

## PROFILE

53R00850254\_3 ISO CE-B

TYPE: PROFILE "R RETCANGULAR" GROUP: CE-B MARKING: Marked CE

RESIN: isophthalic resin ISO  
REINFORCEMENT: Roving glass fiber type "E" - Continuous strand mat  
- Polyester surface veil  
PRODUCTION TECHNOLOGY: pultrusion  
NORM: EN 13706 -2



Indicative image

## PHYSICAL PROPERTIES

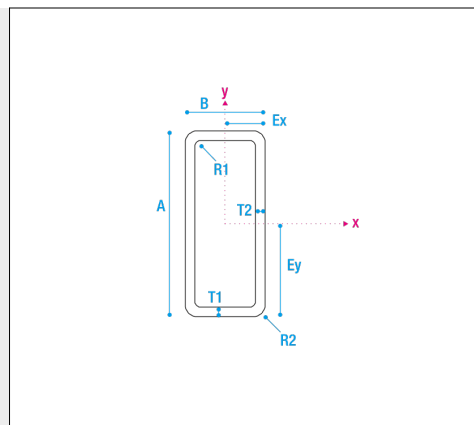
|   |                       |                 |                |
|---|-----------------------|-----------------|----------------|
| LONGITUDINAL THERMAL EXPANSION COEFFICIENT ( $\alpha$ ) | 10,8x10 <sup>-6</sup> | K <sup>-1</sup> | ISO 11359-2    |
| TRANSVERSE THERMAL EXPANSION COEFFICIENT ( $\alpha$ )   | 27,7x10 <sup>-6</sup> | K <sup>-1</sup> | ISO 11359-2    |
| FIBERGLASS WEIGHT RATIO                                 | 68                    | %               | EN ISO 1172    |
| CURING DEGREE (c)                                       | 100                   | %               | EN ISO 11357-5 |

## DIMENSIONS

|                |     |                 |
|----------------|-----|-----------------|
| HEIGHT (A)     | 85  | mm              |
| WIDTH (B)      | 25  | mm              |
| RADIUS (R1)    | > 1 | mm              |
| RADIUS (R2)    | > 1 | mm              |
| THICKNESS (T1) | 4   | mm              |
| THICKNESS (T2) | 3   | mm              |
| AREA           | 656 | mm <sup>2</sup> |

Dimensional tolerances according to EN 13706 -2 annex b

WEIGHT: 1,220 Kg/m



## GEOMETRY

|                              |        |                 |                              |       |                 |
|------------------------------|--------|-----------------|------------------------------|-------|-----------------|
| MOMENT OF INERZIA (Jx)       | 543858 | mm <sup>4</sup> | MOMENT OF INERZIA (Jy)       | 65412 | mm <sup>4</sup> |
| SECTION MODULUS (Wx)         | 12797  | mm <sup>3</sup> | SECTION MODULUS (Wy)         | 5233  | mm <sup>3</sup> |
| CENTROID IN X DIRECTION (Ex) | 12,5   | mm              | CENTROID IN Y DIRECTION (Ey) | 42,5  | mm              |

## REACTION TO FIRE

CLASS E | NORM EN 13501-1

## STANDARD DIMENSIONS AND COLOURS

|                          |                          |
|--------------------------|--------------------------|
| 6000 mm - GRAY RAL 7035  | 7000 mm - GREEN RAL 6010 |
| 6000 mm - GREEN RAL 6010 |                          |
| 7000 mm - GRAY RAL 7035  |                          |



**M.M. SRL** a socio unico  
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**COMPANY WITH  
QUALITY SYSTEM  
CERTIFIED BY DNV GL**  
= ISO 9001 =

## PROFILE

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### MECHANICAL PROPERTIES

#### BENDING EFFECTIVE ELASTIC MODULUS

|   | MEAN VALUE | CHARACTERISTIC VALUE | NORM               |
|---|------------|----------------------|--------------------|
| BENDING EFFECTIVE ELASTIC MODULUS, FULL SECTION ( $E_{eff}$ ) | 28,65 GPa  |                      | ANNEX D EN 13706-2 |

#### FLEXURAL PROPERTIES

|   | MEAN VALUE | CHARACTERISTIC VALUE | NORM                   |
|---|------------|----------------------|------------------------|
| LONGITUDINAL BENDING STRENGTH ( $f_{fl}$ )        | 369,1 MPa  | 265,6 MPa            | EN ISO 14125           |
| TRANSVERSAL BENDING STRENGTH ( $f_{ft}$ )         | 228 MPa    | 201,8 MPa            | EN ISO 14125           |
| LONGITUDINAL BENDING ELASTIC MODULUS ( $E_{fl}$ ) | 19,42 GPa  |                      | EN ISO 14125 (CLASS 4) |
| TRANSVERSE BENDING ELASTIC MODULUS ( $E_{ft}$ )   | 15,26 GPa  |                      | EN ISO 14125 (CLASS 4) |

#### TENSILE PROPERTIES

|   | MEAN VALUE | CHARACTERISTIC VALUE | NORM         |
|---|------------|----------------------|--------------|
| LONGITUDINAL TENSILE STRENGTH ( $f_{tl}$ )        | 471,1 MPa  | 392,7 MPa            | EN ISO 527-4 |
| TRANSVERSAL TENSILE STRENGTH ( $f_{tt}$ )         | 92,5 MPa   | 86,9 MPa             | EN ISO 527-4 |
| LONGITUDINAL TENSILE ELASTIC MODULUS ( $E_{tl}$ ) | 30,54 GPa  |                      | EN ISO 527-4 |
| TRANSVERSAL TENSILE ELASTIC MODULUS ( $E_{tt}$ )  | 10,65 GPa  |                      | EN ISO 527-4 |
| LONGITUDINAL POISSON RATIO ( $\nu_{LT}$ )         | 0,35       |                      | EN ISO 527-4 |
| TRANSVERSAL POISSON RATIO ( $\nu_{TL}$ )          | 0,08       |                      | EN ISO 527-4 |

#### COMPRESSION PROPERTIES

|   | MEAN VALUE | CHARACTERISTIC VALUE | NORM         |
|---|------------|----------------------|--------------|
| LONGITUDINAL COMPRESSIVE STRENGTH ( $f_{cl}$ )        | 386,9 MPa  | 305,2 MPa            | EN ISO 14126 |
| TRANSVERSAL COMPRESSIVE STRENGTH ( $f_{ct}$ )         | 140,5 MPa  | 109,9 MPa            | EN ISO 14126 |
| LONGITUDINAL COMPRESSIVE ELASTIC MODULUS ( $E_{cl}$ ) | 28,8 GPa   |                      | EN ISO 14126 |
| TRANSVERSAL COMPRESSIVE ELASTIC MODULUS ( $E_{ct}$ )  | 10,4 GPa   |                      | EN ISO 14126 |

#### INTERLAMINAR AND IN-PLANE SHEAR PROPERTIES

|   | MEAN VALUE | CHARACTERISTIC VALUE | NORM         |
|---|------------|----------------------|--------------|
| LONGITUDINAL INTERLAMINAR SHEAR STRENGTH ( $f_{vl}$ ) | 22,54 MPa  | 20,46 MPa            | EN ISO 14130 |
| INTERLAMINAR SHEAR MODULUS ( $G_{LT}$ )               | 3,63 GPa   |                      | EN ISO 15310 |

#### PIN BEARING STRENGTH

|  | MEAN VALUE | CHARACTERISTIC VALUE | NORM               |
|--|------------|----------------------|--------------------|
| LONGITUDINAL PIN BEARING STRENGTH ( $f_{pL}$ ) | 161,78 MPa | 131,2 MPa            | ANNEX E EN 13706-2 |
| TRANSVERSAL PIN BEARING STRENGTH ( $f_{pT}$ )  | 156,56 MPa | 139,54 MPa           | ANNEX E EN 13706-2 |

The product can be used in humidity range 0-100% and temperature range -30 °C / + 50 °C, in case of different environmental conditions or contact with aggressive chemicals (acids and alkalis), please contact M.M. Technical Department.

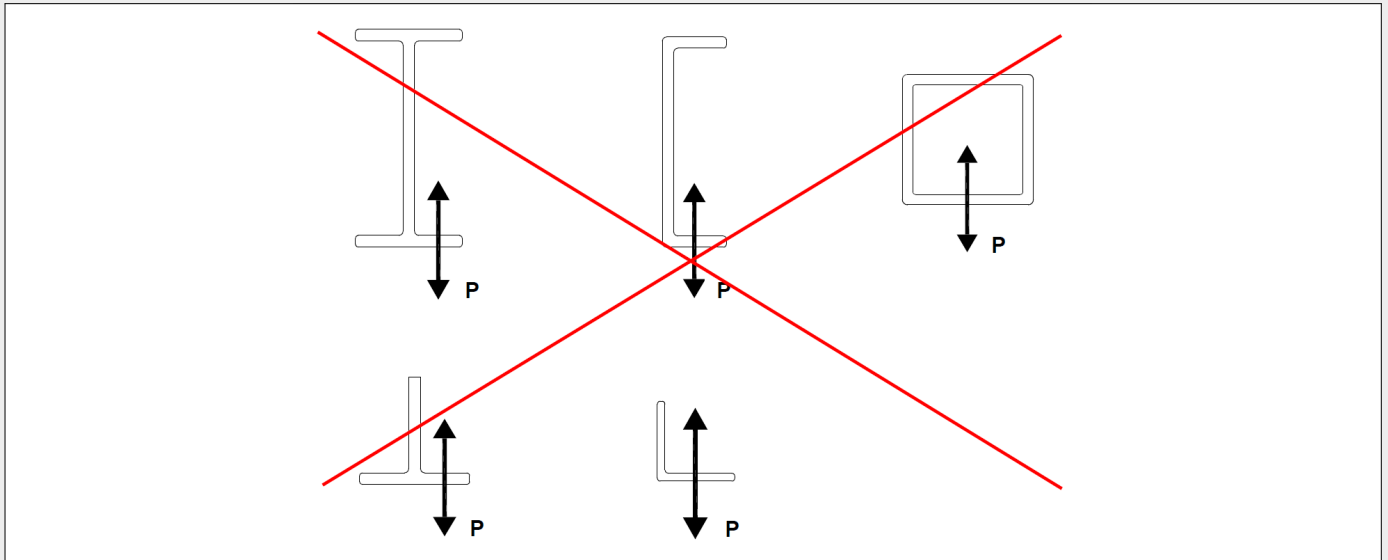
The estimated service life is 50 years, on condition that packing, transport, storage, use and installation, maintenance and repairing are carried out properly. Indications about service life must not be intended as product warranty provided by the manufacturer, but shall be considered as guidelines to help the selection of the correct products in relationship with the

service life foreseen for the main works, under reasonable economical criteria.

ATTENTION: The average values reported in the table shall not be considered as minimum values for material acceptance. For strength verifications the Characteristic Values as defined and required by the Standards in force shall be considered. It is highly recommended to pay extra care to the local and global stability checks of profiles. Please refer to "Design Guidelines". For clarifications please contact M.M. Technical Department.

## DESIGN GUIDELINES

1. For a correct design of FRP structures, we recommend to pay particular attention to the local and global buckling of the profiles. Contact M.M.'s technical department for further assistance.
2. Avoid to apply tensile/compressive concentrated loads on the flanges of the profiles as illustrated in the below drawings.



3. It is highly recommended to pay extra care to the local and global stability checks of profiles. Please refer to addendum "Design Guideline".

