



Luminous ideas with composite barrel vaults





The construction industry has already recognised the advantages of natural light for many years. Our Cintralux® barrel vaults offer the perfect solution :

- Entirely self-supporting for spans up to 4 m width and limitless in the length
- Simple, fast assembly on the basis of standard elements.
- Self-supporting construction calculated according to the current norms for wind and snow load
- Suitable for the construction of new buildings as well as for refurbishment
- Extremely high chemical resistance, adjusted to an industrial environment
- Self-cleaning
- High and permanent light performance with equal spread of light
- Perfectly suitable to incorporate Cintramax CE SHE (Smoke and Heat Extraction) EN 12101-2
- Hailproof: 20 years hailproof guarantee against normal hail damage
- Attractive price = with respect of the budget
- Meets the European norm ENV 1187



Shed - Amsterdam - NL



Natural light is all around, what a feeling !



Refurbishment - Warsaw - PL



## The infallible barrel vault for the industry



### 1. Sheets

The Cintralux® GRP barrel vault is composed of moulded and centred transparent sheets, which interlock. These sheets are fixed in a single- or double- walled way. The choice of the sheets is determined upon the desired purpose. You can make your choice by using the streamschemes for the outer sheet (OS) and the inner sheet (IS) (see scheme 1 and 2). If you opt for 1200 Joule, both the IS and OS must be of the type 1200 Joule. All the outer sheets are standard manufactured in Longlife.

### 2. End panels

The end panels are manufactured in the same glassfibre reinforced resins as these of the sheets, but in opaque. You can opt for single- or double- walled end panels. The latter are insulated with 20 mm PU-foam.

### 3. Assembly accessories

The needed assembly accessories are also delivered, depending upon the type of curb (timber or metal), including the decay - free sealing tape in PE. If you use a non-bituminous roof membrane, we recommend the "Z"-assembly. The manufacturer delivers also the assembly accessories for the end panels.



Storage room - Kuurne - BE

Factory - Waregem - BE



Luminous ideas throughout the years ...



New building project - Paris - FR



Refurbishment - Zürich - CH



Workplace - Waregem - BE



Factory- Berlin - D



Refurbishment - Colombes - FR



**Natural light has priority.**



Factory Zeebrugge after refurbishment



Factory Zeebrugge before refurbishment

**ADVANTAGES:**

1. Barrel vaults give 3x more light than a similar surface in vertical glazing
2. Barrel vaults ensure an optimal spread of light
3. Natural light is free: you regain the purchase of the Cintralux® within 5 years
4. Natural light increases productivity



## The composite barrel vault “à la carte”



New building project - Reykjavik - IS

### LOGLIFE

All the outer sheets of the Cintralux® GRP are always manufactured in Longlife. The Longlife barrel vault offers you all the advantages of the composite barrel vault and ensures the preservation of the initial colour- and light transmission. When using the coextrusion PET-film with the extreme UV-stable top layer, the Cintralux® barrel vault keeps its aesthetical aspect even after many years of outside exposure. Moreover, the surface remains very shiny, which gives a self-cleaning effect when it rains.

### ENV 1187

The barrel vault, which meets the new European fire norm.

### 1200 JOULE

Many European countries demand permanent security for maintenance personnel on roofs. The severest regulations rule in France and Switzerland, where the barrel vaults must resist an energy of 1200 Joule. This energy is caused by a weight of 50 kg falling from a height of 2,4 m on the barrel vault. The Cintralux® GRP 1200 Joule withstands this test with brio. (PV N° 2322.8-047 CEBTP)

### HEATSTOP

When a better climate is requested, you can opt for Heatstop. With the addition of heat-resistant additives to the composite resins, the extreme summer heat is tempered. The Heatstop gives a noticeable difference of heat accumulation in your building. You can easily recognise the reflective Heatstop shell on its pearl colour.

### COOLGREEN

You find a completely renewed look on the barrel vault Cintralux® GRP Coolgreen. The Cintralux® GRP Coolgreen turns your space into a haven of peace. The pleasant green incidence of light provides a restful aspect. People are known to work better in such an environment. This improves both the atmosphere and productivity. The Cintralux® GRP Coolgreen operates as a filter because of its colour. Certain wavelengths, which cause heating, are stopped. The Cintralux® GRP Coolgreen gives your building a “fresh” aspect.





**SHE - and ventilation systems:  
Cintramax® CE, Skyvent® & Cintrair®**



CINTRAMAX® CE SHE according to EN 12101-2

The Cintramax® CE is a very aesthetical and highly efficient ventilation system. It can easily be incorporated in any Cintralux® GRP barrel vault. The opening sheet is lifted with a double scissor system to a height of 80 cm. When the Cintramax® is open, it drains a large volume of heat and stale air away. It offers a permanent protection against the sun, since the sheet is positioned exactly above the opening.



SKYVENT® SHE

De Skyvent® is a slat system, which can be built into every Cintralux® GRP barrel vault. It also can be used as a free-standing ventilation system. Technical information is available on request .

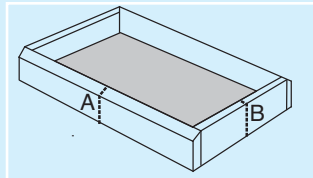


CINTRAIR® VENTILATION

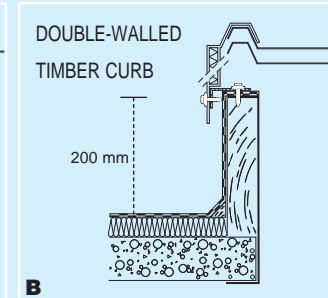
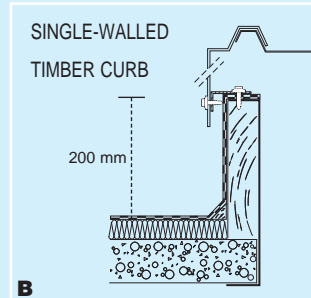
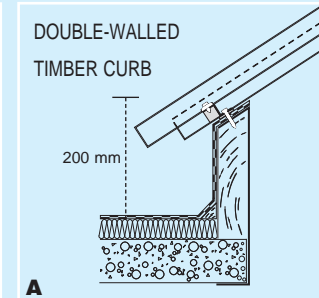
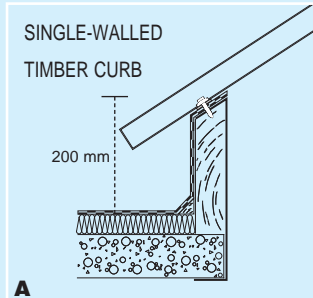
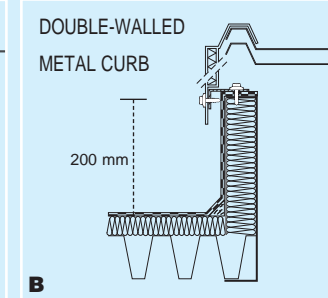
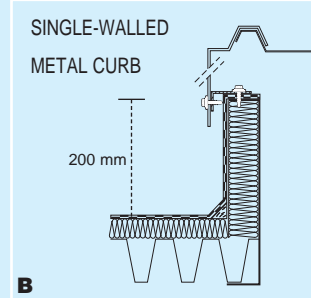
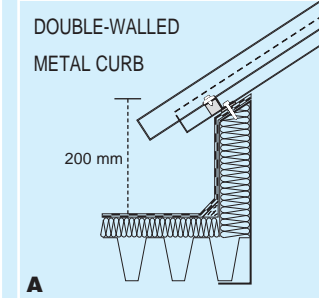
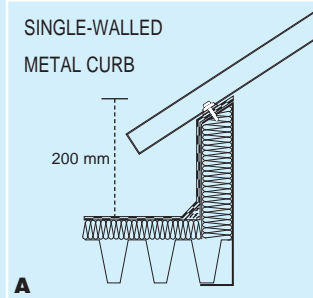
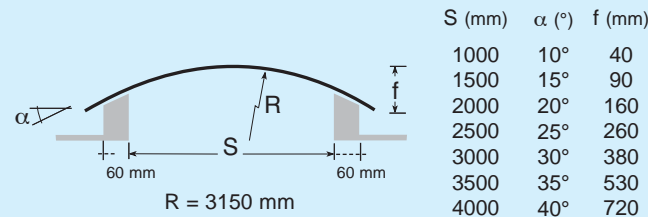
The Cintrair® is a simple hatch, which can be opened on one side. It is built on one sheet of the barrel vault, which hinges on one side of the curb. This provides an oblique opening of 300 mm. The Cintrair® can be opened by means of a 230V AC motor with switch.



## CURBS FOR GRP-BARREL VAULTS



Standard curb width = 60 mm  
When ordering: please mention overall size!



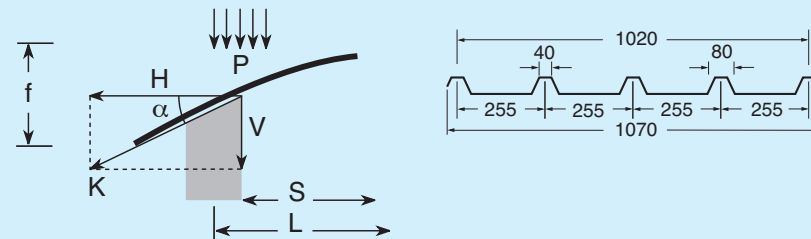
### Force on the curb

Vertical:  $V = \frac{P \times S}{2}$  with:

- V = vertical force per linear meter (N/m)
- P = snowload and deadweight (N/m<sup>2</sup>)
- S = width of the daylight size (m) (overall size - 12 cm)

Horizontal:  $H = \frac{P \times L^2}{8f}$  with:

- H = horizontal force per linear meter (N/m)
- P = snowload and deadweight (N/m<sup>2</sup>)
- L = axis-to axis distance of the supporting points (m)
- f = barrel rise (m)
- α = bevel angle or daylight size S (in dm)



## OFFICIAL CERTIFICATES

The Cintralux®-barrel vaults have:

- Aprobata Technicza AT-5-2194/96 - (Poland)



Certificates on request

- Cintralux® also has the following fire certificates:

- standard Cintralux®:
  - Euroclass E
  - U.K.: Class 3 (report 50144)
  - France: M4 (N° B030491 - CEMAT/2)
- Cintralux® fire retardant:
  - U.K.: Class 1 (A1 in Belgium) (report 50143)
  - France: M2 (N° B120347 - CEMAT/1)
- Cintralux® ENV 1187: (report 010116P)
  - EU: fire test in accordance with the European norm, roofing of buildings lower than 10 m
- Cintralux®
  - Hungary (report 607 - 185/1/2002)
- Body impact:
  - France: according to 1200 Joule-test CEBTP (2322.8.131/2)

## TECHNICAL SPECIFICATION CINTRALUX® GRP LONGLIFE

### .10 EXTENT

The works contain:

- # the manufacturing, delivery and the mounting of the reinforced glass fibre composite barrel vaults # including end panels # with opening parts.
- # the mounting of the Cintramax® SHE-systems (Smoke and Heat Extracting).
- # the mounting of the Cintrair® ventilation systems.
- # the manufacturing, the delivery and the mounting of the inferior construction with bevelled sides, in accordance with the manufacturers specifications.
- # the manufacturing, the delivery and the mounting of the operating elements for the Cintramax® SHE-systems.
- # the manufacturing, the delivery and the mounting of the operating systems of the Cintrair® ventilation systems.

### .20 MEASURING CODE

Per sq.m: daylight size x -width.  
Per unit: Cintramax® SHE-appliance  
Per unit: Cintrair® ventilation-appliance.

### .30 MATERIALS

The Cintralux® GRP is composed of different elements and accessories. These build up an entity and are delivered by the same manufacturer. The outer sheet is always in a longlife U.V. resistant execution.

The different elements are:

- The self-supporting Cintralux® GRP-sheets, with following characteristics:
  - Material: UV-stabilised polyester resins with glass fibre reinforcement.
  - Profile: longitudinally profiled, radius 3150 mm with side overlap # single-walled # double-walled # mounted.
  - Mounting: # standard Longlife clear, light transmission 87%.
  - Outershell: # standard Longlife Coolgreen, light transmission 86%.
  - # standard Longlife opal, light transmission 63%.
  - # ENV 1187 Longlife (always double-walled, inner sheet in the same material).
  - # 1200 Joule sheet with internal body impact reinforcement (always double-walled, inner sheet in the same material).
  - # Heatstop Longlife (HS-LL) : infrared resistant sheet, filters 50% of the IR radiation.
  - # self-extinguishing Longlife (SE-LL) : fire extinguishing execution class A1 (Class 1 - BS 476 - part 7), M2, with Longlife film # clear, # opal, # Coolgreen, # 1200 Joule, # Heatstop,

- Innershell: # standard clear. # 1200 Joule. # ENV 1187 # self-extinguishing # self-extinguishing 1200 Joule.

The Cintralux® GRP end panels:

- Material: UV-stabilised polyester resins with glass fibre reinforcement.
- Execution: # single-walled # double-walled, with insulation. PUR foam 20 mm.
- Ventilator: an Xpelair GX9 ventilator can be provided from daylight size 3m on.

The Cintralux® mounting accessories:

- Sealing tapes in PE-foam as a sealing between the curb and the barrel vault as well as a sealing between two sheets.
- Rustproof fasteners with following characteristics:
  - Type: # standard for mounting in combination with bituminous roofing. # "Z" mounting profile for fixing in combination with non-bituminous roofing systems.

- Screws adapted to the timber # metal # curb...
- The upper side of the curb has an angle of inclination of ....

The Cintramax® SHE system:

- 2 barrel vault elements are lifted vertically through 2 scissor systems for ventilation or for smoke and heat extraction.
  - Type: # standard, opens and closes by means of double operating pneumatic cylinder. # execution with fusible link 70°C. With additional fusible link functioning on CO<sub>2</sub> gas pressure fuses.

The Cintrair® ventilation system:

- 1 barrel vault element is lifted vertically through a lifting system for ventilation or smoke and heat extraction.
  - Type: # standard, opens and closes by means of a 220V. AC motor with switch. # 24V. DC motor. # opens and closes through a spring with:
    - # a fusible link 70°C
    - # an electromagnet 70°C.
    - # a pull & loose system with fusible link 70°C.
    - # a windlass system.

## TECHNICAL SPECIFICATION CINTRALUX® ENV 1187

General product description:

The Cintralux® GRP-barrel vault sheets are made of longitudinally profiled and centred sheets. The sheets are made of U.V. stabilised polyester resins. The outer shells have a standard surface finish consisting of a highly UV resistant LONGLIFE-film. The inner shells are completed with a MELINEX® polyester film. The addition of methylmethacrylate provides a better light transmission.

The ENV 1187 execution provides an excellent fire retarding, which meets the European norm ENV 1187.

This European norm applies to the roofing of buildings lower than 10 m.

The sheets are mounted with the "Z" assembly on the curbs.

The opaque end - panels are made of the same materials and they have equal characteristics as the sheets. The thermal performances of the double - walled panel sheets are improved through the incorporated PUR-insulation.

Specific characteristics:

Mechanical characteristics	Self - supporting up to 4 m width and unlimited in length according to the current snow and wind loads Hailproof.
Chemical characteristics	Extremely high resistance against chemical influences and the weather conditions.
Thermal characteristics	3.0 W/m <sup>2</sup> .K
Fire characteristics	Meets the ENV 1187.
Dimensions	Sheets thickness: average 1.30 mm Radius: 3150 mm
Density	2,165 kg/sq.m



**CINTRAMAX® CE**

*General product description:*

The Cintramax® consists of two galvanised scissors systems, mounted on the inside of the curb just under the barrel vault. The system functions according to the principle of natural ventilation by convection of hot air. It also provides protection against the sun and the rain thanks to the umbrella system. This is an appliance, which permits to combine the aesthetical aspect and the characteristics of light transmission, acoustic and thermal insulation of the barrel vault. The appliance meets the future European norms EN 12101-2.

The Cintramax® can be used in Cintralux® GRP and in massive Cintralux® barrel vaults with daylight size from 1m up to 4m. It has a length of ca 2m and can easily be built in both new and existing barrel vaults.

The Cintramax® is opened by a double operating pneumatic cylinder. A special control cabin for an air pressure circuit, provided with "opening" / "closing" function by means of manual buttons, is applied. The possibility to connect a remote external control by means of a waiting contact on 24 Volt D/C, is foreseen. This electric contact is activated with an impuls on 24 V. On opening, the wire "open" is put under pressure and the wire "close" is automatically ventilated. On closing the opposite occurs. The concerned circuit is permanently under pressure.

*Specific characteristics control cabin:*

Description cabin	Metal cabin coated in RAL 7032 (gravel grey)
Operating temperature	- 20°C up to + 50°C
Dimensions	-For 1 to 2 zones dim. w =380 mm. – h = 300 mm. – d = 155 mm. -For 3 and 4 zones the dim. of the cabin are w = 500 mm. – h = 500 mm. – d = 210 mm. -For 5 zones: 600 x 600 x 210 mm.
Functioning pressure	dry air under pressure – filtered – oilfree operating pressure: 9 à 10 bar
Contains	-reverse valve with automatic ventilation, provided with an electromagnet on 24 Volt = impulse on the "open" valve -pressure regulator with filter and condensation catcher -3 transit screws 4/6 -all necessary cables and wiring in the cabin -the cabin is ready to be connected

*Specific characteristics Cintramax®:*

Dimensions	The cylinders have a diameter of 32 mm and a running length of 800 mm. Total length of 1200 mm.
Operating pressure	Minimum 9 bar and maximum 10 bar.
Wind and rain detection	As option, a wind and / or rain sensor can be installed.
Aerodynamic characteristics	C.V.- value 0.63 (on a daylight size of 1.8m up to 3m and length of 2m).
Option	Fusible link 70°C with CO2 cartridge

**SKYVENT®**

*General product description :*

The Skyvent® is a slat system, which can be built into every GRP barrel vault and/or independently used. On simple request, you can get the technical information.

**CINTRAIR®**

*General product description :*

The Cintrair® consists of a bichromatised opening system, hinged on one side. It is assembled on the inner side of the curb just under the inner shell. The system functions according to the natural ventilation through convection of hot air. Thanks to the screen it offers protection against the sun and the rain. It's an appliance, which permits to keep the aesthetical aspect and the characteristics of the light transmission, the acoustic and thermal insulation.

The Cintrair® can be used in Cintralux® GRP barrel vaults with daylight size from 1m up to 3.5m. It has a length of ca 1m and can easily be built in both new and existing barrel vaults.

The opening of the Cintrair® is applied for :

SHE (Smoke and Heat Extracting)

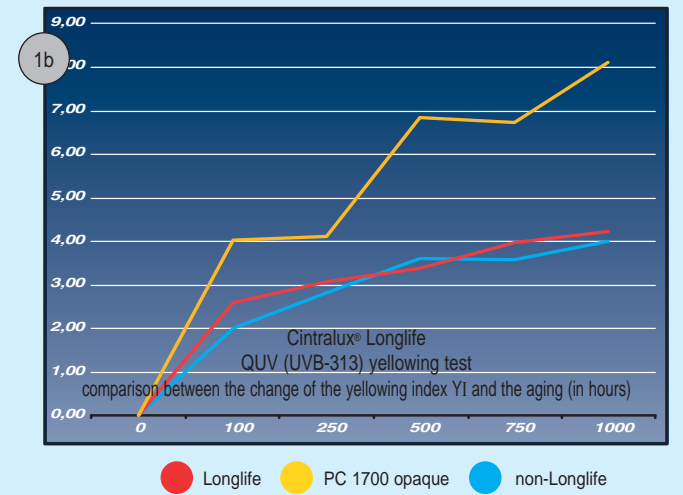
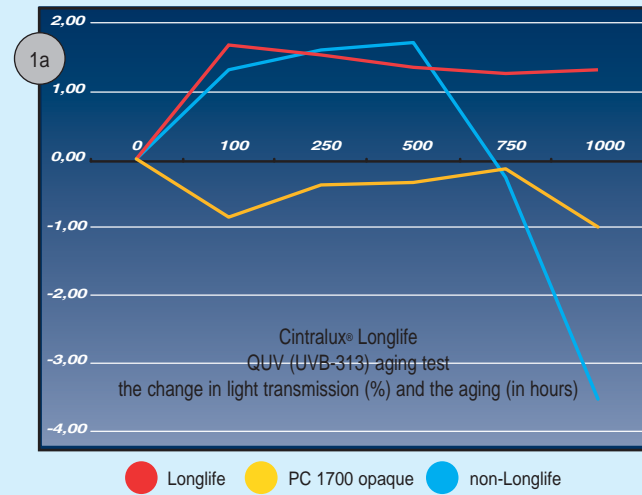
by a 24 Volt D/C motor or by a spring with fusible link.  
The spring with fusible link is provided with:  
- an electromagnet  
\* a windlass system.

VENTILATION  
with a 220 Volt A/C motor with switch.

*Specific characteristics Cintrair®:*

Dimensions	The Cintrair creates a gap of 300 mm on one side of the barrel vault.
Pressure	The D/C motor functions on a pressure of 24V. The A/C motor operates on main voltage of 220V.

**LIGHT TRANSMISSION & COLOUR STABILISATION**



**1a STANDARD (NON SELF-EXTINGUISHING)**

This graph mentions the difference in % of the light transmission for 3 materials, under the influence of 1000 hours of ultraviolet light.

"Longlife" is the new composite material, provided of a Longlife protection film.

"PC 1700 opaque" is opal polycarbonate of 1700 g/m².

"Non-Longlife" is the former composite material with the former protection film.

The light transmission of the Longlife version hardly changed after 1000 hours of exposure, whereas the PC and non-Longlife GRP always develop to a lower light transmission.

**1b STANDARD (NON SELF-EXTINGUISHING)**

This graph shows the difference in points on the yellowing index for 3 materials, under influence of 1000 hours ultraviolet light.

"Longlife" is the new composite material, provided of a Longlife protection film.

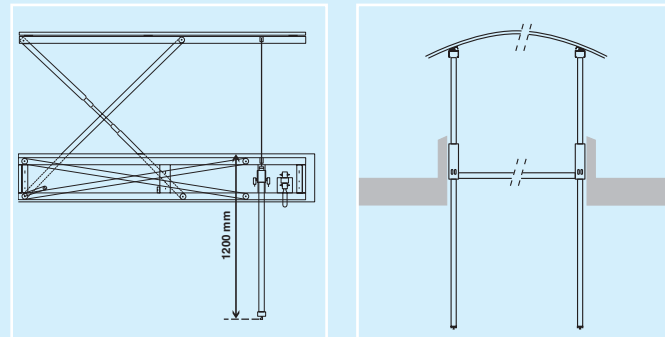
"PC 1700 opaque" is opal polycarbonate of 1700 g/m².

"Non-Longlife" is the former composite material with the former protection film.

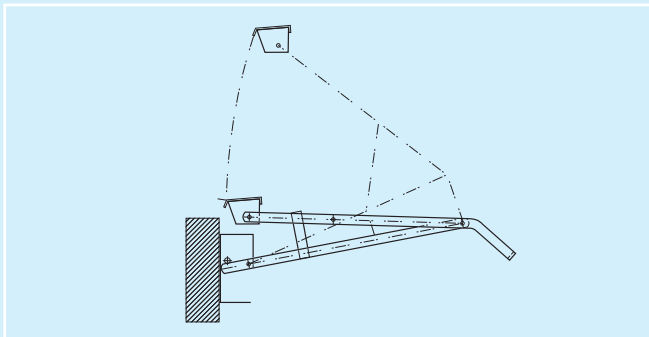
The colour stability of the Longlife version develops much more favourably after 1000 hours of exposure than the PC 1700 sheet.

**SCHEME CINTRAMAX® CE AND CINTRAIR®**

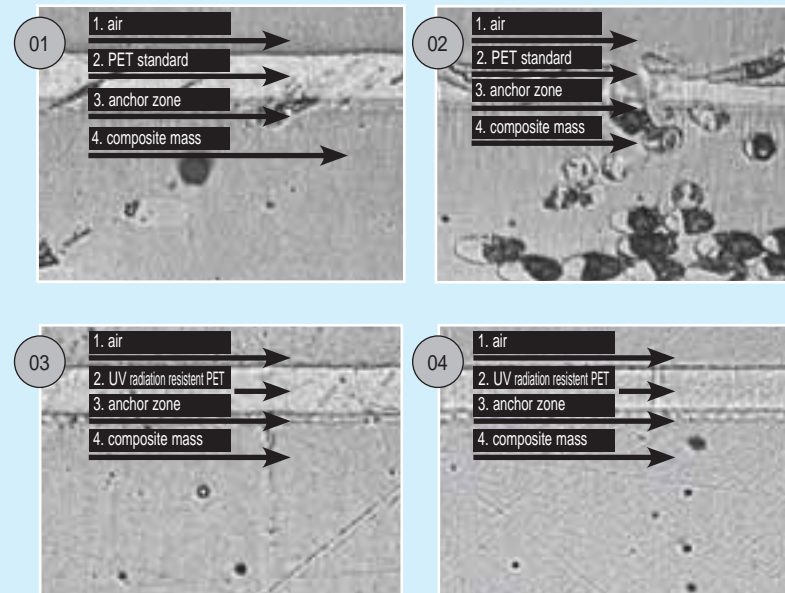
**CINTRAMAX® CE EN 12101-2**



**CINTRAIR®**



**MICROSCOPIC SECTIONS**



01 Cintralux® GRP  
Microscopic section of a new sheet in the former execution

02 Cintralux® GRP  
Microscopic section of an artificially aged sheet in former execution

03 Cintralux® GRP LONGLIFE  
Microscopic section of a new sheet in Longlife execution with high UV resistance

04 Cintralux® GRP LONGLIFE  
Microscopic section of an artificially aged sheet in Longlife execution with high UV resistance







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