TOLERANCES

DIMENSIONAL TOLERANCES OF THE PIECES

With respect to the nominal dimensions, the measurement differences should not exceed the following tolerances:

- **Lenght of the piece (X):**
  For lengths of X ≤ 2,000 mm, the maximum tolerance, $x_{máx}$, must be between 0 mm and 4 mm.
  For lengths of X > 2,000 mm, the maximum $x_{máx}$, should be between 0 mm and 0.002 X.

- **Width of the piece (Y):**
  For lengths of Y ≤ 1,000 mm, the maximum tolerance, $y_{máx}$, should be between 0 mm and 7 mm.
  For lengths of Y > 1,000 mm, the maximum tolerance, $y_{máx}$, should be between 0 mm and 0.003 Y.

- **Diagonals of the piece (D1; D2):**
  For lengths of X ≤ 2,000 mm, the maximum tolerance of the diagonal, $d_{máx}$, should be $d_{máx}$ = D1 - D2 = ±10 mm.
  For lengths of X > 2,000 mm, the maximum diagonal tolerance, $d_{máx}$, should be $d_{máx}$ = D1 - D2 = 0.005 X.
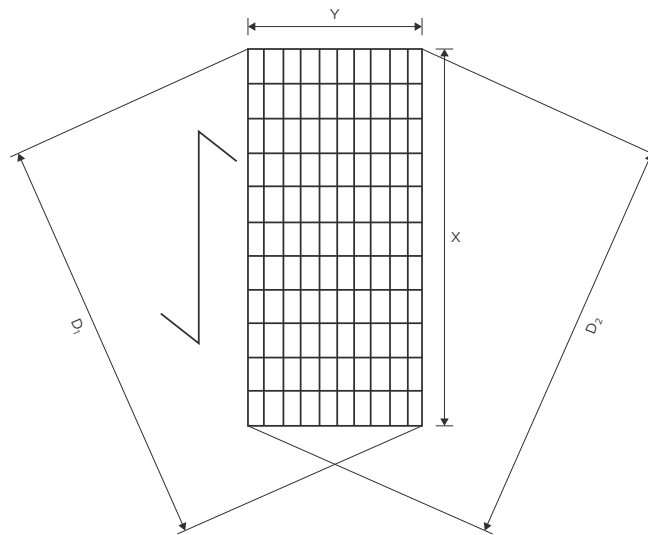

Figure 1 – Diagonals of thepiece (D1; D2)

- **Space between bearing bars (A):**
  The maximum tolerance for the space between bearing bars, $a_{máx}$, is given by:

  For 10 spaces (10 A), $a_{máx}$ = ±4 mm.
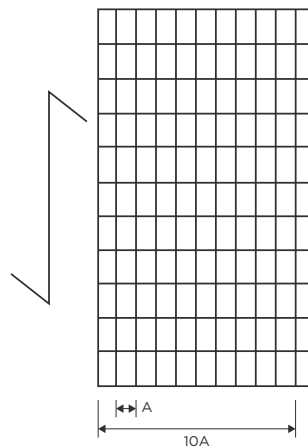 For 1 space, $a_{máx}$ = ±1,5 mm.

Figure 2 – Space between load bearing bars (A)

- **Space between separating transversal bars (B):**
  The maximum tolerance for the space between separating transversal bars, $b_{máx}$, is given by:

  For 10 spaces (10 B), $b_{máx} = \pm 4$ mm.
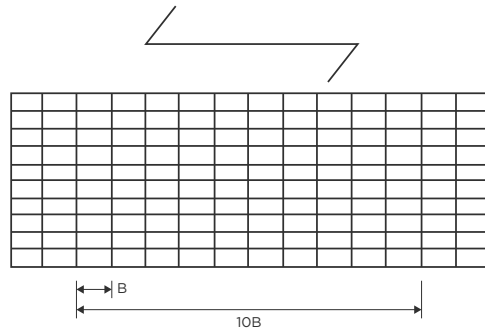 For 1 space, $b_{máx} = \pm 2$ mm.

Figure 3 – Space between separating transversal bars(B)

- **Length of rectilinear pieces (S):**
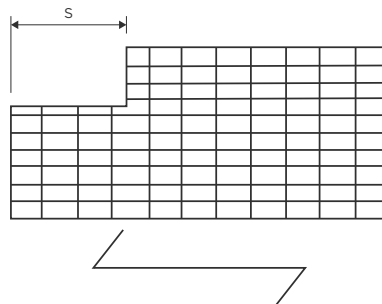 The maximum tolerance of the length of a rectilinear piece, $s_{máx}$, should be +10 mm.

Figure 4 – Length of the rectilinear piece (S)

- **Width of a rectilinearpiece (T):**
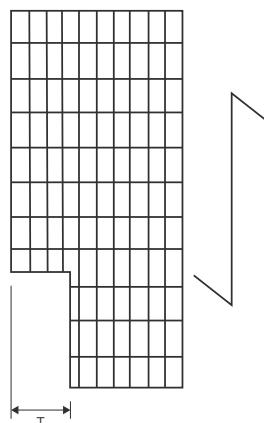 The maximum tolerance of the width of a rectilinear piece, $t_{máx}$, should be +10 mm.

Figure 5 – Width of a rectilinear piece (T)

- **Radius of a piece with a circular shape (R1; R2):**
The tolerances r of the radius R_1 and R_2 of the piece with a circular shape, shown in figure 13, should be respectively:
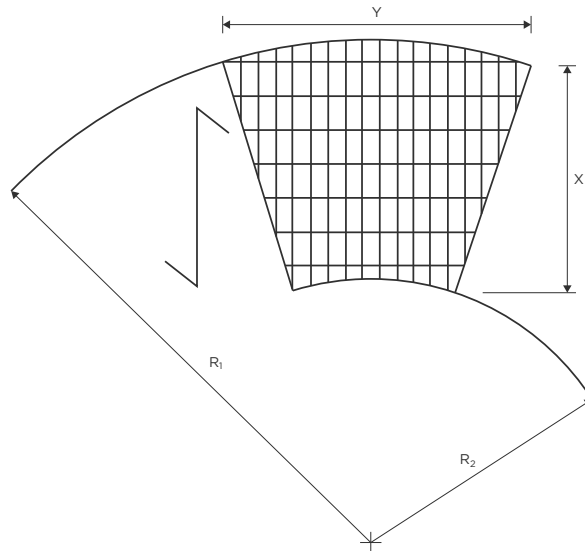
    r_1 = -8 mm.
    r_2 = +8 mm.

Figure 6 – Radius of a circular piece (R1; R2)

- **Tolerances for the making of pieces:**
The construction of pieces may present differences with respect to the nominal measurement which should be between the tolerance limits shown below:

  - **Protruding between separating transversal rods in electrowelded gratings (q; k):**
  The maximum tolerance of the projection between the separating transversal bars and the bearing bars, $q_{máx}$, equals 80% of the height of the separating rods.
  The maximum tolerance between separating transversal bars with respect to the bearing bars, $k_{máx}$, equals 1.5 mm.

  - **Protruding between separating transversalbars in pressed gratings (q; k):**
  The maximum tolerance of the projection between the separating transversal bars and the load bearing bars, $q_{máx}$, equals 1,5 mm.
  The maximum tolerance of the projection between separating transversal bars with respect to the bearing bars, $k_{máx}$, equals 1.5 mm.
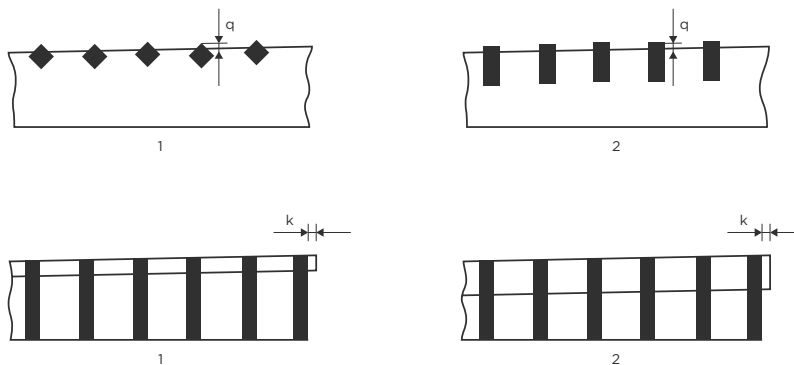
Key:
1 - Electrowelded grating
2 - Pressed grating

Figure 7 – Projection from the separating transversal bars (q; k)

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- **Protruding from the binding bar (m; n):**
  The maximum tolerance of the projection between the binding bar and the bearing bars in the upper part of the piece, $m_{máx}$, is equal to1.5 mm.
  The maximum tolerance of the projection between the binding bar and the bearing bars in the lower part of the piece, $n_{máx}$, is equal to 1.5 mm.
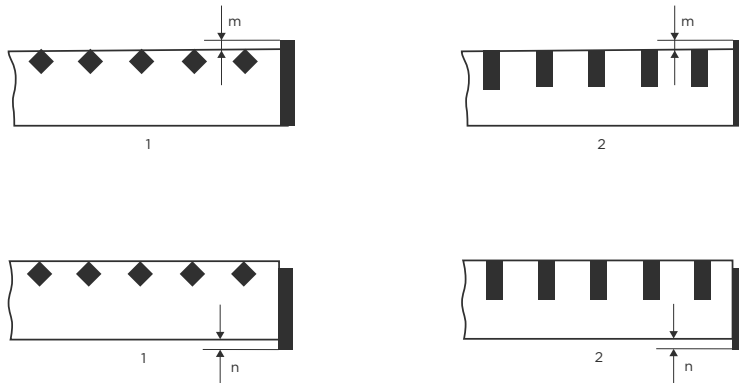
Key:
1 - Electrowelded grating
2 - Pressed grating
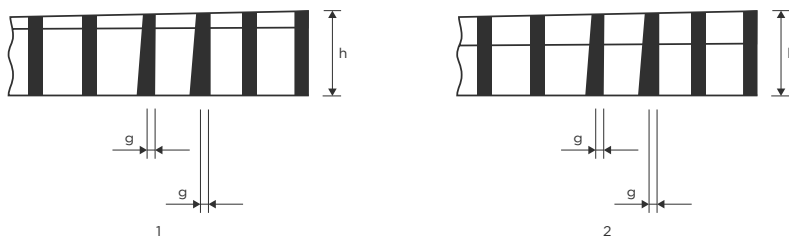
Figure 8 – Projection from the binding bar (m; n)

- **Inclination of the load bearingbars (g):**
  The maximum tolerance of the slope of the bearing bars, $g_{máx}$, should not exceed the greater of the following conditions:

  $g_{máx}$ = 0,1 h
  $g_{máx}$ = thickness of the bearing bar.
  $g_{máx}$ = tolerance of the projection between the binding bar and the bearing bar in the lower part of the piece.

Key:
1 - Electrowelded grating
2 - Pressed grating
h - Height of the bearing bar

Figure 9 – Inclination of the bearing bars (g)

-**Inclination of the binding bar (i):**
The maximum tolerance of the inclination of the binding bar, $i_{máx}$, should not be greater than the following conditions:

$i_{máx}$ = 0,1 h
$i_{máx}$ = thickness of the binding bar.
$i_{máx}$ = 1,5 mm

Key:
1 - Electrowelded grating
2 - Pressed grating
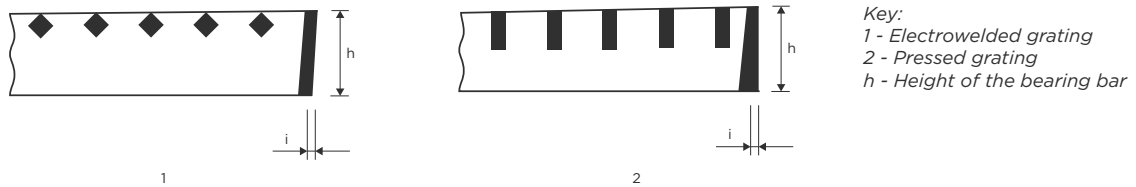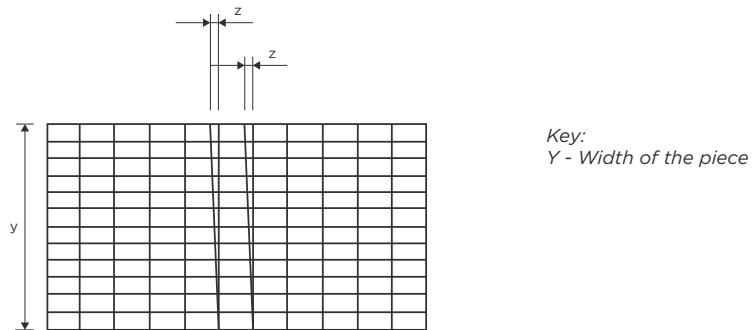h - Height of the bearing bar

Figure 10 – Inclination of the binding bar (i)

-**Intersection of separating transversal bars (z):**
The maximum tolerance of separating transversal bars with respect to the bearing bars, $z_{máx}$, is equal to a 0.003 Y.

Key:
Y - Width of the piece

Intersection of the separating bars (z)

-**Curvature of separatingtransversal bars (w):**
The maximum tolerance of the curvature of the separating transversal bars, $w_{máx}$, is equal to 0.004 Y

Key:
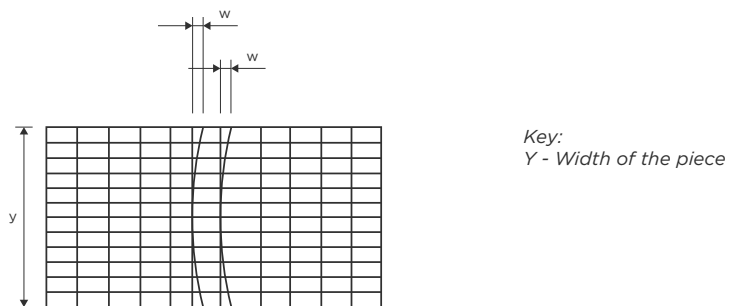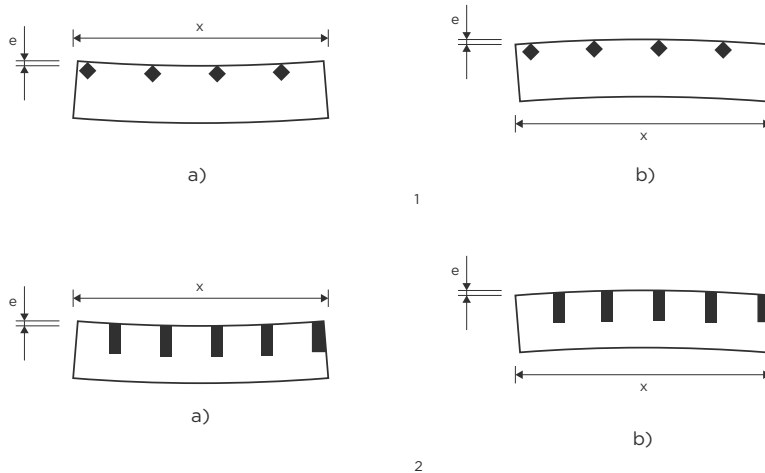Y - Width of the piece

Figure 12 – Curvature of the separating bars (w)

- Longitudinal plane (e):

The maximum tolerance in the longitudinal plane $e_{máx}$, should be:

    a) concave piece: $e_{máx} = X/200$ mm
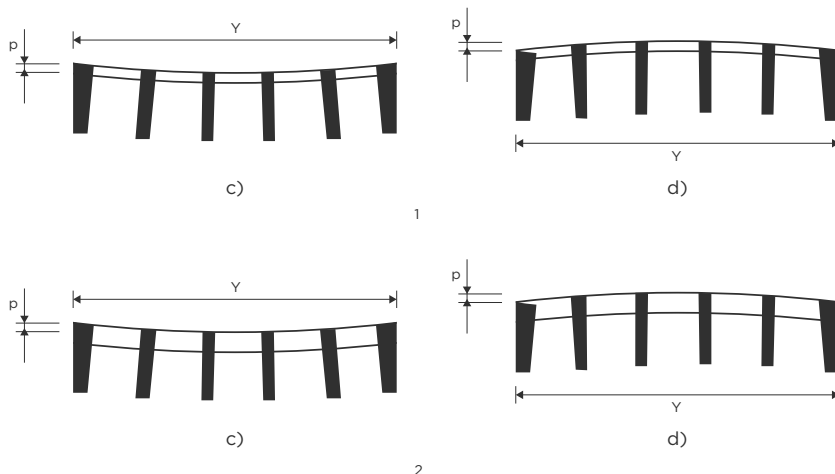   b) convexpiece: $e_{máx} = X/150$ mm

Key:
1 - Electrowelded grating
2 - Pressed grating
x - Length of the piece

Figure 13 – Longitudinal plane (e)

- Transversal plane (p):

The maximum tolerance of the transversal plane, $p_{máx}$, should be:

    c) concave piece: $p_{máx} = Y/200$ mm
    d) convexpiece: $p_{máx} = Y/150$ mm

Key:
1 - Electrowelded grating
2 - Pressed grating
x - Width of the piece

Figure 14 – Transversal plane (p)

- **Curvature of the bearing bars (c):**
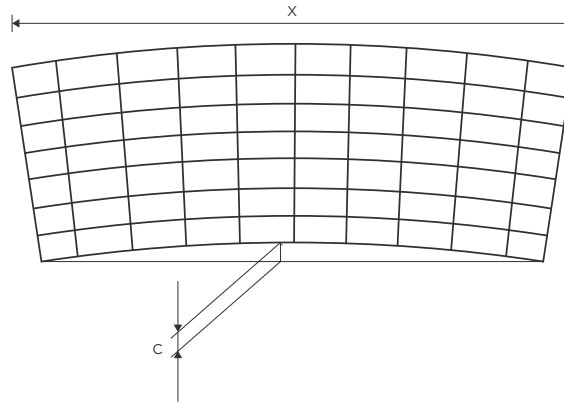 The maximum tolerance of the curvature of bearing bars, $c_{máx}$, is equal to 1/200 X.

Figure 15 – Curvature of the bearing bars (c)

Torsion:
The tolerance of the curvature of the diagonals $sv_{máx}$, is equal to D/150mm, with D being the diagonal of the piece.

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