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About the process

SADEV

Product/Process family: Attached exterior glazing system

Holder(s): SADEV Company

FOREWORD

The technical opinions and the technical application documents, hereinafter referred to interchangeably as Technical Opinions, are intended to provide those involved in the construction industry with information on the suitability for use of the products or processes whose constitution or use is not based on traditional skills and practices.

This resulting document should be taken as such and is therefore not a document of compliance or regulation or a reference of a "quality mark". Its validity is decided independently of that of the supporting documents of the technical file (in particular any regulatory certificates).

The Technical Assessment is a voluntary approach by the applicant, which in no way changes the distribution of the responsibilities of the construction actors. Independently of the existence or not of this Technical Assessment, for each structure, the actors must provide or request, depending on their roles, the required supporting documents.

As the Technical Notice is intended for players reputed to know the rules of the art, it is not intended to contain otherinformation than that relating to the non-traditional nature of the technique. Thus, for aspects of the process that comply with recognized rules of the art for implementation or dimensioning, a reference to these

Specialized Group no.2.1 - Light facade products and processes



CONMISSION CHARGER Secretariat: AVIS TECHNIQUES

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Document releases

Version	Description	Rapporteur	President
V1	 This fifth revision includes the following changes: Added S3100-12, S3100DU, S3030 and S3030L attachments. Addition of joints between glazing. Update of the list of glazing suppliers. Removal of the H/L ratio. The fourth revision constitutes the consolidated version of Technical Advice 2/11-1448*V1 and addendum 2/11-1448*02 Add. The following changes have been included: Removed 3 attachments: S3006, S3001 and S3101. Update of the attachments and ball joints according to the SADEV addendum. Update of the lens inserts according to the SADEV addendum. Updated gaskets. Addition of two glazing manufacturing sites: CRISTEC and SGGS COUTRAS. 	MOKRANI Youcef	VALEM Frederic

Descriptor:

Crossing point devices and simple glazing support fasteners on an interior or exterior framework, generally metal, for the production of vertical or inclined panes of glass (wall whose angle is greater than $\pm 5^{\circ}$ with respect to the vertical). The system, designed solely for flat single glazing (monolithic or laminated), includes the through fixing devices and the fixing lugs on the building structure.

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1. Opinion of the Specialized Group

The process described in Chapter 2 "Technical File" below was examined by the Specialized Group, which concluded favorably that it was suitable for use under the conditions defined below:

1.1. Accepted field of employment

1.1.1. Geographical area

This Notice has been formulated for use in European France.

1.1.2. Targeted works

Vertical or sloping panes of glass in premises whose destination allows the possibility of water infiltration to be accepted in the long term within the meaning of CSTB Specification 3574_V2 and for which a deformation of the glazing of 1/100th of the free edge between point fixings under service limit state (SLS) load.

1.2. Appreciation

1.2.1. Ability to use the process

1.2.1.1. Safety under climatic loads and weight of glazing

The panes of glass do not contribute to the stability of the building, which is the responsibility of its structure.

The deformations of the edges of the glazing at the serviceability limit state are limited to 1/100th of the distance between point fixings.

For glazing 19 mm thick with six through fixings and in the case of overhangs, the radius of curvature at the ultimate limit state on intermediate supports must be determined by test, on a case-by-case basis, according to the Cahier of CSTB 3574_V2.

The limitation of the constraints at the fixing points, the clearances provided on the fasteners and the provisions for immobilizing the latter make it possible to consider that the inherent stability of the panes of glass is ensured under the action of climatic and wind stresses and on the other hand, in the event of accidental failure of a glass volume.

1.2.1.2. Fire safety

Must be assessed under the same conditions as those for glazed facades with single glazing of the same type.

1.2.1.3. Accident prevention and accident control and risk control during implementation and maintenance

The Sadev system does not have a Safety Data Sheet (SDS). The contractor installing the Sadev system must apply the usual precautions, with the use of recommended PPE and the application of the rules and standards in force for this field of application.

1.2.1.4. Stability in seismic zone

The installation of the SADEV process in seismic zones requires specific implementation instructions detailed in § 2.5.7.

1.2.1.5. Impact safety

Satisfaction with safety requirements with respect to people falling can be ensured by means of a case-by-case verification and, moreover, for monolithic glazing by association with residual protection according to the NF P 01-012 standard.

1.2.1.6. Thermal insulation

Thermal regulations can only be satisfied in a very limited number of cases due to the use of single glazing.

The consequences of foreseeable condensation are to be assessed in the same way as for structures of the same type comprising single glazing installed in the traditional way.

1.2.1.7. Sealing

The tightness between the glazings is based on the effectiveness of the mastic filling. Any damage to this barrier will cause infiltration, which must be taken into account with regard to the destination of the premises concerned.

1.2.2. Sustainability

The nature of the materials used makes it possible to limit the risks of corrosion.

1.2.3. Environmental impacts

1.2.3.1. Environmental and health data

Sadev systems do not have any environmental declaration (ED) and therefore cannot claim any particular environmental performance. It is recalled that the DE do not fall within the scope of examination of suitability for use of the product.

1.2.3.2. Health aspects

This opinion is formulated with regard to the holder's written commitment to comply with the regulations, and in particular all the regulatory obligations relating to hazardous substances, for their manufacture, their integration into works in the accepted field of use and the exploitation of these. The verification of information and declarations issued pursuant to the regulations in force does not fall within the scope of this notice. The holder of this notice retains full responsibility for this information and statements.

1.3. Additional remarks from the Specialized Group

The system of panes of glass and skylights in Attached External Glazing SADEV, like most systems of this type, requires great precision of the primary structure and the secondary framework and requires special precautions during implementation for positioning. and the adjustment of the attachment brackets, the tightening of the nuts and the respect of the width of the joints.

Sealing between the glazing is achieved by a simple bead of silicone mastic. Any degradation, the possibility of which is foreseeable, of this sealing barrier will be the cause of water infiltration, which should be ensured that it can be considered as not very harmful with regard to the destination of the premises. and, particularly in the case of skylights, according to the materials likely to be humidified. In addition, maintenance of the seals should be provided.

Although the glass products are not supplied by the SADEV Company, this Technical Assessment is only valid insofar as the supplier of the glass products undertakes to respect the Specifications defined by SADEV and presented in § 2.10 of the Technical File and validates it with a specific markup.

For the sizing of the Sentryglas spacer, please refer to its valid Technical Assessment.

For Sentryglas laminated glazing and for laminated glazing configurations that are not declared in table 14, radius of curvature tests must be carried out on a case-by-case basis according to Cahier du CSTB 3574-V2. Furthermore, as a check, for Sentryglas laminated glazing, a check of the radii of curvature will be carried out with the thickness of a monolithic glass component whose thickness is closest to that of the composition of the laminated glazing provided (or framing the thickness of the laminated glazing.

On a case-by-case basis, a glass calculation note must be drawn up and validated by SADEV.

2. Technical file

From the elements provided by the holder and the Specialized Group's prescriptions accepted by the holder

2.1. Marketing method

2.1.1. Contact information

The process is marketed by the holder. Holder: Sadev Company Chemin des Poses BP 18 FR-74330 Poisy Such. : +33 4 50 08 39 00 Fax: +33 4 50 08 39 49 E-mail :<u>info@sadev.com</u>Internet :<u>www.sadev.com</u>

2.1.2. Identification

Fasteners and fasteners bear the indelible SADEV marking. The glazing bears the indelible marking of the manufacturer's logo and the SADEV logo (see figure 33).

2.2. Description

2.2.1. Principle

Crossing point devices and simple glazing support fasteners on an interior or exterior framework, generally metal, for the production of vertical or inclined panes of glass (wall whose angle is greater than $\pm 5^{\circ}$ with respect to the vertical).

2.2.2. Component characteristics

2.2.2.1. Glass products

The glazing is manufactured with the following flat glass products:

- clear or extra-clear glass, in accordance with standard NF EN 572,
- colored glass, in accordance with standard NF EN 572,
- glass enamelled by screen printing in accordance with standard NF EN 12150,
- reflective lens with pyrolytic layer, in accordance with standard NF EN 1096,
- puff ice cream, compliant with standard NF EN 12543-2, with PVB interlayer,
- puff ice cream, compliant with standard NF EN 12543-2 and SentryGlas.

These glasses must be tempered in accordance with the NF EN 12150 standard and Heat Soak treated according to the NF EN 14179 standard.

All the edges of the glazing are at least in industrial flat seal (JPI).

The type of spacer will be specified at least on the invoice for the glazing or on the labels accompanying the glazing (see figure 34).

2.2.2.2. Fixing devices

Ball-jointed fasteners, manufactured and branded SADEV, include the elements shown in figures 1 to 8 in § 2.10 of the Technical File.

2.2.2.3. Fasteners

Comprising one to four branches intended to receive occasional fixing devices for glazing, the SADEV brand fastening brackets can be:

- Cast stainless steel X5 Cr Ni Mo 19-11-2 according to NF EN 10213-4 for the S3000 (see figures 10), S3001EVO (see figure 12), S3030 (see figure 17) and S3030L (see figure 18), brushed finish.
- In folded stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3 for the S3003-10, brushed finish (see figure 13).
- Cast aluminum Al Si 5 Mg according to NF EN 1706 AC for the S3007, sandblasted finish (see figure 16).
- Cast stainless steel X5 Cr Ni Mo 19-11-2 according to NF EN 10213-4 for the S3100 (see figure 19), S3100-12 (see figure 20), S3101EVO (see figure 22) and S3105 (see . figure 23), brushed finish.

- Cast stainless steel X5 Cr Ni Mo 19-11-2 according to NF EN 10213-4 for the S3002 (see figure 14), electropolished finish.
- Cast stainless steel X2 Cr Ni Mo 22-5-3 / Duplex 1.4462 according to NF EN 10213-4 for the S3000DU (see figure 11), the S3100DU (see figure 21) with brushed finish, and S3002DU (see figure 15) with electropolished/brushed finish.

2.2.2.4. Sealing products between glazing

Class 25E silicone sealant benefiting from the SNJF label for sealing between glazing, compatible with the peripheral sealing profiles and the various spacers of laminated glazing, implemented on the bottom of the joint in accordance with DTU 44.1. This sealant may be an original Dow Corning type DC791 silicone sealant or a compatible one.

Example of sealing profile between glazing (see figure 31):

- Silicone profile joint backing for glazing thickness from 12 to 18 mm: JOINT-VEA4235, JOINT-VEA1368, JOINT-VEA1324, JOINT-VEA1809, JOINT-VEA1684, JOINT-VEA1667, JOINT-VEA3413, JOINT-VEA3446, JOINT- VEA1369, SEAL-VEA1399, SEAL-VEA1444.
- Joint backing in silicone profile 19 to 24 mm: JOINT-VEA1369, JOINT-VEA1399, JOINT-VEA1444.
- Joint backing in silicone profile for glazing thickness greater than 25 mm: JOINT-VEA2592, JOINT-VEA2512, JOINT-VEA1746, JOINT-VEA1312A, JOINT-VEA1376.

2.2.2.5. Peripheral sealing profiles

Profiles with bellows or profiles allowing to respect a homogeneous operation of the glazing vis-à-vis deformations out of plane, in extruded silicone comprising on one or two longitudinal edges flexible lips forming a groove for receiving the edges of the glazing and intended to create caulking between glazing and adjacent structural work or between glazing at outgoing or reentrant angles. The implementation is carried out with a class 25E silicone sealant benefiting from the SNJF label (silicone sealant type DC791 of Dow Corning origin or compatible). Example of masonry connection profile (see figure 32)

- Example of profile for corner connection:
 - JOINT-VEA1015D for glazing thickness from 10 to 15 mm,
 - JOINT-VEA2322 for glazing thickness from 18 to 22 mm,
 - JOINT-VEA2030D for glazing thickness from 25 to 30 mm.
- Example of masonry connection profile:
 - JOINT-VEA1015S for glazing thickness from 10 to 15 mm,
 - JOINT-VEA1822S for glazing thickness from 18 to 22 mm,
 - JOINT-VEA2030S for glass thickness from 25 to 30 mm.

2.3. Design layouts

2.3.1. General

The Common Technical Requirements Booklet consists of Chapter 3 of the CSTB Booklet 3574_V2 "Attached Exterior Glazing (VEA) subject to a Technical Assessment - General design, manufacturing and implementation conditions " especially for :

- the choice and sizing of glass products,
- the sizing of the fixing devices and the attachment brackets,
- meeting safety requirements,
- the allowable loads per attachment arm are such that:
 - $_{\odot}$ $\,$ the deformations under loading at ELS are less than 1 mm for forces applied parallel and perpendicular to the glazing,
 - o when weighted, they do not cause the elastic limit of the fastener material to be exceeded,
 - \circ $\;$ the local deformations of the fasteners under the combinations of unfactored loads must be less than 1 mm,
 - the deformations in the plane of the panes of glass, due to the differential movements of the frames and the expansion of the glass products must not generate compressions or tractions in the sealants between glazing units greater than those admissible given in DTU 44.1 (Watertightness of joints façade by applying mastic – NF P 85-210) and be compatible with the clearances provided for the system.

Special requirements must be taken into account:

- Depending on the types of fasteners and fixings chosen, the maximum weights of the glazing must be respected.
- For glazing with a non-rectangular format, the dimensioning may be carried out on the basis of a circumscribed rectangle, failing which an experimental check must be carried out.

2.3.2. Glazing

Rectangular glazing can be:

• either monolithic from 6 to 19 mm with cylindrical holes or from 8 to 19 mm with countersunk holes,

- or laminated with inserts with an interior and exterior component 6 to 15 mm thick with cylindrical holes. With countersunk holes the minimum thickness of the outer component becomes 8 mm.
- The differences in thickness between the two components of the laminated glazing are limited to 4 mm.

These glazings generally include, in each corner and possibly at mid-length of the long sides, holes whose dimensions are indicated in table 11 at the end of the Technical File.

2.3.3. Point fixings

The amplitude of rotation in the ball joint cage of the part comprising the threaded rod with spherical head is \pm 20° maximum. The nominal distance between the interior face of the glazing and the reference plane constituting the bearing surface of the fasteners is 45 mm \pm 5 mm. This distance can be adapted according to the needs according to the cases of loading subject to validation.

See table 12 at the end of the Technical File.

- Point fixings R1006, R1106, R1008 and R1038 allow blind mounting.
- For mounting on an external frame, and in order to guarantee better sealing, the locking nut is replaced by:
 - $_{\odot}$ a grooved nut in X2 Cr Ni Mo 17-12-2 stainless steel according to NF EN 10088-3, Ø 50 mm for R1101 and R1106 ball joints or Ø 60 mm for other ball joints,
 - \circ and a silicone bellows.
- If the Option Monti tightening nut is chosen, the useful tightening length is 23 mm maximum; with the Option 3025 nut this length is reduced to 20 mm.

2.3.4. Fasteners

They have one to four branches and allow the connection of point fixings with the frame in the different possible configurations: angles of the pane of glass, horizontal and vertical edges, window frames, etc.

The central hole is intended for the passage of the stud, bolt or screw of a suitable diameter for fixing to the frame. The organization of the passage holes of the through fixing rods, cylindrical or oblong, allows:

- the suspension or support of the glazing by the two respectively upper or lower fixings, comprising a fixed point and a horizontally expanding point,
 - absorption of dimensional differences related to tolerances or thermal expansion of glazing:
 - ± 3.5 mm for the S3000, S3001EVO, S3007, S3100, S3101EVO, S3000DU and S3105 brackets,
 - +/- 7.25 mm for the S3002 and S3002DU brackets,
 - ± 7.5 mm for S3030 brackets,
 - \circ ± 12 mm for the S3030L brackets.
- the absorption of the differential movements between glazing and framework resulting either from the effects of the wind, or from the effects of the temperature, by the free points.

Table 13 at the end of the Technical File presents the main characteristics of the fasteners (see figures 10 to 23). The branch or branches1 comprise in the case of an M14 rod:

- either a 17 mm cylindrical hole,
- either a 17 x 24 mm or 17 x 28 mm vertical or horizontal oblong hole,
- either a cylindrical hole 24 mm or 28 mm.

The branch or branches1 comprise in the case of an M16 rod:

- either a 19 mm cylindrical hole,
- either a vertical or horizontal 19 x 28 mm oblong
- hole. In the case of larger expansions:

The branch or branches include (attachment S3002 and S3002DU) in the case of an M14 or M16 stem:

- either a 22.5 mm cylindrical hole,
- either a 22.5 x 37 mm horizontal oblong hole,
- i.e. a 37 mm cylindrical hole.

The branch or branches include (S3030 attachment) in the case of an M20 rod:

- either a 26 mm cylindrical hole,
- either a 26 x 41 mm horizontal oblong hole,
- i.e. a cylindrical hole 41 mm.

The branch(s) comprise (attachment S3030L):

- either a 22 mm cylindrical hole,
- either an oblong hole of 22 x 46 mm,
- i.e. a free hole of 51 mm.

 $^{^{1}}$ The S3000, S3001EVO, S3007, S3100, S3101EVO, S3000DU, S3002, S3002DU and S3105 attachments with 1, 2 or 3 branches are equipped with inserts.

On the central core of the attachment lugs, the support surface on the framework has a hole intended for the passage of a locking screw, as well as two or four pre-drilled holes intended for the installation of anti-slip pins. rotation of a diameter:

- 6 mm for the brackets S3000, S3001EVO, S3007, S3100, S3101EVO, S3000DU, S3002, S3002DU and S3105,
- 8 mm for S3030 brackets.

Depending on the loading cases or for other attachment references, an alternative system to the pins is possible to allow the rotational forces to be taken up (see figures 24 and 25). This patented system also allows additional horizontal and vertical adjustment.

2.3.5. Sizing

2.3.5.1. Actions and combinations of ELS and ULS loads

The actions, load combinations at SLS and ULS are determined from CSTB Book 3574_V2.

2.3.5.2. Glass products

The determination or verification of the thickness of the glass products, with regard to the admissible deformations under the effects of the wind (deflection between supports or radius of curvature on intermediate support) and with regard to the constraints, will be carried out according to the method defined in I appendix A of the document "General conditions for the design, manufacture and installation of attached exterior glazing" - CSTB notebook 3574_V2.

The allowable radii of curvature are given in table 14 at the end of the Technical File for laminated glazing with PVB interlayers. For so-called rigid spacers (SentryGlas), a case-by-case study will be carried out. The calculation notes are validated by SADEV.

2.3.5.3. Point fixings

Their strengths are greater than the limits set for the maximum loads of the glazing and the fasteners (see § 2.5.5.4 Fasteners).

2.3.5.4. Fasteners

In the case of standard attachment brackets (supplied by SADEV) or non-standard (supplied by SADEV), SADEV verifies by calculation or by testing that:

- The strains at ELS are:
 - 1 mm parallel to the plane of the glazing,
 - 1 mm perpendicular to the plane of the glazing.
- The stresses at ULS are below the elastic limit of the metal.
- For the S3003-10 coupler, it is necessary to check:

$$\frac{Charges \ parallèles \ (ELU)}{629} + \frac{Charges \ perpendiculaires \ (ELU)}{136} \leq 1$$

The maximum admissible resistances at ULS on 1 attachment branch, respecting the previously mentioned deformation and stress criteria, are given in table 15 at the end of the Technical File.

The dimensioning of the connection between the attachment and the frame (bolt, pins, etc.) must be carried out according to the rules in force.

2.3.6. Thermal insulation

The coefficient U of thermal transmission of SADEV panes of glass is given by the formulas:

$$U = Ug + \Psi . I / A + N . \chi / A$$

Ug: Surface coefficient in the main part of the glazing $(W/m^2.K)$

 Ψ : Peripheral linear transmission coefficient (W/mK) χ : Point

transmission coefficient of the fasteners (W/K) I: Perimeter of

the glazing (m)

A: Glazing area (m2)

N: Number of through fixings of the glazing

The values of Ψ and χ are to be determined by a specific study. Otherwise, the following values can be used: Ψ = 0.055 W/mK and χ = 0.030 W/K.

2.3.7. Dimensioning with respect to seismic provisions

According to the decree of October 22, 2010 and its amendments, the field of use is limited to zone 1 for the categories of buildings of importance I, II, III and IV and zone 2 for the categories of buildings of importance I and II with the exception of the following cases:

Glasses with a maximum surface of 4.65 m^{2} and a maximum span of 3000 mm

The SADEV process, for glass with a maximum surface area of 4.65 m², and a maximum span of 3000 mm, assembly at 4 points or 6 points, glass thickness 10.10, 8.10, 8.8 or 6.8, assembly on primary framework or on typical secondary framework SAFCO

with standard aluminum slider, can be implemented in areas and buildings according to table 1 below (according to the decrees of October 22, 2010 and its amendments).

Seismic zones		Building Importance Category Classes				
		I	II	III	IV	
	1	Х	Х	Х	Х	
2		Х	Х	Х	х	
3		Х	Х	Х	Х	
	4	Х	Х	0		
х	 Installation authorized on flat and vertical concrete walls, according to the provisions described in the Technical File drawn u the applicant. Installation authorized according to the provisions described in the Technical File drawn up by the applicant w maximum surface area of 4.65 m², and a maximum span of 3000 mm. Mounting on primary frame or on secondary SAFCO type frame with standard aluminum slider. 					
Х	X Installation authorized without special provision depending on the accepted field of use.					
	Unauthorized installati	ion				
0	Laying permitted only	for soil classes A, B and C				

Table 1 – Requirements according to the category of structure and the seismicity zone

Glasses with a maximum surface area of 3.56 m² and a maximum span of 2300 mm

The SADEV process, for glass with a maximum surface area of 3.56 m², and a maximum span of 2300 mm, assembly at 4 points or 6 points, glass thickness 10.10, 8.10, 8.8 or 6.8, assembly on primary frame or on typical secondary frame SAFCO with steel-reinforced slider, can be implemented in areas and buildings according to table 2 below (according to the decrees of October 22, 2010 and its amendments):

Seismic zones		Building Importance Category Classes					
		I	II	III	IV		
	1	Х	Х	Х	Х		
	2	Х	Х	Х	Х		
	3	Х	Х	Х	Х		
	4	Х	Х	Х	Х		
X	Installation authorized the applicant. Installat maximum surface area Mounting on primary f	Installation authorized on flat and vertical concrete walls, according to the provisions described in the Technical File drawn up by the applicant. Installation authorized according to the provisions described in the Technical File drawn up by the applicant with a maximum surface area of 3.56 m ² , and a maximum span of 2300 mm. Mounting on primary frame or on secondary SAFCO type frame with steel reinforced slider.					
Х	Installation authorized	l without special provision d	epending on the accepted fi	eld of use.			

Table 2 – Requirements according to the category of structure and the seismicity zone

The assembly is carried out:

- either on a SAFCO-type secondary frame with slider,
- or on primary framework.

The ball joints are fitted in the brackets according to the SADEV procedure described in § 2.6.3, which is supplemented for implementation by:

- use of thick washers for fixing the ball joint in the bracket,
- assembly with thread lock on the nuts of the threaded rods. The ball joints are tightened to the torque indicated in the SADEV technical documentation,
- the foot/post connection is completed by an axis to reduce the degree of freedom out of

plane. Ball joints are mounted in M14 or M16 configuration.

The ball joints concerned by the earthquake qualification are the references: R1001, R1003, R1008 and

R1006. The fasteners concerned by the earthquake qualification are the references: S3000 and S3001.

Attachments S3007, S3000DU, S3001EVO, S3002, S3002DU, S3100, S3105 and S3101EVO can also be used.

For areas of use of seismicity zones 2 importance category of buildings III and IV and for seismicity zones 3 and 4 importance category of buildings II, III and IV, on a case-by-case basis a supporting calculation note must be established by SADEV. This calculation note will validate the sizing of the glass products and the various SADEV fixing elements.

The glasses used for the VEA assembly are tempered laminated with thicknesses of 6.8, 8.8, 8.10 and 10.10. For other glazing thicknesses, justification by calculation must be carried out in order to verify the resistance to seismic forces.

2.4. Implementing provisions

2.4.1. General

SADEV panes of glass or canopies can only be installed on structures specially designed for this purpose

- The frameworks must comply with § 3.1 of CSTB 3574_V2.
- For low slope skylights, the cumulative deformations of the glazing, the secondary framework and the loadbearing framework under the combinations of unweighted loads must not cause a negative slope.
- The local deformations of the frameworks at the level of the fasteners under the combinations of unfactored loads must be less than 1 mm.

The implementation, carried out by companies technically assisted at their request by SADEV, requires precautions, in particular for:

- the adjustment of the fasteners,
- control of the tightening torque applied to point fasteners,
- compliance with the width of the joints between

glazing. Damaged glazing can be replaced individually.

2.4.2. framework

The SADEV process is intended for the production of vertical panes of glass and canopies, in front of an interior or exterior frame and whose glass components are fixed independently of each other on said frame.

The requirements applicable to this framework are as follows:

- Deformability in accordance with the requirements of the rules in force and the Technical Specifications Booklet of the VEA taking into account the weight of the pane of glass.
- Positioning tolerances of the axes of the screws, bolts or mounting studs of the attachment brackets: ± 1 mm.
- Minimum support surface of the fasteners must be at least equal to the support surface of the central hub of the fasteners, plus the adjustment play required for implementation.
- The connecting device between the bracket and the frame must allow adjustment in both dimensions of at least 5 mm (horizontal and vertical). The depth adjustment ± 5 mm can be made on point fixings.

2.4.3. General process

- Positioning and laser adjustment of the brackets on the framework.
- Counter-drilling in the framework using the pre-drilled holes in the brackets, housings for the anti-rotation pins.
- Installation of these pins.
- Assembly on the glazing:
 - the cylindrical-conical aluminum ring,
 - stainless steel screw or ball joint, with fixing rod,
 - polyacetal or polyethylene washer,
 - stainless steel flat nut.
- Tightening of this assembly, with a dynamometric wrench and with a tightening torque of 10 Nm; the immobilization of the flat nut is obtained by removal of the FREINFILET 2701 type of LOCTITE between the thread of the ball joint body and the thread of the nut.
- Installation of the nuts, washers, and inserts, distinguishing between the fixed points and the expanding points, according to one of the assemblies A to H proposed in figures 28 and 29.
- Installation at the dilating points of a spacer with a width 0.5 mm greater than the thickness of the branches of the brackets.
- Display of the glazing equipped in this way on the attachment brackets.
- Adjustment of the flatness and verticality of the pane of glass by screwing unscrewing the nuts on either side of the bracket.
- Tightening the DIN 934 nuts on the DIN 127 lock washer to 60 Nm

2.4.4. Sealing

2.4.4.1. Between glazing (see figure 31)

The joints between glazing, with a nominal width of 12 mm, are caulked with a class 25E silicone sealant with the SNJF Label, possibly on a silicone profile joint backing (see table 16 at the end of the Technical File). The compatibility of the putty with the slip sheets should be checked.

2.4.4.2. Periphery of the pane of glass (see figure 32)

• Junctions with structural work

A joint 30 mm \pm 10 mm wide is provided between the edges of the glazing and the adjacent structural work. This joint is caulked using an extruded silicone bellows profile fixed, on the one hand by gluing with silicone mastic on the glazing and on the other hand, by continuous flange screwed on the structural work.

Junctions between panes of glass

In the case of panes of glass constituting an angle, protruding or re-entrant, or even in front of an expansion joint, the connection between edges of panes of glass is ensured by a bellows profile of the same type as the previous one and also secured by gluing with mastic silicone on the edges of the glazing.

2.4.4.3. Waterproofing of point fixings

- For the R1001, R1101 and R1008 fasteners, it is ensured by 2 O-rings: 1 on the outside diameter of the aluminum ring and 1 on the outside diameter of the ball joint body (see figures 1, 2 and 4).
- For the R1003, R1006 and R1103 fasteners, a bead of DC791 neutral silicone sealant from Dow Corning is applied to the internal and external faces of the aluminum ring.

2.5. Maintaining the product or process in service

Cleaning

Washing with clean water possibly added with a surfactant.

In the case of coated glazing, periodic cleaning is necessary with abundant rinsing. Maintenance instructions are available on our SADEV website.

Replacement

Damaged glazing can be replaced by glazing of the same size.

In the event of breakage of a laminated glazing component, the client or the occupant must replace it as soon as possible. Where applicable, until the said volume has been removed, parking below the glazing must be prohibited by any suitable means.

2.6. End of life treatment

No information provided.

2.7. Technical assistant

The technical assistance missions provided by SADEV to its customers:

- Establish the calculation note for fixings and glazing.
- Validate the customer's fixings and glazing calculation note.
- Assistance with installation (installation manual, technical sheet, etc.).

2.8. Principles of manufacture and control of this manufacture

2.8.1. General

The glazing is checked according to the provisions defined in the technical file and according to the SADEV specifications. The manufacturer is required to exercise control over the manufacture of point fixings and fasteners.

2.8.2. Glass products

SADEV identifies and validates the companies manufacturing glazing using the SADEV process (machining, HST tempering, lamination). The list of manufacturers is specified in Table 17.

This list is likely to be supplemented, and is available on request. Any new company is subject to an initial inspection by CSTB, which has validated the inspection plan in accordance with the requirements of § 4.1 and CSTB Book 3574_V2.

2.8.2.1. Identification

Tempered glasses are identified according to their origin by a discreet and indelible stamp bearing the logo of the glass manufacturer and the SADEV logo (see figure 33).

2.8.2.2. The general manufacturing process

It is the following:

- cutting glass products,
- shaping of edges with industrial flat seal,
- window washing,
- drilling and countersinking of holes on a multi-spindle drill, flat quenching.

The glazing undergoes the Heat Soak treatment after tempering in accordance with standard EN 14179.

2.8.2.3. Tolerances

The manufacturing tolerances are as follows:

- length and width of the glazing: + 0/- 2 mm,
- hole spacing: ± 0.5 mm,
- edge alignment: + 0.5/- 0 mm
- hole diameter + 0.5/- 0 mm,
- milling depth: + 0/- 0.5 mm,
- offset of laminated components: ± 1 mm.

2.8.2.4. Controls

- In-process controls:
 - quality and dimensions of the glazing,
 - positioning of the holes,
 - hole diameter,
 - quality of milling (depth, absence of scale),
 - control of hardening furnaces.
- Checks on finished products:
 - after Heat Soak test, measurement of surface tension with a refractometer, according to the sampling plan defined in CSTB Book 3574_V2 (minimum value of 90 MPa),
 - positioning of laminated components,
 - absence of bubbling of the interlayer.

2.8.3. Point fixings

2.8.3.1. Identification

Point fixings are identified by an indelible SADEV marking.

2.8.3.2. General manufacturing process

The parts of the point fasteners are obtained by machining on a numerically controlled machine. The ball joints are crimped on a 60 ton press.

2.8.4. Controls

Control of threads on rings and plugs.

Dimensional check (ball joint cage, nut, aluminum ring and rod):

- interior: maxi/mini buffer,
- depth: depth gauge,
- outside: micrometer,
- tapping: maxi/mini threaded plug,
- thread: max/min threaded ring.

2.8.5. Fasteners

2.8.5.1. Identification

The fasteners are identified by an indelible SADEV marking.

2.8.5.2. General manufacturing process

Foundry Fasteners (S3000, S3100, S3000DU, S3100DU, S3030, S3030L, S3002, S3002DU)

These fasteners are obtained by lost-wax casting from ISO 9001-2000 certified manufacturers, designated by SADEV. The finish is obtained by brushing.

Foundry Fasteners (S3002, S3002DU, S3105)

These fasteners are obtained by lost-wax casting from ISO 9001-2000 certified manufacturers, designated by SADEV. The finish is obtained by shot-blasting and electro-polishing.

Foundry Fasteners (S3001EVO, S3101EVO)

These fasteners are obtained by lost-wax casting from ISO 9001-2000 certified manufacturers, designated by SADEV. The finish is obtained by shot-blasting and electro-polishing. The exterior finish is obtained by brushing.

Foundry Fasteners (S3007)

These fasteners are obtained by shell molding from ISO 9001-2000 certified manufacturers, designated by SADEV. The finish is obtained by sandblasting.

Folded Die-Cut Ties (S3003-10)

These fasteners are obtained by laser cutting then bending the arms. The finish is obtained by brushing.

For all fasteners except S3003-10

The different drilling positions are obtained by fitting a specific insert.

For all fasteners except S3030L

The resumptions of the pin holes are obtained by machining on a numerically controlled machine.

2.8.5.3. Control

The dimensional and visual inspection is carried out according to SADEV's internal procedure.

2.9. Mention of supporting documents

2.9.1. Experimental results

- Test to determine the tightness of a VEA fixing with silicone bellows (CSTB Report CL01-105).
- Sealing test of VEA fasteners (CSTB Report CL04-030).
- Test to determine the mechanical tensile strength on VEA fasteners (CSTB Report CL04-023).
- Test to determine the mechanical resistance to bending on the VEA fixing pins (Report DEM-000816-1).
- Fatigue test on VEA fasteners (CSTB Report CL04-042).
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on fasteners S3001, S3002, S3003-10 (10 mm), S3005, S3007, S3009, S3101 (CSTB Report CL03-108).
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on the S3001-short fastener (CSTB Report CL05-006).
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on the S3100 two-arm clip (CSTB Report CL06-26002971).
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on the S3000 attachment (CSTB Report CL05-007*01-Mod).
- Test to determine the mechanical tensile strength of the R1106 ball joint (Report DEM-005889-1).
- Test to determine allowable radii of curvature (CSTB reports CLC08-26014705/A, CLC08-26014705/B and CLC10-26026360).
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on the S3006 attachment (CSTB report CLC10-26027676).
- Test to determine the strength of fasteners S3030 ref. Report: DEM0049297-1 of 05/24/2017 produced by the CTICM/ctdec.
- Test to determine the strength of fasteners S3030L ref. Report: DEM0053100-1 of 26/11/2018 produced by the CTICM/ctdec.
- Test to determine the resistance of S3100 fasteners in 316 stainless steel 1b-180° Plate thickness 12mm ref. Report: DEM0046906-1 of 07/11/2016 produced by the CTICM/ctdec.
- Test to determine the resistance of S3100 fasteners in duplex stainless steel 1b-45° Standard plate thickness ref. Report: DEM0046906-3 of 07/21/2016 produced by the CTICM/ctdec.

CSTB seismic tests:

- CSTB report EEM 13 26043812
 - CSTB report EEM 13 26045665

SADEV/Sté Méca seismic study:

- 2012-11-R229-SD-Sadev Earthquake vI_1.pdf
- 2012-11-R229-SD-Sadev Earthquake vI_2.pdf
- 2012-11-R229-SD-Sadev Earthquake vJ_3 Supplement.pdf
- Test to determine the mechanical resistance to loads parallel and perpendicular to the plane of the glazing on the fasteners:
 - S3000DU: report 2012-CTDEC-Flexion-S3000DU Duplex-DEM-026085-1
 - o S3105:2012-CTDEC-Flexion-S3105-DEM-023366-1.pdf
 - S3001EVO: 2014-CTDEC-Flexion-S3001EVO_4b-DEM-031400-2.pdf
 - S3101EVO: 2014-CTDEC-Flexion-S3101EVO_2b90-DEM-031400-6.pdf
 - o S3002 and S3100: 2003-CSTB-Résistance-Attaches-CL03-108 EN.pdf
 - o S3002DU: 2014-CTDEC-Flexion-S3002DU-DEM-0040906-3 FR GB.pdf

2.9.2. Site references

All the achievements relating to the SADEV process cover more than 82,000 m2, 5,000 m2 since 2016.

2.10. Annex to the Technical File – Implementation diagrams

Fixation	Outer glass Drillin	^{1g} Glass interior (case of laminated glasses)
T IXelion		
R1001 R1008	Hole Ø36 mm countersunk at 45° over 5 mm (Ø46 mm on the outside face)	Hole Ø41mm
R1003 R1006 R1038	Hole Ø41mm	Hole Ø36mm
R1101	Hole Ø31 mm countersunk at 45° over 4.5 mm (Ø40mm on the outside face)	Hole Ø36mm
R1106	Hole Ø35mm	Hole Ø30mm
R1103	Hole Ø35mm	Hole Ø30mm
	All right angle edges have a 1mm ch	amfer

Table 11 – Dimensions of glazing holes (see figure 1 to 8)

		45mm	60mm
1.4418	M14	577	364
16-5-1	M16	827	525

 Table 12 – Maximum admissible resistances at ULS parallel to the plane of the glazing (in daN) according to the lever arm (axis of the ball joint to the support plane of the attachment)

Kind	Fastener thickness (mm)	Spacer height (mm)	Nominal distance along X and Y of the holes in relation to the edge of the glazing (mm)	Hole spacing (mm)	Nature	Central drilling Ø (mm)
S3000	12 ±0.2	12.5	96	204	Cast stainless steel	16.5
S3000DU	12 ±0.2	12.5	96	204	Cast duplex stainless steel	16.5
S3001EVO	12 ±0.2	12.5	96	204	Cast stainless steel	12.5
S3003-10	10 ±0.2	10.5	96	204	Folded stainless steel	16
S3007	21 ±0.2	21.5	96	204	Cast aluminum	12.5
S3002	21 ±0.2	21.5	96	204	Cast stainless steel	16.5
S3002DU	21 ±0.2	21.5	96	204	Cast duplex stainless steel	16.5
S3100	12 ±0.2	12.5	96	204	Cast stainless steel	13x23
S3100-12	12 ±0.2	12.5	96	204	Cast stainless steel	13x22
S3100DU-45°	12 ±0.2	12.5	96	204	Cast stainless steel	13x22
S3101EVO	12 ±0.2	12.5	96	204	Cast stainless steel	13x23
S3105	12 ±0.2	12.5	96	/	Cast stainless steel	17x26
S3030	18 ±0.2	18.5	141	300	Cast stainless steel	25
S3030L	18 ±0.2	18.5	141	300	Cast stainless steel	25

Table 13 – Main characteristics of fasteners

ATec No. 2.1/16-1736 V1

	///cc//di 2.1/10/1/50/V1				
(mm)	Fixing R1003 (diameter 36 mm)		Fixing R1001 (diameter 36 mm)		
	vertical wall	Inclined wall*	vertical wall	Inclined wall*	
6	3.014	3.918	-	-	
8	4.570	5.941	4.738	6.159	
10	6.909	8.982	8.904	11,575	
12	9.042	11,755	9.428	12.256	
15	-		13.478	17.521	

*wall inclined from 0° to 60° inclusive with respect to the horizontal.

For any other configuration, tests on the radius of curvature must be carried out on a case-by-case basis according to CSTB Booklet 3574-V2

Table 14 – Permissible radii of curvature of monolithic glazing

	Maximum admissible resistances at ULS per a	rm (elastic limit) in daN
Attached	Loads parallel to glazing planes	Loads perpendicular to the planes of the glazing
S3000	398	300
S3000DU	568	470
S3001EVO	319	145
S3003-10	820	136
S3007	199	198
S3002	275	225
S3002DU	735	408
S3100	410	184
S3100-12	318	346
S3100DU-45°	672	510
S3101EVO	444	312
S3105	525	632
S3030	1182	599
S3030L	1315	607

Table 15 – Maximum allowable resistances at ULS

Total thickness in mm	Glazing	Example of backing strip reference	
8 to 10	8 10	Temporary joint base	
	12 6.6.4	JOINT- VEA4235JOINT- VEA1368	
		JOINT-VEA1324	
	15	JOINT-VEA1809	
12 to 10	6.8.4	JOINT-VEA1684	
12 to 18		JOINT-VEA1667	
		JOINT- VEA3413JOINT- VEA3446	
	8.8.4 6.10.4	JOINT-VEA1369	
		JOINT-VEA1399	
		JOINT-VEA1444	
		JOINT-VEA1369	
	19 8.10.4	JOINT-VEA1399	
		JOINT-VEA1444	
		JOINT-VEA1369	
19 to 24	8.12.4 10.10.4	JOINT-VEA1399	
		JOINT-VEA1444	
		JOINT-VEA1369	
	10.12.4	JOINT-VEA1399	
		JOINT-VEA1444	
		JOINT-VEA2592	
	12 12 4	JOINT-VEA2512	
	12.12.7	JOINT-VEA1746	
		JOINT-VEA1746	
> 25	15.15.4	JOINT-VEA1746	
	15 10 /	SEAL-VEA1312A	
	13.17.4	JOINT-VEA1376	
	10 10 4	SEAL-VEA1312A	
	19.19.4	JOINT-VEA1376	

Table 16 – Sealing between glazing

					Leafi Asser dividers:	ng nblywith
Manufacturer website	Address	Machining	Hardening	OHS treatment	PVB	Sentry Glass
AIV (RIOUGLASS)	ZI – 13 rue COLBERT - 35300 FOUGERES	\checkmark	\checkmark	\checkmark		
AGC BVI	ZI - Route d'ARCIS - 10170 MERY SUR SEINE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
AGC VERTAL SOUTHEAST	25 rue du Lyonnais - 69800 SAINT-PRIEST	\checkmark	\checkmark	\checkmark		\checkmark
COPROVER (MIR CASTRAISE)	20 rue Henri REGNAULT - 81100 CASTRES	\checkmark				
DESCHANET Michel SA	ZAC d'Augny - 57685 AUGNY	\checkmark				
DISSEMINATE	ZI de l'Etang - 42210 MARCLOPT	\checkmark				
DANIA	ZI of three Fountains - 51100 SAINT DIZIER	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
LA VENECIANA GLASSOLUTIONS Saint Gobain	Cima do Alle, Filgueira - 36500 Lalin (Pontevedra) Spain	\checkmark	\checkmark	\checkmark	\checkmark	
CHARTREUSE MIRROR	ZA du Parvis - 38507 VOIRON	\checkmark	\checkmark	\checkmark		
CHARTREUSE MIRROR	ZA Bievres Dauphine - 38690 COLOMBE	\checkmark			v	
WEST MIRROR FACTORY	ZI Head of Bay - 14040 LA ROCHELLE	\checkmark				
MIROITERIE JOSSERAND	2086 avenue de Trevoux - 01000 SAINT- DENIS-LES-BOURGS	\checkmark				
SGGS ALP'VERRE	8 rue des Terrasses - 74960 CRAN GEVRIER	\checkmark	\checkmark	\checkmark	\checkmark	
SGGS DUTTLENHEIM (TECHNIVERRE 67)	ZI – rue Denis PAPIN - 67120 DUTTLENHEIM	\checkmark	\checkmark	\checkmark	\checkmark	
SGGS PARIS NORMANDY	ZI CAEN WEST - 14651 CARPIQUET Cedex	\checkmark				
SGGS COUTRAS	ZI d'Eygreteau – BP 50 – 33230 Coutras	\checkmark	\checkmark	\checkmark	\checkmark	
SGGS ECKELT (Austria)	Resthofstrasse 18. 4400 STEYR	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
SUNGLASS INDUSTRY SRL	Via Piazzola 13/F - 35010 VILLAFRANCA PADOVANA (PD) Italia	\checkmark	\checkmark	\checkmark	\checkmark	
V2S (RIOU GLASS)	ZI Plaisance - Crafts Street - 11100 NARBONNE				\checkmark	\checkmark
WEHR ETUPES	ZI Technoland - 25461 ETUPES Cedex	\checkmark				
WEHR MUNDOLSHEIM	10 street Thomas Edison - 67450 MUNDOLSHEIM	\checkmark				

This list is likely to be supplemented, and is available at the official request of Sadev.

Table 17 – List of glazing manufacturers



extension





VERRE FEUILLETE



R1	001	
Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint M14 or M16 with spherical end Ø20 mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Conical ring glazing support height 7 mm	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1 mm	Polyacetal or polyethylene	4
Locking nut Ø60 mm – thickness 5 mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	A4	6
Washer Ø14 or 16 according to NFE 25-513	A4	7
Grower washer Ø14 or 16 according to DIN127	A4	8
M14 or M16 nut according to DIN934	Α4	9
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11
Spacer outer Ø 16.5 or 18.5 mm – inner Ø 14 or 16 mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

Figure 1 – R1001 – Point Fixing





VERRE FEUILLETÉ



R110	1	
Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint M14 or M16 with spherical end Ø20 mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Conical ring glazing support height 7 mm	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1 mm	Polyacetal or polyethylene	4
Locking nut Ø50mm – thickness 5 mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	Α4	6
Washer Ø14 or 16 according to NFE 25-513	Α4	7
Grower washer Ø14 or 16 according to DIN127	Α4	8
M14 or M16 nut according to DIN934	Α4	9
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11
Spacer outer Ø 16.5 or 18.5 mm – inner Ø 14 or 16 mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

Figure 2 – R1101 – Point Fixing



VERRE FEUILLETÉ



hitter or



V = 1^m verial + films intracatories = 2^{mm} verial.

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R10	003	
Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint M14 or M16 with spherical end Ø20 mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Cylindrical glazing support ring of height determined by the formula ⁽¹⁾	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1 mm	Polyacetal or polyethylene	4
Locking nut Ø60mm – thickness 5 mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	A4	6
Washer Ø14 or 16 according to NFE 25-513	A4	7
Grower washer Ø14 or 16 according to DIN127	A4	8
M14 or M16 nut according to DIN934	A4	9
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11
Spacer outer Ø 16.5 or 18.5 mm – inner Ø 14 or 16 mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

(1) V-4<H \leq V-1 where V is the thickness in mm of the glazing and H the height in mm of the glazing support ring.

Figure 3 – R1003 – Point Fixing



\$46*8.5

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R100	8	
Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint M14 or M16 with spherical end Ø20 mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Conical ring glazing support height 7 mm	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1 mm	Polyacetal or polyethylene	4
Locking nut Ø60 mm – thickness 5 mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	A4	6
Washer Ø14 or 16 according to NFE 25-513	A4	9
Grower washer Ø14 or 16 according to DIN127	A4	10
Plug Ø10mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	7
Patella bearing	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	8
M14 or M16 nut according to DIN934	Α4	11
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	12
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	13
Spacer outer Ø 16.5 or 18.5 mm – inner Ø 14 or 16 mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

Figure 4 – R1008 – Point Fixing



VERRE FEUILLETÉ

entérieur



V - 1* venu + films intercalence + 2^{ker} venu

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R1006							
Designation	Matter	Mark					
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1					
Ball joint axis M14 or M16 with spherical end Ø20mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2					
Cylindrical glazing support ring of height determined by the formula ⁽¹⁾	Anodized aluminum AW 1050A according to NF EN 573-3	3					
Contact washer thickness 1mm	Polyacetal or polyethylene	4					
Locking nut Ø60mm – thickness 5mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5					
M14 or M16 nut according to DIN934	A4	6					
Washer Ø14 or 16 according to NFE 25-513	Α4	7					
Grower washer Ø14 or 16 according to DIN127	A4	8					
M14 or M16 nut according to DIN934	A4	9					
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10					
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11					
Spacer outer Ø 16.5 or 18.5mm – inner Ø 14 or 16mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E					

(1) V-4<H \leq V-1 where V is the thickness in mm of the glazing and H the height in mm of the glazing support ring.

Figure 5 – R1006 – Point Fixing





VERRE FEUILLETE



nteres



V = 1* veno + filma intercelareo + 2*** veno

extensur:

R1038							
Designation	Matter	Mark					
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1					
Ball joint axis M14 or M16 with spherical end Ø20mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2					
Cylindrical glazing support ring of height defined by the formula ⁽¹⁾	Anodized aluminum AW 1050A according to NF EN 573-3	3					
Contact washer thickness 1mm	Polyacetal or polyethylene	4					
Locking nut Ø60mm – thickness 5mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5					
M14 or M16 nut according to DIN934	A4	6					
Washer Ø14 or 16 according to NFE 25-513	A4	7					
Grower washer Ø14 or 16 according to DIN127	A4	8					
Plug Ø10mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	9					
Bearing Ø60	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10					
M14 or M16 nut according to DIN934	A4	11					
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	12					
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	13					
Spacer outer Ø 16.5 or 18.5mm – inner Ø 14 or 16mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	Е					

(1) V-4<H \leq V-1 where V is the thickness in mm of the glazing and H the height in mm of the glazing support ring.

Figure 6 – R1038 – Point Fixing

ATec No. 2.1/16-1736_V1



VERRE MONOLITHIQUE

VERRE FEUILLETÉ



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Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint axis M14 or M16 with spherical end Ø20mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Cylindrical glazing support ring of height defined by the formula ⁽¹⁾	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1mm	Polyacetal or polyethylene	4
Locking nut Ø50mm – thickness 5mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	A4	6
Washer Ø14 or 16 according to NFE 25-513	A4	7
Grower washer Ø14 or 16 according to DIN127	A4	8
M14 or M16 nut according to DIN934	A4	9
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11
Spacer outer Ø 16.5 or 18.5mm – inner Ø 14 or 16mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

(1) V-4<H \leq V-1 where V is the thickness in mm of the glazing and H the height in mm of the glazing support ring

Figure 7 – R1106 – Point Fixing



VERRE FEUILLETÉ



#14'=x #30⁺8⁵

extériéur.

R1103		
Designation	Matter	Mark
ball joint body	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	1
Ball joint axis M14 or M16 with spherical end Ø20mm	Stainless steel X4 Cr Ni Mo 16-5-1 according to NF EN 10088-3	2
Cylindrical glazing support ring of height defined by formula (1)	Anodized aluminum AW 1050A according to NF EN 573-3	3
Contact washer thickness 1mm	Polyacetal or polyethylene	4
Locking nut Ø50mm – thickness 5mm	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	5
M14 or M16 nut according to DIN934	A4	6
Washer Ø14 or 16 according to NFE 25-513	A4	7
Grower washer Ø14 or 16 according to DIN127	A4	8
M14 or M16 nut according to DIN934	A4	9
Option 3025 M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	10
Option Monti M14 or M16	Stainless steel X2 Cr Ni Mo 17-12-2 according to NF EN 10088-3	11
Spacer outer Ø 16.5 or 18.5mm – inner Ø 14 or 16mm	X8 Cr Ni S 18-9 stainless steel according to NF EN 10088-3	E

(1) V-4<H \leq V-1 where V is the thickness in mm of the glazing and H the height in mm of the glazing support ring

Figure 8 – R1103 – Point Fixing



Designation	Matter	Mark
M14 or M16 nut according to DIN439	A4	1
Thick washer Ø14 or 16 according to DIN 7349	A4	2
Grower washer Ø14 or 16 according to DIN127	A4	3

Figure 9 – Seismic option



* For standard 4-point hitch position 5 (see assembly recommendations figure 28): a fixed point Ø17mm, expanding point Ø17x28 or free Ø28mm.



Représente :

Pour une fourton M12 et M14 un point fixe (317mm), point distant (317x24 ou libre (324mm) en tonction de la position de l'attache sur la façade (voir preconsistions de montage)

Pour une fixation M16 un point file Utilieren, point dilatare Utilis28 ou ibre 02/8mm en function de la position de l'attache sur la tapade evair préconsations de montager

Figure 10 – S3000 – Attachment



* For standard 4-point hitch position 5 (see assembly recommendations figure 28): a fixed point \emptyset 17mm, expanding point \emptyset 17x28 or free \emptyset 28mm.



Pour une fixation M12 et M14 un ponit fixe 017mm, point dialant 017x24 ou libre 024mm en tonction de la position de l'attache sur la façade (voir preconsistions de montage)

Pour une fixation M16 un point file Utilieren, point diletant G119x28 ou ibre G28cm en function de la position de l'attache sur la tapade ovar préconsations de montager

Figure 11 – S3000DU – Attachment



* Pour attache standard 4 branches position 5 (voir preconsiations de montage figure 29): un point fixe \$717mm, point dilatare 1017x28 ou libres \$22mm

Vives cold write-



Pour une fixation M12 et M14 un point lixe Ø17mm, point utilidant Ø17x24 ou libre Ø24mm en fonction de la position de l'attache sur la tagade (voir préconstations de montage)

Pour une fixation M16 un point fixe Ø19mm, point dilatant Ø19x28 ou libre Ø28mm en fonction de la position de faitache sur la façade (voir préconsations de montage)

Figure 12 – S3001EVO – Attachment



Pour une fixation M12 et M14 un point fixe Q17mm, porti diatant Q17xQ4 ou item Q24mm en Konction de la position de l'atlache aur la façade (voir préconstations de montage)

Pour une Skation M16 un point fixe @19mm, point dualant 019x27 ou libre @27mm et Fonction de la position de l'attache suit la façade (voir preconsuitors de montage)

Figure 13 - S3003-10 - Clip



Figure 14 - S3002 - Clip



Figure 15 – S3002DU – Clip



Figure 16 – S3007 – Clip



Figure 17 – S3030 – Clip



Figure 18 – S3030L – Clip



Pour une fination M12 et M14 un point fixe 2017mm, point ditatant 2017x24 ou item 024mm en fonction de la pointrui de l'artache sur la façade (von preconsistione de montage)

Pour une Baution M18 un point two @10mm, point distant @19x28 ou titre @28mm en fonction de la poellion de l'attactie sur la façade (voir préconsations de montage)

Figure 19 – S3100 – Attachment



Représente

Pour une lixption M12 et M14 un point lixe 017mm, pont diatant 017x24 ou ibre x024mm en function de la position de l'attache sur la façade (voir préconnations de montaple)

Pour une fixation M16 un point fixe Ø19mm, point disated Ø19x28 ou libre Ø29mm en fonction de la position de l'attache sur la taçade (volt préconsultons de montage)

Figure 20 - S3100-12 - Clip



Représente

Pour une Exation M12 et M14 un point Res (217mm, point illutant (217x)4 ou lline (224mm an bouction de la position de l'attache sue la lacadé (solr potentiations de montage). Pour une fluidon M16 en point fine (219mm, pour ellatent (219x)26 ou lline (228mm en fonction de la position de l'attache sur la façade your précentiations de montage).

Figure 21 – S3100DU-45° – Attachment



Pour une faceton M12 et M14 un point five @17mm, point diletent @12x24 su ibin @24mm en loischon de la position de l'attentie sur la laçada (voe préconsations de montage).

Pour une Texton M16 un poet faie 2H filmer, pont miniant 619x25 ou litre 228mm en texction de la poeten de l'inflacter mi la feçade (vor préconsistence de montage)

Figure 22 – S3101EVO – Attachment



Représente

Pour une Skation M12 et M14 un point five (317mm, point ditatant (317x24 ou libre (824mm en Sonction de la position de l'attache sur la façade (voir préconsations de montage)

Pour une fixation M16 un point the Ø18mm, point diatant Ø19x26 ou stire Ø28mm en tonction de la position de l'attache sur la façade (voix précorisations de montage)

Figure 23 – S3105 – Clip



rep	Nu mb er	Designation	Matter
1	1	Omega	X5 Cr Ni Mo 19-11-2 according to NF EN 10213-4
2	1	Screw	A4
3	1	Anti-rotation plate	X5 Cr Ni Mo 19-11-2 according to NF EN 10213-4
4	1	Washer	A4
5	1	Washer DIN 127	A4
6	1	Nut DIN 934	A4



Figure 24 – Foundry cone omega kit



rep	Numbe r	Description	Matter
1	1	toothed omega	X5CrNiMo19.11.2/AISI 316/1.4408
2	1	Intermediate Piece (Toothed)	X5CrNiMo19.11.2/AISI 316/1.4408
3	1	Spring pin Ø6 Lg:20	A2
4	1	HM screw 20 x 70	A4
5	1	Flat washer M 20	A4
6	1	Grower washer Ø20	A4
7	1	Nut HM 20	A4



Figure 25 – Toothed omega kit with S3030L



Figure 26 – other assembly possibilities allowing adjustment of the attachments (consult SADEV)





Coulisseau SAFCO

- Coulisseau standard :
- Coulisseau renforcé :

matière : Aluminium anodisé AW 2017A suivant NF EN 573-3 matière : Acier C45 suivant NF EN 10083-2

Figure 27 – SAFCO app



Figure 28 – Mounting suggestions A and D

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Figure 29 – Mounting suggestions E to H





Figure 31 – Example of sealing profiles between glazing



Figure 32 – Example of perimeter sealing profiles



Figure 33 – Example of glazing marking (SADEV can communicate the logos on request)



Figure 34 – Example of glass product identification label