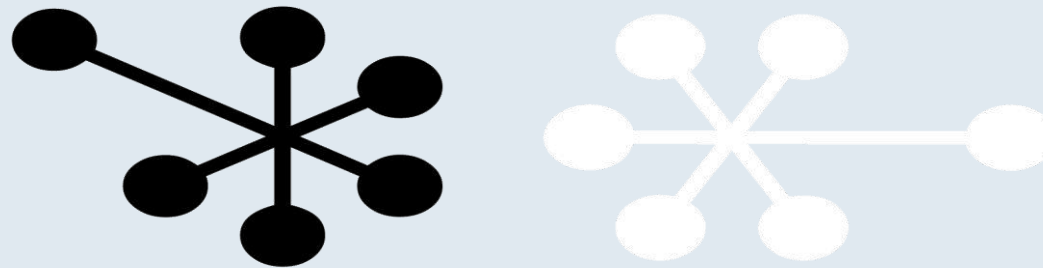


LIFE / FIT FOR REACH



Ohtlike kemikaalide asendamisest –
pakettakende hermeetikud

xx

Juhan Ruut (Hendrikson & Ko)

Ringmajanduse konverentsi ehitusmaterjalide töötuba

06.11.2019



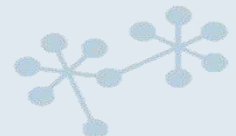
The Project "Baltic pilot cases on reduction of emissions by substitution of hazardous chemicals and resource efficiency" (LIFE Fit for REACH, No.LIFE14ENV/LV000174) is co-financed with the contribution of the LIFE Programme of the European Union.

Partnerettevõtte tutvustus



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TENACHEM

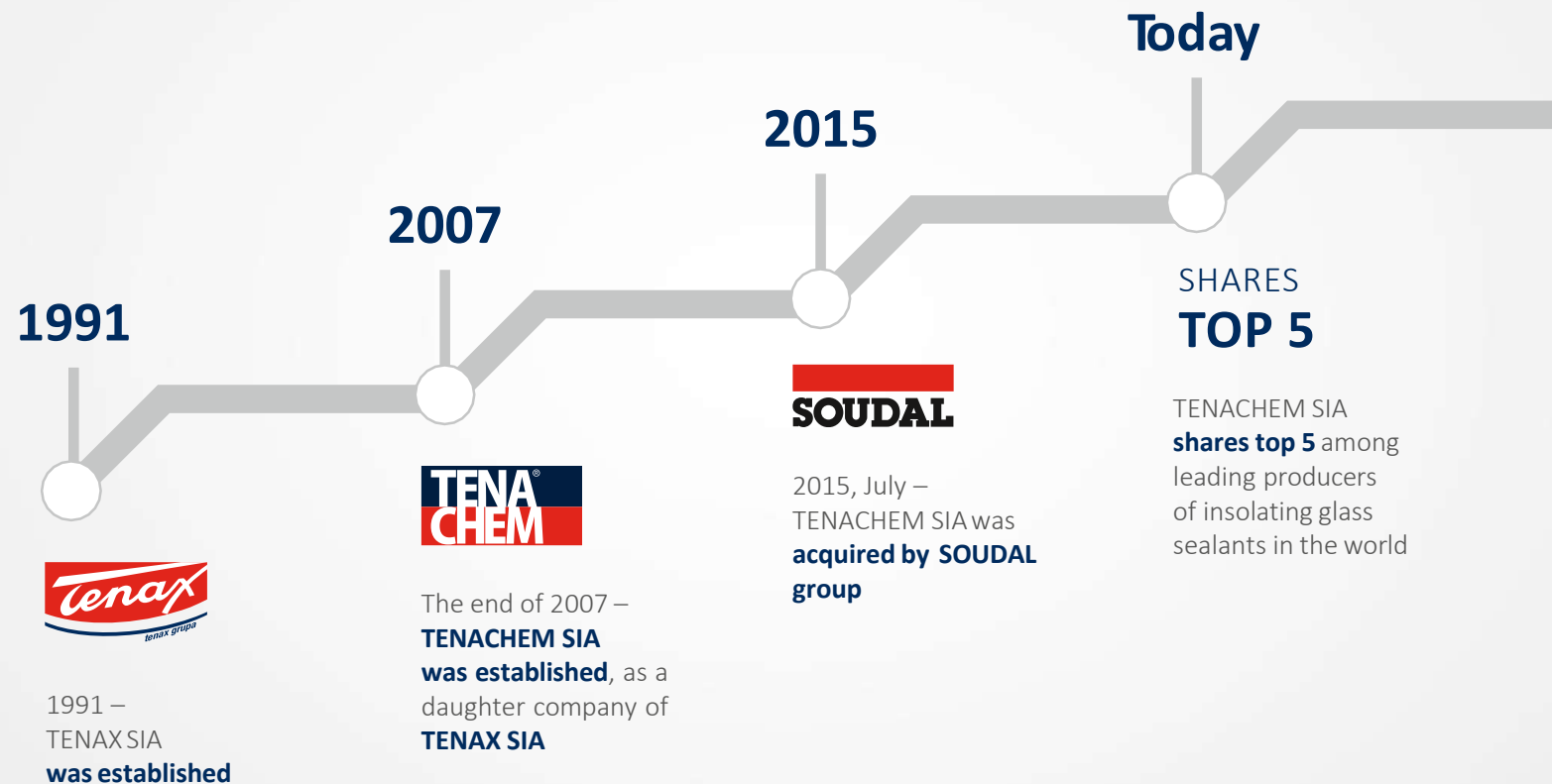
One of the **LEADING EUROPEAN MANUFACTURER** of sealants for the glass industry

The **LARGEST** construction sealant producer **IN THE BALTICS**



PROUD OF OUR HISTORY

TENACHEM is a reliable partner
for its customers and suppliers
for more than 25 years



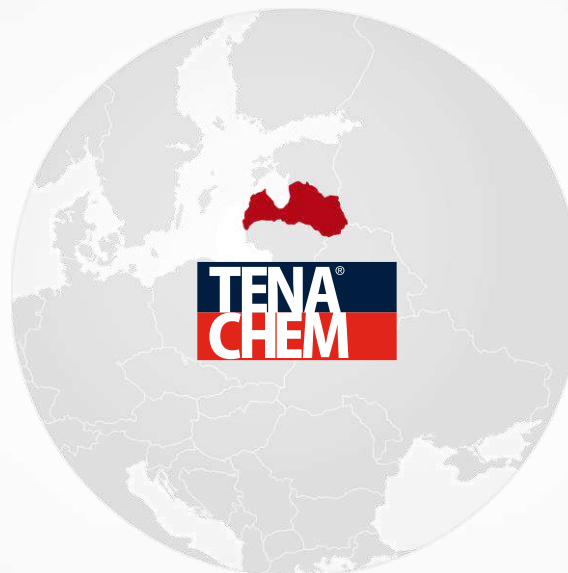
TENACHEM – leading producer



TENACHEM shares
top 5 among leading
producers of insulating
glass sealants
in the world



growth 2016–2017
over **20%**



Exporting **95%**
of all products

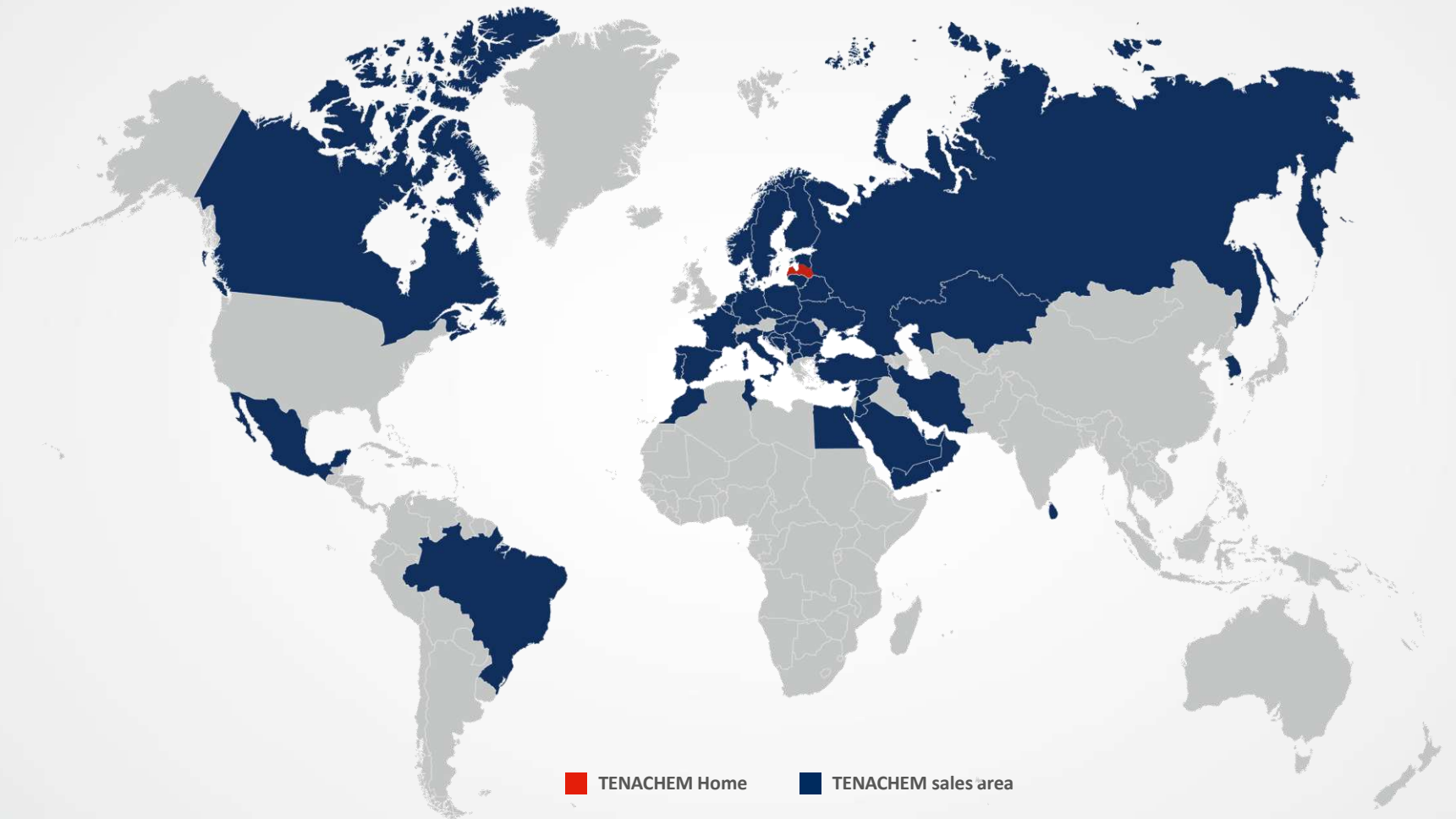


75 employees



Exporting to around
40 countries
worldwide

TENACHEM Sales Area Map



TENACHEM Product Range



Insulating glass sealants and other constituents

TENAGLASS® PU
TENAGLASS® MPU
TENAGLASS® PS
TENAGLASS® MPS
TENAGLASS® 3
TENASIEVE
TENASOL PU/PS
TENASIL



MS Polymer® based sealants and adhesives

TENALUX®
TENABOND®



Construction sealants

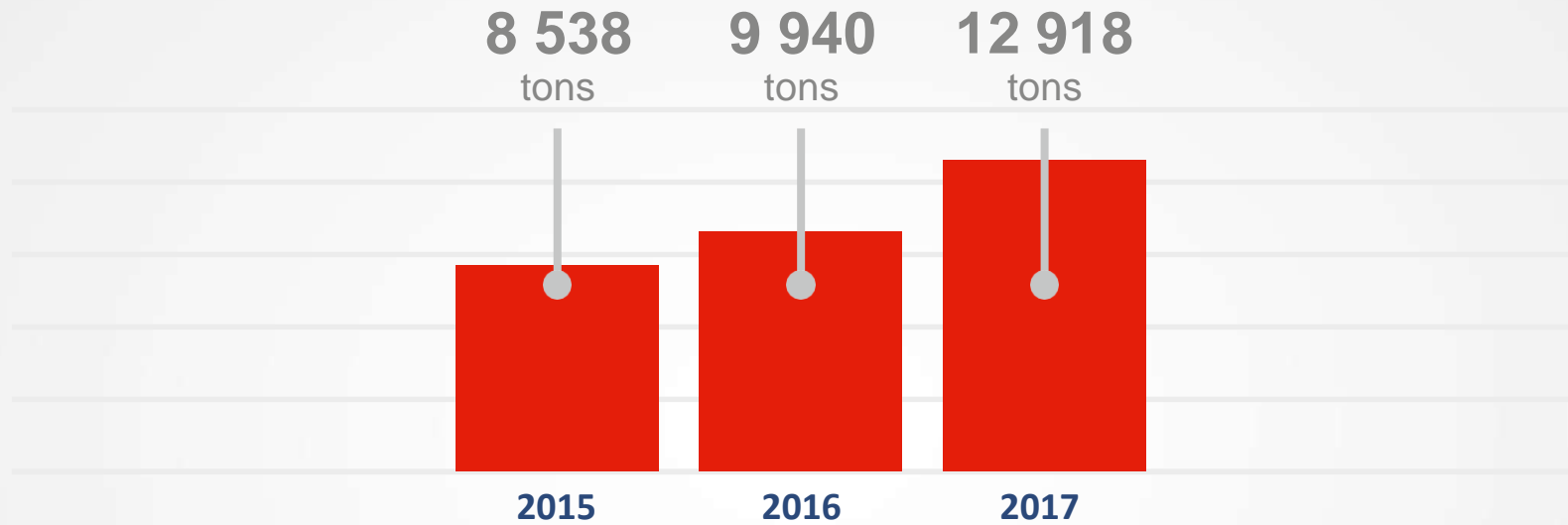
TENAPLASTS®
OKSIPLASTS®



Glues

EP-1-K
88-M
VILATS

TENACHEM Sales Facts

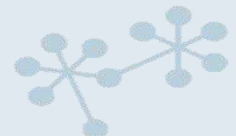


Pakettakendest



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Millest pakett koosneb?

Glass

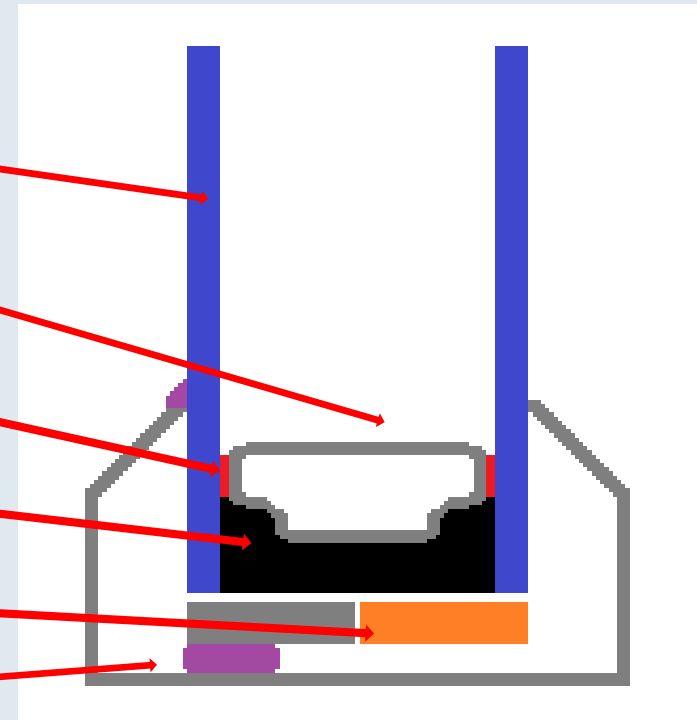
Spacer

Primary sealant

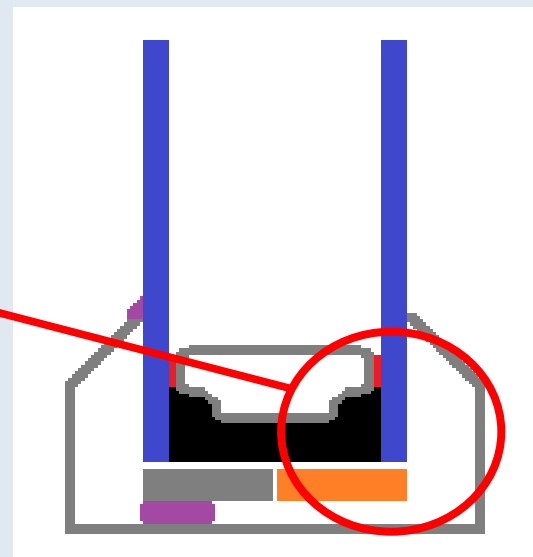
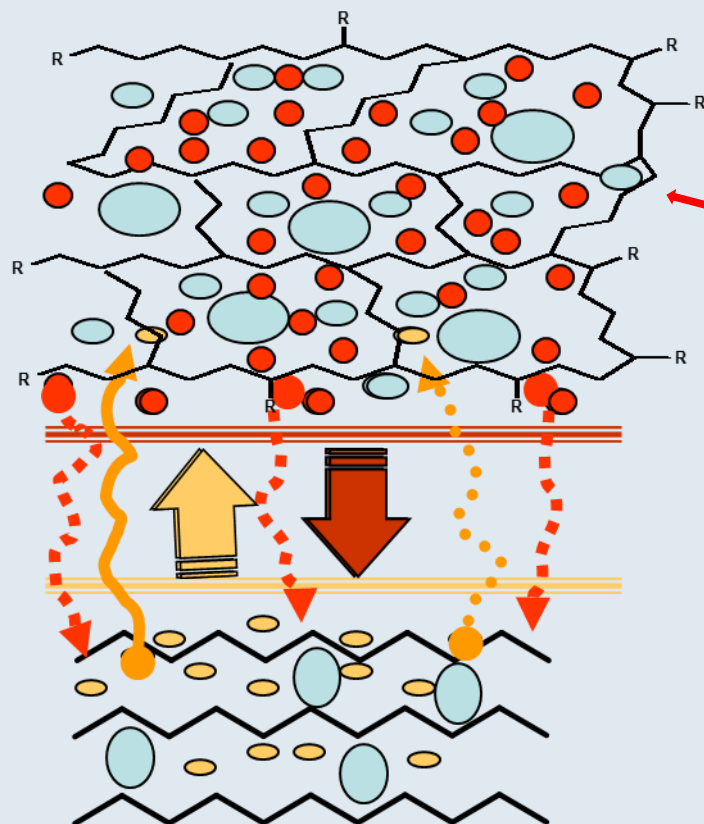
Secondary sealant

IGU glue

Silicon



Kemikaalide sobivus



Erinevad hermeetikud

Price ←			Quality →		
TENAGLASS-	NR	SD	EN:2002	EN:2016	FR
PU	X	X	V	X	V
MPU	X	X	V	X	X
PS	X	X	V	V	?
MPS	V	V	V	X	X
Russian market ←			European market →		



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Hermeetikute tüübid

TENAGLASS-	Polymer structure
PU	$\text{HO} \left[\text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_2 \right]_m \left[\text{CH}_2 - \text{CH}(\text{CH}_2) - \text{CH}_2 \right]_n \left[\text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_2 \right]_o \text{OH}$
MPU	$\text{H} \left[\text{O} - \text{CH}(\text{CH}_3) - \text{CH}_2 \right]_n \text{OH}$
PS	$\text{HS} \left(\text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{S} - \text{S} \right)_n \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{SH}$
MPS	$\text{HS} - \text{X} \left[\text{O} - \text{CH}(\text{CH}_3) - \text{CH}_2 \right]_n \text{X} - \text{SH}$

Standardid

TENAGLASS-	meaning	requirements
NR	Norm	ГОСТ 24866
SD	Standard	ГОСТ 24866
EN:2002	European standard	EN 1279 : 2002 / ГОСТ 24866 : 2014
EN:2016	European standard	EN 1279 : 2016
FR	French standard	CEKAL



Pakettakna sertifitseerimine

EN 1279	Description
Part 1	Generalities, dimensional tolerances and rules
Part 2	Long term test method, moisture penetration
Part 3	Long term test method, gas leakage rate, gas concentration tolerances
Part 4	Methods of test for the physical attributes of edge seals
Part 5	Insulating glass units-Evaluation of Conformity
Part 6	Factory production control and periodic tests

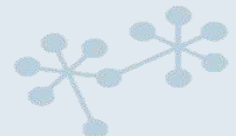


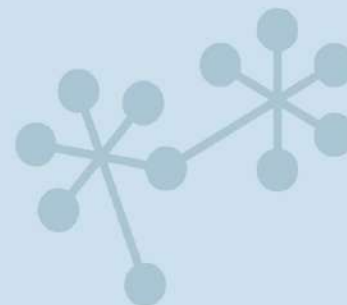
Hermeetikus ftalaadi asendamine



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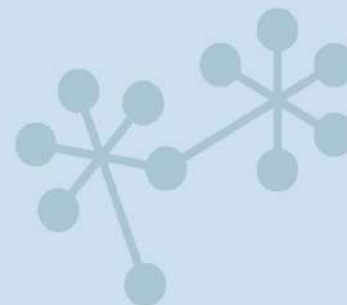




DINP substitution

- Product «TENAGLASS-PU EN» - polyurethane based two component secondary sealant for insulated glass units
- DINP has been substituted with DINCH as plasticizer – structurally similar, but without aromatic structures, i.e. avoiding some of undesired properties of phthalates
- After several trial runs a stable recipe avoiding DINCH leaking was developed, test batches were produced for external testing and certification
- Generally positive testing results were received in April 2019. Some finetuning to increase stability after ageing needed, then product is ready for commercialization





DINP substitution (2)

- DINP - Diisononylphthalate
- “Some uses of this substance are restricted under REACH Annex XVII.
- Although restrictions do not apply for uses under Tenachem, industry tendencies indicate moving away from phthalate-based substances. This is mostly driven due to concerns of potential endocrine-disrupting activities and environmental harms.
- DINCH - 1,2-Cyclohexane dicarboxylic acid, diisononyl ester



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Tootearenduse ressursivajadus



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TENACHEM Benefits Package

The products of the highest quality meet the standards

Quality control system

All necessary documentation / certification

Technical service assistance in setting and adapting of equipment and technical advice

Cooperation with IGU sealant`s equipment producers - LISEC, BYSTRONIC

Central Customer service in various languages



BENEFITS PACKAGE

Local representatives in Europe countries – Germany, Austria, Switzerland, France, Spain, Italy, Portugal, Netherlands, Belgium, Poland, Czech Republic, Slovakia, Romania, Hungary and affiliates in CIS countries

Product Compatibility Tests and Documentation

Flexible logistics system

Soudal warehouses – quick delivery

Product liability insurance from the Soudal Group

TENACHEM Product Quality Control

1. Incoming raw material
quality controlling process

2. Production process
controlling system

3. Multi level end product
quality controlling system



4. Qualified and well process
instructed employees

5. Update Technical
documentation package

6. Exact and professional using
instructions and support from
laboratory specialists

TENACHEM Business Partners



TENACHEM R&D LABORATORY

Tenachem laboratory – **the center of excellence for glass sealants** of the Soudal Group

Latest technologies and equipment

Improvement and development of existing and new products

14 skilled and highly qualified **chemists**

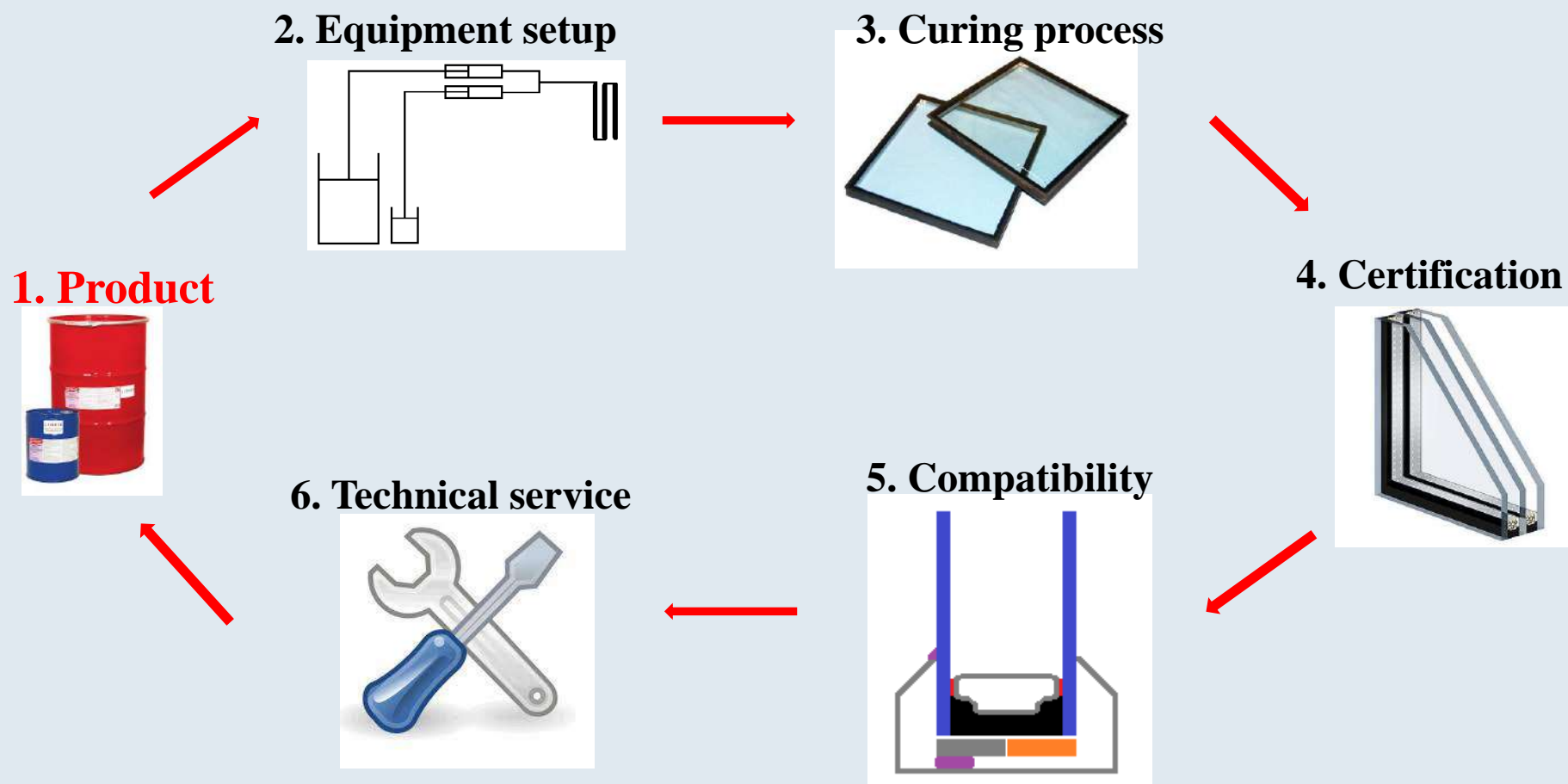


Innovative and competitive solutions for customers – Technical service in clients production site

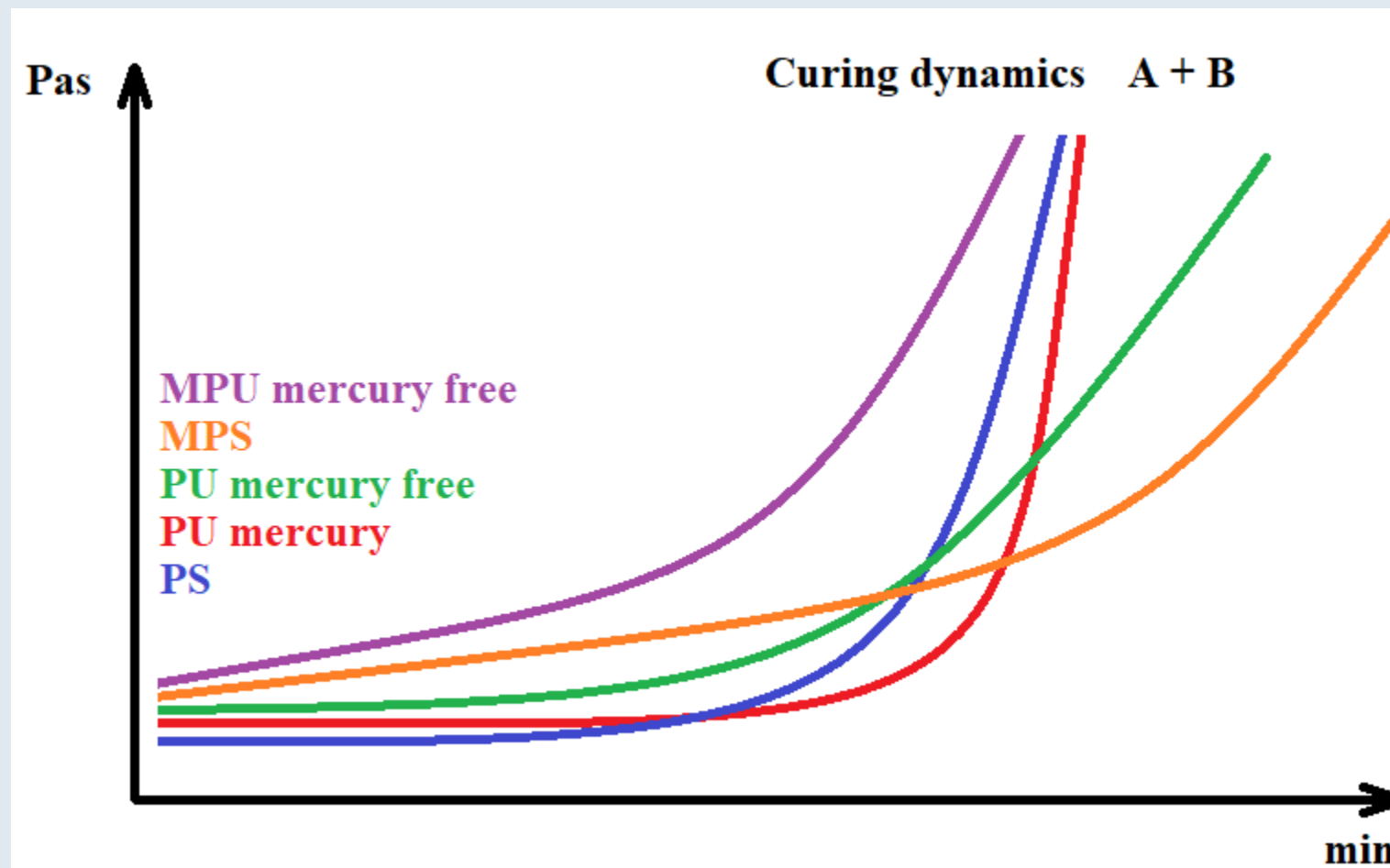
3 employees with **chem. Doc degree**

Cooperation with quality certifying institutions – **IFT ROSENHAIM, TUV, SSV, CSTB** and associations

TENAGLASS

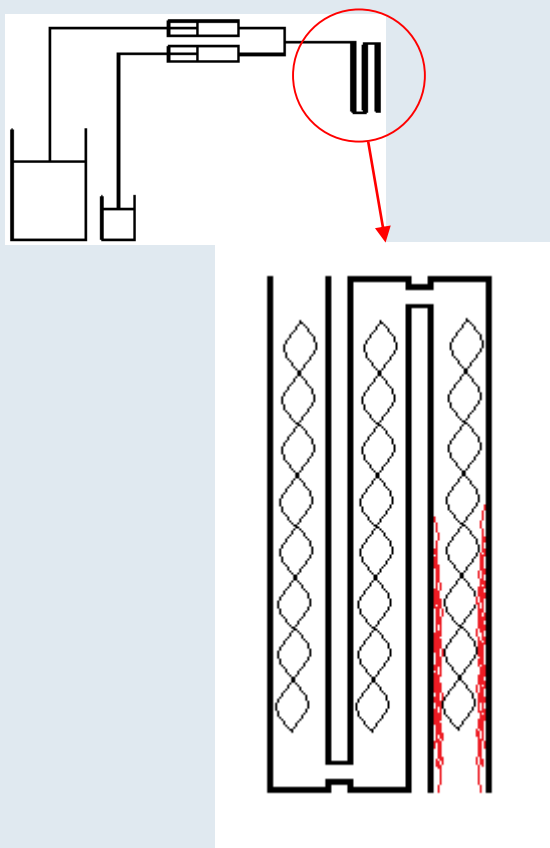


Hermeetiku omadused



Koostise mõju tootmisele

Clogging of static mixer



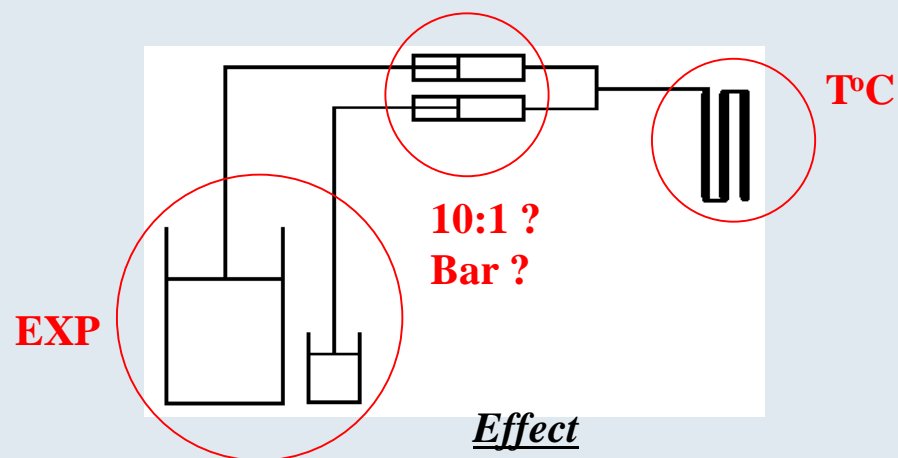
Depends on the temperature - A + B mixture adheres to the surface of the static mixer

Increased pressure – damaging valves

Incorrect mixing ratio – problems with adhesion

- **PU(mercury) - change 1-2 times per month**
- **PU/MPU - change 1-2 times per week**
- **PS - change 1 time per 1-3 months**
- **MPS - change 1-2 times per month**

Koostise mõju hermeetikule



Cause

- 1) Shelf life
- 2) Mixing ratio A:B 10:1?
- 3) Temperature of A+B mixture from the static mixer
- 4) Technical condition of the static mixer
- 5) Technical conditions of the counter valves of B component
- 6) Technical conditions of the filters for B component

Effect

- Slow curing
- Poor mixing quality
- Loss of adhesion
- High pressure in the system (A or B line)
- Sticky surface
- Unfilled corners

Hermeetikuga tehtavad katsed

Test conditions for sealant – glass samples	ГОСТ 24866:99	EN 1279:2002	EN 1279:2016	CEKAL
28d	V*	V	V	V
28d + 7d H ₂ O		V	V	V
28d + 7d 70°C		V		V
28d + 96h UV		V		V
28d + 504h UV + 7d 60°C at 95% R.H			V	V
28d + 1008h UV at 95% R.H.				V



RESEARCH & DEVELOPMENT

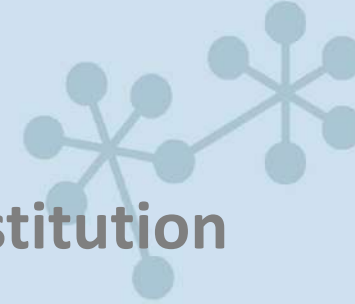
5 million EUR – Soudal group annual Research & Development budget

Soudal Group continually innovates and develops **new products**



Long term vision for **innovations** have resulted in the success of the Group

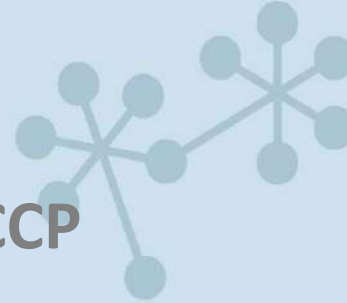
TENACHEM is developing as **the center of excellence for glass sealants** of the Soudal Group



Other Cases : Dibutyltin dilaurate substitution

- Product “Oksioplasts” – 2-component polyurethane based construction sealant for joints and cracks
- Dibutyltin dilaurate has been entirely substituted with dioctyltin dilaurate, similar percentages used
- Substitute – still hazardous but not CMR anymore
- Product performance or price have not seen substantial impacts – end consumers do not notice differences
- No major obstacles encountered
- Duration of the project 18 months, related costs 30 000 €





Other cases: Partial substitution of MCCP

- Product «TENAGLASS-PS» - polysulphide based two component secondary sealant for insulated glass units
- Aim is to substitute MCCP as plasticizer in component B with other – non-environmentally hazardous
- Laboratory scale research has begun, test batches to be produced by end of the year



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Kontaktid

- [*http://fitreach.eu/et*](http://fitreach.eu/et)

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Tänan kuulamast!



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