

324



Introduction

This technical book has been developed by our Technical Sales Department, relying on our internal technical expertise.

Our Research & Development department deals with two main responsibilities:

- To develop new innovative systems
- To bring its expertise to attend our customers and our technical and sales team in dealing with current complex projects.

Our R&D department has played a major role in providing the market with innovative polycarbonate systems solutions for over 10 years. Its expertise has led to Pioneering polycarbonate applications such as:

- Prada Foundation in Milano.
- Gorky Park Museum in Moscow.
- Multipurpose hall in Cluji.
- "Il Centro" Mall in Arese.
- Protoshop Lamborghini in Sant'Agata Bolognese.
- "Centro Sicilia" Mall in Catania.

Our Technical Sales Department team works in close connection with the various technical departments in CSTB, LNE and GINGER in order to finalise new systems and specific solutions to complex projects falling out from the Technical Certification perimeter.

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1 – System definition

ArcoPlus® Interlocking system 324 is 20mm in thickness. It can be span an infinite width or height to create lighting glazing for applications such as cladding or certain roofs “saw tooth”. It is made of cellular polycarbonate panels, anti-UV co-extruded on one side (or two sides upon request) and are assembled vertically by interlocking of longitudinal ribs.

This system can be used for any building type (industrial, air-conditioned offices, schools, hospitals, sport centers, housing, swimming pool, etc ...), heated or not, however not refrigerated. It can be installed with a maximum slope of 15°, including for “saw tooth” application, and they can also be installed in any humidity level (high or low) environments (ie: swimming pools). ArcoPlus® systems do not contribute to the functions of loads transmission, bracing and shock resistance for security purpose (railing function). Those functions are performed by the supporting structure.

Any application falling out from those criteria can be submitted to our technical department to be assessed within a specific analysis.

2 – Thermal expansion

The linear expansion coefficient is 0,065mm/ml/°C. The precise expansion of a panel can be calculated with the following expression: $\Delta L = \alpha \times L \times \Delta T^\circ$

ΔL : Thermal expansion;

$\alpha = 0.065 \text{ mm/m}^\circ\text{C}$;

L = panel's lenght;

ΔT° = estimated temperature in Celsius degrees.

While installing the panels, it is essential to check on the polycarbonate panels covering section (R in mm) of the aluminium profile according to the following chart:

T° C Installation	Panel length in meter								
(L)	1	3	5	7	8	10	12	14	16
0°C	20 mm	23 mm	25 mm	27 mm	29 mm	30 mm	31 mm	33 mm	37 mm
15°C	22 mm	26 mm	31 mm	35 mm	39 mm	41 mm	44 mm	47 mm	53 mm
30°C	23 mm	30 mm	36 mm	42 mm	48 mm	53 mm	56 mm	60 mm	70 mm

Panels are freely expanding towards the top within the connectors and the top lateral profiles.

3 – Technical Assistance

Technical assistance and distribution in Italy and abroad is realized by dottor Gallina srl, based in La Loggia (TO). The company analyse the solution best suited to the project and develop a detailed list of panels, profiles and accessories required for the installation.

Even though dottor Gallina does not install, the company can attend the beginning of the implementation and provide advices at customer request.

4 – Panels specifications/treatments

	324
Width (mm)	333±3
Thickness (mm)	40±0.3
AR	X
IR	X
Bi-coloured	X
UV Tech	✓
UV Matt	✓
AG	✓

AR : Anti-glare treatment (visual comfort, prevent from neon effect)

IR : Infrared treatment (prevent from heat increase within the building)
 UV Tech : Reinforced UV Protection – 15 years warranty.
 UV Matt: Matt finishing treatment (prevent from surface glares, better distribution of the light)
 AG: Anti-graffiti and anti-scratch treatment.

Panels are available in various colours, included in our “Caleido” range. Due to extrusion process constraints, a visual difference in colour shade is admitted as long as it does not interfere with the mechanical characteristics of the polycarbonate components. Some treatments like AR (anti-glare) and IR (infrared) can create some shade variations with colour range.

5 – Thermal specifications

Pannelli	Uc (W/m².K)	ψi (W/m.K)	χk (W/k)
324	1.8	n.d.	n.d.

Uc : Thermal coefficient in the core part of the panel (in between connectors)

ψi et χk : Thermal coefficient alongside the connectors.

6 – Acoustic insulation values

Panel	Internal	External	Rw (C,Ctr)
324	18 dB(A)	16 dB(A)	19 (-1,-4) dB

Report CFI Andrésy: n° ACOU/09/03

Report EUROFINs: n° 1.12.AVM.0160/44313

Report EUROFINs: n° M1.13.AVM.0482/51984

Acoustic test according to regulation ISO 140-4 e UNI ISO 10140

7 – Optical characteristics

Panel	Color	Light Transmission (LT) in %	Solar factor (SF) in %
324	Crystal	70	74
	Opal	45	50

8 – Fire reaction according to EN 13501-1

Panel	Fire classification	Combustible mass (MJ/m²)
324	B,s1-d0	n.d.

9 – Resistance to chemical agents

The polycarbonate has good resistance to most chemicals with which it is likely to come into contact during normal use. Specific tests are recommended for applications where the material is likely to come into contact with aggressive chemicals. It is essential to verify their compatibility prior to use. Below some examples:

Chemical agents	Resistance
Diluted acids	Good
Concentrated acids	Average to good
Alkali	Low to average
Organic solvents – alcohol	Good
Chlorinated hydrocarbons	Good
Aromatic hydrocarbons	Good
Aliphatic polycarbonates	Good
Lubricating oils	Good
Detergents	Good

10 - Storage

ArcoPlus® systems should be stored avoiding exposure to direct sunlight and rain. Should storage be outside, it should not be directly in contact with the ground (a ventilation space must be kept) and should be protected with a light coloured non-transparent tarpaulin.

To avoid oxidation, untreated aluminium profiles should be unpacked straight away after unloading to avoid any contact with potential residual humidity within the package, and stored in a dry environment. In any case, untreated aluminium profiles should not be kept in contact of each others in a humid environment.

Do not store more than two pallets on top of each other.

In case of heavy wind, use straps.

11 - Maintenance

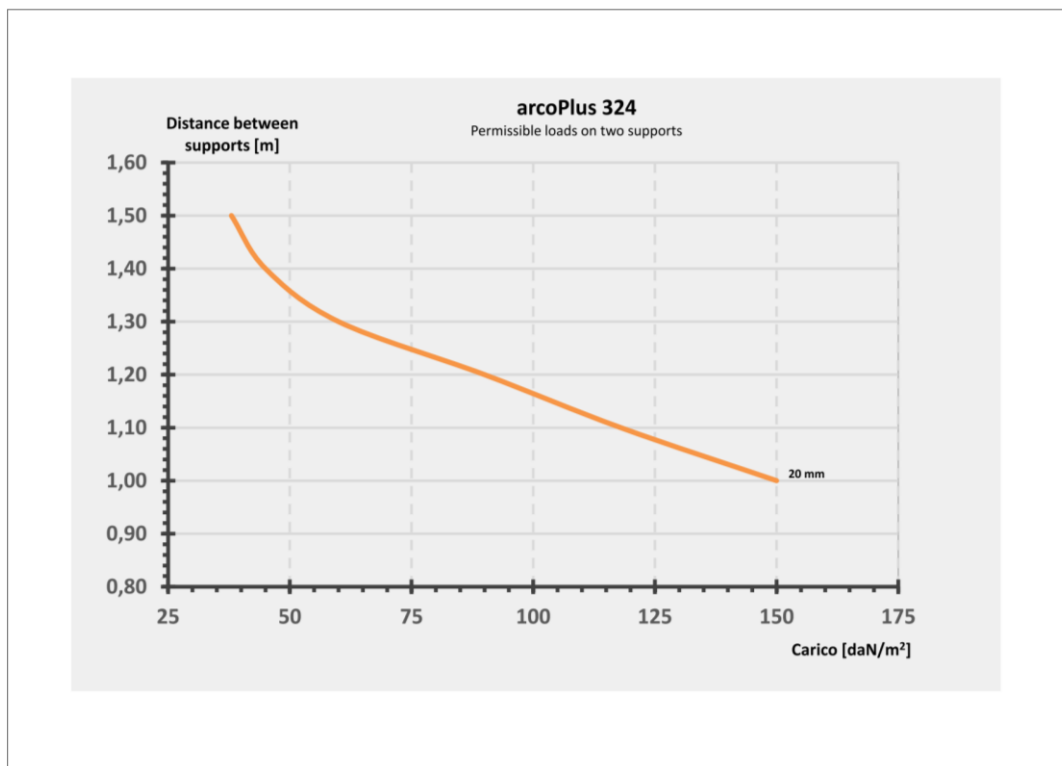
ArcoPlus® panels should be frequently cleaned with mild soapy water (neutral detergent) and thoroughly rinsed with clear water. Do not use warm water. Do not use organic solvents, abrasive or alkaline products.

14 – How to replace a damaged panel?

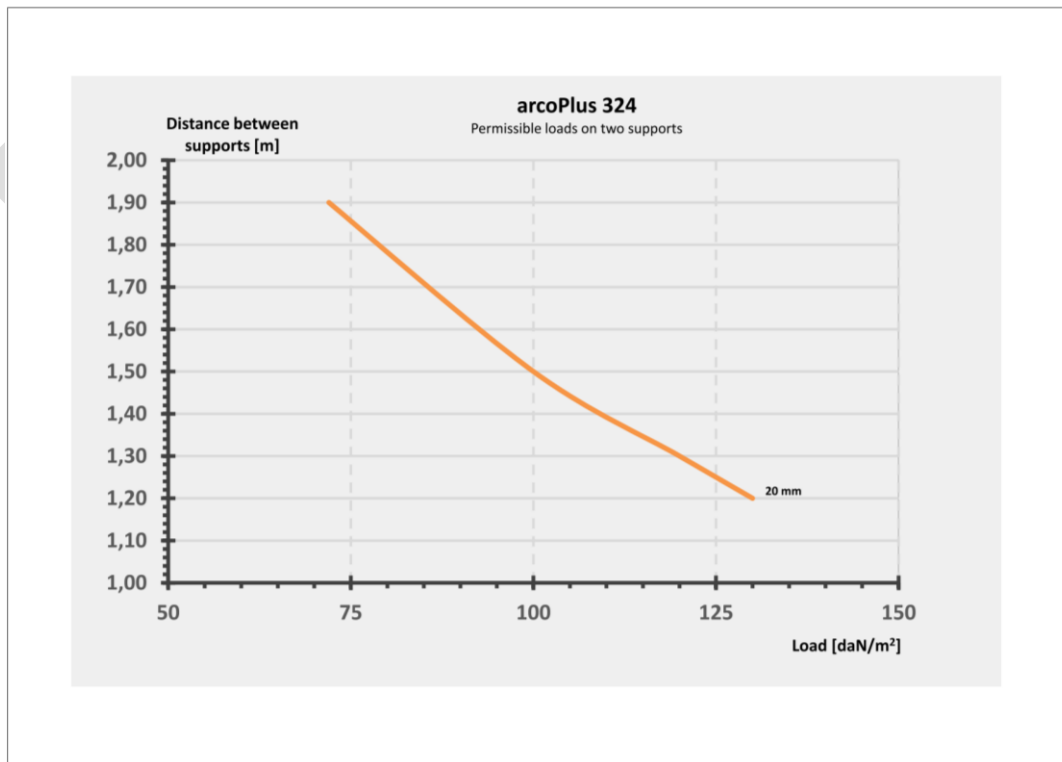
1. Remove the EPDM gasket 1169/b on top and low part of the cladding.
2. Cut the damaged panel with a diamond cutting disc and remove the different parts.
3. Remove the panel on the right side, pushing it on the left and then pulling it down. Remove in the same way the panel on the left side.
4. Create a "V-shape" with this panel and the new one. Then, insert them in the upper profile and press on the side joints to click the panels with the ones on the sides. Pull them down to put them in place.
5. Put back in place the AL drip edge, on the top and low part of the cladding.
6. Re-insert the EPDM gasket 1169/b between the gasket and the panels.

15 - Permissible loads - plan system

arcoPlus® 324 - Permissible loads on two supports



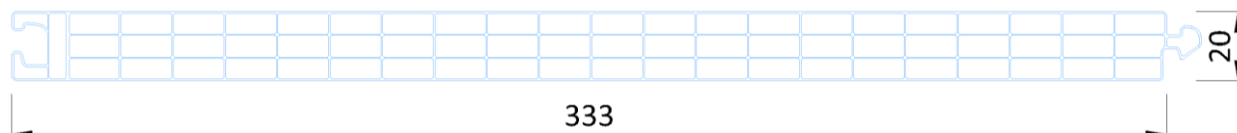
arcoPlus® 324 - Permissible loads on multiple supports



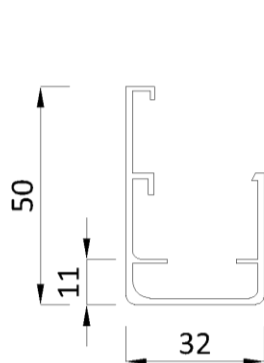
The permissible load for a specific distance between the supports can be calculated by interpolation between the x-axis value and the y-axis value.

ArcoPlus® 324 panel, aluminium profiles and accessories

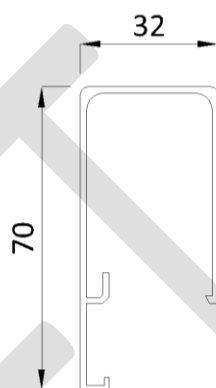
arcoPlus 324



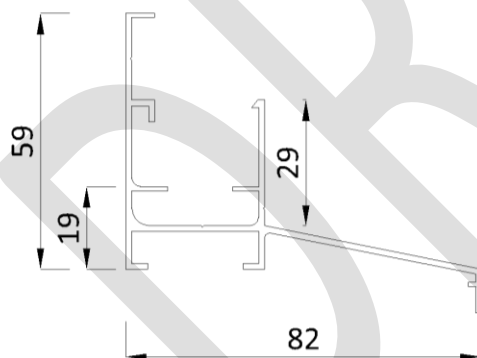
tolerance +/- 3mm



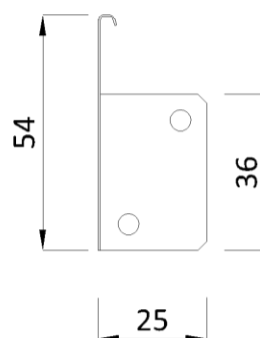
Base AL profile
cod.4062



Upper/side AL profile
cod.4061



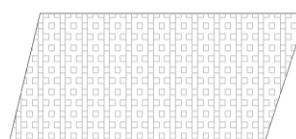
Base AL profile with eave
cod.4064



Inox bracket
cod.4063

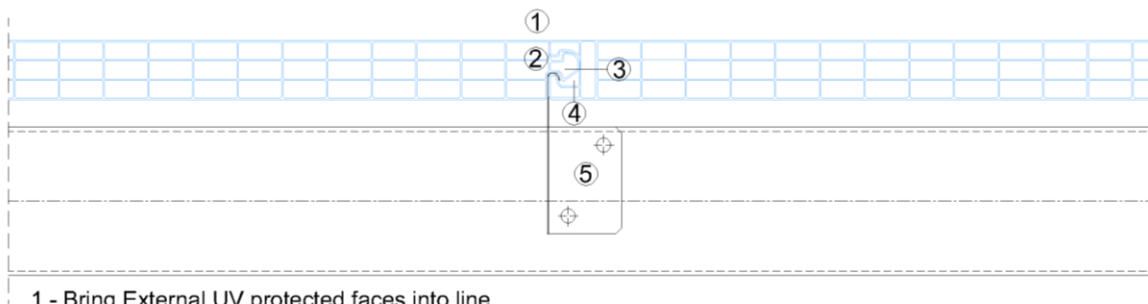


Gasket
cod.1169/b

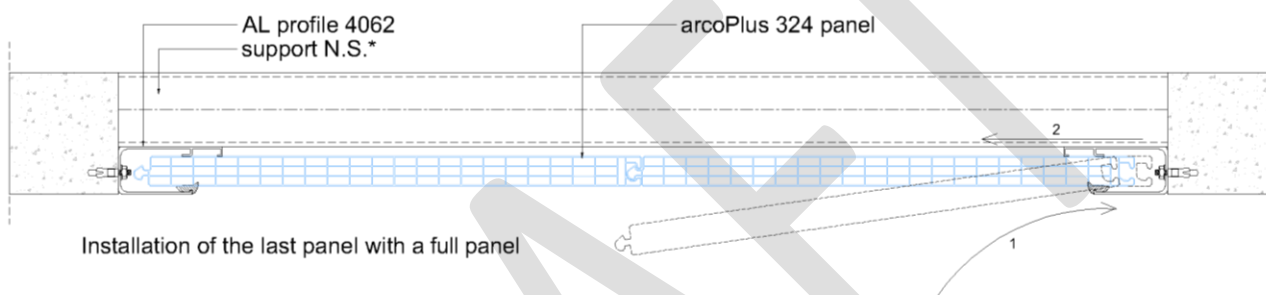


Additional "antidust"
tape cod.4327

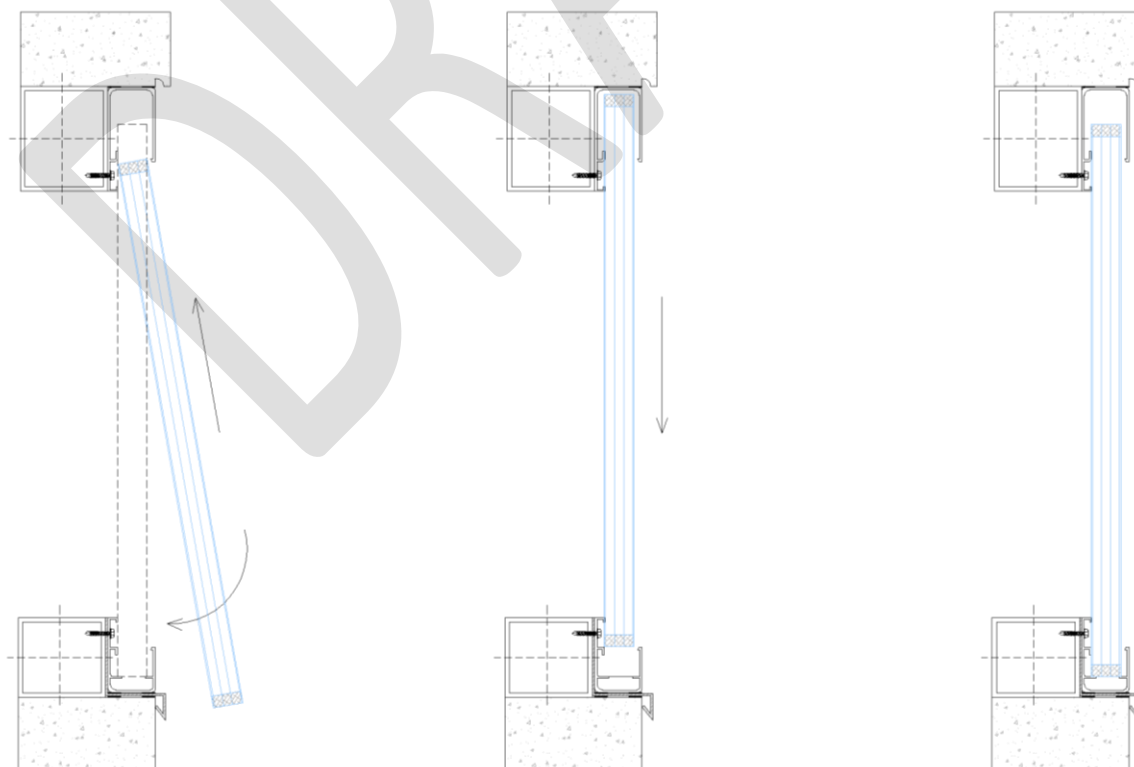
Installation



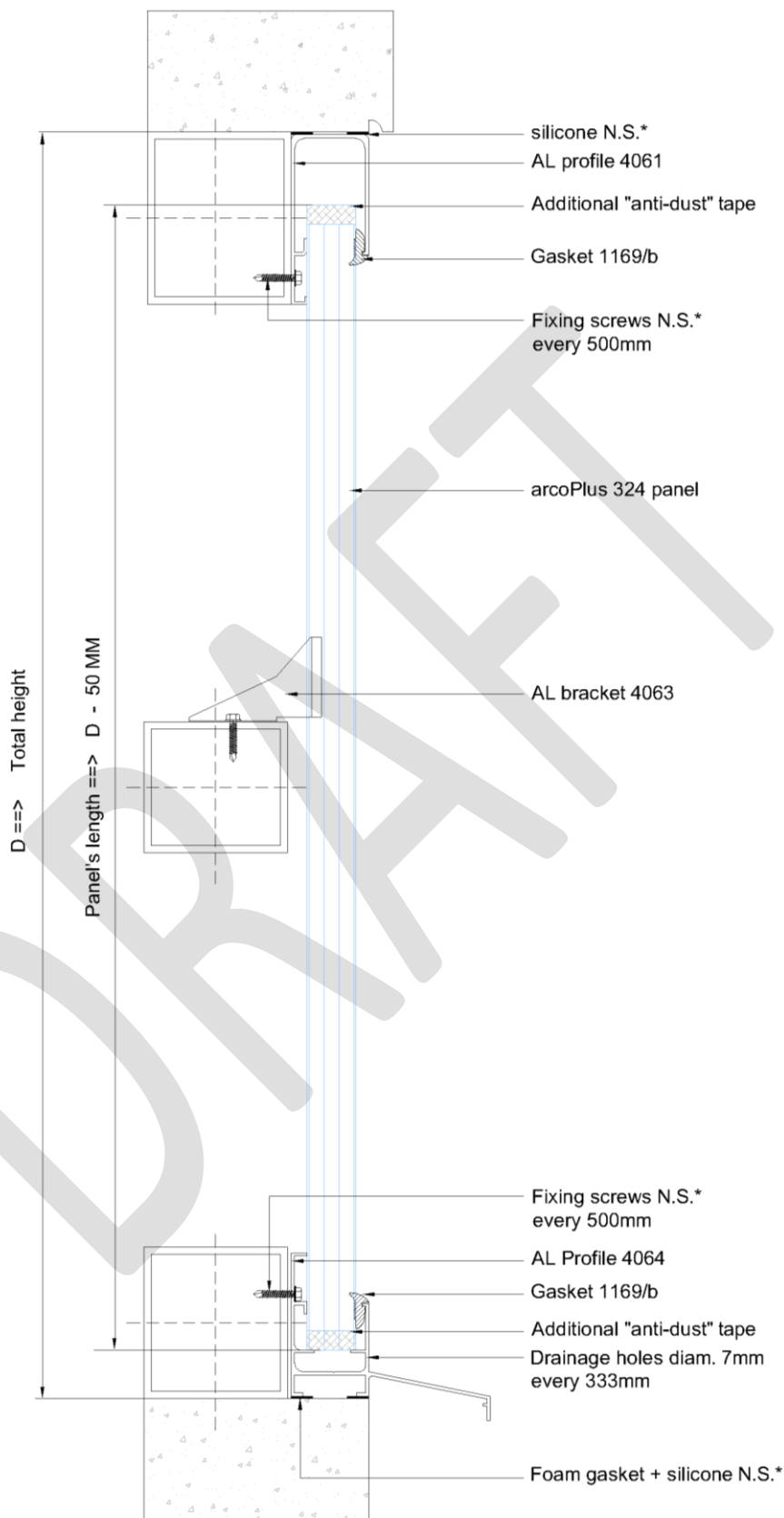
- 1 - Bring External UV protected faces into line
- 2 - Low pressure channel
- 3 - Adjacent panel assembly
- 4 - Important drainage channel
- 5 - Fixing bracket maintaining the 2 interlocking faces



Panel's installation: vertical section

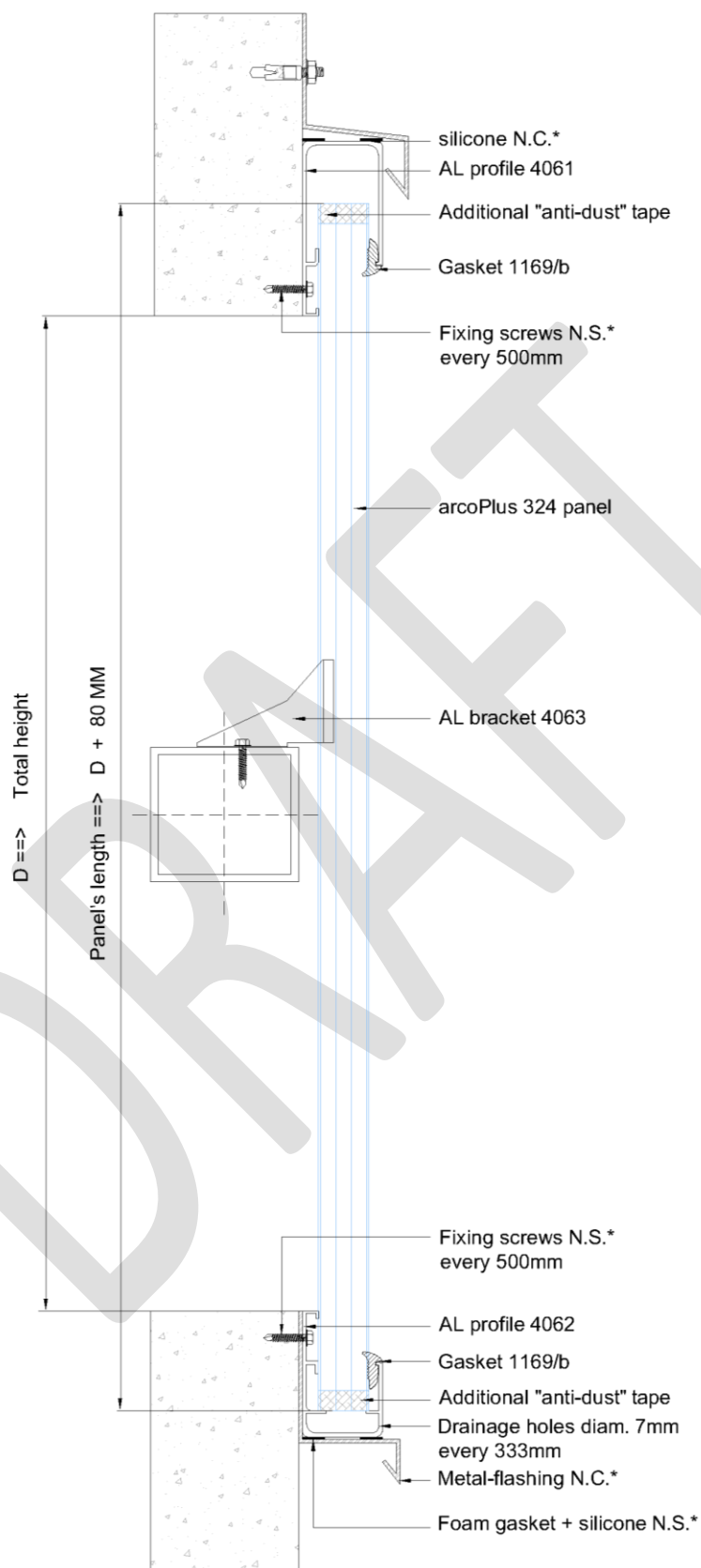


Vertical installation: fitting between two supports with profiles cod. 4064 e 4061



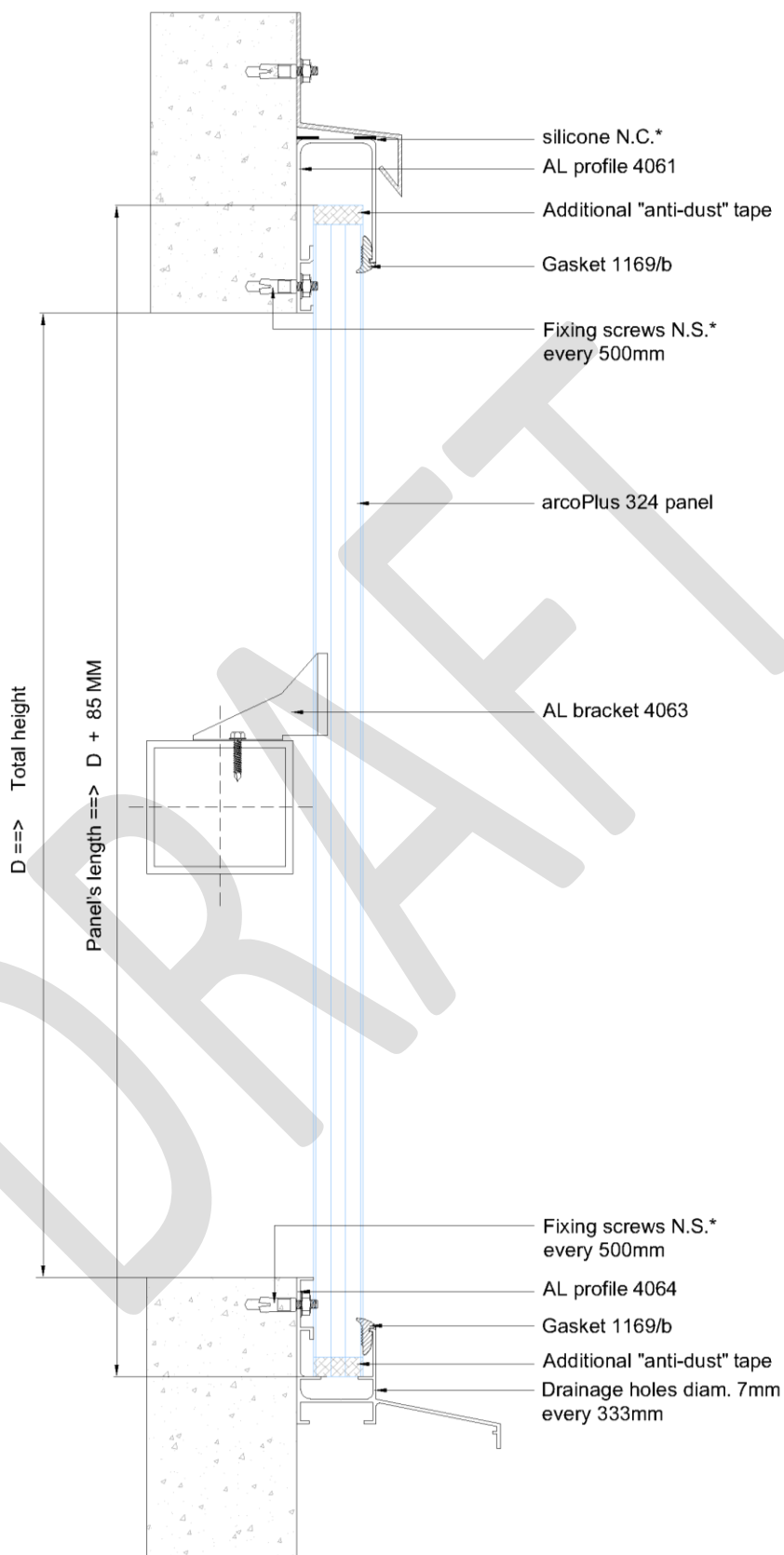
N.S.* = Not supplied by Gallina

Vertical installation: front of the building installation with profiles cod. 4062 e 4061



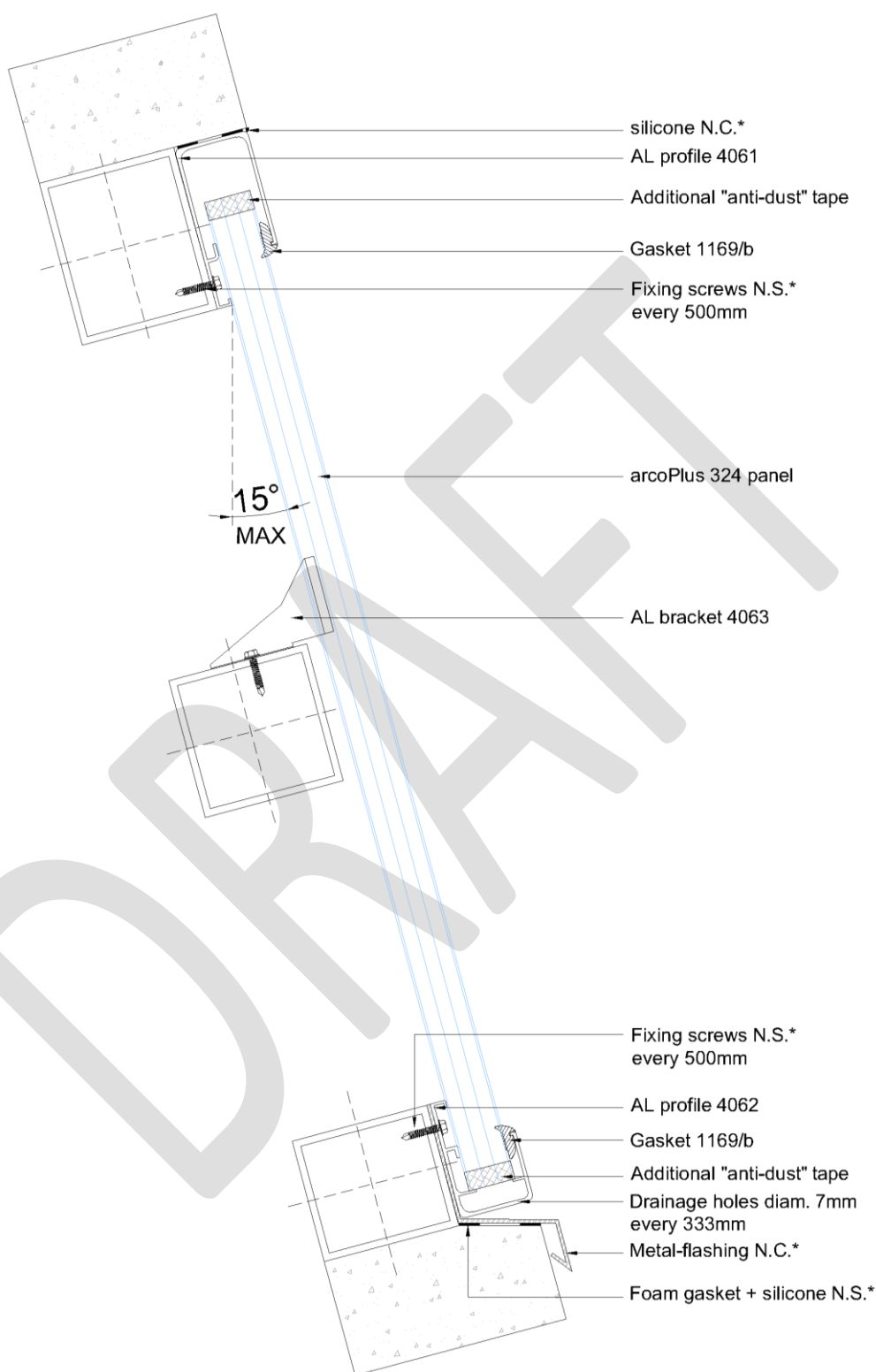
N.S.* = Not supplied by Gallina

Vertical installation: front of the building installation with profiles cod. 4064 e 4061



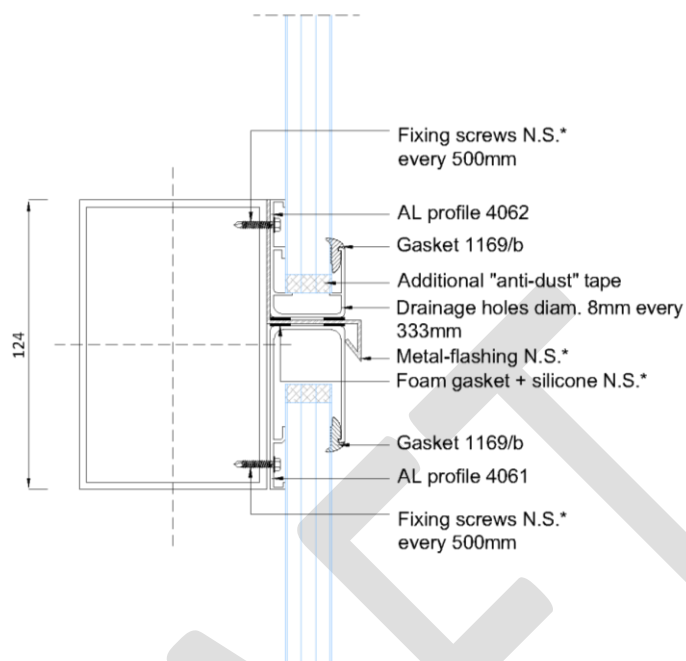
N.S.* = Not supplied by Gallina

Inclined installation: fitting between two supports with profiles cod. 4062 e 4061

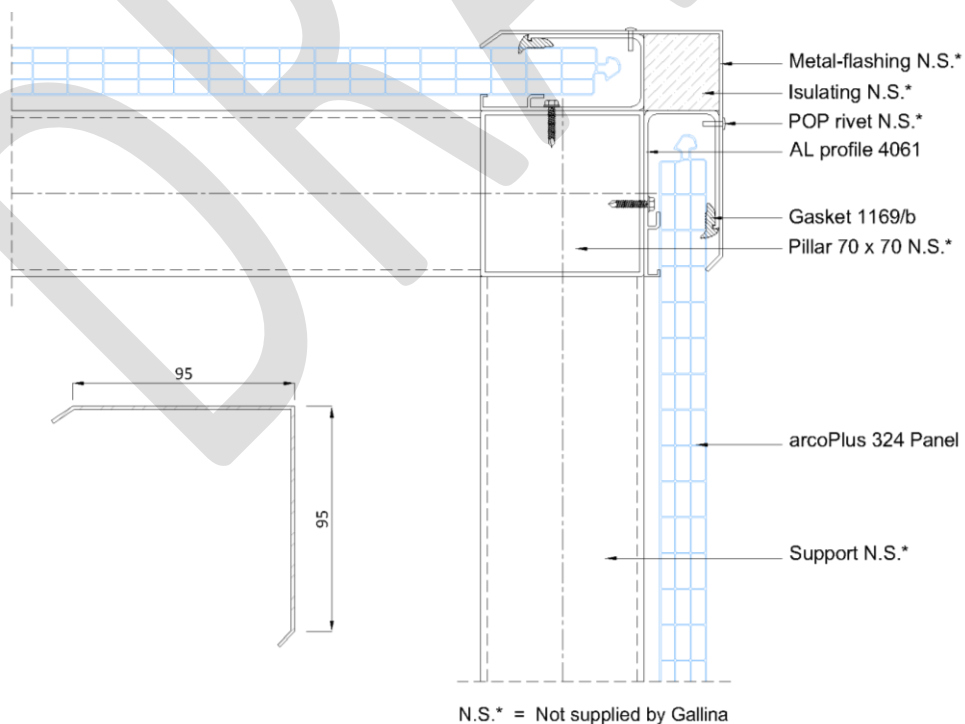


N.S.* = Not supplied by Gallina

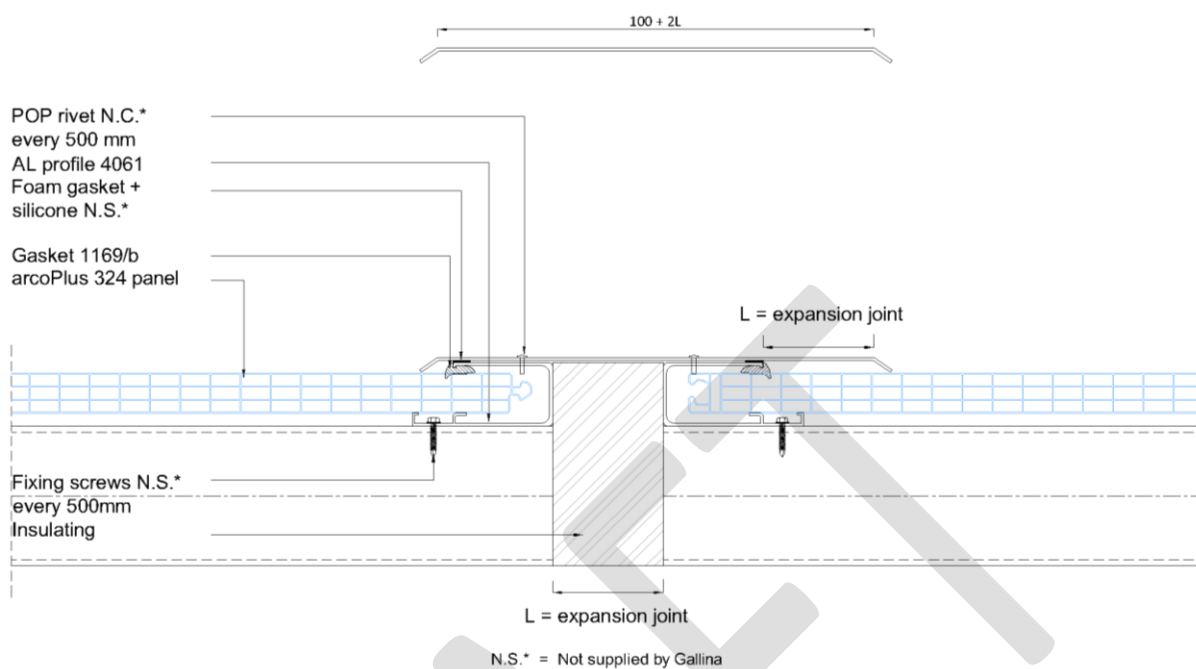
Junction of two superposed claddings with profiles cod. 4062 e 4061



Angle detail with profile cod. 4061



Expansion joint's detail with profiles cod. 4061



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