

Product Specification

REHAU S920 Euro Design-Slide System

REHAU S921 Prestige-Design System

REHAU is the leading UPVC manufacturer of window profiles creating UPVC extrusions for windows and doors for premium performance and is committed to encourage the correct use of all its products, by assisting the building industry in ensuring the correct specification, design, manufacture and installation of UPVC windows and doors.

Windows and doors made from REHAU profiles are resistant to aging and weathering, maintain their form, easy to maintain, tough and economical and can be recycled. They are ideal for sound insulation and saving energy – thanks to very good heat insulation properties.

Windows and doors made from REHAU profiles are therefore suitable for energy houses, passive houses and energy-conscious renovation. And also to allow peaceful living through the installation of corresponding double glazing enables the achievement of optimum soundproofing – tested to attain up to STC 45.

Every effort has been made to ensure that the information contained in this specification is correct at the time of publication. And changes to the specifications referred to in this document, after publication date, must be taken into consideration.

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

The Casement System:

The REHAU-Prestige-Design System, S921 is the casement window and door system. The REHAU-Prestige-Design is a 3-chamber system; the main profiles have 3 separate internal air spaces across the 60mm profile depth, which provide better thermal performance than single or 2 chamber systems.

The Sliding System:

The REHAU-Euroslide-Design System, S920 is the sliding window and door system. The REHAU-Euroslide-Design is a combination of 2- & 3- chamber system; the frame profiles are 3 chambered while the sash profiles are 2 chambered.

The REHAU-Euroslide-Design and REHAU-Prestige-Design are product names for particular group of REHAU UPVC extruded profiles and other components collectively known as a Window and Door Systems. The individual profiles and components have been designed in such a way as to be capable of being used with each other to achieve different varieties of window and door configurations in a variety of styles and sizes.

The multi-chamber technique utilizes the insulating effect of air and optimizes the good heat insulation, even ceiling-high elements can be easily installed.

Both REHAU-Euroslide-Design and REHAU-Prestige-Design have a common installation depth of 60mm that offers versatility and are ideal in meeting requirements for renovation and new construction applications in residential and commercial buildings.

REHAU-Euroslide-Design and REHAU-Prestige-Design have an optimized frame to sash overlap of 8mm that ensures tight clasp which improves energy saving and resistance to water and dust penetration.

1.2 CONFIGURATIONS

REHAU offers a range of windows and doors that can be customized and fabricated for new buildings and replacement applications:

A. Casement System (REHAU-Prestige-Design System)

1. Casement doors
 - Single swing door
 - French door
 - Tilt & turn door
 - Tilt & slide door
 - Slide & fold (or Multi-folding) door
2. Outward opening windows
 - Single & multi panels side hung window
 - Top hung window
 - French window
 - Side hung & top hung combination window
3. Inward opening windows
 - Tilt & turn window
 - Tilt & slide window
 - Slide & fold (or multi-folding) window

B. Sliding System (REHAU-Euroslide-Design System)

1. Sliding doors
 - double- or multi- panel sliding
2. Sliding windows
 - double- or multi- panel sliding

The possibilities are almost endless and limited only by the design imagination of the window and door designer. All popular styles can be created. There are however size limitations arising out of safety factor considerations, physical performance requirements and other manufacturing restrictions.

1.2 SYSTEM CERTIFICATION

REHAU-Euroslide-Design and REHAU-Prestige-Design Systems

1. have been assessed by SKZ, Germany meeting all requirements according to BS EN 12608.
2. conformed to performance requirements according to Australian standard, AS 2047

Air-Tightness:

3. inhibited air-infiltration through a casement window unit to 0.51 litre/sec.m², measured at pressure across the unit of 75 Pa as tested in accordance to AS 4420.4
4. inhibited air-infiltration through a casement door unit to 0.62 litre/sec.m², measured at pressure across the unit of 75 Pa as tested in accordance to AS 4420.4
5. inhibited air-infiltration through a sliding window unit to 0.24 litre/sec.m², measured at pressure across the unit of 75 Pa as tested in accordance to AS 4420.4

Water-Tightness:

6. resisted water up to a pressure differential of 300 Pa with no leakage when the casement window unit is subjected to water sprayed uniformly and continuously for 15 minutes as tested in accordance to AS 4420.5
7. resisted water up to a pressure differential of 400 Pa with no leakage when the casement door unit is subjected to water sprayed uniformly and continuously for 15 minutes as tested in accordance to AS 4420.5
8. resisted water up to a pressure differential of 250 Pa with no leakage when the sliding window unit is subjected to water sprayed uniformly and continuously for 15 minutes as tested in accordance to AS 4420.5

Wind Resistance:

9. attained positive and negative ultimate strength of 2300 Pa (est. 223 km/hr) for 1 min for the casement and sliding window units as tested in accordance to AS 4420.6
10. attained positive and negative ultimate strength of 3300 Pa (est. 265 km/hr) for 1 min for the casement door unit as tested in accordance to AS 4420.6

Sound Insulation:

11. attained Sound Transmission Class, STC 45 for casement window unit with laminated double-glazed glass as assessed by the Australia Hearing, National Acoustic Laboratories
12. attained Sound Transmission Class, STC 36 for tilt-turn window unit with laminated single-glazed glass as assessed by the Australia Hearing, National Acoustic Laboratories

Thermal Insulation:

13. U_F-value of frame-sash combination of 1.7 W/m².K *
14. attained U_w-value of window of 1.5 W/m².K of casement window size 1800mm (ht) x 1500mm (wt) with Low-E double-glazed glass (5+12A+5)mm

* the value is estimated from a test report of a similar window system, REHAU Euro-Design tested by accredited laboratory ift Rosenheim GmbH. Frame 60 & Sash Z58 are the corresponding profiles in the REHAU Prestige-Design.

1.3 MATERIAL PROPERTIES

The profiles of the REHAU window systems are made from RAU-PVC 1406 and RAU-PVC 1476, which are unplasticised, weather resistant, modified polyvinyl chloride, classed as high impact resistant to DIN 7748.

RAU-PVC 1406 and RAU-PVC 1476 are distinguished by their resistance to impact at low temperature. The material is especially intended for outdoor use and is light and weather stabilized.

Weathering and Aging Resistance

The special formulation RAU-PVC 1406 is designed for outdoor use gives excellent resistance to weathering and aging. In addition, RAU-PVC 1476 meets the necessary requirements for countries with high levels of solar radiation. Even after many years of use in outdoor conditions, its properties remain to a great extent unaltered.

REHAU window and door profiles made of RAU-PVC 1406 and RAU-PVC 1476 fulfill the quality requirements in all properties for the application in regions with a global radiation up to 160 kcal/cm² per annum and 180 kcal/cm² per annum respectively.

A. Thermal Properties

Vicat-softening point (method B)	DIN 53460	82 °C
Thermal conductivity (20 °C)	DIN 52612	approx 0.21 W/m.K
Coefficient of linear expansion		0.8 x 10 ⁻⁴ K ⁻¹
Specific heat		approx 1.05 kJ/kg.K

B. Mechanical Properties (if not stated otherwise, at 23 °C)

Density	DIN 53479	1.44 ± 0.02 g/cm ³
Tensile strength	DIN 53455	> 45 N/mm ²
Elongation at break	DIN 53455	> 100 %
Tensile stress	DIN 53455	> 40 N/mm ²
Flexural yield strength	DIN 53452	> 85 N/mm ²
Impact strength @ 0 °C	DIN 53453	no break
@ -20 °C	DIN 53453	no break
Impact strength, notched @ +23 °C	DIN 53453	> 25 kJ/m ²
Ball indentation hardness 30 sec	DIN 53456	approx 95 N/mm ²
Modulus of elasticity	DIN 53457	> 2,500 N/mm ²
Shore hardness D	DIN 53505	81 ± 3

Note: some of the test information in A & B are tested by in-house laboratory according to test procedure of the Standard indicated.

C. Chemical resistance

RAU-PVC 1406 and RAU-PVC 1476 are resistant to diluted and concentrated acids (excluding those with an oxidizing effect) and alkalis, mineral oils, paraffin oils, alcohols, benzene, aliphatic hydrocarbons and higher fatty acids. For exact details, please consult Material Data Sheet for RAU-PVC 1100-1999.

D. Combustibility

RAU-PVC 1406 and RAU-PVC 1476 are difficult to ignite and self-extinguishing after the removal of the flame

E. Welding

RAU-PVC 1406 and RAU-PVC 1476 can be welded without difficulty. All corners of frames and sashes of REHAU UPVC windows and doors are welded unless due to specific design restraint. When required, mullions and transoms can also be welded to frames and sashes.

F. Recyclability

RAU-PVC 1406 and RAU-PVC 1476 have basic properties that make them ideal materials for recycling and making new products from. Profiles offcuts and waste can be collected and then in most cases re-processed to produce new profiles.

Even old profiles that have given many years of service will retain most of their original properties, can be recycled and used to make other products requiring low-, medium- or high-grade PVC.

G. EPDM Gaskets

The gaskets for the REHAU window systems are made of EPDM material, known as RAU-SR, which has an outstanding weathering and light resistance. As RAU-SR is an amorphous polymer its cold resistance is also very good. The RAU-SR has very good values for compression set and a notably low specific gravity.

RAU-SR is excellent for sealing windows and doors where it is essential to have permanent elasticity, colour fastness, no brittleness and no tack.

1.4 WARRANTY

Warranty for REHAU-Euroslide-Design and REHAU-Prestige-Design is given to the REHAU window fabricators.

A. Warranty for standard white profiles produced in RAU-PVC 1406

Profile shape and dimensions conform to drawings and specified tolerances, quality of material supplied is constantly in accordance to REHAU Technical Specifications and resistance to colour fastness for 10 years in accordance with EN 12608:2003 (5.8.3).

The warranty is effective from the moment REHAU has completed delivery of the PVC-U window profiles. It is valid for regions with a global radiation of maximum 212 W/m^2 ($=1,860 \text{ kW/h/m}^2/\text{annum} = 160 \text{ kcal/cm}^2/\text{annum}$); the warranty covers the colour white 159.

B. Warranty for standard white profiles produced in RAU-PVC 1476

Profile shape and dimensions conform to drawings and specified tolerances, quality of material supplied is constantly in accordance to REHAU Technical Specifications and resistance to colour fastness for 10 years, whereby a colour deviation of > level 3 of the grey scale to ISO 105-A03 being admissible.

The warranty is effective from the moment REHAU has completed delivery of the PVC-U window profiles. It is valid for regions with a global radiation of maximum 239 W/m^2 ($=2,092 \text{ kW/h/m}^2/\text{annum} = 180 \text{ kcal/cm}^2/\text{annum}$). The warranty covers the colour white 159.

C. Warranty for laminated white profiles

The warranty for REHAU laminated profiles is 10 years for the colour-fastness and the fastness to weathering of the articles to which the film is applied.

The assessment of any color changes shall be subject to ISO 105-A03 (gray scale). The color shall be deemed to have remained constant if grade 3 of the gray scale is attained or exceeded (test conditions according to TL No. VI/1).

PART 2 PRODUCT

2.1 FABRICATORS & INSTALLERS

- A. All REHAU windows and doors shall be fabricated by an approved REHAU window fabricator. An approved window fabricator shall be of the following criteria:
1. Have completed training and certified by appropriate REHAU personnel
 2. Uses REHAU designed, extruded and produced articles
 3. Have determined suitable hardware for the specific applications by way of appropriate functional tests.
- B. All REHAU windows and doors shall be installed by a trained installer appointed by REHAU window fabricator. An approved window installer shall be of the following criteria:
1. Have completed training and certified by appropriate REHAU personnel
 2. Have obtained the appropriate knowledge on the hardware used by the window fabricator

2.2 COMPONENTS & PROCESSES

- A. UPVC Profiles:
1. external wall thicknesses range from 2.5mm up to 3.0mm
 2. multi-chambered design with maximum optimal air spaces between exterior and interior surfaces
 3. the UPVC finish will not blister, crack or warp under normal atmospheric conditions
- B. Steel Profiles:
1. All steel reinforcement shall be cold-rolled and galvanised with minimum plating of 140g/m².
 2. For window profiles - the "U-channel" or "box-section" shaped steel reinforcement installed in the window sashes shall be of minimum thickness of 1.5mm
 3. For door profiles - the "U-channel" or "box-section" shaped steel reinforcement installed in the door sashes shall be of minimum thickness of 2.0mm
- C. Accessories:
1. fasteners shall be stainless steel or corrosion resistant
 2. hardware shall be multi-point locking, corrosion resistant zinc-nickel finish, or equivalent.
 3. glazing shall be accomplished from the interior, using appropriate sizes of glazing beads and glazing seals. If exterior glazing is required, it shall be subject to approval by architect.
 4. silicone sealant of neutral cure & low modulus are recommended and shall be applied when appropriately required

D. Fabrication

1. REHAU fabrication/glazing/installation Guidelines shall be followed
2. all frames and sashes to be fabricated with fusion welded corners.
3. all frames, sashes, mullions and transoms are reinforced appropriately with galvanised steel where required for structural rigidity
4. uses dual compression casement seal or gasket between frames and sashes
5. drainage and pressure equalisation slots are done in appropriate settings

2.3 TRANSPORT, STORAGE & HANDLING

- A. temporary storage of finished windows at site shall be in an upright position on firm and solid wooden blocks and cover with plastic sheet to prevent dirt and dust
- B. Windows shall be handled to avoid scratches and damages - extra protection with adhesive tape is recommended for prevention of scratches to the reveal surfaces of windows.
- C. When the elements are transported and then stored on the building site, the following factors must be taken into account:
 1. Firm and stable placement of the elements
 2. Transport and storage of the elements in a vertical position
 3. Appropriate protection shall be taken to protect against damage due to slipping, twisting, jamming and bending of the elements
 4. Appropriate protection shall be taken for protection against mechanical damage and dirt
 5. Appropriate steps shall be taken for prevention of direct contact between elements
 6. Support of the hardware in larger elements with transport brace profiles

2.4 QUALITY ASSURANCE

The quality of the windows and doors units corresponds closely with the appropriate planning and execution from fabrication to installation to ensure the operability of installed units over long period of time.

- A. Fabricator Qualification
The appointed fabricator shall be capable of fabricating UPVC windows and doors that meet or exceed performance requirements indicated and of documenting this performance.
- B. Installer Qualification
The appointed installer shall be capable of installing UPVC windows and doors that meet or exceed performance requirements indicated and of documenting this performance.
- C. Site Qualification
 1. Site inspections shall be conducted by the appointed fabricator to qualify the site before installation begins
 2. An inspection checklist for installation shall be conducted and agreed with the site coordinator/manager

PART 3 INSTALLATION

3.1 WALL OPENING

- A. Squareness of wall opening shall be taken with at least six measurements; top, middle and bottom edges, both vertically and horizontally
- B. The smallest measurements less the expansion allowance shall be used for window size determination if the opening is not square
- C. Wall opening reveal shall be checked for projection that may cause obstruction during the insertion of window into the wall, and shall be removed

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation
- B. Verify all rough openings are correctly sized and located
- C. Use level and square or plumb-line to ensure the window frame is level and square apart from of the squareness of the opening. Adjust the squareness of wall opening by inserting installation wedges at appropriate positions
- D. Verify all rough openings are correctly sized and located

3.3 INSTALLATION

- A. Fixing can be done by wall-plug method or metal lug method. For replacement window, where wall surface becomes irregular after dismantling of old window, wall-plug method is more appropriate.
- B. Use appropriate anchorage devices to securely attach frames to structure
- C. Anchorage devices shall be fixed at 200mm from the outer corner and at every interval between 500mm (min) & 700mm (max)
- D. Window frame will be pre-drilled with installation holes in the wall for the insertion of wall-plugs
- E. Align frames plumb and level and free of warp and twist. Maintain frame dimensional tolerances
- F. Install sashes and operate the sash several times to ensure smooth operation
- G. Silicone sealant of neutral cure & low modulus is recommended to seal between frame and wall opening.
- H. Recommend to inject Polyurethane foam (PU foam) into the cavities between frame and wall opening to enhance insulation against noise and heat. Trim-off excessive foam when PU foam is cured and seal with appropriate silicone sealant compatible with the PU foam.

Our verbal and written application engineering advice is based upon experience and the best of our knowledge. However it is to be regarded as non-binding information. Working conditions and use under conditions for which the product was not intended and over which we have no influence exclude any claim resulting from our information. We recommend that a suitable check is made as to whether the REHAU product is suitable for the envisaged purpose. Application, use and processing of the products is carried out beyond the scope of our control and are therefore carried out exclusively at your own responsibility. If liability should still apply, then this is restricted, in the case of all damage, the value of the goods supplied by us and used by you.