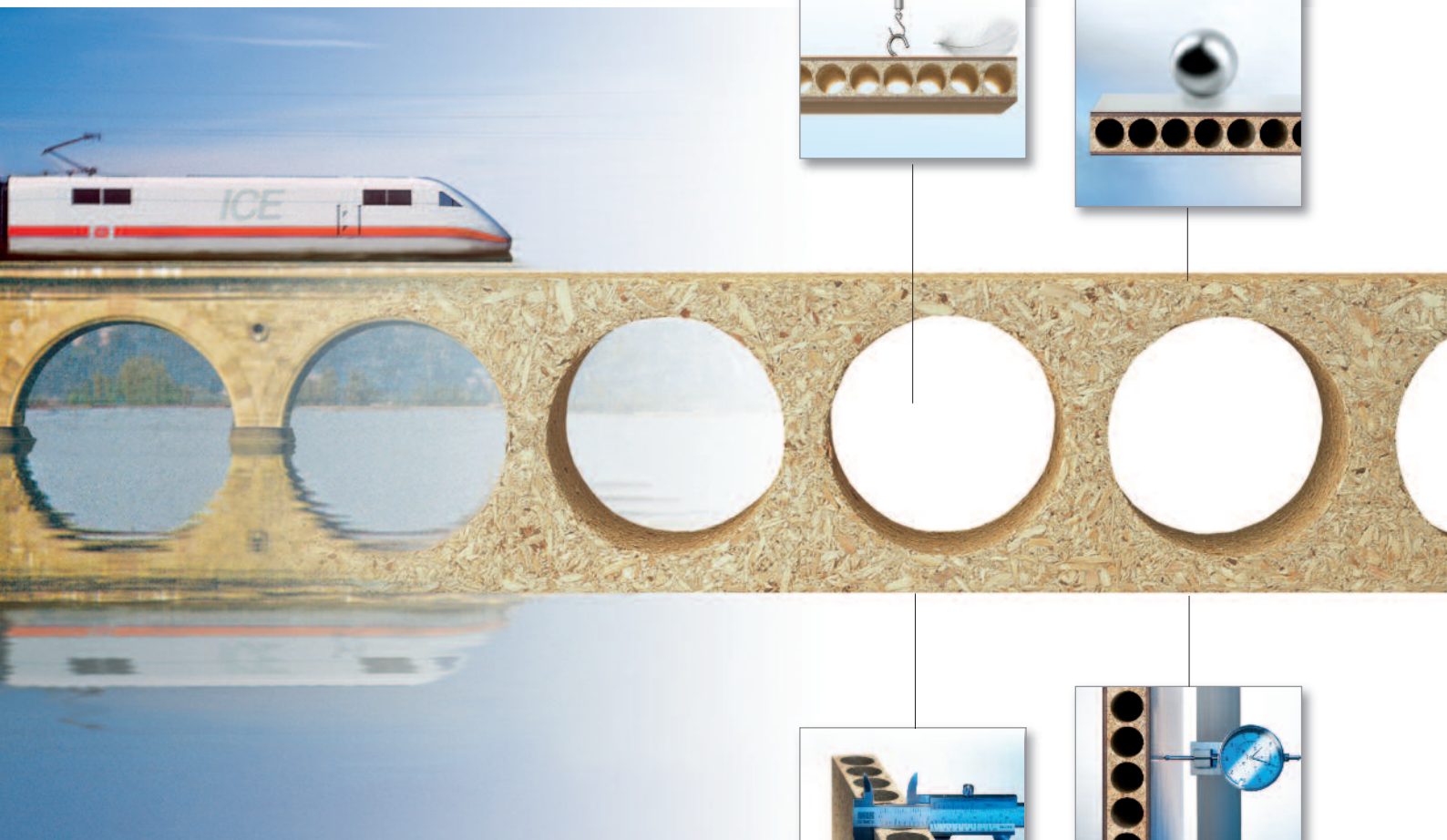
Tubular board makes use of the age-old engineering principle of bridge arches. The analogies are obvious:

### **Weight reduction:**

Tubes reduce the weight of the SAUERLAND Board by up to 60% compared to solid boards.

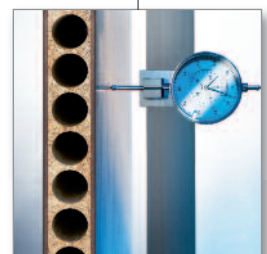
### **Impact resistance:**

Pressure of up to 20 kg/cm<sup>2</sup> will not cause any deformation of the SAUERLAND Board.



### **Thickness precision:**

SAUERLAND Board has a guaranteed thickness tolerance of +/- 0.1 mm.



### **Distortion performance:**

The distortion of doors with SAUERLAND Board is remarkably low.



### ***The special material***

What makes this board such a unique product?

SAUERLAND extruded particle board is manufactured by a special extrusion process, the first continuous production method for wood based materials. This process differs fundamentally from other production methods, which results in the following features and advantages:

#### ***1. It is the only way to produce tubular particle boards:***

- Weight reduction
- Cost reduction

#### ***2. The particles are positioned vertically to the surface of the board:***

- low thickness swelling
- great impact resistance
- high flexibility
- good performance during fire test

#### ***3. Homogeneous density over the whole cross-section of the board:***

- Uniformly high screw withdrawal resistance on all board areas

#### ***4. Solid and tubular sectors can be combined in one board:***



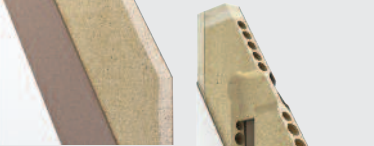



- lock and hinge areas
- profile areas



# Perfect Core

## Summary

The technical characteristics of SAUERLAND Board offer the right solution for every demand and meet all requirements of modern door production.

	Cores	Characteristics
	<b>TUBULAR</b>	<b>High stability and impact resistance, yet low weight</b>
	<b>SOUND</b>	<b>No comparable wood based material reaches the sound insulation values of SAUERLAND Board</b>
	<b>FIRE</b>	<b>The typical positioning of the particles slows down the burn-off rate</b>
	<b>PROFILE</b>	<b>SAUERLAND cores improve the technical and qualitative characteristics even of doors with moulded skins</b>
	<b>STRIP</b>	<b>The advantages of the SAUERLAND technology, yet minimum weight</b>
	<b>FRAMES</b>	<b>Components for frames in individual cut-sizes</b>





#### GENERAL DATA:

Parameter	Description	Size / Weight
1. Thickness:	<b>Solid boards</b>	<b>10 - 42 mm</b>
	<b>Tubular boards</b>	<b>23 - 80 mm</b>
2. Width:		<b>900 - 2,100 mm</b>
3. Length:	<b>Press-line sizes</b>	<b>600 - 1,200 mm</b>
	<b>Special dimensions</b>	<b>up to 3,500 mm</b>
4. Density:	<b>Solid material</b>	<b>420 - 700 kg / m<sup>3</sup></b>
5. Tubes:	<b>Different tube diameters</b>	<b>12 - 48 mm</b>
	<b>Different tube spacings</b> <b>Solid areas possible</b>  <b>Resulting weight, depending on tubes</b>	<b>210 - 460 kg / m<sup>3</sup></b>
6. Glueing:	<b>Increased glue content for frame components</b>	

#### PROCESSING:

Production stage	Variations	Details
1. Cutting:	<b>Customised cut-sizes, strips</b>	<b>Various dimensions, &gt; 10 mm width</b>
2. Stapling:	<b>Multi-layered "sandwich" boards</b>	<b>2-layer - 4-layer</b>
3. Routing:	<b>Different profiles</b>	<b>Various designs and combinations</b>
4. Crossbanding:	<b>Different materials</b>	<b>Cork, rubber cork, HDF</b>





# Tubular Core

**... it's a classic**

Like a bridge construction, Tubular Core provides an ideal combination of light weight and stability.

Compared to solid boards, the weight of Tubular Core is reduced by up to 60%. This impressive fact proves that high quality doors do not have to be heavy.



All SAUERLAND Boards have a very low thickness swelling being rather unusual for wood based materials. This makes them particularly suitable for doors with delicate surfaces.

The special positioning of the particles guarantees a very high impact resistance:

Doors with Tubular Core withstand even the hardest impact – in spite of maximum tube diameter.



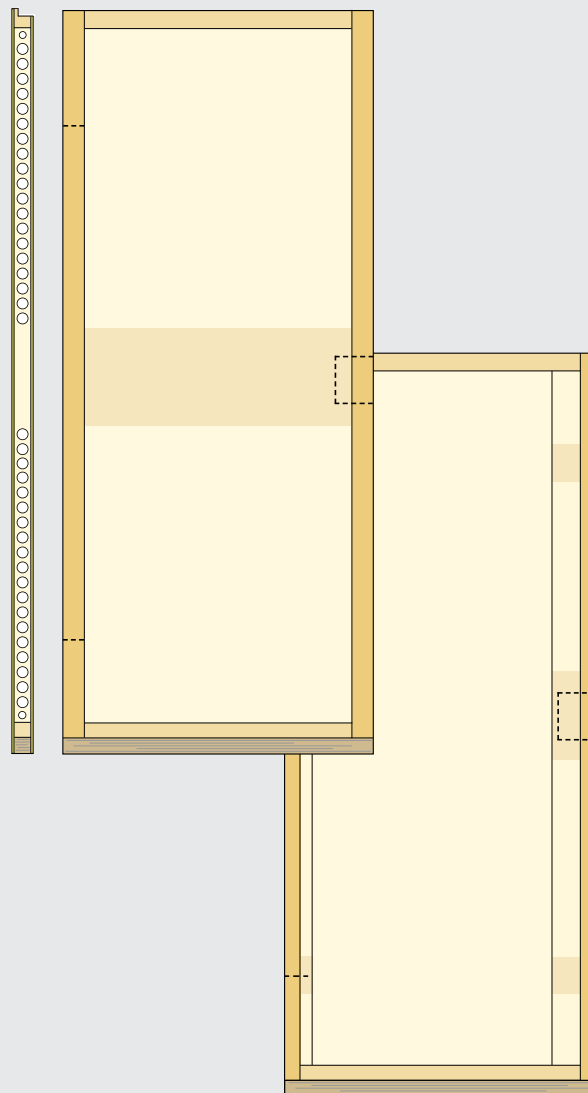
**Weight  
reduction**



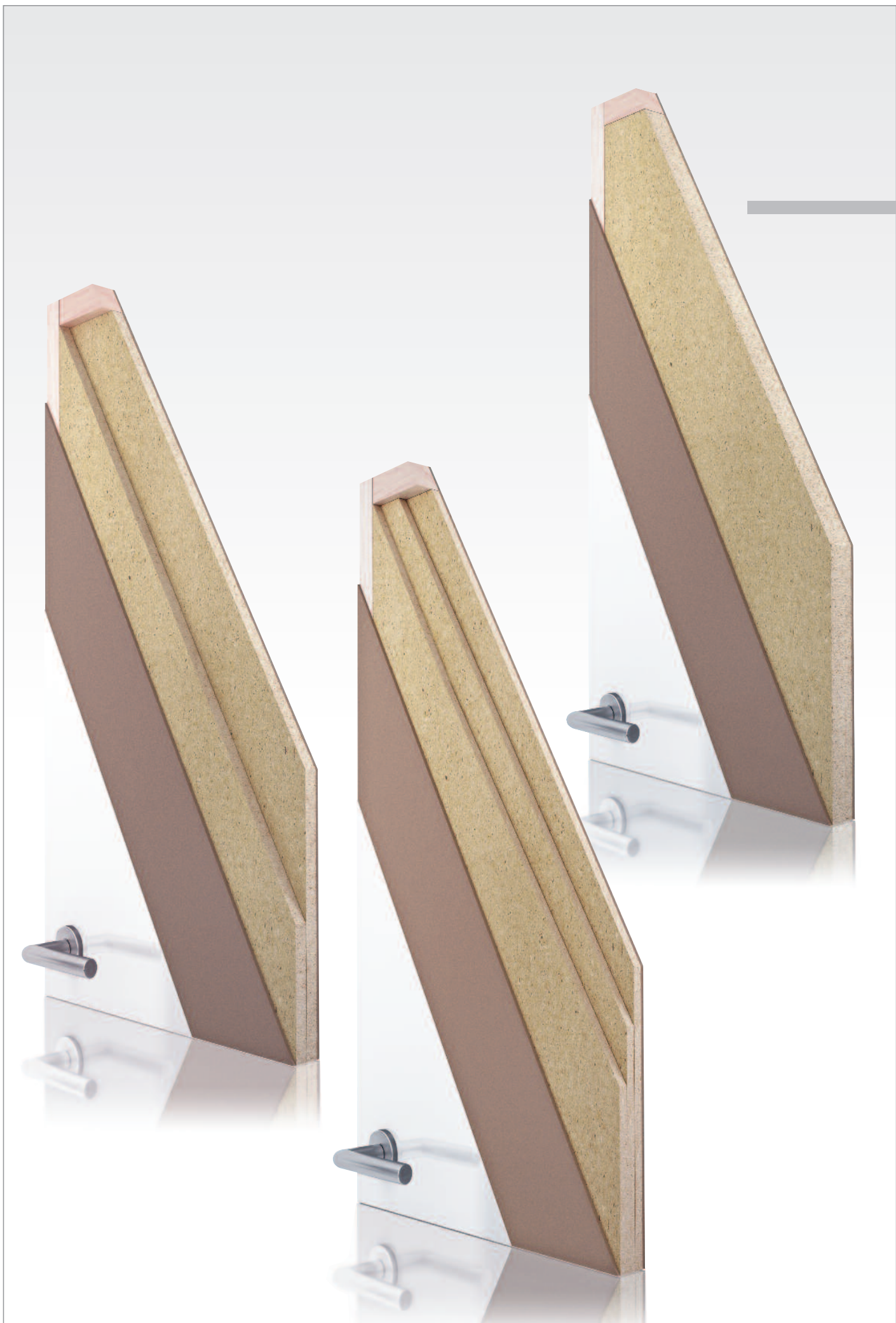
**Thickness  
precision**



**Impact  
resistance**



Type	Tube - Ø	Weight / m <sup>3</sup>
RD	22 mm	<b>300 kg</b>
RT	25 mm	<b>250 kg</b>
RT8	25 mm	<b>210 kg</b>





# Sound Core

## ... top of the range

Door sound insulation is influenced considerably by the following parameters:

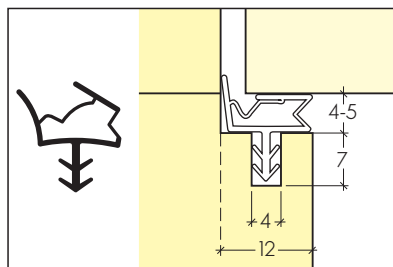
- weight of the door
- flexibility of the core
- sandwich design with a minimum number of fixings between the layers.

The typical structure of SAUERLAND Board results in high flexibility – a prominent feature of Sound Core – allowing to reach the highest sound insulation of all wood based boards.

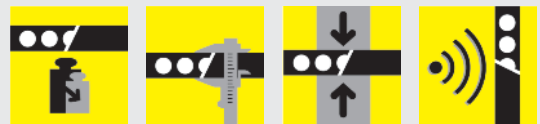
Thickness precision and high impact resistance are important features in sandwich design, achieving the best surface quality and optimum technical values.

Sound Core offers an ideal solution for all these requirements.

**Frame seal**



Sound Core	Achievable insulation values	Application recommendations	
Solid board	<b>32 dB</b>	Apartment entrance doors, offices, classrooms, hotel rooms	)))
2-layer solid board	<b>36 dB</b>		
3-layer solid board	<b>39 dB</b>	Offices, classrooms, hospitals, hotel rooms	))
Multi-layer board	<b>44 dB</b>	Conference rooms, consulting and surgery rooms	



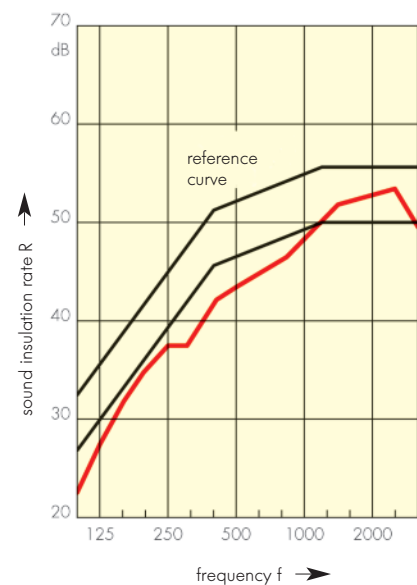
**Weight reduction**

**Thickness precision**

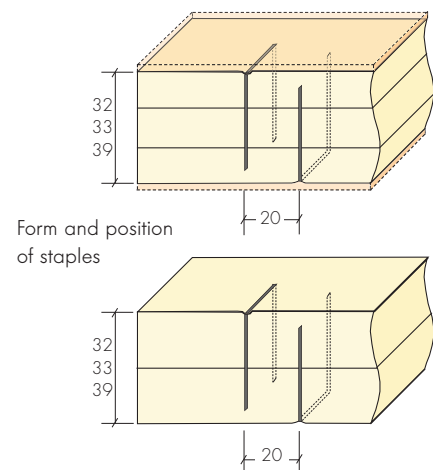
**Impact resistance**

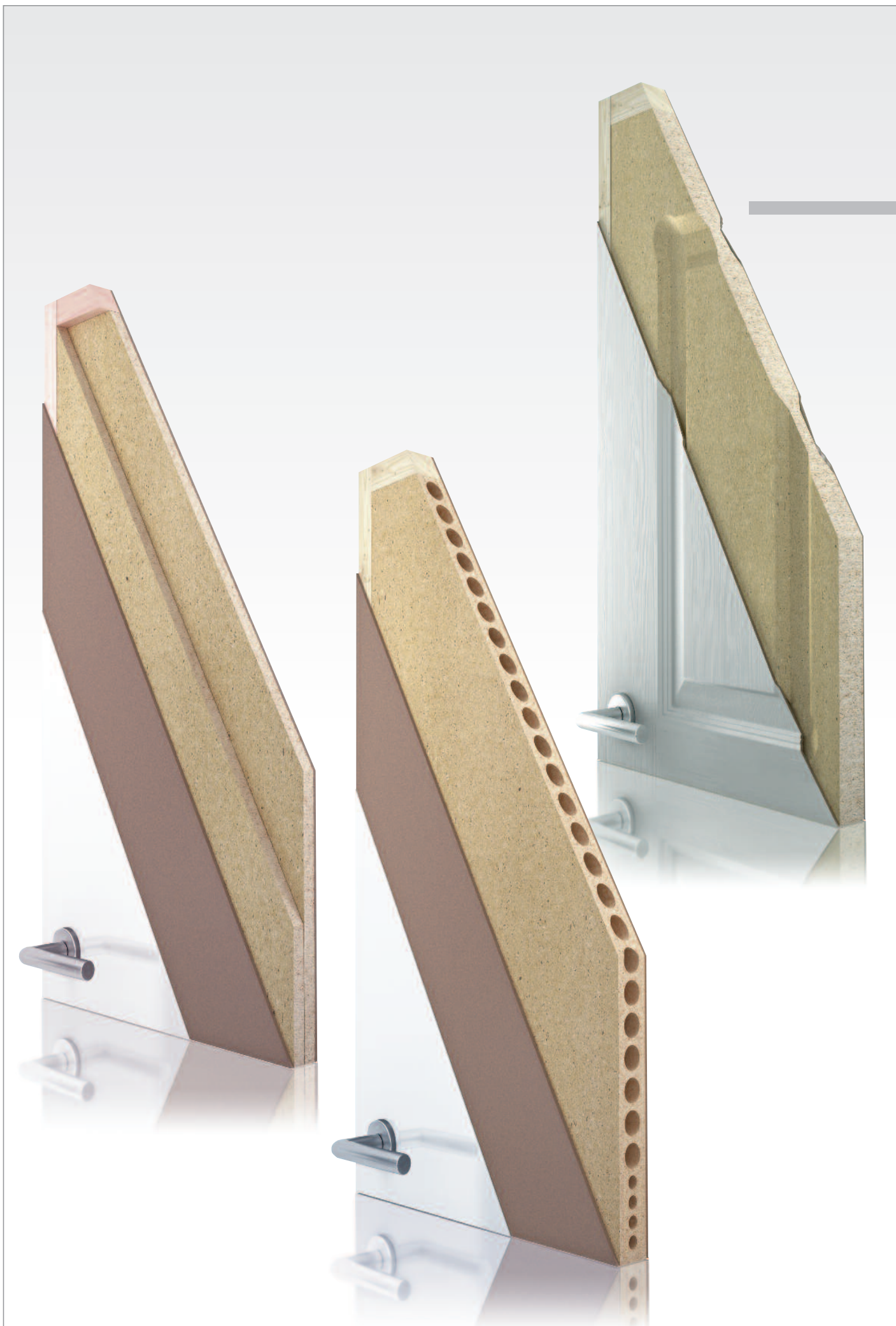
**Sound insulation**

## Sound insulation



## Sound Core with staples, optional with cork







# Fire Core

## ... approved results

Fire Core	Type	Achievable fire resistance
Tubular Core for high-quality flush doors	tubular board: 250 kg / m <sup>3</sup>	<b>20 min</b>
	tubular board: 320 kg / m <sup>3</sup>	<b>30 min</b>
Sound Core for sound insulation doors	solid board: VL, VV, S1M	<b>30 – 60 min</b>
	sandwich board: S2, S3K	<b>30 min</b>
Profile Core for moulded skin doors	solid board: PV	<b>30 min</b>

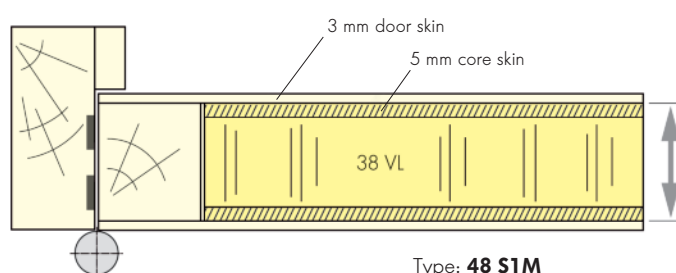
The unique structure of SAUERLAND Board is the main reason for the superior fire resistance of Fire Core without using any fire-retarding additives.

Even at relatively light weight the burn-off rate is very low. This leads to doors with excellent fire rating and stability.

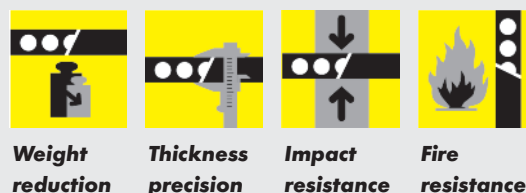
Fire Core is suitable for almost all types of doors:

- flush doors
- profile doors
- sound insulation doors
- multi-functional doors
- glazed doors
- high performance fire doors – more than 60 minutes.

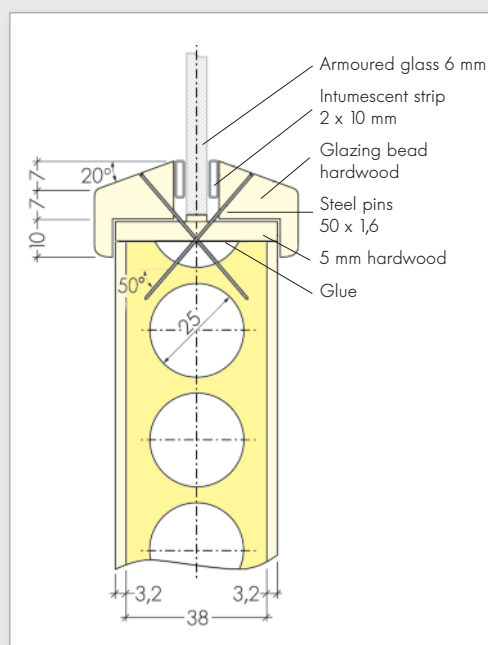
### SAUERLAND Fire Core



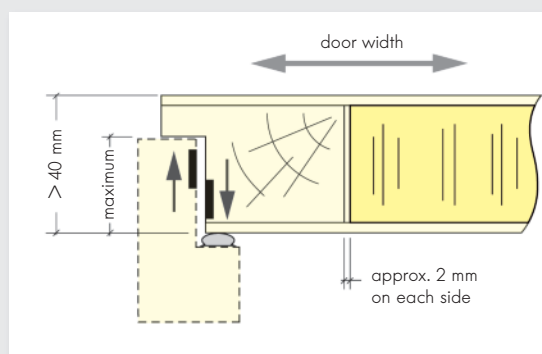
Type: **48 S1M**  
60 min fire and 36 dB sound

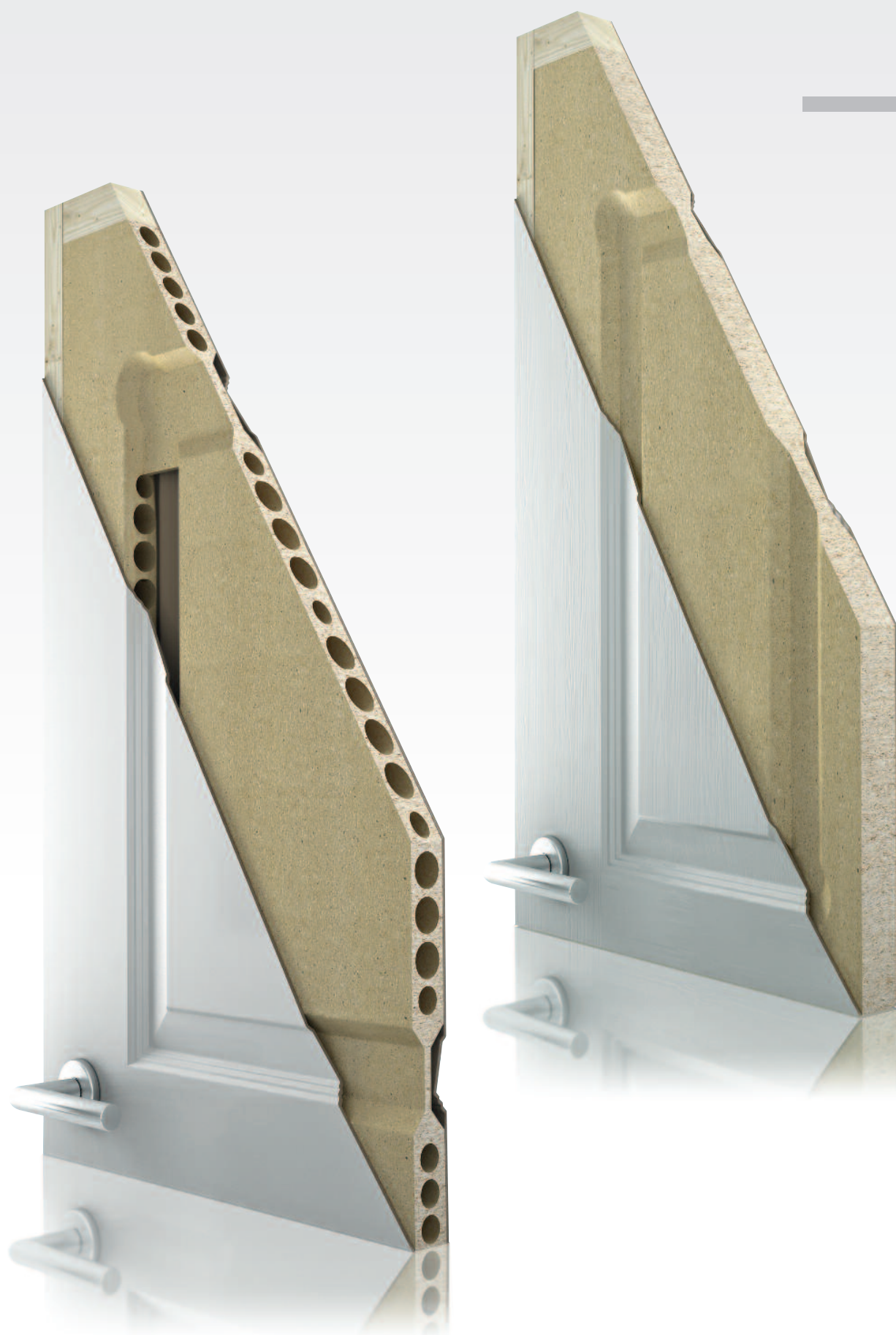


### Glazed door with tubular Fire Core



### Door detail







# Profile Core

## ... customised design

SAUERLAND Profile Core has been developed to meet the increasing demand for solid cores in moulded skin doors.

As a result, these doors show perfect finish, excellent stability and very good sound insulation.

Several options are available:

### 1. Tubular Profile Core

for the light weight heavy duty door with perfect finish.

### 2. Solid Profile Core

for fire rated moulded doors. The structure of the board offers excellent protection against fire – especially important in the vulnerable routed areas.

### 3. Sandwich Profile Core

for high sound insulation values – especially suitable for apartment entrance doors.

Glazed doors use "nail sectors" with low tube diameters.

Profile Core is available for all skin designs, sizes and manufacturers. Mouldings for two or more skin designs can be combined on one board. This reduces the number of stock items.



**Weight reduction**



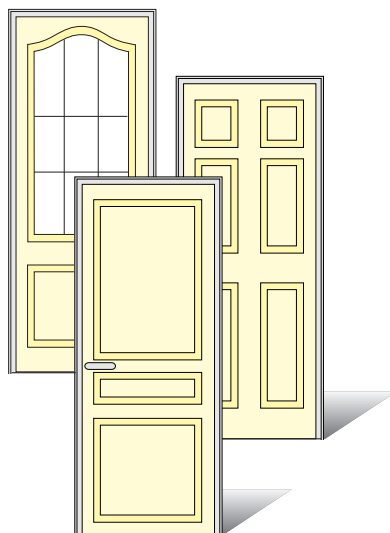
**Thickness precision**



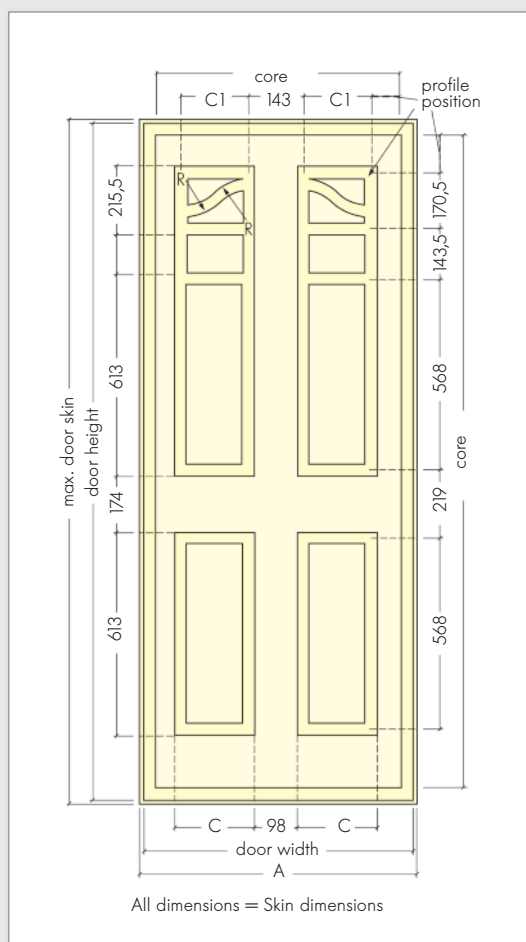
**Impact resistance**



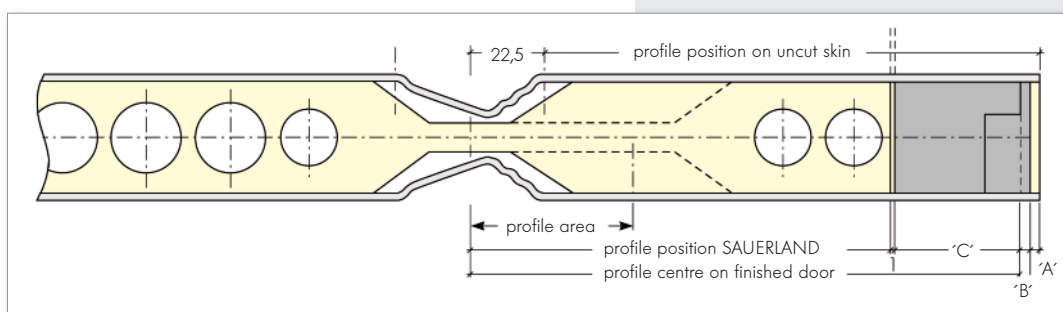
**A wide range of profiles**

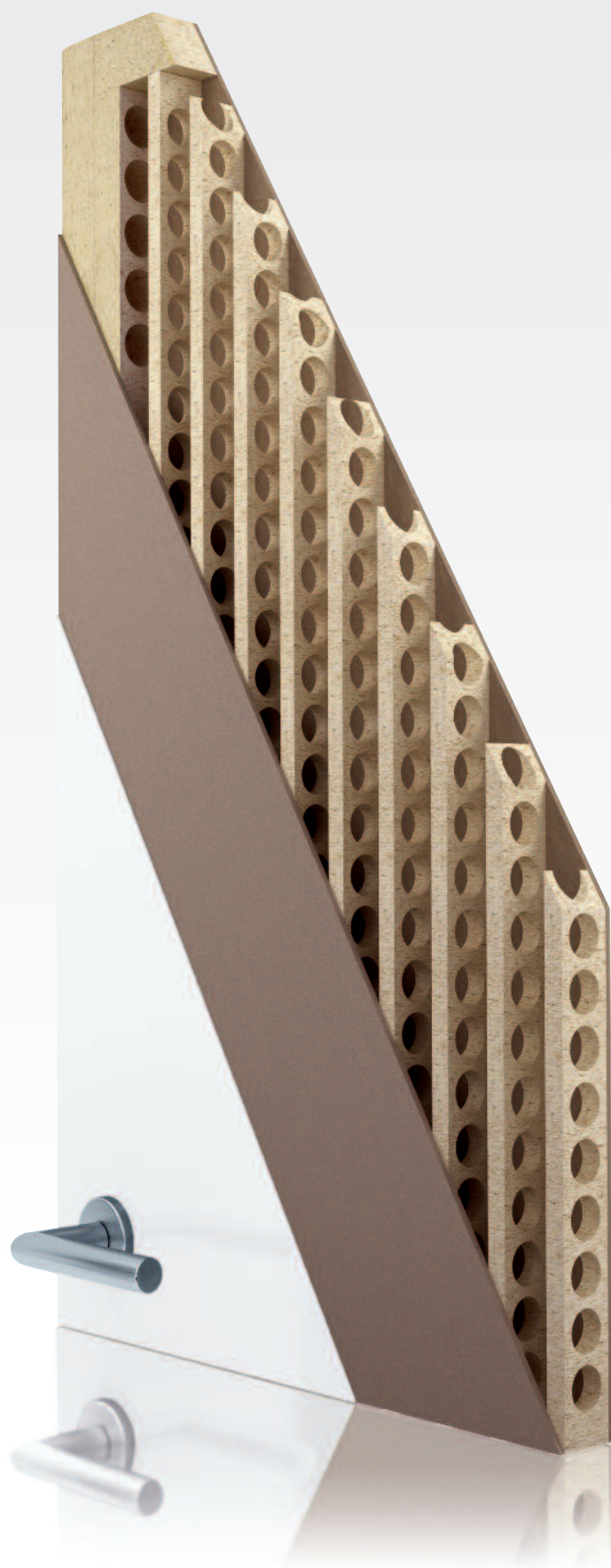


## Core with combined designs



## Door detail







# Strip Core

**... light weight but stable**

Strip Core ideally combines Tubular Core advantages with cost reduction:

- low weight
- high impact resistance
- economical materials usage

Strip Core therefore is highly superior to other hollow cores.

Fully automated assembly lines allow a most economical door production.

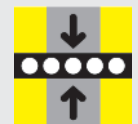
That is why Strip Core is the ideal core for light weight, stable and reasonably priced interior doors.



**Weight reduction**



**Thickness precision**



**Impact resistance**

## 12 mm tubular strips type RZ

Type/design

with tongue:



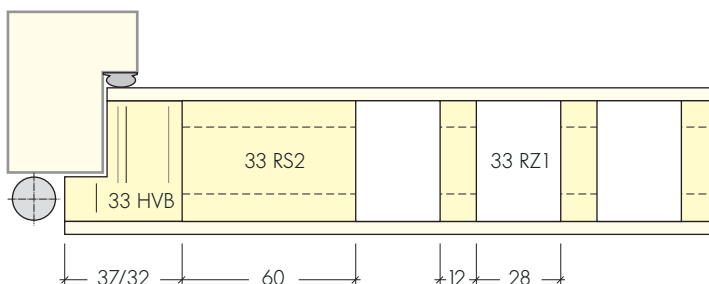
RZ1

flush/rebate:

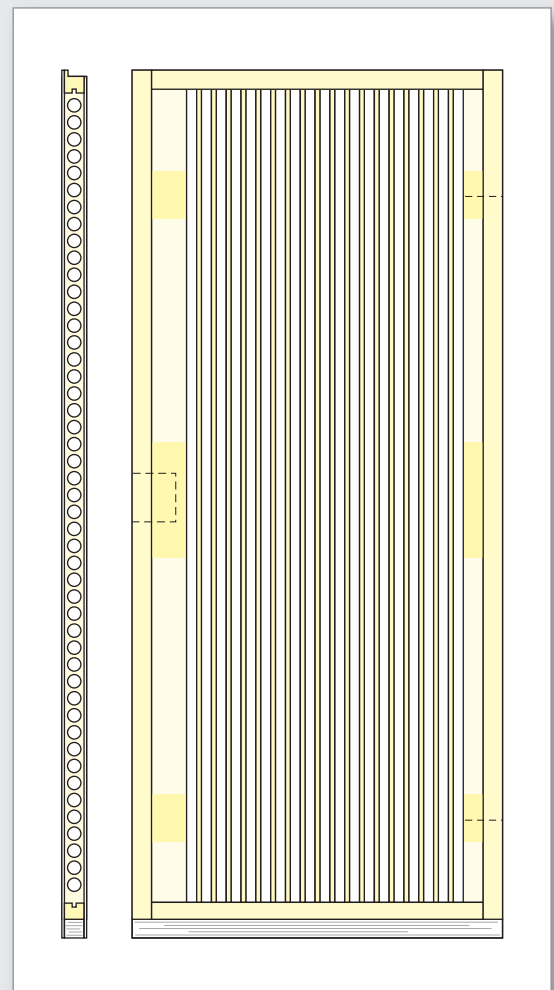


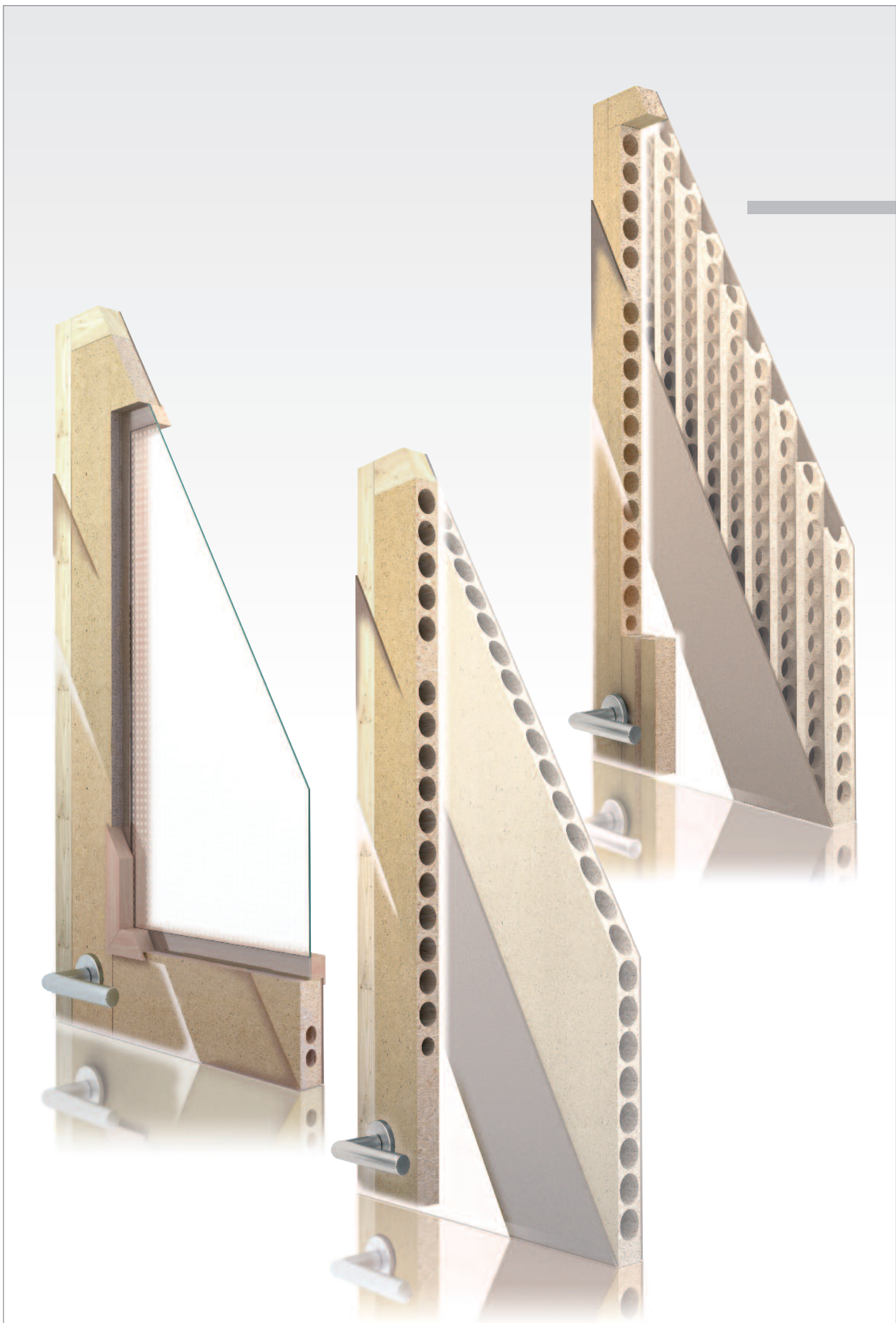
RZ3

## Door detail



## Door with Strip Core







# Frames

## ... individual solutions

This product group includes complementary core components for interior doors:

- stiles
- rails
- stile reinforcements
- lock blocks
- cut-sizes for glazed doors

The following product parameters are especially important for these components:

### 1. High screw withdrawal resistance on all board areas

The special production process of SAUERLAND Board ensures an absolutely homogeneous density. Thus, a uniformly high screw withdrawal is guaranteed on all areas of the components.

### 2. High thickness precision

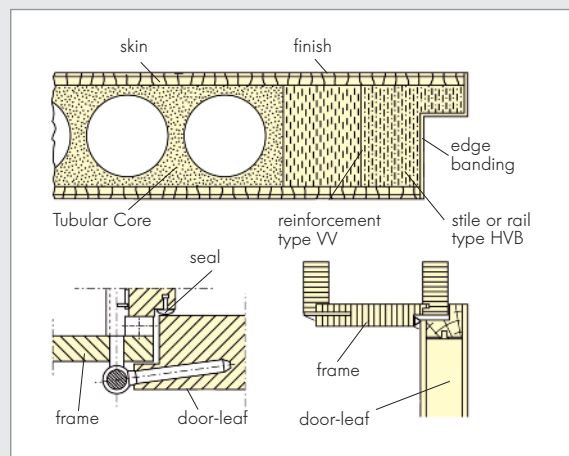
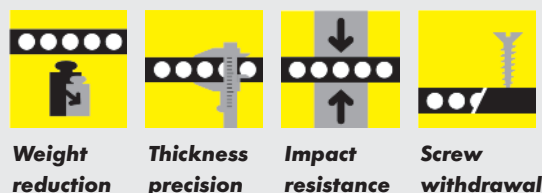
The precision in thickness during production as well as a minimum deformation throughout its lifetime avoid any kind of surface telegraphing even of small components, e.g. lock blocks.

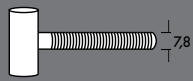
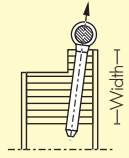
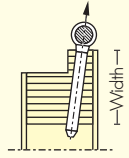
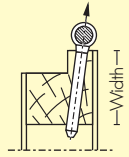
### 3. Most economical materials usage

Combining solid and tubular sectors on one board minimises the consumption of materials.

### 4. High impact resistance

Last but not least, SAUERLAND frame components do not only improve door constructions but also help to save costs.



Hinge Thread		V 0020 M 8	
	Frame width	35 mm	45 mm
	Frame reinforcement	+ RS	
	Pre-drilled hole	7,5/ 6,5	7,5/ 6,5
33 HVA 650 kg/m <sup>3</sup>		4,5 kN	4,5 kN
33 HVB 700 kg/m <sup>3</sup>		5,1 kN	5,4 kN
Spruce approx. 480 kg/m <sup>3</sup>		4,7 kN	5,0 kN

# Core Options

... an overview



**Strip  
Core**



**Tubular  
Core**  
with maximum  
tube diameter



**Tubular  
Core**  
with reduced  
tube diameter



**Solid  
Core**

<b>Sound Insulation</b> <small>DIN 4109</small>	26 dB	29 dB	28 dB	32 dB
<b>Fire Protection</b> <small>DIN 4102    EN 13501</small>	-	15 min	30 min	up to 60 min
<b>Smoke Protection</b> <small>DIN 18095    prEN 14013</small>	-	-	-	optional
<b>Climate Protection</b> <sup>1)</sup>	medium	medium	high	high
<b>Mech. Performance</b> <sup>2)</sup>	medium duty	heavy duty	heavy duty	heavy duty

<sup>1)</sup> Straightness under climatical stress

<sup>2)</sup> Additionally depending on skin, frame and hardware



**2-layer Core**  
**3-layer Core**



**3-layer Core**  
with cork or  
rubber cork



**Multi-layer Core**



**Profile Tubular Core**



**Profile Solid Core**

37 / 39 dB

42 dB

44 dB

27 dB

32 dB

30 min

30 min

up to 30 min

-

30 min

optional

optional

-

-

optional

high

high

high

medium

high

heavy duty

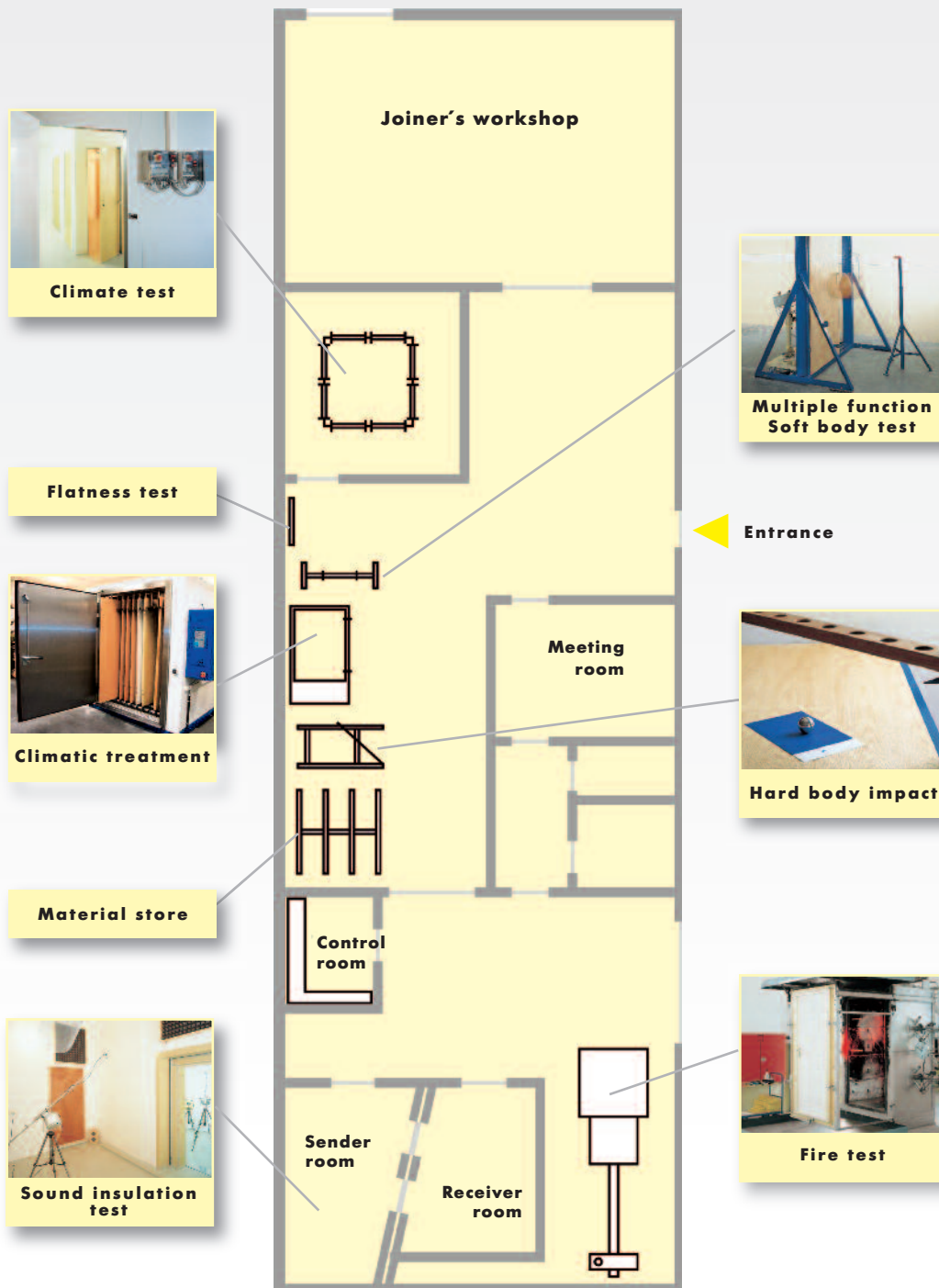
heavy duty

heavy duty

medium duty

heavy duty





# The Service Centre

## Research and development

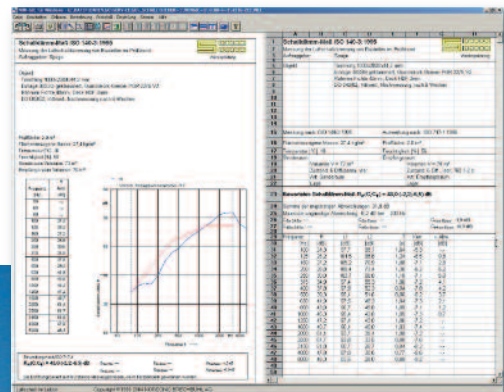
The quality of a door is mainly influenced not only by the optimum choice of materials, but also by its constructional design and the combination of its components.

The SAUERLAND Service Centre in Gotha provides facilities to test the technical performance of interior doors:

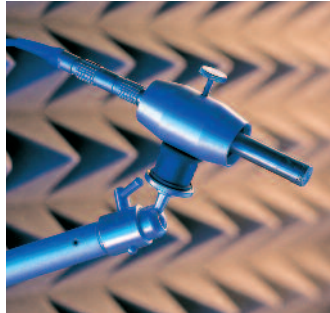
- for the development of products, designs or production processes
- for an in-house check before official testing by authorised institutes
- for a periodic quality control on serial production.

The up-to-date technical equipment and the know-how of our qualified staff guarantee reliable test results.

*Reliable data are the key to successful product development and long-term quality assurance.*



# Sound Test



Sound insulation is tested in compliance with DIN EN ISO 10140 in testing stations that are acoustically fully insulated.

Sound is transmitted exclusively through the tested door element and not through openings, wall or ceiling connections.

By testing both the fully caulked and the operative

condition the manufacturer is provided with important information about the door leaf's performance and the influence of frame, hinges and seals.



## **Our sound testing station:**

- Station and measuring instrumentation comply with DIN EN ISO 10140
- Testing of door sets up to 59 dB is possible
- Opening: 1,030 x 2,015 mm
- Wall thickness: 260 mm; Wall-high elements also available
- Steel frames available: 985 x 1,985 mm DIN left; Special frames can be mounted



# Fire Test



Fire doors principally require the approval of national authorities that is usually granted after testing operating door sets by accredited test institutes.

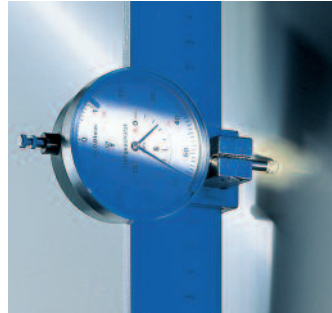
- Different materials and construction details are tested to achieve optimum results.
- Periodical tests of doors from serial production ensure a constant quality level.
- The reduced size of the furnace allows an immediate check on the specimen.
- Moreover these indicative tests are economically interesting for our customers.



## **Our fire testing station:**

- Conditions based on DIN 4102 (EN 1363)
- Temperature and pressure in the testing station are programmable
- Test duration: up to 90 minutes
- Opening: 1,000 x 2,000 mm  
Doors max: 950 x 1,950 mm
- Wide range of fitting variations

# Climate Test



Doors separate either rooms with *equal* temperatures and humidities or rooms with *differential* climates.

Climatic distinctions lead to swelling and shrinking of the components and thus deformation of the door.

In order to meet not only the functional demands in respect of sound insulation and fire protection but also the optical requirements deformation and distortion of the door may not exceed certain values.

The classification of the doors is defined by DIN EN 1530 / EN 12219.

## ■ Test in constant climate:

The doors are exposed all-round to certain climates, e.g. for testing their performance under extreme conditions.

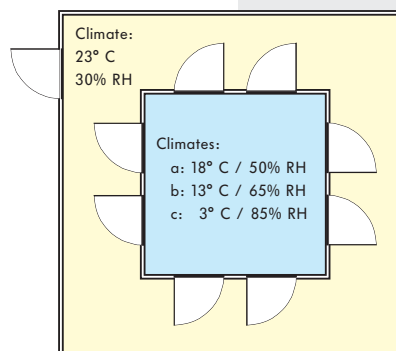
## ■ Test in differential climate:

After conditioning in constant atmosphere the doors separate different climates. Bowing and distortion are recorded over a period of 28 days.

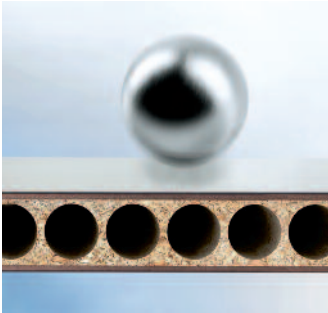


## Our climatic testing station:

- Conditions correspond in the main to DIN EN 1121
- Constant climate:  
Humidity: 30 - 95% RH  
Temperature: 20 - 35° C
- Differential climate:  
Simultaneous testing of 8 doors  
from 3° C / 85% RH up to 23° C / 30% RH
- Deformation and distortion are metered mechanically resp. electronically
- Test opening:  
steel frame 985 x 1,985 mm



# Mechanical Test



The mechanical performance of a door is classified into various stress groups according to DIN EN 1192.

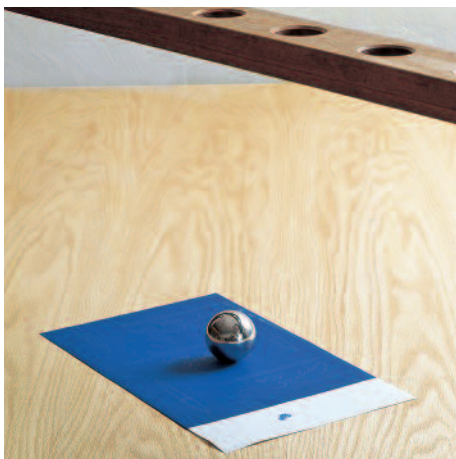
■ The “hard impact” provides information about the surface impact resistance. The quality of core and deck is the decisive factor.

For the following mechanical strains not only the door leaf’s construction but also the choice of fittings – e.g. lock, hinges and screws – is of importance.

■ The “soft impact” simulates stress caused by body impact on the door.

■ The permanent performance check proves that all door elements – glass panels, too – withstand the dynamical strain of up to 100.000 use cycles.

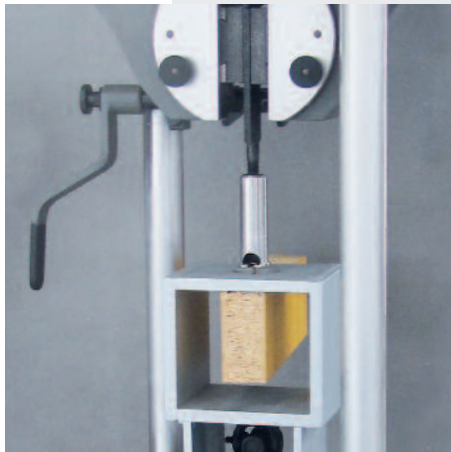
■ The test of withdrawal of screws and hinges is relevant to all mechanical strains.



## **Our mechanical testing station:**

A wide range of mechanical tests can be conducted in accordance with the respective standard. For example:

- Hard impact
- Soft impact
- Multi-function
- Screw and hinge withdrawal





# Raw Materials

Untreated residues from local saw mills provide an environmentally friendly basis for the wood supply. (PEFC-certified)



# Control

The production process is accompanied by continuous quality controls of raw material and finished products.



# Individual solutions

Routed tubular and solid boards, sandwich constructions as well as additional door components cover even the highest technical requirements and guarantee an economical production.



# Tested safety

Independent institutes monitor the products and conduct performance tests. Constructions using SAUERLAND materials have been tested and certified by official institutes around the world.



# Environment, Quality, Service

**Optimized Processes**



## Availability

The extensive warehouse guarantees continuous availability of standard sizes and products made to order.



# How to contact us

**... in Arnberg and Gotha**

You can contact us at any time. Application support on site and qualified advice in our factories are an integral part of our services.

You will find further information in our Technical Manual, on our CD and DVD as well as our homepage.

Headquarters & Production	Production & Service Centre
<p>Sauerländer Spanplatten GmbH &amp; Co. KG Zur Schefferei D-59821 Arnberg Germany</p> <p>Phone +49 29 31 / 876-120 Fax +49 29 31 / 876-151</p>	<p>Spanplattenwerk Gotha GmbH Mühlhäuser Str. 9 D-99867 Gotha Germany</p> <p>Phone +49 36 21 / 21 00-0 Fax +49 36 21 / 21 00-20</p>
<p><a href="http://www.sauerland-spanplatte.de">www.sauerland-spanplatte.de</a></p>	

