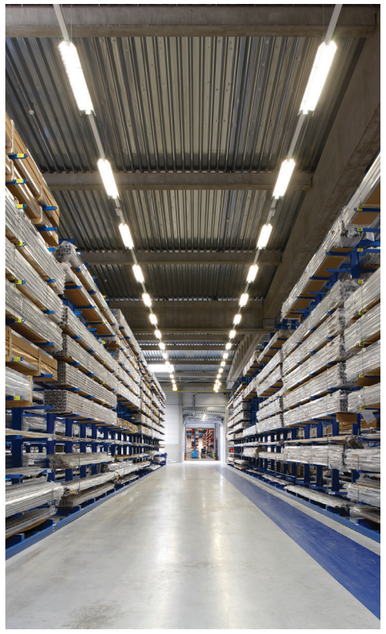
REYNAERS CAMPUS

REYNAERS
aluminium

TOGETHER
FOR BETTER



INTRODUCTION

Since the company's creation in 1965, Reynaers Aluminium has been playing a leading role in the construction industry. Its profile systems have evolved from aesthetic modules to state-of-the-art building components.

In order to facilitate innovation in its field, the Reynaers Campus was established in 2017. This unique campus with a total surface of 283.000 m², focusses on sharing the know-how and experience with architects, fabricators, contractors and other building partners while inspiring them with new technologies.

The Reynaers Campus includes:

- **Operations Centre**: to serve customers worldwide
  - **Logistics Centre**: 62.000 m² warehouses and quality control
  - **Production Centre**: the insulation centre of excellence, ERAP
- **Research and Development**: to boost the innovation
  - **Technology Centre**: to increase knowledge and officially certify solutions
  - **Training & Automation Centre**: to share knowledge and assist customers
- **Experience Centre**: to explore future buildings in **AVALON**, discover the unique offering of Reynaers solutions in the experience room and come together in the auditorium
- **Sales, Technical support and Customer service** of Reynaers Aluminium Belux and Roval Belux
- **Head Office** with strategic, supply chain, ICT and controlling departments supporting the Reynaers Group

The Reynaers Campus is much more than just a building. It is a state of mind and a permanent incentive to implement core values such as partnership and innovation. It is an international communication forum and a source of inspiration for all those involved in the building process.

Watch our corporate videos:

TRAINING CENTRE

At Reynaers Aluminium we endorse the importance of qualitative production and installation for the long-term performance of our aluminium systems. That is why we maintain daily contacts with a strong international network of professional manufacturers and designers and why we advise and train our customers.

We organise numerous training sessions in order to teach our customers the necessary skills and know-how enabling them to provide their own customers with high-quality service. Our practical training is made up of both standard and specialised courses (assembly and installation) as well as software classes.

Reynaers Aluminium organizes an average of 1800 training days every year (around 1200 practical training courses and 600 software training courses) for our customers and own employees. The trainees come from all over the world.

TRAINING OFFER

1. ASSEMBLY TRAINING

A professional trainer guides you through the process of efficiently producing a qualitative Reynaers system: turn-tilt windows, flush doors, sliding or folding doors, curtain walls, or any other Reynaers system. At the same time, you learn to operate specific tooling and dedicated machines for the required operations:

- profile sawing
- profile operations (milling, drilling, punching,...)
- corner connections (crimp or screw connections)
- gasket application
- fitting of the window/door hardware
- glazing beads
- positioning of the glass supports

Watch our training videos:

2. INSTALLATION TRAINING

The correct installation on site is very important for the functioning of the finished elements. During this training, the specific building connections and the glazing of the elements are explained, with special attention to airtight building connections with ReynaConnect. Additionally, all possible adjustments to the hardware are demonstrated to fine-tune the elements.

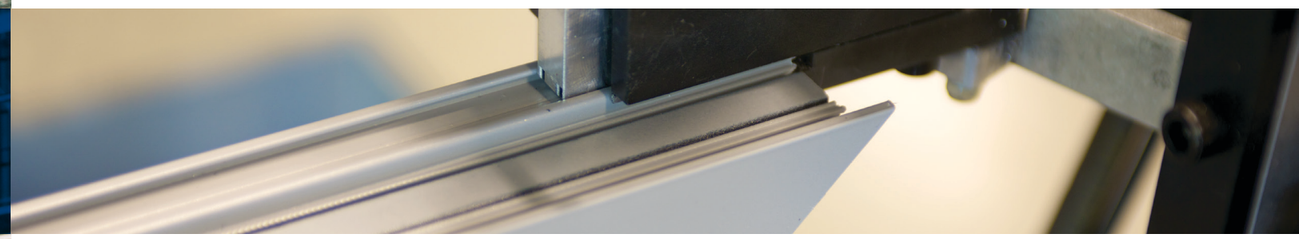
3. SOFTWARE TRAINING

This dedicated training focuses on the use of the ReynaPro software. This Reynaers software solution is created for calculation and manufacturing of windows, doors, sliding systems and curtain walls. In addition to the availability of the complete Reynaers system database, the ReynaPro software provides links to miscellaneous machines to automate the production process.

Modules:

- calculation of the moments of inertia and the U-value
- CAD-section generation, order list and production schedule
- calculation of cost price and sales price
- creation of an attractive and visual presentation
- CNC database, CNC management, clamping positions, tools, operations

AUTOMATION CENTRE



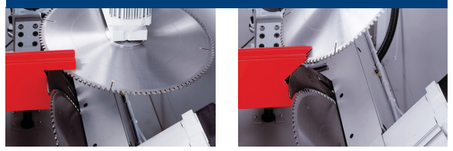
Reynaers Aluminium offers a full range of automation solutions to the customer through dedicated partnerships. Every stage of the production process can be optimized using a fine-tuned combination of the right experience and know-how, state-of-the-art machinery, the most recent technologies and an optimized link with the ReynaPro-software. In this way, the fabricator gets the opportunity to produce in the most efficient way, reduce costs and increase profitability.

In order to realize this, Reynaers Aluminium selects the best performing and most suitable solution for every type of operation on our profiles. For most operations, **conventional tooling** are available. This is the first step to increase efficiency and quality.

- **Multifunctional punch tool:** for all simple operations on profiles
- **Notching saw:** high quality tooling for the notching of curtain wall transoms
- **Copy routers:** specialized copy routers are available for more complex operations to profiles
- **Glazing bead / single head saws**: a range of sawing machines for small profiles

MULTIFUNCTIONAL PUNCH TOOL

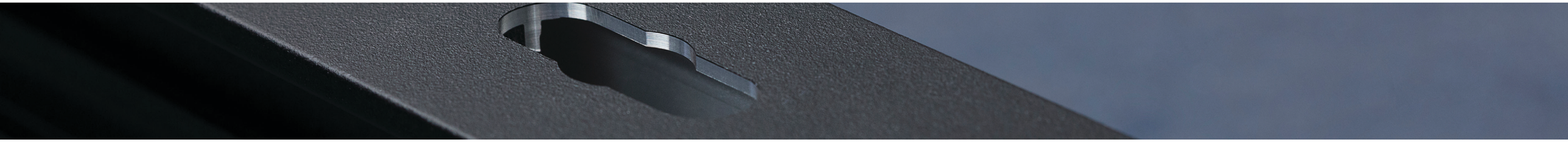
NOTCHING SAW



COPY ROUTERS

SAWING GLAZING BEADS

SINGLE HEAD SAW

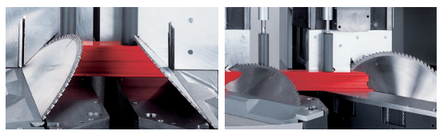


For an optimised production, Reynaers Aluminium established close partnerships with machine suppliers, to optimally set-up and install different types of machines, but also to ensure full service and support after installation. The partnership between Reynaers Aluminium and the machine suppliers results in an optimisation of the start-up times (1 week on average for a CNC-machining centre) and support after sales (specialised teams from Elumatec and Reynaers Aluminium).

A SELECTION OF OUR MACHINE OFFER

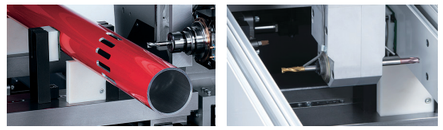
elumatec

Double mitre saw:
2 types of high quality double mitre saws, with special clamping blocks to fully support the entire Reynaers profile range.



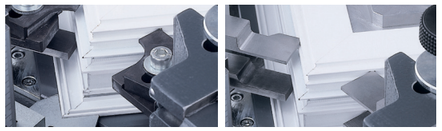
DG244

CNC-machining centres:
a whole range of state of the art CNC machining centres, with special developed clamping blocks and optimized tooling sets to optimally allow all necessary operations to the Reynaers profiles.



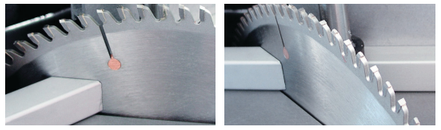
SBZ140

Corner press:
dedicated 1 press machines to create high quality corner connections, with special quick-change sets for supports and crimping knives to reduce adjustment time.



EP124

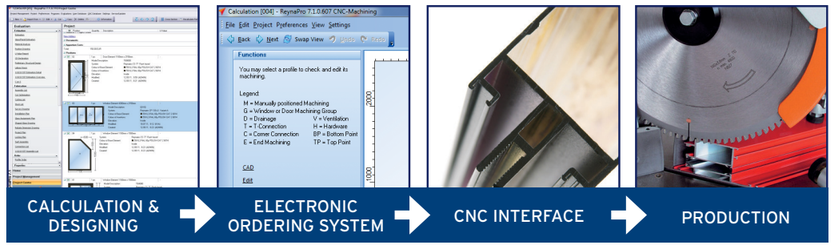
Table saw:
fast and accurate cutting cycles, wide angle cutting range and a special pivoting mechanism enabling working from the front at any angle position.



TS161

Transporting units:
a combination of tables and transporting units are able to process your elements throughout the workshop with minimal risk of damage.

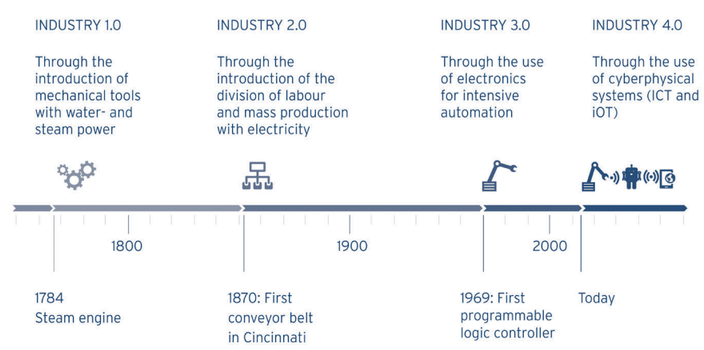
All experience and know-how by Reynaers Aluminium is also used to assist fabricators in selecting these correct tools and machines, fit for their production, and setting up a perfect work floor lay-out.



To allow fully automated production of our systems, there is a direct link between miscellaneous machines and the **ReynaPro software**. This ReynaPro software includes a database of all profiles and accessories, allowing calculation and manufacturing of projects. The technical data and commercial information are continuously updated and supported by our technical service. Today, over 2200 supported ReynaPro-licenses are in use.

On top of this, we guide our customers to help them introducing **Industry 4.0**: in the 4th industrial revolution, all production steps are linked together. We have 'smart' workplaces that have access to and can forward all the necessary information for an optimum production flow.
In order to prepare our customers for Industry 4.0, Reynaers Aluminium developed **ReynaFlow**, a smart manufacturing solution for production and **HIM**, Human Interface Mate that assists our fabricators in the future.

Watch a video about ReynaFlow:



TECHNOLOGY CENTRE

The Reynaers Campus accommodates one of the most advanced testing centres for windows, doors and façades. In the Technology Centre all our systems are meticulously tested to comply with various European (EN), Australian (AS) and American (ASTM) standards and to meet the highest standards for quality, durability and reliability, resulting in a 10-year system guarantee (based on the European standards).

10 YEAR system guarantee

Yearly, Reynaers Aluminium performs an average of 180 tests in the Reynaers Technology Centre. Our tests are performed in close collaboration with various European notified bodies such as SKG IKOB-IFT-WTCB-TNO-Peutz-Efectis-ITB-WFRG-WINTECH-ATI INTERTEK-...

The different tests are centered around these **3 MAJOR TRENDS** in the aluminium industry:

COMFORT	SUSTAINABILITY	SAFETY
1. AIR-, WIND-, WATER TIGHTNESS	1. MECHANICAL PERFORMANCE	1. IMPACT RESISTANCE
2. ACOUSTIC INSULATION	2. SOLAR RADIATION	2. BURGLAR RESISTANCE
	3. OTHER TEST FACILITIES	3. BULLETPROOF
	4. ENERGY PERFORMANCE	4. FIRE RESISTANCE
		5. SMOKE RESISTANCE
		6. SMOKE & HEAT EVACUATION

Depending on **your project specifications**, the Reynaers Technology Centre is at your disposal and offers support in organising tailored and extensive testing on different systems in various situations and conditions.

COMFORT

1. AIR-, WIND-, WATER TIGHTNESS (AWW)

All window-, door- and curtain wall systems are tested according to the relevant standards for air permeability, wind load resistance and water tightness.

1.1. AWW windows & doors

Test facility:

2 test walls with a total capacity of 8 positions for test elements

- max. dimensions element wall 1: 20m (W) x 6m (H)
- max. dimensions element wall 2: 5m (W) x 6m (H)
- max. test pressure : 7500Pa, 380 km/h
- Test methods following EN/AS/ASTM*

Watch a video about AWW testing on windows & doors:

1.2. AWW Façades

Test facility:

1 dedicated test wall with a total capacity of 2 positions for test elements

- 1 operating unit
- max. dimensions element: 10m (W) x 15m (H)
- max. test pressure : 8000Pa, 400 km/h
- Test methods following EN/AS/ASTM*
- Dynamic testing following EN 13050

Watch a video about AWW testing on façades:

**European Standard (EN)/Australian Standard (AS)/American Standard (ASTM)*

2. ACOUSTIC INSULATION

The sound insulation properties of finished building elements are tested in a specially designed, fully equipped and calibrated acoustic test lab.

Test facility:

The flexible separation wall between the sending and receiving chamber of the acoustic test lab enables a broad range of test openings.

	Opening	Element
Windows	1250 x 1500 mm	1230 x 1480 mm
Single door	1000 x 2380 mm	980 x 2360 mm
Double door	1370 x 2380 mm	1350 x 2360 mm
Sliding door	2725 x 2380 mm	2705 x 2360 mm
CW / Sliding door	4080 x 2380 mm	4060 x 2360 mm

SUSTAINABILITY

1. MECHANICAL PERFORMANCE

The durability of systems is tested to guarantee the long-lasting performance in the building.
Different types of tests are performed.

1.1. Repeated opening and closing

All opening types can be tested on their durability: turn-tilt windows, door, swing doors, folding doors, horizontal flush roof, sliding elements, balcony glazing, ...

- test rig: maximal element up to 5.6m (W) x 4m (H)
- 6 tests simultaneously (4 heavy elements and 2 small elements)
- average for windows: 20.000 cycles
- average for doors: 200.000 cycles, up to 1.000.000 cycles

Watch a video about cyclic testing:

1.2. Operating forces

Operating forces for all opening types are measured and classified according to the relevant standards.

- opening/closing
- locking/unlocking

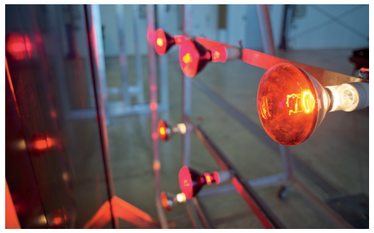
1.3. Racking & torsion

The racking and torsion test is performed, according to the relevant standards, to simulate the effects of the wrong use of windows and doors.

- dedicated test rig for racking and torsion tests
- element height up to 3m and higher is possible

2. SOLAR RADIATION

Dedicated test equipment simulates the solar radiation on systems using infrared lights. By exposing the element to the infrared light, the surface temperature of the profile increases depending on the colour of the coating. The temperature and behaviour of the element can be evaluated.



3. OTHER TEST FACILITIES

3.1. Ageing test

QUV test:
The QUV test equipment generates an accelerated reproduction of the damage caused by sunlight, rain and dew that normally occurs over months and years of outdoor exposure. This test on profiles is done according to Qualicoat guidelines.

Climate chamber:
This climate chamber simulates the influence of extreme changes in temperature and humidity on profile systems or specific components.

- thermal cycle (-10°C / +70°C):
  a test of 1.000.000 cycles takes about 42 days
- mechanical load can be applied

Oven:
Profile systems are tested in a universal oven for precise, absolutely reliable and safe temperature control (temperatures up to +200°C).

3.2. Strength & shear tests

Dedicated tensile-strength test equipment is used to measure the strength of assembled profiles (CTQ-values), connections between components, pull-out forces on screw connections, ... Both the deformation values and the rupture value are accurately logged.

SUSTAINABILITY

4. ENERGY-PERFORMANCE

The R-cube is specially designed and built to provide state-of-the-art analyses of curtain walls, sun shading systems, windows and doors allowing the product designers to develop more energy-efficient and comfortable building solutions. This unique 360° rotatable testlab can be considered as a passive house, with an overall U-value of 0.12 W/m²K.

The testlab has 2 identical climate rooms, with controlled humidity and temperature, allowing to simulate the effect of different climates and seasons on a system. Both chambers can be used to simultaneously test and compare the energy performance of 2 different systems, under identical circumstances with a specific orientation of the R-Cube.

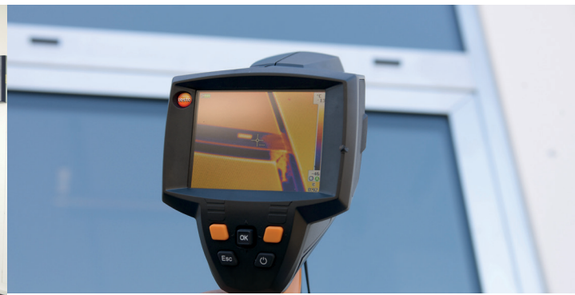
Some of the tests which can be performed:

- climatic (condensation) tests on (ventilated) façades or window systems
- behaviour of systems during wintertime/summertime
- tests and demonstrations on building connections

Test facility:
Dedicated measuring equipment is available:

- equipment for blowerdoor test to measure the air tightness
- infrared camera to evaluate the thermal performance and air tightness
- full automated logging system for the registration of indoor and outdoor conditions (temperature, wind speed, solar radiation, relative humidity)

OUTDOOR MEASUREMENTS				INDOOR MEASUREMENTS				
Temperature - 20°C up to +70°C (infrared camera)	**Relative humidity** 30% up to 90%	**Solar radiation** W/m²K according orientation	**Wind speed** and wind direction	**Surface temperatures** - 20°C up to +70°C (infrared camera)	**Relative humidity** 30% up to 90%	**Illuminance level** (lux)	**Air tightness** +50 or -50 Pa during blower door test	**Energy consumption** of cooling and heating (HVAC) installation



INTERNAL SAFETY TESTING

1. IMPACT RESISTANCE

In order to guarantee full safety of systems, the effect of soft and heavy body impact on the element is meticulously tested, according to relevant standards.

Test facility:

- test rig: 9.2m (W) x 4.4m (H)
- max. dimensions element: 6m (W) x 3.5 m (H) x 0.22m (D)
- a mobile and free level adjustable pendulum test unit with impactor (double tyre, sandbag, ...)
- the drop height of the impactor determines the classification

Watch a video about impact testing:

2. BURGLAR RESISTANCE

The systems are tested for intrusion safety.
The elements can be tested for the **burglar resistance classes RC 2, RC 3 and RC 4.**

Test facility:

- test rig: 9.2m (W) x 4.4m (H)
- max. test element: 6m (W) x 3m (H) x 0.22m (D): this allows you to mount the element for pretesting and the official test element at the same time
- a mobile and free level adjustable pendulum test unit with impact
- fully equipped for static or dynamic testing and for manual burglar testing
- different tool sets are available to test according to the specific classification

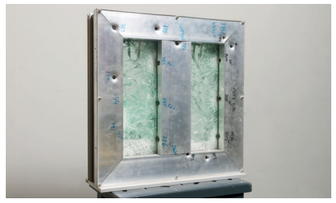
Watch a video about burglar proof testing:

EXTERNAL SAFETY TESTING

Apart from the internal testing facilities, the Reynaers Technology Centre provides full support for testing at external testlabs. Extensive advice and support, manufacturing of test elements, installation on location, ... are all part of the Reynaers Aluminium expertise. For external testing, and in coordination with the Reynaers Aluminium representative, a person from Reynaers Aluminium can witness and support the tests on location. This enables us to exchange our know-how and expertise.

3. BULLETPROOF

Tests on the bullet impact on profile systems, according to the most severe European standards, are performed in notified testlabs such as TNO and the Royal Military School..



Watch a video about bulletproof testing:

4. FIREPROOF

The resistance of systems against fire breakthrough for a period of at least 30 minutes and up to 60 minutes, are performed in close cooperation with various accredited European labs such as WFR, IFT, Efectis Group, ITB, ...

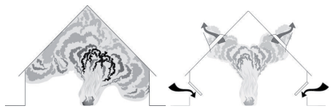
Watch a video about fireproof testing:

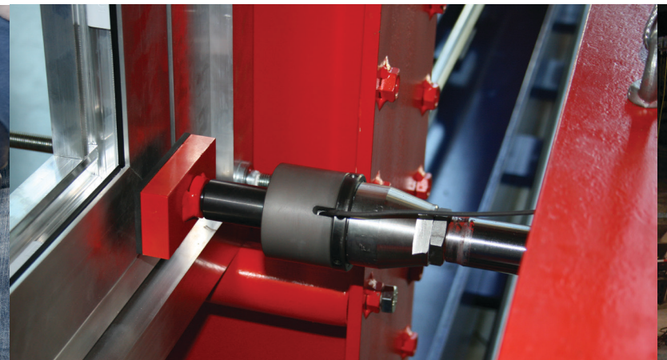
5. SMOKE RESISTANCE

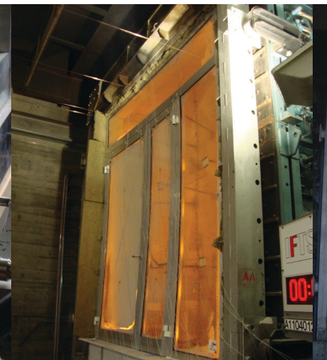
Tests on the smoke tightness of the profile systems for a minimal diffusion of smoke throughout the building, are performed in notified testlabs such as ITB, IFT and MPA Braunschweig.

6. SE (SMOKE & HEAT EVACUATION)

Door constructions are being submitted to a smoke leakage test to determine the leakage of cold and warm smoke from one side of the door construction to the other. These tests are performed by MPA Braunschweig.







RELEVANT TEST STANDARDS: WINDOWS & DOORS

TESTS ACCORDING TO PRODUCT STANDARD EN 14351-1: 2006 + A2	Test method	Classification
Air-, wind-, water tightness Windows & Doors		
Air permeability	EN 1026	EN 12207
Water tightness	EN 1027	EN 12208
Resistance to wind load	EN 12211	EN 12210
Acoustic insulation		
Measurement and sound insulation in buildings & building elements	EN ISO 10140-2	EN ISO 717-1
Mechanical performance		
Repeated opening & closing	EN 1191	EN 12400
Mechanical strength, racking and torsion windows	EN 14608 - racking	EN 13115
	EN 14609 - static torsion	EN 13115
Mechanical strength, racking and torsion doors	EN 947 - resistance to vertical load	EN 1192
	EN 948 - resistance to static torsion	EN 1192
	EN 949 - soft and heavy body impact	EN 1192
	EN 950 - hard body impact	EN 1192
Operating forces windows	EN 12046-1	EN 13115
Operating forces doors	EN 12046-2	EN 12217
Doors - behaviour between two different climates	EN 1121	
Solar radiation		
Infrared measurements	EN 13187	
Energy performance tests in R-Cube		
Air tightness of buildings (Blowerdoor)	EN ISO 9972	
Thermal transmittance	EN 10077-1 & EN 10077-2	
Impact resistance		
Impact resistance windows & doors	EN 13049	EN 13049
Burglar resistance		
Static load test	EN 1628	EN 1627
Dynamic load test	EN 1629	EN 1627
Manual test	EN 1630	EN 1627
Bulletproof		
Bullet resistance windows and doors	EN 1523	EN 1522
Fire resistance		
Fire resistance windows and doors	EN 1364-1 / EN 1364-1	EN 13501-2 / EN 13501-2

TESTS ACCORDING TO PRODUCT STANDARD AS 2047:2014 (Australian standard)	Test method
Air-, wind-, water tightness	
Resistance to wind load	AS 4420.2
Air permeability	AS 4420.4
Water tightness	AS 4420.5
Ultimate strength	AS 4420.6
Mechanical performance	
Operating forces	AS 4402.3

RELEVANT TEST STANDARDS: CURTAIN WALLS

TESTS ACCORDING TO PRODUCT STANDARD EN 13830:2015	Test method	Classification
Air-, wind-, water tightness		
Air permeability	EN 12153	EN 12152
Water tightness	EN 12155	EN 12154
Water tightness under dynamic pressure	EN 13050	EN 13050
Resistance to wind load	EN 12179	EN 13116
Mechanical performance		
Resistance to dead load	EN 1991-1-1	-
Impact resistance		
Impact resistance façades	EN 12600	EN 14019
Accoustic insulation		
Measurement and sound insulation in buildings & building element	EN ISO 10140-2	EN ISO 717-1
Burglar resistance		
Static load test	EN 1628	EN 1627
Dynamic load test	EN 1629	EN 1627
Manual test	EN 1630	EN 1627
Bulletproof		
Bullet resistance façades	EN 1523	EN 1522
Fire resistance		
Fire resistance façades	EN 1364-3	EN 13501-2
Thermal transmittance		
Thermal transmittance façades	EN 13947	-

TESTS ACCORDING TO PRODUCT STANDARD AS 4284:2008 (Australian standard)	Test method
Air-, wind-, water tightness	
Preliminary: Static Pressure SLS	AS 4284
Preliminary: Static Water	AS 4284
Structural Test at Servicibility Limit State	AS 4284
Air Infiltration	AS 4284
Water Resistance	AS 4284
Structural Test at Ultimate Limit State	AS 4284

EXPERIENCE CENTRE

AVALON

AVALON, the Virtual Reality Room at the Campus, lets you visit future buildings through a shared virtual reality experience. Imagine walking into a building which is still in the design phase. Together with your project partners you can have a joint experience and navigate through different spaces and review any design aspect by adjusting dimensions of rooms or building elements and change colours and materials. This powerful tool radically changes the way the design of a building is evaluated and visualised.

Reynaers Aluminium enables architects to effortlessly move between BIM and VR. This way of working truly revolutionises the way buildings are designed. At any stage of the design process, the architect can visit AVALON and instantly get a feeling of being inside the building. This simply cannot be matched by viewing a BIM model on screen. Having access to BIM data inside a VR environment could be a hugely powerful capability for any project.

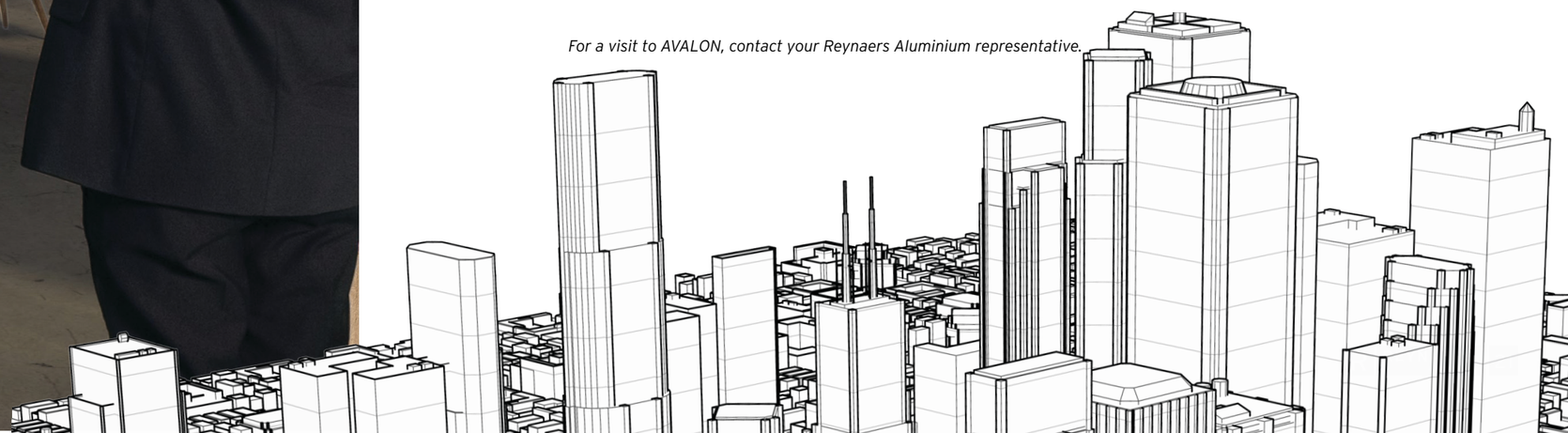
The benefits of virtual reality in architectural design:

- Visualisation for investors and end-customers: every detail and building component is visible up close
- Add a feeling of space to your design
- Facilitates the decision making process
- Reduce costs for mock-ups and prototyping
- Reduce building mistakes during the design phase

The AVALON VR room system comprises 25 projectors and uses cutting edge laser technology to project the model in ultra-high resolution onto the walls of what is referred to as a Cave VR system. Active 3D glasses allow you to become immersed in a shared 3D experience of the project. This high-end virtual reality room enables our partners to evaluate buildings and products by visualising an entire building before construction has even started. It really is a collaborative tool that brings our slogan “Together for Better” to a whole new level.

Watch a video about AVALON:

For a visit to AVALON, contact your Reynaers Aluminium representative.

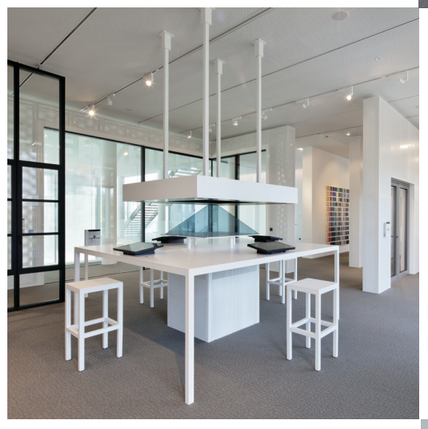


EXPERIENCE ROOM

The Reynaers Experience Room showcases our extensive product range, offering inspiration and information at a glance. This digitally enhanced product showroom allows customers, fabricators, architects and project developers to experience the Reynaers solutions up close and evaluate their technical characteristics. At the same time, it offers inspiration by showing their application in various project types.

1. SHOWROOM ELEMENTS

Reynaers' latest product innovations are showcased in the experience room. You can view and operate the full size elements, collect product information on the go and relive the showroom experience after the visit.



2. PRODUCT FINDER

The product finder guides customers and architects through the offering of Reynaers' architectural solutions. Detailed product information and inspirational project photography can be consulted and technical specifications of the products can be compared. Visitors can collect and store this information effortlessly o recollect this after the visit.

3. SAMPLE WALL

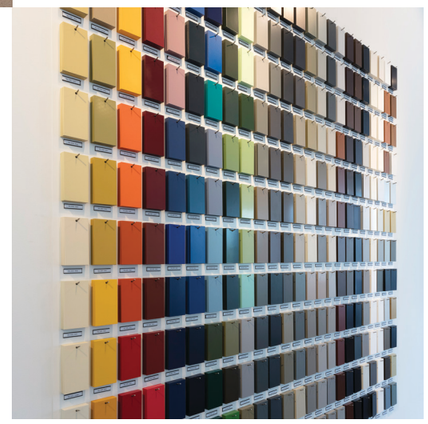
The sample wall features corner sections of the different product groups. By positioning the slidable touchscreen at the samples, interesting information is provided such as the insulation or lacquering process, opening types, drainage principles etc.

4. WORLD OF REYNAERS

The World of Reynaers features 8 different project types, ranging from private homes to residential and office buildings. Choose the building of your preference and modify the design aspects of the integrated Reynaers solutions such as design variants, opening configurations, element colours etc. View inspirational project photography and get a preview on the monthly Showcase projects.

5. COLOUR WALL

The selection of the right colour and surface treatment is facilitated by the Reynaers Colour Wall. The colour wall includes a variety of available colours and finishes ranging from metallic or anodised, ano-look, matt or gloss RAL-colours, Tiger structure coating or even special low maintenance and scratch resistant Coatex finish. Make your choice!



We welcome you at the Reynaers Campus to experience our latest products and innovations in full interactivity. Together we can increase the value of buildings and enhance the living and working environment of people across the world. Together for Better.

For a visit to the Reynaers Campus, contact your Reynaers Aluminium representative.

ABOUT REYNAERS ALUMINIUM

Established in 1965 and with its headquarters in Duffel, Belgium, the Reynaers Group is a global, family-owned company, active in more than 70 countries worldwide. Driven by innovation and entrepreneurship, the Reynaers Group has spun out activities as a supplier of aluminium and steel solutions for architectural applications, surface treatments of profiles and accessories, products for roofs and façades and ready-to-install elements for the building industry.

As a part of the Reynaers Group, Reynaers Aluminium is a leading European specialist in the development and marketing of innovative and sustainable aluminium solutions. These include a wide variety of window and door systems, curtain walling, sliding systems and conservatories. Besides offering an extensive range of standard solutions, the company also develops solutions that are tailored to the individual customer or project and provides extensive technical support and advice to fabricators, contractors and architects.
Research, product development and testing are conducted at the Reynaers Campus, the sector's largest private innovation and testing centre, located in Duffel (Belgium).

Driven by innovation, the focus on digitalisation is key for Reynaers Aluminium. At the Reynaers Campus, you can experience the most advanced digital technologies: from the AVALON virtual reality room, where you can visit future buildings in 3D, and the Experience Room with numerous digital applications to the implementation of the ReynaFlow software to digitalize the entire production process.

The company's success is based on the close partnership with 5,000 partner fabricators, architects and project developers worldwide. This unique cooperation is reflected in our motto: Together for Better.

For more information: **www.reynaers.com**

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TOGETHER FOR BETTER

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