INSTALLATION GUIDE
FENCE SYSTEM

SALAMANDER®
DECKING, FENCE & FACADE
MADE OF Resysta®

www.ttp-online.de/resysta

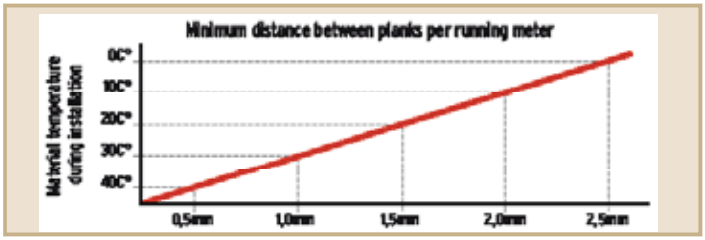
CONTENT

The added PLUS for your fence:

/// 100 % rot-resistant
/// No greying
/// UV-resistant
/// Weather-resistant
/// Timelessly beautiful natural surface
/// Wide colour range
/// No colour flaking
/// No elaborate maintenance, sanding or painting necessary
/// No cracking
/// Durability class 1 to fungal attack
/// No inground sleeve necessary
/// Easy installation
/// Easy care
/// 100 % recyclable

/// Basics

/// Dimensional change of Resysta solely depends on thermal expansion. Air humidity and water have no influence on dimensional change. Thermal expansion has to be considered at installation. The expansion is eliminated by screw connecting so that normal, material-characteristic thermal expansion can only occur at the loose ends.



/// Please ensure constant material temperatures when cutting to size. Therefore the material should be kept in the shade and not be exposed to direct sunlight before pre-cutting. The material may significantly warm up when exposed to sunlight, resulting in increased change in length. In the case of considerable temperature fluctuations optionally adjust cutting to length. At 10° difference in temperature the variance will be approx. 0.4 mm per running meter.

/// Cut-off pieces and/or abrasive dust have to be disposed separately. Please comply with regulations of your waste management authority. You may under no circumstances burn profiles, made of Resysta.

Wood preservation – properties in comparison to wood

In comparison to wood and owing to the material properties the following does not apply to Resysta:

/// Discoloring of the surface due to chemical decomposition and wash off of wood components
/// Resin discharge
/// Surface erosion
/// Crack formation due to swelling and shrinking
/// Ingress of moisture (water)
/// Dishing due to varying moisture spreading
/// Capillary action at front area

Storage

/// Please store products made of Resysta material horizontally on level surface.
/// The profiles should never be covered with plastic foil – no matter if before or after installation. Condensation and accumulated water can cause staining.

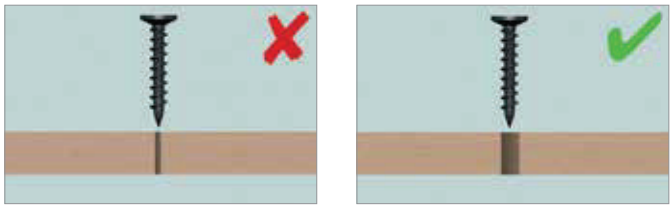
Resysta is an innovative material consisting of polymers and rice husks and does not feature typical wood characteristics like graying, cracking and splintering. Owing to the special properties of profiles made of Resysta, the basic installation technique merely differs in some aspects from the installation of other products.

/// General Advice

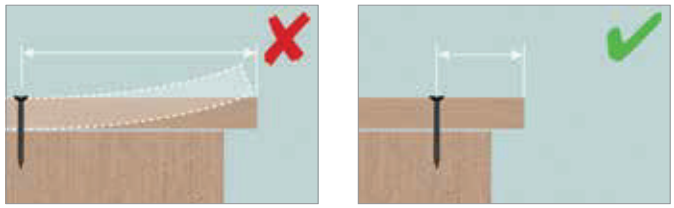
General application instructions

Please observe the instructions given by the summarized overview. Detailed explanations on pages to follow.

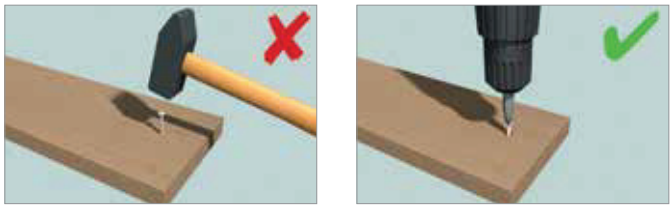
Adequate pre-drilling



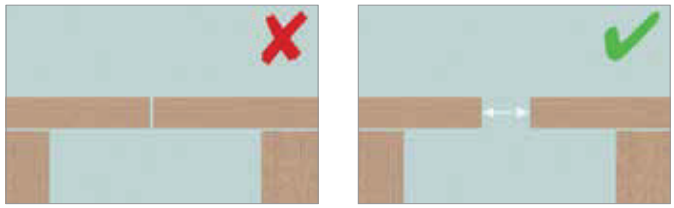
Reduce projecting



Use screws to fasten



Sufficient spacing for thermal expansion



Standard woodworking tools can be used for processing.

SAWING: Profiles made of Resysta may be cut longitudinal and transversal with all customary saws.

MILLING: Any profiles can be milled easily by means of customary woodworking machines.

GRINDING: Profiles made of Resysta should be ground in longitudinal direction only. Depending on the required surface structure, we recommend the use of sand paper with graining between 24 and 60. Fine-grit sand paper should only be employed for the removal of dirt.

DRILLING: Drilling can also be done with customary standard wood drills.

SCREW CONNECTION: For visible frontal screw connection the drill-holes must be drilled 1 mm bigger than screw diameter to avoid tension. For screw connection into the material the screw penetration depth should be at least three times the diameter of the screw (3xØ). Resysta should be pre-drilled with 0.7 - 0.8 times the screw diameter (0.7-0.8xØ).

SCREWS: Use appropriate screws/fastening material according to requirements. Optionally carry out suitability test.
Due to the high density of Resysta the use of nails is not recommended.

BONDING: Profiles made of Resysta may be glued with standard PUR-adhesives or other appropriate plastic adhesives. The surface must be cleaned and be free of loose particles and dirt to ensure optimal bonding.

/// Product Range

PLAIN POST

Material	Resysta
Color	natural
Width x Height	90 x 90 mm
Length	2000 mm

MIDDLE POST

Material	Resysta
Color	natural
Width x Height	90 x 90 mm
Length	2000 mm

CORNER POST

Material	Resysta
Color	natural
Width x Height	90 x 90 mm
Length	2000 mm

RESYSTA FPHR 10520

Material	Resysta
Color	natural
Width x Height	105 x 20 mm
Length	2900 mm

RESYSTA FPHR 6520

Material	Resysta
Color	natural
Width x Height	65 x 20 mm
Length	2900 mm

RESYSTA FPH 7020

Material	Resysta
Color	natural
Width x Height	70 x 20 mm
Length	2900 mm

RESYSTA FPH 14020

Material	Resysta
Color	natural
Width x Height	140 x 20 mm
Length	2900 mm

RESYSTA FS 7020

Material	Resysta
Color	natural
Width x Height	70 x 20 mm
Length	2900 mm

RESYSTA FPS 7012

Material	Resysta
Color	natural
Width x Height	70 x 12 mm
Length	2900 mm

RESYSTA FPS 4510

Material	Resysta
Color	natural
Width x Height	45 x 10 mm
Length	2900 mm

RESYSTA ARO 180

Material	Resysta
Color	natural
Width x Height	180 x 44 mm
Length	2900 mm

RESYSTA POST CAP

Material	Resysta
Color	natural
Width x Height	98 x 98
Length	7 mm

/// Product Range

BINDER POST BATTEN GALVANIZED YELLOW

Material	Metall
Color	galvanized yellow
Width x Height	25 x 40
Length	70 mm

BINDER POST BATTEN WHITE

Material	Metall
Color	white
Width x Height	25 x 40
Length	70 mm

SPACER RHOMB

Material	Resysta
Color	natural
Width x Height	20 x 5 mm
Thickness	12 mm

SPACER RHOMB

Material	Resysta
Color	natural
Width x Height	20 x 20 mm
Thickness	12 mm

SPACER RECTANGULAR

Material	Resysta
Color	natural
Width x Height	20 x 5 mm
Thickness	12 mm

SPACER RECTANGULAR

Material	Resysta
Color	natural
Width x Height	20 x 20 mm
Thickness	12 mm

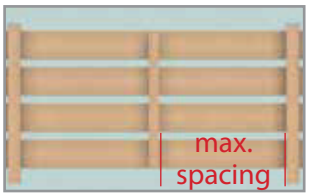
/// Technical Advice

1. Post mounting

Sink post at frost-free conditions in concrete foundation at least 25 x 25 x 80cm deep. Insertion depth of Resysta posts into concrete foundation must be at least 30 cm.

2. Post spacing, span length, filling profiles

The maximum gap between posts is subject to the employed filling profiles and their maximum span lengths. When using a transom to connect and support filling profiles, the post spacing may be increased accordingly.



The maximum span length for filling profiles FPH 7020, FPH 14020, FPHR 6520 and FPHR 10520 is approx. 60 cm. When using a transom (e.g. profile FPS 4510) the spacing between posts would be approx. 120 cm.

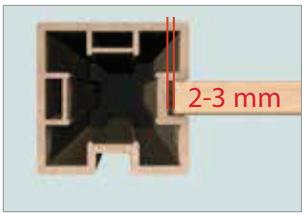
3. Fastening filling profile / posts

Alternative a) Fastening in the groove with spacer

Fix the lowermost filling profile with the connecting angle to the post. Fasten the connecting angle with the appropriate screws.

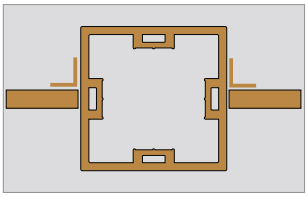
Glue the spacer into the groove and insert the following profiles. Fix the the topmost filling profile with the connecting angle to the post.

To achieve a defined space between the crossbars, two kinds of spacers (rhomb or rectangular) are available depending on the choosen profile.



NOTE:

leave a space of approx. 2-3 mm in the groove

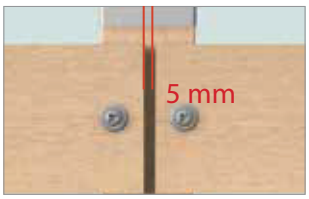


Alternative b) Fastening at smooth post profile

Fix every individual filling profile with the conncecting angle to the post. Optionally other connection angles - suitable for outdoor use - may be employed.

Alternative c) Direct screw connection at the post profile

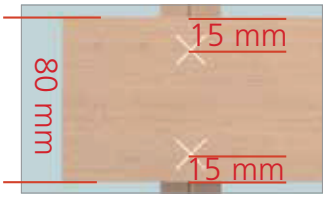
In this case each individual filling profile can be visibly screwed directly to the post.



Keep space of approx. 5 mm at the end of profiles

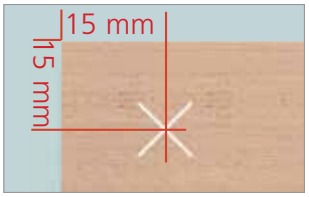
/// Technical Advice

Installation instruction screw connection



For profiles made of Resysta which are more than 80 mm wide, 2 screws/fastening elements are required.

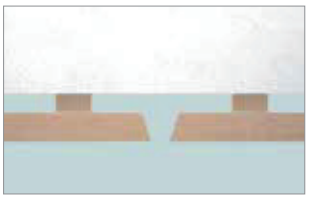
The maximum space from the end of profile to the screw connection may be 25 mm.



The space between screw and profile edge must be at least 15 mm.

Note:
The screws may be flush-mounted or counter-sunk. (For hollow chamber profiles: carefully tighten the screws). When counter-sunk, no tearing of surface fibers or ingress of water can occur.

Concealing hollow chamber profiles



To avoid high dead weight, numerous profiles made of Resysta were produced as hollow chamber profiles.
Concealing the hollow chamber by bevel cut

4. End cap

Closing off posts and hollow chamber profiles with the end cap made of Resysta (only available for posts) or other end caps suitable for outdoor use (stainless steel or galvanized steel).
Fix the cap with PUR-adhesive.

/// Color Glaze FVG

1. Application of color glaze

To obtain a uniform and optimal color result, the glaze should be applied at consistent basic conditions. We therefore recommend applying the glaze before installation on each profile individually. Application temperature approx. 5° - 25°C, relative air humidity approx. 50 – 60%.

Please do not apply the glaze under direct exposure to sunlight or at high risk of rain. The glaze should be applied rapidly and with a flat paint-brush.

Drilling holes, bolt fittings and cutting edges that occur after installation, should be glazed subsequently. Scratches and damages can be refinished by applying the glaze on the damaged surface with a cloth. For detailed information please refer to the application instructions for the glaze.

2. Care

Care on a regular basis is not required.

3. Cleaning

Dirt can be removed by means of a gentle jet of water or with a soft brush. Tenacious dirt (e.g. organic residues, fat) may also be removed with a stiff brush or by gentle sanding.

4. Maintenance

Depending on the area of application the glaze can wear to a greater or lesser extent in the course of time. If required, the glaze can always be renewed at any time in diluted form (i.e. ratio: 3 parts water – 1 part glaze). Prior to this, the glazed surface should be thoroughly cleaned (optionally gently sanded). Traces of usage may be glazed partially.

5. Refinishing

Rub with a soft cloth in case of minor scratches or damages. Gently sand larger areas and reapply the glaze with a paint-brush.

6. Removal

/// Grind off the glaze (sand paper: 100-120 graining).
/// Optionally re-create the Resysta structure (sand paper: 24-60 graining).
/// Re-apply the glaze.

/// Sealing RFS

The sealer RFS closes the surface and small joints. Ingress of moisture is prevented and the surface is more hard-wearing. Thanks to the sealed structure, dirt particles do not adhere and are therefore easy to remove.

1. Application

The sealer consists of 2 components. After mixing it should be applied promptly (with a flat paint-brush) within 30 minutes. The sealer should not be applied at direct exposure to sunlight.
Please refer to the processing instructions of the sealer for detailed information.

2. Care

Care on a regular basis is not required.

3. Cleaning

Dirt can easily be removed by means of a gentle jet of water or with a soft brush. Tenacious dirt (e.g. organic residues, fat) may also be removed with a stiff brush or by gentle sanding.

4. Maintenance

Maintenance is basically not required. Depending on the area of application the glaze can wear to a greater or lesser extent in the course of time. To renew the sealing, the old layer has to be removed first before the new sealing is applied.

5. Refinishing

In the case of mechanical damages (e.g. scratches) moisture will not penetrate profiles made of Resysta. Flaking of the coating will not occur. To refinish the damaged areas reseal the surface after cleaning and gentle sanding. To mend deep scratches the use of a color-providing glaze is recommended. Gentle sanding and rubbing in the glaze is sufficient (e.g. with a cloth).

6. Removal

/// Grind off the sealer thoroughly (sand paper with 100-120 graining).
/// Optionally re-create the Resysta structure (sand paper with 24-60 graining).
/// Re-apply the sealing.

/// Further Information

MILDEW SPORES, HEAVY SOILING: Depending on the environment, organic residues may deposit on profiles made of Resysta. This is the ideal nutrient medium for mildew spores, contained in the ambient air, which could cause staining. Depending on the degree of soiling, we recommend to thoroughly clean profiles made of Resysta and remove organic matter (e.g. foliage, leaves). This procedure will not harm profiles made of Resysta. Stains can be removed by gentle sanding or intensive brushing.

EDGES: Ingress of moisture at the edges does not occur. We, however, recommend to round off the edges with sandpaper prior to color treatment.

FRONT END PROTECTION: Profiles made of Resysta do not feature capillary action. Therefore a frontal surface protection by means of color is not strictly necessary. Paint coating may however be done for visual reasons.

DRIVING RAIN PROTECTION: Due to the high material density no adverse effects are caused by driving rain.

SPLASH WATER PROTECTION: Owing to the high durability (resistance) of profiles produced of Resysta, a material impairment does not occur. Increased soiling can, however, be expected and can result in staining. We implicitly recommend treating the affected area with the sealer (RFS).

/// Technical Data

Density	ASTM D2395:2002	approx.1.46 kg/m^3
Coefficient of Linear Thermal Expansion	ASTM D696	3,6x10(-5) m/mC
Water Absorption and Air Humidity Behaviour	ASTM D1037:2006a	none or very low water absorption (only surface wetting)
Weathering and UV Resistance	QUV Test	Resysta surfaces treated with glaze show extremely high resistance
Skid Resistance	DIN 51097	C Rating (highest rating)
Fire Behaviour (British Standard)	EN ISO 11925-2	B2, normal flammability (by adding flame retardants, a higher rating of B1 can be reached)
Fire Behaviour (US Standard)	NFPA	A Rating (flame propagation 25, smoke emission 450)
Fire Behaviour (British Standard)	BS 476 Teil 6&7	Rating 1
Durability (Resistance to Wood-Destructive Fungi)	DINV ENV 12038:2002	the material has not been affected, highest durability – Class 1
Emission	DIN EB ISO 9001/14001	passed
Brinell Hardness (HB)	EN 1534	81,1 N/mm^2
Friction Coefficient µ untreated	EN 13893	0,46
Friction Coefficient µ with 2K	EN 13894	0,52
Screw Withdrawal Resistance	EN 320.2011-07	5777 N
Heat conductivity (λ)	EN 12664	0.199 W/(mK)
Water vapor permeability	DIN EN ISO 12572	µ=1300 -> sd 7.22m diffusion inhibiting
Bending Strength	ISO 178	46 N/mm^2
Bending Modulus	ISO 178	3850 N/mm^2
Tensile Strength	ISO 527	21,8 N/mm^2
Tensile Modulus	ISO 527	2340 N/mm^2
Shearing Strength	EN 392	16,8 N/mm^2
Resistance to Mould Fungal Decay	CEN/TS 15083-2	The material features almost no mass loss, highest durability classification 1 (very durable)
Resistance to termites	ASTM D3345-08	Resistant to termite infestation (coptotermes curvignathus), very little loss of mass - very high durability