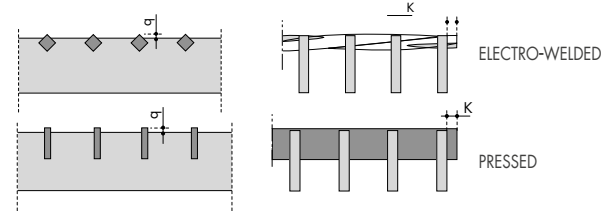


TOLERANCES

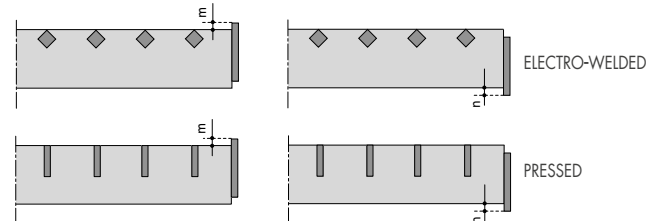
Gratings can vary in measures compared to the nominal measures caused by nominal measures, expansions or strains on the material for various reasons. Here are the average values to consider within tolerances.

PANELS CONSTRUCTION TOLERANCES

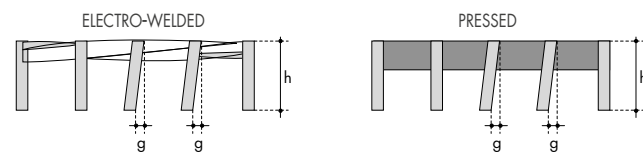
- Bar Protrusion (q; k)
 - (q) tolerance on projections between cross bars and bearing bars
max.q = 1,5 mm
 - (k) tolerance on protrusions of cross bars with bearing bars
max.k = 1,5 mm



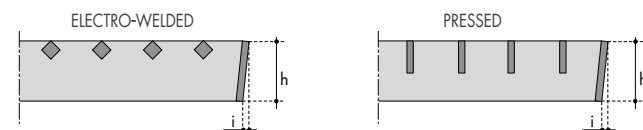
- Protrusion of end plate (m; n)
 - (m) tolerance on the protrusion between binding bar and bearing bars on the panel upper part
max.m = 1,5 mm
 - (n) tolerance on the protrusion between binding bar and bearing bars on the panel lower part.
Max. n = 1,5 mm



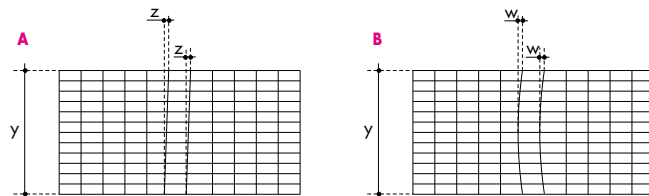
- Inclination of bearing bars (g)
 - (g) tolerance of inclination of the bearing bars
max.g = 0,1 • h
max.g = bearing bar thickness
Anyway max g = 4 mm



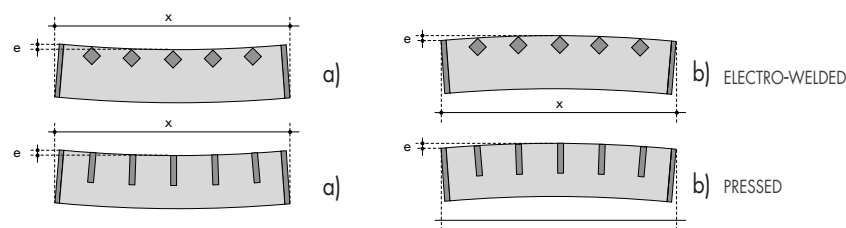
- Inclination of binding plate (i)
 - (i) tolerance of banding plate inclination
max.i = 0,1 • h
max.i = banding plate thickness



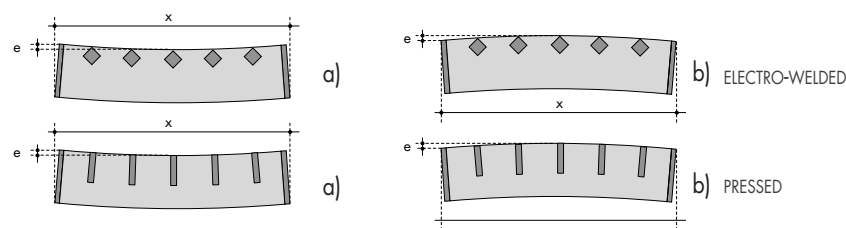
- Orthogonal position of cross bars (z)
 - (z) tolerance of orthogonal position of cross bars compared to bearing bars
max. z = 0,003 • Y



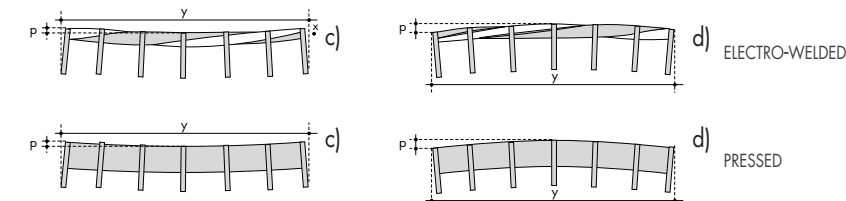
- Bars deflection (w)
 - (w) bars deflection tolerance
max. w = 0,004 • Y



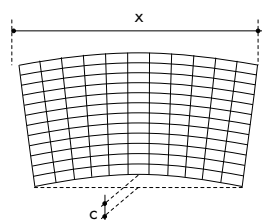
- Lengthwise flatness (e)
 - (e) flatness deviation
 - a) recess panel
max.e = X/200 mm
 - b) protruding panel
max.e = X/150 mm



- Crosswise flatness (p)
 - (p) flatness deviation
 - c) recess panel
max.p = Y/200 mm
 - d) protruding panel
max.p = Y/150 mm



- bearing bars deflection (c)
 - (c) deflection tolerance of bearing bars
max.c = 1/200 • X



- Twist
 - (sv) tolerances of the diagonal lines curve
max. sv = D/150 mm
D = panel diagonal

PANEL MEASURE TOLERANCES

- Panel length (X)
 - (x) length tolerance
for x ≤ 2 000 mm
x max. = 0 mm
-4 per x > 2 000 mm
x max. = 0 mm
-0,002 • x

- Panel width (y)
 - (y) width tolerance
for y ≤ 1 000 mm
max.y = 0 mm
-6 for y > 1 000 mm
y max. = 0 mm
-0,006 • y

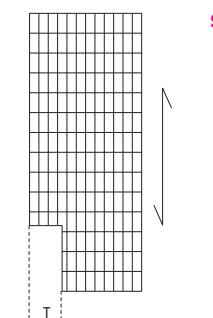
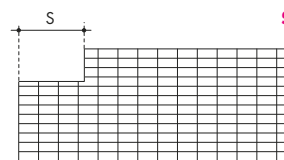
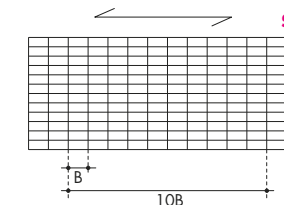
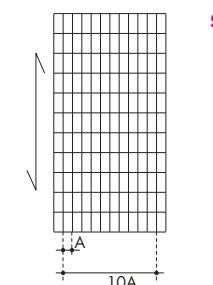
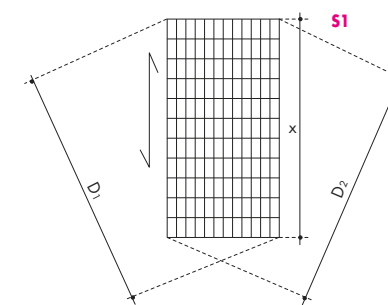
- Panel diagonals (R₁; R₂)
 - d. tolerance on the diagonals
d. for x ≤ 2 000 mm
max.d = D1-D2 = ±6 mm
for x > 2 000 mm
max.d = D1-D2 = 0,003 • x S1

- Bearing bars pitch (A)
 - (a) tolerance on bars pitch
on n°10 pitches (10 • A)
max.a = ±4 mm
on n°1 pitch
max.a = ±1,5 mm S2

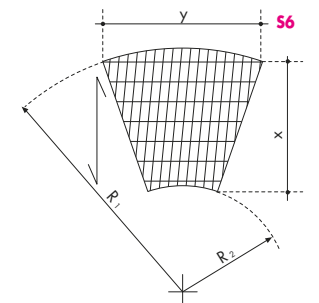
- Bars pitch (B)
 - (b) tolerance on the cross bar pitch
on n°10 pitches (10 • B)
max.b = ±4 mm
on n°1 pitch
max. b = ±2 mm S3

- Length of straight shape (S)
 - (s) tolerance on the shape length
max. s = 0 mm +10 S4

- Width of straight shape (T)
 - (t) tolerance on the shape width
max. t = 0 mm +10



- Circular Shape Radius (R₁; R₂)
 - (r) tolerance on the radius of the shaping
R₁ = 0 mm
-8
R₂ = 0 mm
+8



TOLERANCES

Standard UNI Series 11002
Tolerances are set by the standard UNI Series 11002 "Panels and grating electro-welded and/or Pressed steps" of August 2002 and following revisions, promoted by Assogrigliati - National Association of Italian producers of electro-welded and pressed gratings of steel and metallic alloys. The norm aims at supplying a suitable safety standard to the final client also as far a product according to current norms. In particular go to entry 1.1.3 which sets materials, dimensions and construction tolerances for installation on walkways or driveways made with bars, panels and stair treads. The values set in the norm, at the entry title 'Tolerances' defines the limits according to which the grating performance doesn't undergo any changes and therefore, the nominal measures of the deflections that should not be exceeded.