

Cable trays in FRP/GRP
KP series - pultruded



Challenging time



Composites FRP/GRP

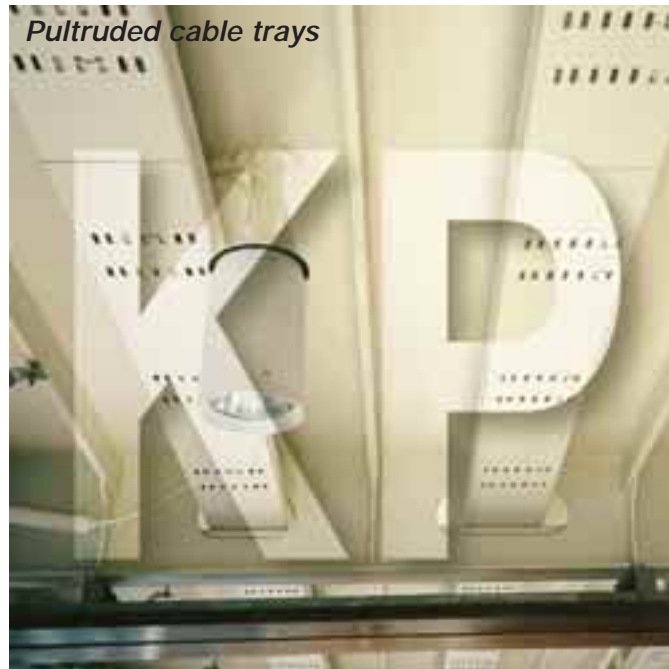
A material whose features challenge time.

Five reasons to choose composites :

- 1 Resistance to corrosion
- 2 insulating
- 3 extremely robust and light
- 4 long life span
- 5 excellent fire characteristics



Pressed cable trays
K² series



Pultruded cable trays



Cable Ladders
UL series

Supporting material
FX and FP series



Cable ducting system
BK series

Ebo Systems :
40 years of experience
in the manufacture of
composite materials.

Halve your installation
time :

- the possibility of 4 m support distances,
- clip in connector pieces, without bolts,
- clip on lids.

Increase the life span of your installation* using Glass Reinforced Polyester (GRP) technology.

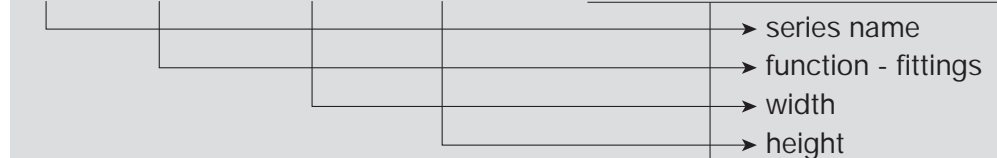


Summary

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Reference guide

KP | **BA** | **300** | **80** / **6** - **450** - **VY** - **RAL 9001**



- options :
- length (m)
 - radius (mm)
 - resin : acrylic (AC), vinylester (VY), special (SP)
 - RAL color

(* This gain in life span is variable according to applications ; the gain is much more marked when comparing a GRP installation to galvanised steel in a very corrosive environment (eg : coastal sites, road tunnels...)

Maintenance free



- No corrosion
- Examples available of products in situ in aggressive environment for more than 40 years
- No electrolytic corrosion
- No need for painting and protective varnishes

Fast installation



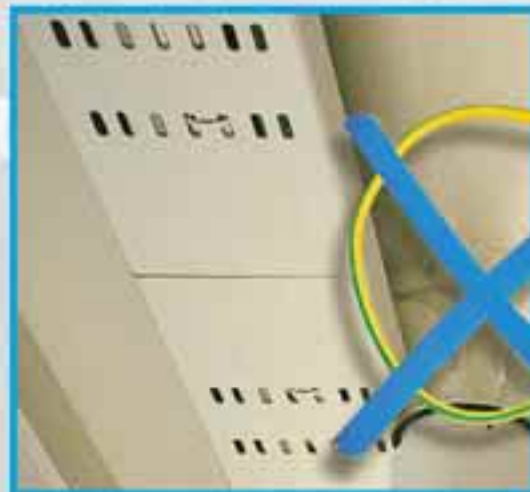
- Cable trays can accommodate up to 4 m support distance

Maximum fire security



- Self-extinguishing, without toxic fumes,
- Answers to the most demanding international fire norms
- Zero halogen
- Low thermal conductivity
- Allows cables to keep their electric function longer

Insulating



- Extremely insulating material (>7kV/m)
- No need to earth
- Excellent cable protection



- Quick assembly with clip in jointing pieces
- Expansion joint automatically set
- Easy to cut and drill



- Easy to cut up and to adapt on site
- Security : no sharp edges and therefore no risk to people or cables



- Fast fix clip on lids
- Easy maintenance

Lightness



- Light and robust
- Optimal transportation and handling

GRP cable trays and fittings

| Height (mm) | Width (mm) | | Cable trays | | Separation | Pultruded | Pressed |
|-----------------|------------|------------|-----------------------|------------|------------------------------|----------------------|----------------------|
| | | | KP (Length = 3 m*) | KPL | | | |
| | | | Non perforated | Perforated | | Horizontal elbow 90° | Horizontal elbow 90° |
| 50 | 100 | Cable tray | KP 10050 | KPL 10050 | standard KP T50 | KP B10050 | KP B10050/P |
| | | Cover | KP D100 | | | KP BD100 | KK BD100 |
| | 150 | Cable tray | KP 15050 | KPL 15050 | ready mounted KP T50/M | KP B15050 | KP B15050/P |
| | | Cover | KP D150 | | | KP BD150 | KK BD150 |
| | 200 | Cable tray | KP 20050 | KPL 20050 | | KP B20050 | KP B20050/P |
| | | Cover | KP D200 | | | KP BD200 | KK BD200 |
| 80 | 100 | Cable tray | KP 10080 | KPL 10080 | standard KP T80 | KP B10080 | KP B10080/P |
| | | Cover | KP D100 | | | KP BD100 | KK BD100 |
| | 200 | Cable tray | KP 20080 | KPL 20080 | ready mounted KP T80/M | KP B20080 | KP B20080/P |
| | | Cover | KP D200 | | | KP BD200 | KK BD200 |
| | 300 | Cable tray | KP 30080 | KPL 30080 | | KP B30080 | KP B30080/P |
| | | Cover | KP D300 | | | KP BD300 | KK BD300 |
| Colisage | | | 3 metres | | piece | | |

* stocked also in 6 m
références : KP_ _ _ _ _ /6

Accessories

| Height (mm) | Width (mm) | | Rack for cables in vertical zone | Couplers |
|-------------|------------|--|----------------------------------|---------------------|
| | | | | |
| 50 | 100 | | KR100 | KP GH50 |
| | 150 | | KR150 | |
| | 200 | | KR200 | |
| 80 | 100 | | KR100 | KP GH80 |
| | 200 | | KR200 | |
| | 300 | | KR300 | |
| Unit | | | piece | 1 set of 2 couplers |

| Pultruded | Pressed | Pultruded | Pressed | Pressed | Pressed | Pressed |
|------------|--------------|------------|--------------|--------------|--------------|------------|
| | | | | | | |
| KP BA10050 | KP BA10050/P | KP BI10050 | KP BI10050/P | KP SS10050/P | | KP KE10050 |
| KP BAD100 | KK BAD10050 | KP BID100 | KK BID10050 | KK SSD100 | | |
| KP BA15050 | KP BA15050/P | KP BI15050 | KP BI15050/P | KP SS15050/P | | KP KE15050 |
| KP BAD150 | KK BAD15050 | KP BID150 | KK BID15050 | KK SSD150 | | |
| KP BA20050 | KP BA20050/P | KP BI20050 | KP BI20050/P | KP SS20050/P | | KP KE20050 |
| KP BAD200 | KK BAD20050 | KP BID200 | KK BID20050 | KK SSD200 | | |
| KP BA10080 | KP BA10080/P | KP BI10080 | KP BI10080/P | | KP ST10080/P | KP KE10080 |
| KP BAD100 | KK BAD10080 | KP BID100 | KK BID10080 | | KK STD100 | |
| KP BA20080 | KP BA20080/P | KP BI20080 | KP BI20080/P | | KP ST20080/P | KP KE20080 |
| KP BAD200 | KK BAD20080 | KP BID200 | KK BID20080 | | KK STD200 | |
| KP BA30080 | KP BA30080/P | KP BI30080 | KP BI30080/P | | KP ST30080/P | KP KE30080 |
| KP BAD300 | KK BAD30080 | KP BID300 | KK BID30080 | | KK STD300 | |
| piece | piece | piece | piece | piece | piece | piece |

Bolts

| Diameter (mm) | Length (mm) | Dome head screw, nut and washer V4A stainless steel | Dome head screw, nut and washer reinforced polyamide |
|---------------|-------------|---|--|
| 6 | 16 | M616/V4A | |
| | 20 | M620/V4A | |
| 8 | 20 | | M820/PA6 |
| 10 | 30 | M1030/V4A | |
| Unit | | 100 pieces | 100 pieces |

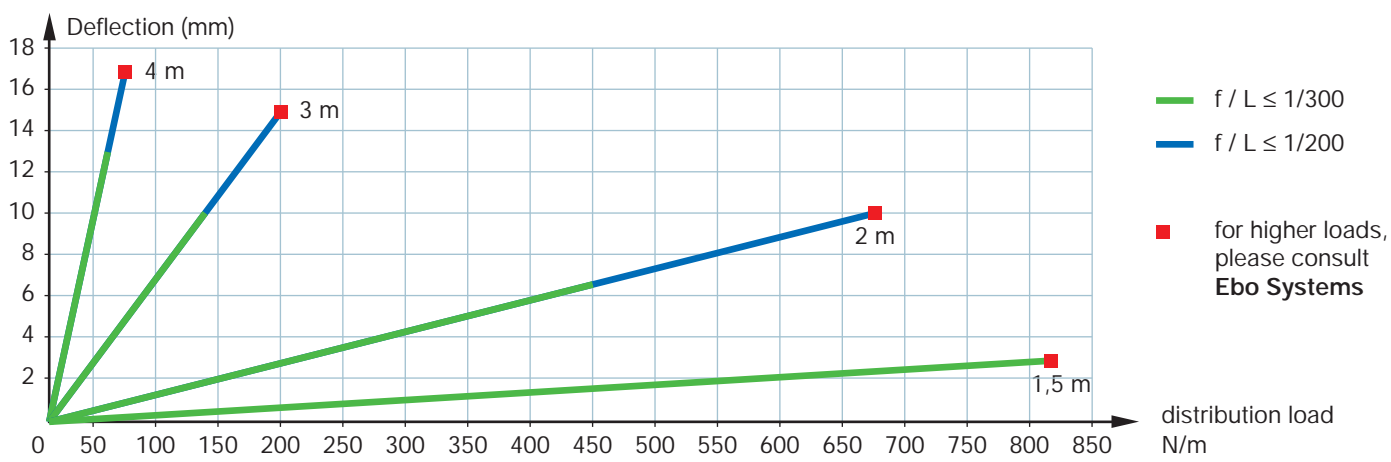
Optimize your installation :

The exceptional resistance of our pultruded composite materials for the service of your electric installation

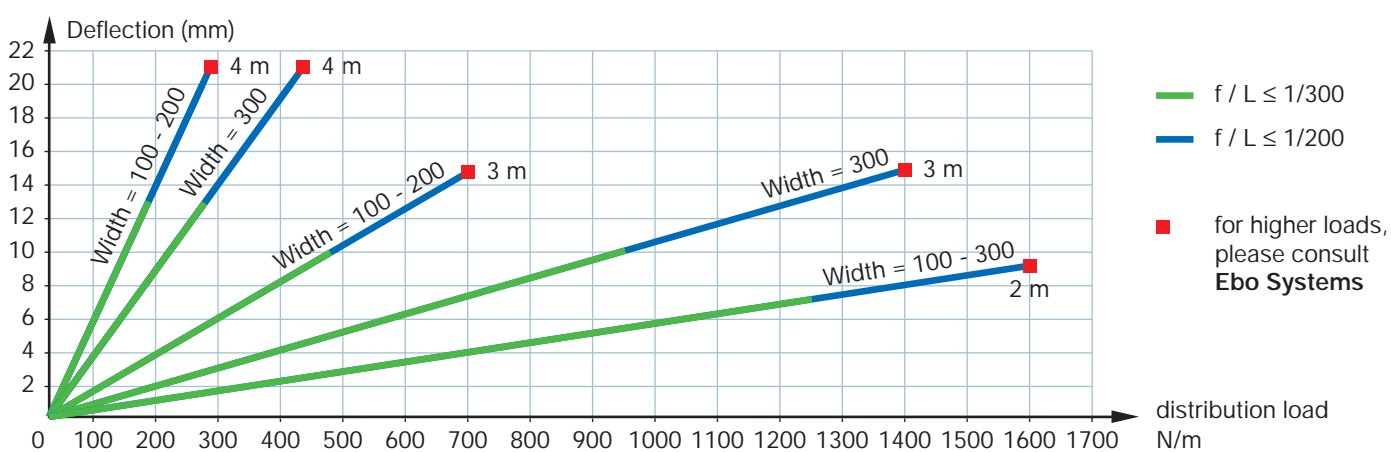
| | Useful area (mm ²) | Weight of cables** (N/m) | Maximum admissible load (N/m) according to the distance between supports* | | | | | |
|---------|--------------------------------|--------------------------|---|------|-------|-----|-------|--|
| | | | 1,5 m | 2 m | 2,5 m | 3 m | 3,5 m | 4 m |
| KP...50 | 100 | 3700 ≈ 100 | 700 | 400 | 200 | 150 | 100 | Ebo Systems recommends to use the K² series Ebo Systems especially conceived the UL53 series |
| | 150 | 5700 ≈ 150 | 700 | 400 | 200 | 150 | 100 | |
| | 200 | 7700 ≈ 200 | 700 | 400 | 200 | 150 | 100 | |
| | 300→600 | | | | | | | |
| KP...80 | 100 | 6600 ≈ 150 | 1600 | 1200 | 700 | 400 | 300 | Ebo Systems recommends to use the K² series Ebo Systems especially conceived the UL80 series |
| | 200 | 13500 ≈ 350 | 1600 | 1200 | 700 | 400 | 300 | |
| | 300 | 19600 ≈ 550 | 1600 | 1600 | 1400 | 700 | 400 | |
| | 400→900 | | | | | | | |

* For supporting distances greater than 4 m, please consult us.
 ** weight of cables corresponding to a maximum fill, estimated according to the NF C 68-102 norm.

KP 50 series load diagram : supporting distances from 1,5 to 4 m.



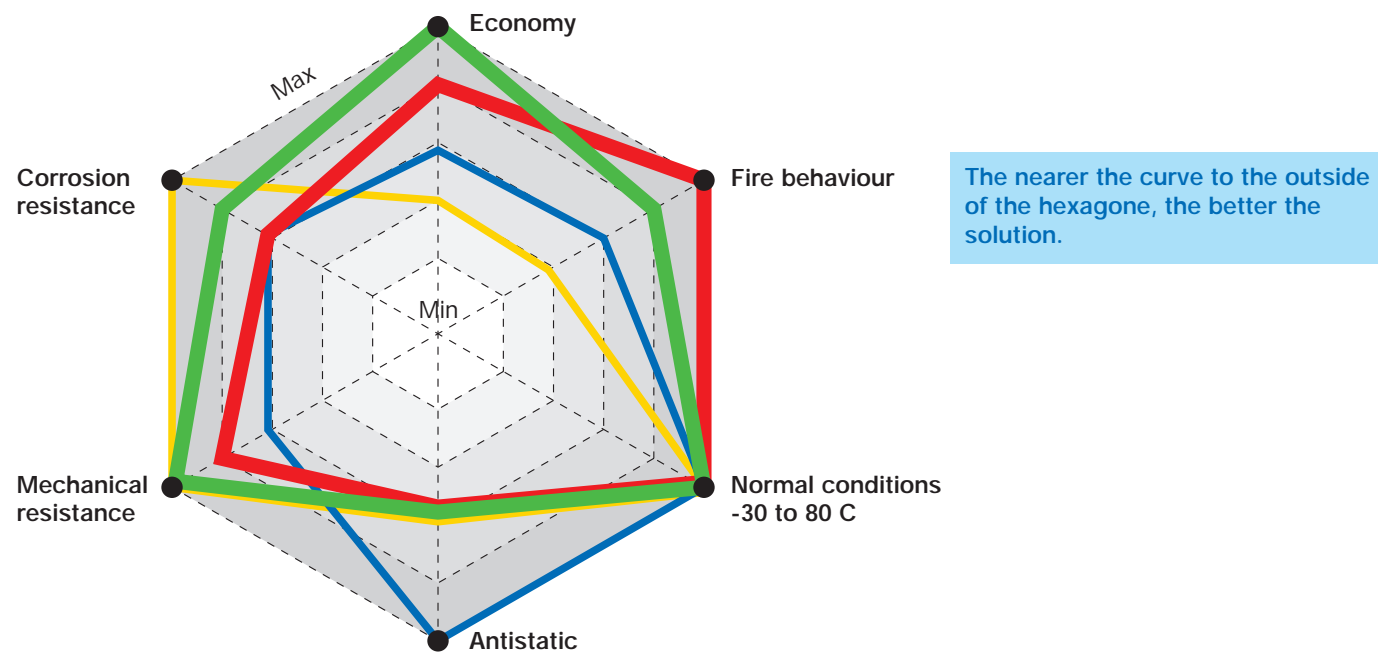
KP 80 series load diagram : supporting distances from 2 to 4 m.



All our cable trays are tested in accordance with the project of international norm CEI 61537, at an ambient temperature of 25° C, and in accordance with our installation instructions.

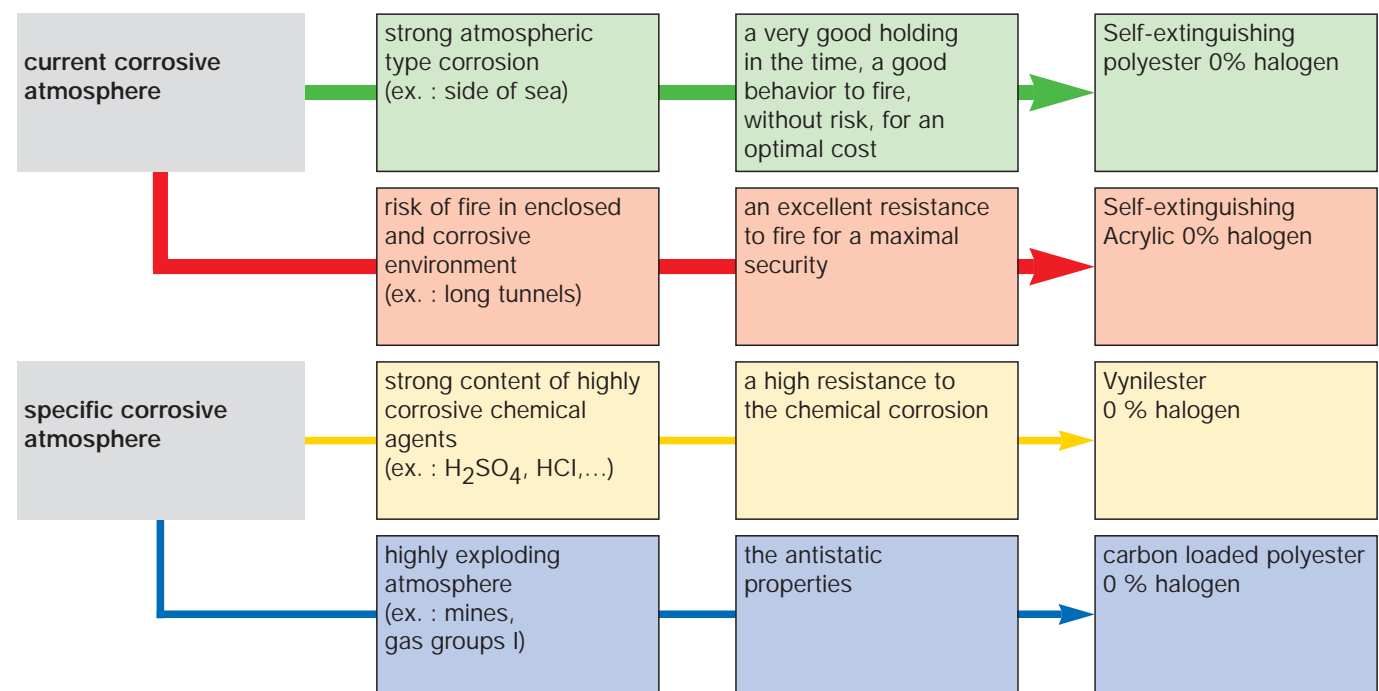
Select your resins :

Dedicated solutions for aggressive environments



The nearer the curve to the outside of the hexagone, the better the solution.

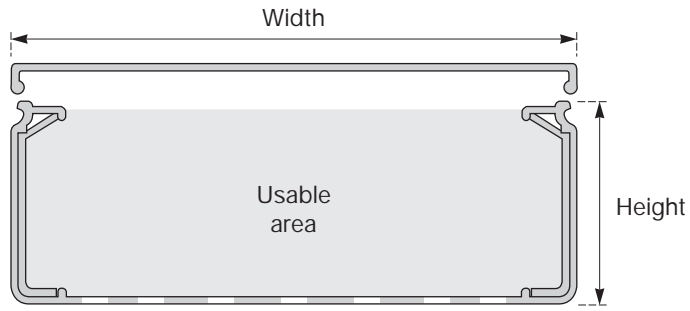
You are in presence of : Your environment : Your requirements : Our recommendation :



For specific projects we will define solutions to meet your needs.

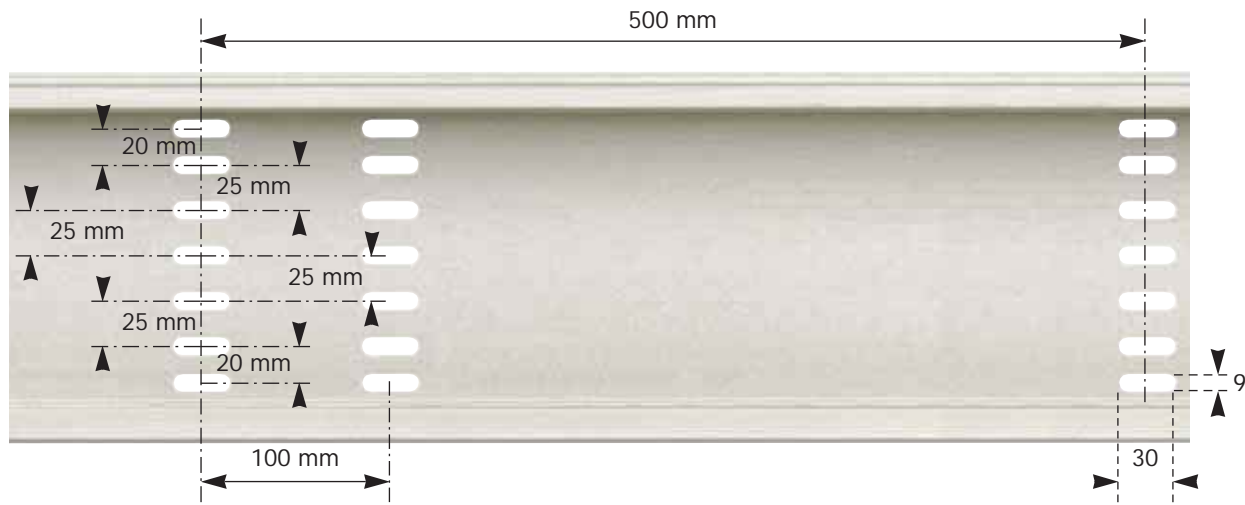
The composite cable trays **KP series** are available :
as standard : - with polyester resin, Zero halogen,
 - in RAL 7032 (light grey),
one request : - please consult our technical resin cards



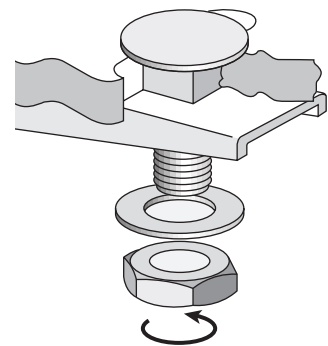
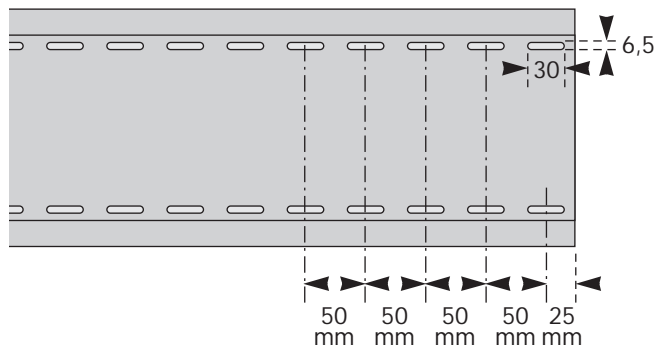


| Height (mm) | Width (mm) | Length (mm) * | Reference tray | Weight (kg/m) | | Usable area (mm ²) |
|-------------|------------|---------------|----------------|---------------|--------------|--------------------------------|
| | | | | Tray | Tray + Cover | |
| 50 | 100 | 3000 | KP(L) 10050 | 1,0 | 1,5 | 3700 |
| | 150 | 3000 | KP(L) 15050 | 1,2 | 2,0 | 5700 |
| | 200 | 3000 | KP(L) 20050 | 1,4 | 2,4 | 7700 |
| 80 | 100 | 3000 | KP(L) 10080 | 1,3 | 1,8 | 6600 |
| | 200 | 3000 | KP(L) 20080 | 2,3 | 3,3 | 13500 |
| | 300 | 3000 | KP(L) 30080 | 3,6 | 5,0 | 19600 |

* stocked also in 6 m references : KP.../6

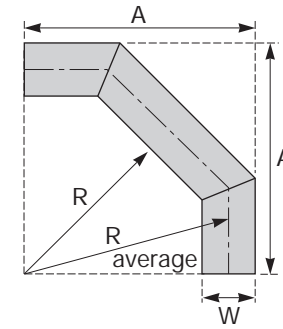


For special perforations, please consult us.
Example : special perforations 6,5 x 30 mm adapted to support fixation with a self-locking bolt M6 x 20 TRCC / V4A

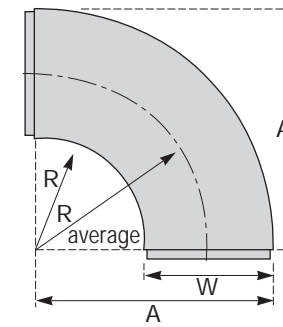


M6 x 20 TRCC / V4A

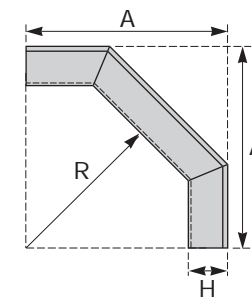
Pultruded horizontal elbow 90°



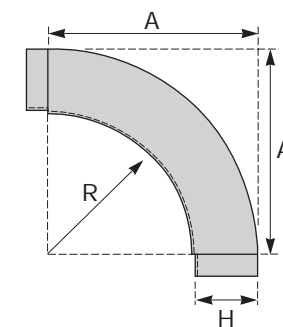
Pressed horizontal elbow 90°



Pultruded exterior elbow 90°



Pressed exterior elbow 90°



$$R \text{ average} = R + \frac{W}{2}$$

| Height H (mm) | Width W (mm) | Reference tray | Weight (kg/m) | | Curvature Radius R (mm) | Dimension A (mm) |
|---------------|--------------|----------------|---------------|--------------|-------------------------|------------------|
| | | | Tray | Tray + Cover | | |

| | | | | | | |
|----|-----|-----------|-----|-----|-----|-----|
| 50 | 100 | KP B10050 | 0,8 | 1,4 | 350 | 450 |
| | 150 | KP B15050 | 1,0 | 1,7 | 350 | 500 |
| | 200 | KP B20050 | 1,3 | 2,2 | 350 | 550 |
| 80 | 100 | KP B10080 | 1,0 | 1,6 | 350 | 450 |
| | 200 | KP B20080 | 1,8 | 2,7 | 350 | 550 |
| | 300 | KP B30080 | 2,9 | 4,6 | 350 | 650 |

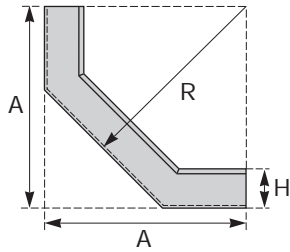
| | | | | | | |
|----|-----|-------------|-----|-----|-----|-----|
| 50 | 100 | KP B10050/P | 0,3 | 0,5 | 100 | 225 |
| | 150 | KP B15050/P | 0,6 | 1,0 | 175 | 350 |
| | 200 | KP B20050/P | 0,8 | 1,5 | 200 | 425 |
| 80 | 100 | KP B10080/P | 0,4 | 0,6 | 100 | 225 |
| | 200 | KP B20080/P | 0,9 | 1,6 | 200 | 425 |
| | 300 | KP B30080/P | 1,5 | 2,5 | 225 | 550 |

| | | | | | | |
|----|-----|------------|-----|-----|-----|-----|
| 50 | 100 | KP BA10050 | 0,4 | 0,8 | 330 | 380 |
| | 150 | KP BA15050 | 0,5 | 1,2 | 330 | 380 |
| | 200 | KP BA20050 | 0,7 | 1,6 | 330 | 380 |
| 80 | 100 | KP BA10080 | 1,0 | 1,4 | 330 | 410 |
| | 200 | KP BA20080 | 1,5 | 2,4 | 330 | 410 |
| | 300 | KP BA30080 | 2,2 | 3,5 | 330 | 410 |

| | | | | | | |
|----|-----|--------------|-----|-----|-----|-----|
| 50 | 100 | KP BA10050/P | 0,3 | 0,6 | 170 | 245 |
| | 150 | KP BA15050/P | 0,4 | 0,8 | 170 | 245 |
| | 200 | KP BA20050/P | 0,5 | 1,0 | 170 | 245 |
| 80 | 100 | KP BA10080/P | 0,4 | 0,7 | 170 | 275 |
| | 200 | KP BA20080/P | 0,6 | 1,1 | 170 | 275 |
| | 300 | KP BA30080/P | 0,8 | 1,5 | 170 | 275 |

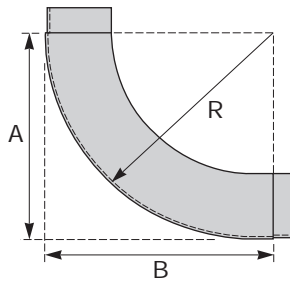


Pultruded vertical elbow 90°



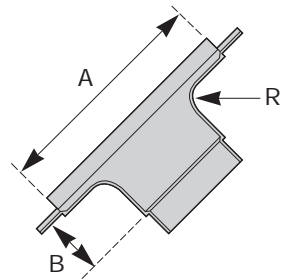
| Height H (mm) | Width W (mm) | Reference tray | Weight (kg/m) | | Curvature Radius R (mm) | Dimension (mm) | |
|---------------|--------------|----------------|---------------|--------------|-------------------------|----------------|---|
| | | | Tray | Tray + Cover | | A | B |
| 50 | 100 | KP BI10050 | 0,8 | 1,1 | 420 | 420 | |
| | 150 | KP BI15050 | 0,9 | 1,4 | 420 | 420 | |
| | 200 | KP BI20050 | 1,1 | 1,8 | 420 | 420 | |
| 80 | 100 | KP BI10080 | 1,0 | 1,3 | 420 | 420 | |
| | 200 | KP BI20080 | 1,7 | 2,5 | 420 | 420 | |
| | 300 | KP BI30080 | 2,5 | 3,5 | 420 | 420 | |

Pressed vertical elbow 90°



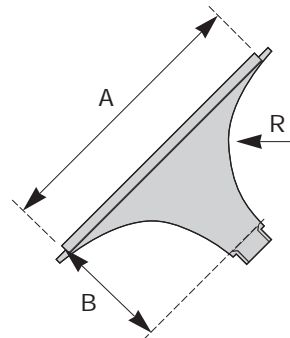
| | | | | | | | |
|----|-----|--------------|-----|-----|-----|-----|-----|
| 50 | 100 | KP BI10050/P | 0,4 | 0,6 | 250 | 250 | 280 |
| | 150 | KP BI15050/P | 0,5 | 0,7 | 250 | 250 | 280 |
| | 200 | KP BI20050/P | 0,6 | 1,0 | 250 | 250 | 280 |
| 80 | 100 | KP BI10080/P | 0,5 | 0,7 | 250 | 250 | 280 |
| | 200 | KP BI20080/P | 0,8 | 1,1 | 250 | 250 | 280 |
| | 300 | KP BI30080/P | 1,0 | 1,5 | 250 | 250 | 280 |

Pressed small radius



| | | | | | | | |
|----|-----|--------------|-----|-----|----|-----|----|
| 50 | 100 | KP SS10050/P | 0,1 | 0,2 | 25 | 200 | 50 |
| | 150 | KP SS15050/P | 0,2 | 0,3 | 25 | 250 | 50 |
| | 200 | KP SS20050/P | 0,2 | 0,3 | 25 | 300 | 50 |

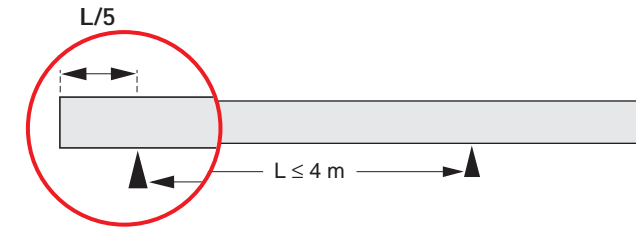
Pressed large radius



| | | | | | | | |
|----|-----|--------------|-----|-----|-----|-----|-----|
| 80 | 100 | KP ST10080/P | 0,7 | 1,1 | 250 | 600 | 250 |
| | 200 | KP ST20080/P | 0,9 | 1,5 | 250 | 700 | 250 |
| | 300 | KP ST30080/P | 1,1 | 1,8 | 250 | 800 | 250 |

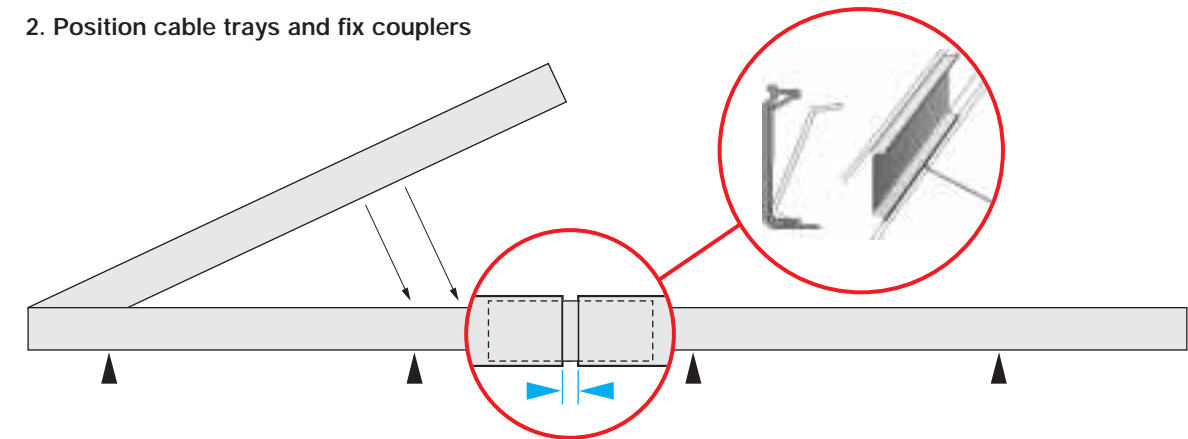
For a fast, safe installation :

1. Support the end of the cable tray at a maximal distance of L/5 in relation to the console



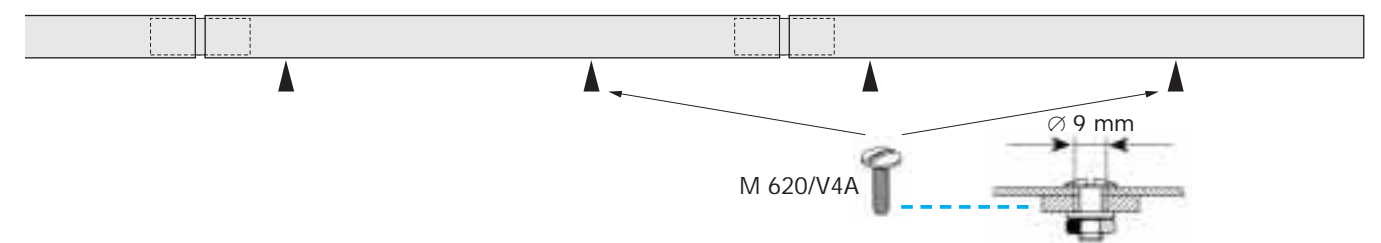
L/5 corresponds to the ideal place for mechanical stability. For distances between supporting pieces, greater than 4 m, it is necessary to take special precautions : please consult us in this instance.

2. Position cable trays and fix couplers



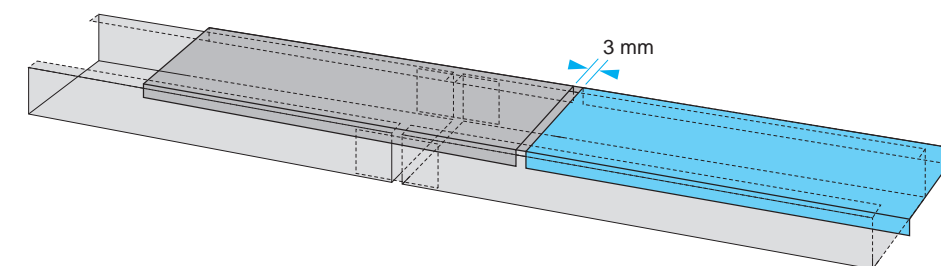
Thanks to a coupling system, the 2 lengths of cable trays position themselves automatically to allow for expansion.

3. Screw cable trays to the supports



To better allow for expansion, do not screw the cable tray to the supporting piece close to a junction.

4. In normal conditions (moderate loads or internally) clip the covers to the trays



To increase the rigidity, offset the junction of trays and covers.

In extreme conditions, surround cable trays and covers with ties to secure covers' fixing.

Ebo SystemsChallenging Time

January 1999 :
Composite cable trays Ebo Systems are chosen for the extension of the communication network of the Channel Tunnel.

Well co-ordinated production and logistic schedules guarantee the delivery of 52 km of cable tray in less than 3 months.

A close partnership helps to define and to develop a material without halogen, answering to the most stringent fire requirements :

- BS476 part 7 : classe 1
- BS476 part 6 : I<12
- NFP 92-501 : M1
- NFF 16-101 : IO, FO
- low calorific power.

A product designed to reduce installation times and to minimise the cost of maintenance

- no corrosion sensitivity,
- reduced coupling costs thanks to 6 m lengths,
- Clip in couplers to speed installation.



Attending to your needs
EBO teams are dedicated ensuring the success of your project. Our aim is to be available at all stages of a project, from design to installation, in order to propose the best technical and economic solutions.



Dedicated solutions
Every project requires a solution. Ebo Systems is available to advise on all aspects of a project, taking in account dimensional constraints and material requirements.



Continuous support
In order to ensure the optimal solution, Ebo Systems offers :

- an initial technical survey,
- on-going training, either in our own extensive facilities or on-site,
- technical advice on-site,
- continuous personal advice from design to installation.



Logistical support
Ebo Systems keeps a large range of references permanently in stock which can be delivered quickly to site. Our logistics department can schedule planned deliveries to meet specific requirements.



Quality control
Ebo Systems has been ISO 9001 qualified since 1994. We commit to

- regularly assess our own suppliers for quality,
- verify their own technical data on their products, communicated by these regularly,
- systematically control materials entering our manufacturing process,
- continually look to improve our designs of products,
- 100% control of all critical stages of manufacture,
- do final control and inspection before despatch.



Respect for the environment
Ebo Systems is committed to respect for the environment and is actively progressing towards ISO 14001 certification. All our products are zero halogen.



Your Ebo system catalog



do not hesitate to complete
your catalog with

Corporate brochure and CD-Rom



Technical catalogues



Market application sheets



Resin characteristics



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