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# NAIL PLATE STRIPS NAIL PLATES



# NAIL PLATES / NAIL PLATE STRIPS

## NAIL PLATE STRIPS

GH nail plate strips are simple connecting elements for fixing narrow timber parts or for large surface connection.



Basics of statics **from page 252**  
Products **from page 256**

## NAIL PLATES

GH nail plates have numerous application options. Mainly used as hub connectors in various forms for connecting timber constructions, such as strut connections, rolled tie strap hubs, truss connectors, etc. GH nail plates are also available in the **GREENline** series.



Basics of statics **from page 252**  
Products **from page 258**

# NAIL PLATE STRIPS / NAIL PLATES

## SORTIMENT

|                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     | Length<br>[mm]                                                                     | Width<br>[mm] | Basics<br>Statics | Products &<br>Statics |     |
|----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------|-------------------|-----------------------|-----|
|                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                    |               | from page         | from page             |     |
| NAIL PLATE STRIPS 2.0            |  |  |  |  |                                                                                   | 1200                                                                               | 40-400        | 252               | 256                   |     |
| NAIL PLATE STRIPS 2.5            |  |  |  |  |                                                                                   | 1200                                                                               | 40-400        | 252               | 257                   |     |
| NAIL PLATE BOARDS                |  |  |  |  |                                                                                   | 2500                                                                               | 1200          |                   | 256                   |     |
| NAIL PLATES 2.0                  |  |  |  |  |   |  | 120-500       | 40-200            | 252                   | 258 |
| NAIL PLATES 1.5 <b>GREENLINE</b> |  |  |  |  |                                                                                   | 120-500                                                                            | 40-200        | 252               | 259                   |     |

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CE symbol



Steel with indication of the steel quality and galvanisation



Stainless steel with material number



Timber/timber connection



Timber/concrete-connection



### Usage class 1

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated.  
Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.



### Usage class 2

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof.  
Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.



### Usage class 3

Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

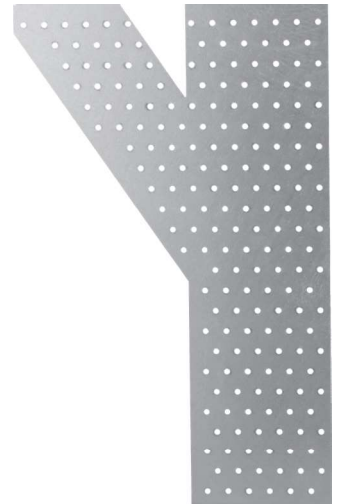
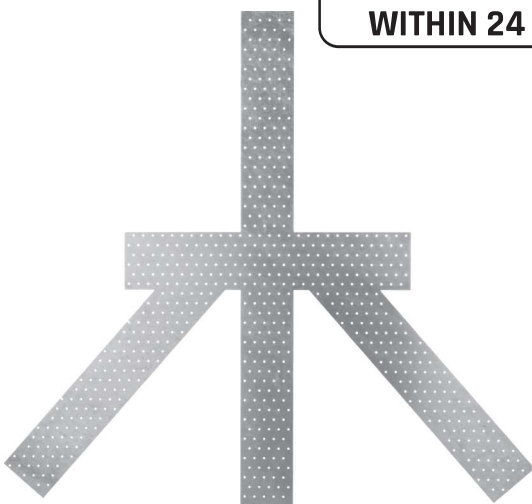
# CUSTOMISED NAIL PLATES

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## WITHIN 24 HOURS WITH MODERN MACHINES



**CUSTOMISED PARTS  
ACCORDING TO DRAWING  
WITHIN 24 HOURS.**



# NAIL PLATES / NAIL PLATE STRIPS

## TECHNICAL FEATURES

### Geometry

|      |                         |
|------|-------------------------|
| L    | Length [mm]             |
| W(B) | Width [mm]              |
| T(S) | Material thickness [mm] |

### Tables

|       |                                         |
|-------|-----------------------------------------|
| $n_o$ | Number of connecting elements in timber |
|-------|-----------------------------------------|

### Design

|            |                                                     |
|------------|-----------------------------------------------------|
| $R_k$      | Characteristic value of a load capacity [kN]        |
| $R_d$      | Design value of load capacity [kN]                  |
| $R_{90,d}$ | Design value of load capacity vertical to the grain |
| $n_{ef}$   | Effective number of connecting elements             |
| $\gamma_M$ | Partial safety factor                               |
| $k_{mod}$  | Modification coefficient for load impact duration   |

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Steel with indication of the steel quality and galvanisation



Stainless steel with material number



Timber/timber connection



Timber/concrete-connection



### Usage class 1

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated. Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.



### Usage class 2

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof. Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.



### Usage class 3

Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

# NAIL PLATES / NAIL PLATE STRIPS

## APPLICATIONS

### Application:

Nail plates and nail plate strips are intended for transfer of tensile forces in connections.

### Materials:

250  
GD  
Z275

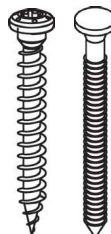
A4  
1.4571

### Material thicknesses:

1,5 bis 3,0 mm



### For use in usage classes



### Connecting element:

GH threaded nails 4,0 x 35 / 40 / 50 / 60 / 75 / 100 mm

GH screws 5,0 x 25 / 35 / 40 / 50 / 60 / 70 mm

Connecting elements from page 274

# Connection to timber

A connection should always consist of two opposite nail sheets. The width of the connected timbers must be the same. Only holes with their centre of gravity at least 6 mm from the nail plate edge may be used.

## Design example

Load capacities in kN  
Characteristic raw density of timber:  $\rho_k = 350 \text{ kg/m}^3$  (C24)  
Characteristic value  $R_{v,k}$   
Design value  $R_{z,Rd}$  for KLED "short"

The following proof must be kept for the design of the connection:

$$R_d = n_{ef} \times k_{mod} / 1,3 \times R_{v,k}$$

$$R_d = 0,9 \times A_{net} \times f_u / y_{M2} \quad \text{with } A_{net} = 0,75 \times b \times t, \quad y_{M2} = 1,25$$

$$R_{90,d} = 14 \times b \times \sqrt{\frac{h_e}{1 - h_e/h}} \times \frac{k_{mod}}{1,3}$$

Cross-tensile proof in the strap according to EN 1995-1-1 8.1.4

Strap Softwood C24 100 [mm] x 160 [mm]  
Tensile rod Softwood C24 100 [mm] x 160 [mm]  
Nail plates 2 x 80 x 240 x 1.5 steel sheet S 250 with tensile strength  $f_u = 330 \text{ [N/mm}^2]$   
Threaded nails 4 x 50 according to ETA-13/0523 - 2 x 5 threaded nails in the strap and 2 x 6 threaded nails in the tensile rod  
Usage class 2, class of load impact duration "short"  $\rightarrow k_{mod} = 0,9$

Load capacity of nails in the strap  
Shearing load capacity of a threaded nail 4x50 according to ETA-13/0523:  $R_{v,k} = 2,21 \text{ [kN]}$   
 $R_d = 2 \times 5 \times 0,9 / 1,3 \times 2,21 = 15,3 \text{ [kN]}$

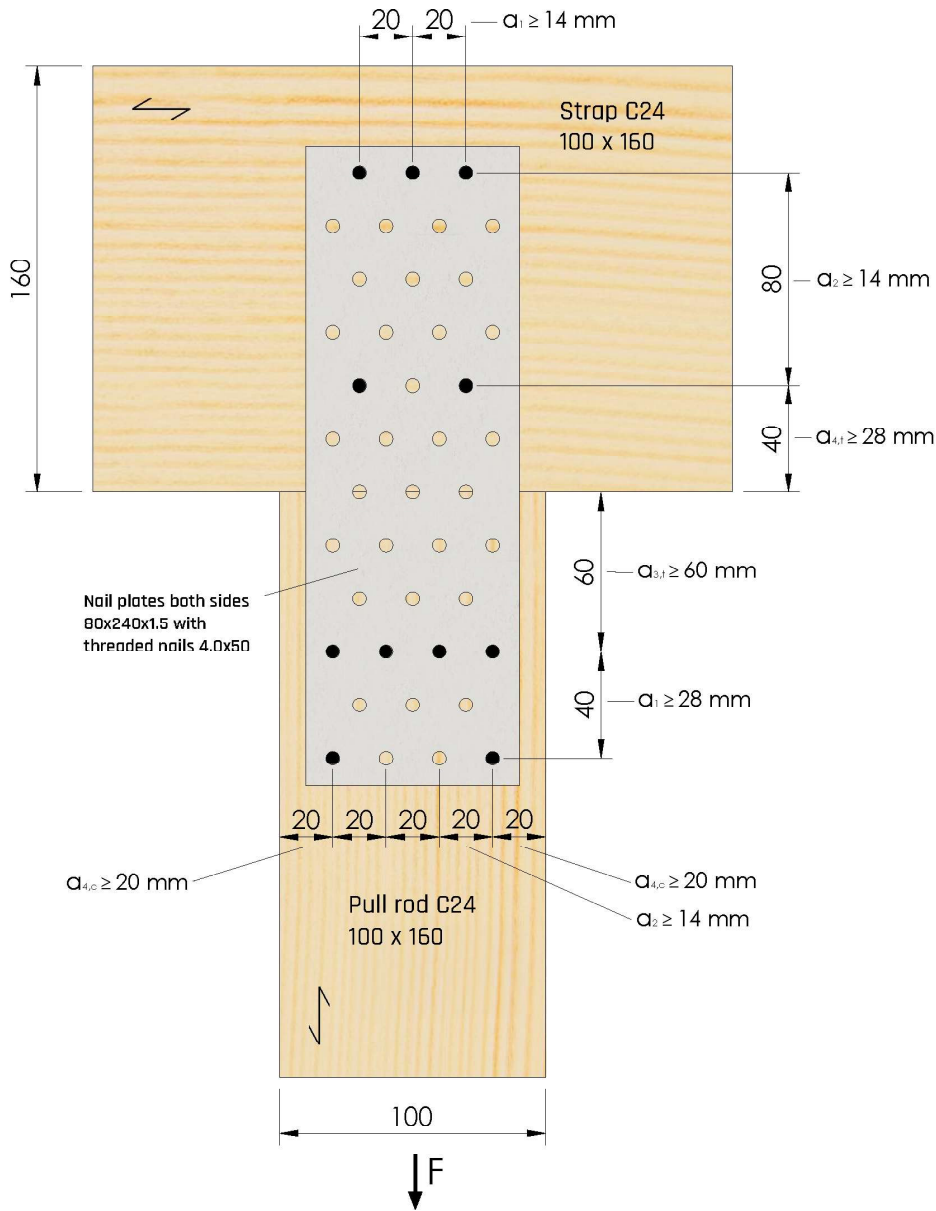
Load capacity of nails in the pull rod  
Determination of  $n_{ef}$  according to EN 1995-1-1 8.3.1.1 (8):  $n_{ef} = n^{0,85} = 2 \times 3 \times 2^{0,85} = 10,8$   
 $R_d = 10,8 \times 0,9 / 1,3 \times 2,21 = 16,5 \text{ [kN]}$

Load capacity of nail plates  
Net cross-section surface:  $A_{net} = 0,75 \times w \times d = 0,75 \times 80 \times 1,5 = 90 \text{ [mm}^2]$   
 $R_d = 0,9 \times 2 \times 90 \times 330 / 1,25 = 42,8 \text{ [kN]}$   
The off-centre load of the nail plates is not taken into account.

Load capacity of transverse connection  
Spacing of the outer connecting element row from the stressed edge:  $h_e = 120 \text{ [mm]}$

$$R_{90,d} = 14 \times 100 \times \sqrt{\frac{120}{1 - 120/160}} \times \frac{0,9}{1,3} = \mathbf{21,2 \text{ [kN]}}$$

Load capacity of connection:  $R_d = \min (15,3; 16,5; 42,8; 21,2) = 15,3 \text{ [kN]}$



# Minimum and edge spacing

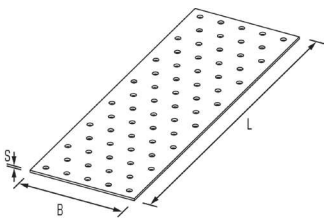
The regulations according to EN1995-1-1 apply for edge spacing parallel and vertical to the grain. In accordance with DIN 1052:2008-12 it is recommended that the clear distance between the outer connecting element groups of two joist hangers corresponds to 2 times the main beam height. If this is not achieved, the load capacity should be reduced.

|                                                                                         |                                    | Force parallel to the grain | Force at a right angle to the grain |
|-----------------------------------------------------------------------------------------|------------------------------------|-----------------------------|-------------------------------------|
| $a_1$                                                                                   | in grain direction                 | 28 mm                       | 14 mm                               |
| $a_2$                                                                                   | Right angle to the grain direction | 14 mm                       | 14 mm                               |
| $a_{3,t}$                                                                               | End grain with stress              | 60 mm                       | 40 mm                               |
| $a_{3,c}$                                                                               | End grain without stress           | 40 mm                       | 40 mm                               |
| $a_{4,t}$                                                                               | Loaded edge                        | 20 mm                       | 28 mm                               |
| $a_{4,c}$                                                                               | Unloaded edge                      | 20 mm                       | 20 mm                               |
| See EN 1995-1-1 Tab.8.2 for other brackets than those specified between force and grain |                                    |                             |                                     |

Minimum spacing according to EN 1995-1-1, for threaded nails  $\varnothing 4 \text{ mm}$  in nail sheets,  $\rho_k \leq 420 \text{ kg/m}^3$

# NAIL PLATE STRIPS

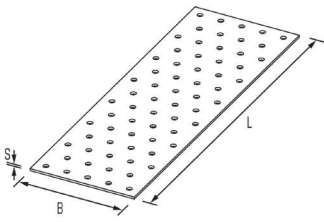
2.0 MM



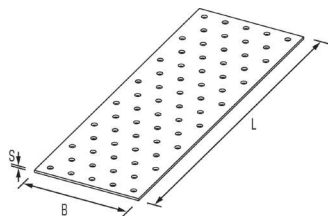
| Art. No. | Dimensions [mm] |   |      |   |      | nN<br>Ø 5 | EAN<br>4019346 | Weight<br>kg | Pallet | PU |   |  |
|----------|-----------------|---|------|---|------|-----------|----------------|--------------|--------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|          | W(B)            | x | L    | x | T(S) |           |                |              |        |    |                                                                                                                                                                         |  |
| 101563   | 40              | x | 1200 | x | 2,0  | 90        | 125007         | 0.659        | 1200   | 20 | ■                                                                                                                                                                       |  |
| 101526   | 60              | x | 1200 | x | 2,0  | 150       | 125014         | 0.988        | 780    | 20 | ■                                                                                                                                                                       |  |
| 101527   | 80              | x | 1200 | x | 2,0  | 210       | 125021         | 1.318        | 600    | 20 | ■                                                                                                                                                                       |  |
| 101528   | 100             | x | 1200 | x | 2,0  | 270       | 125038         | 1.647        | 420    | 10 | ■                                                                                                                                                                       |  |
| 101529   | 120             | x | 1200 | x | 2,0  | 330       | 125045         | 1.977        | 360    | 10 | ■                                                                                                                                                                       |  |
| 101530   | 140             | x | 1200 | x | 2,0  | 390       | 125052         | 2.306        | 300    | 10 | ■                                                                                                                                                                       |  |
| 101531   | 160             | x | 1200 | x | 2,0  | 450       | 125069         | 2.636        | 200    | 10 | ■                                                                                                                                                                       |  |
| 101532   | 180             | x | 1200 | x | 2,0  | 510       | 125076         | 2.965        | 200    | 10 | ■                                                                                                                                                                       |  |
| 101533   | 200             | x | 1200 | x | 2,0  | 570       | 125083         | 3.295        | 200    | 5  | ■                                                                                                                                                                       |  |
| 101534   | 220             | x | 1200 | x | 2,0  | 630       | 125090         | 3.624        | 150    | 5  | ■                                                                                                                                                                       |  |
| 101535   | 240             | x | 1200 | x | 2,0  | 690       | 125106         | 3.954        | 150    | 5  | ■                                                                                                                                                                       |  |
| 101536   | 260             | x | 1200 | x | 2,0  | 750       | 125113         | 4.283        | 150    | 5  | ■                                                                                                                                                                       |  |
| 101537   | 280             | x | 1200 | x | 2,0  | 810       | 125120         | 4.613        | 100    | 5  | ■                                                                                                                                                                       |  |
| 101538   | 300             | x | 1200 | x | 2,0  | 870       | 125137         | 4.942        | 100    | 5  | ■                                                                                                                                                                       |  |
| 101543   | 400             | x | 1200 | x | 2,0  | 1170      | 125182         | 6.589        | 100    | 5  | ■                                                                                                                                                                       |  |

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# NAIL PLATE BOARDS



| Art. No. | Dimensions [mm] |   |      |   |      | EAN<br>4019346 | Weight<br>kg | PU |   |  |
|----------|-----------------|---|------|---|------|----------------|--------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|          | W(B)            | x | L    | x | T(S) |                |              |    |                                                                                                                                                                             |  |
| 101600   | 1200            | x | 2500 | x | 2,0  | 127308         | 40.860       | 1  | ■                                                                                                                                                                           |  |
| 101700   | 1200            | x | 2500 | x | 2,5  | 127315         | 51.070       | 1  | ■                                                                                                                                                                           |  |
| 101800   | 1200            | x | 2500 | x | 3,0  | 127322         | 61.280       | 1  | ■                                                                                                                                                                           |  |



# NAIL PLATE STRIPS

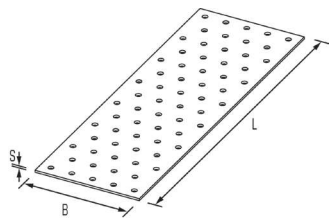
## 2.5 MM

| Art. No. | Dimensions [mm] |   |      |   |      | nN<br>Ø 5 | EAN<br>4019346 | Weight<br>kg | Pallet | PU |   |
|----------|-----------------|---|------|---|------|-----------|----------------|--------------|--------|----|---|
|          | W(B)            | x | L    | x | T(S) |           |                |              |        |    |   |
| 101564   | 40              | x | 1200 | x | 2,5  | 90        | 125199         | 0.824        | 1200   | 10 | ■ |
| 101544   | 60              | x | 1200 | x | 2,5  | 150       | 125205         | 1.236        | 800    | 10 | ■ |
| 101545   | 80              | x | 1200 | x | 2,5  | 210       | 125212         | 1.647        | 600    | 10 | ■ |
| 101546   | 100             | x | 1200 | x | 2,5  | 270       | 125229         | 2.059        | 420    | 10 | ■ |
| 101547   | 120             | x | 1200 | x | 2,5  | 330       | 125236         | 2.471        | 400    | 10 | ■ |
| 101548   | 140             | x | 1200 | x | 2,5  | 390       | 125243         | 2.883        | 400    | 5  | ■ |
| 101549   | 160             | x | 1200 | x | 2,5  | 450       | 125250         | 3.295        | 200    | 5  | ■ |
| 101550   | 180             | x | 1200 | x | 2,5  | 510       | 125267         | 3.707        | 200    | 5  | ■ |
| 101551   | 200             | x | 1200 | x | 2,5  | 570       | 125274         | 4.118        | 200    | 5  | ■ |
| 101552   | 220             | x | 1200 | x | 2,5  | 630       | 125281         | 4.530        | 150    | 5  | ■ |
| 101553   | 240             | x | 1200 | x | 2,5  | 690       | 125298         | 4.942        | 150    | 5  | ■ |
| 101554   | 260             | x | 1200 | x | 2,5  | 750       | 125304         | 5.354        | 150    | 5  | ■ |
| 101555   | 280             | x | 1200 | x | 2,5  | 810       | 125311         | 5.766        | 100    | 5  | ■ |
| 101556   | 300             | x | 1200 | x | 2,5  | 870       | 125328         | 6.178        | 100    | 5  | ■ |
| 101561   | 400             | x | 1200 | x | 2,5  | 1170      | 125373         | 8.237        | 100    | 5  | ■ |

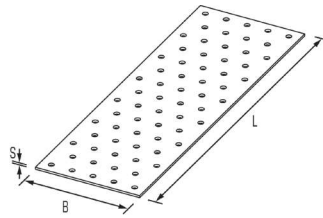


# NAIL PLATES

## 2.0 MM



| Art. No. | Dimensions [mm] |   |     |   |      | nN  | EAN     | Weight | Pallet | PU  |   |
|----------|-----------------|---|-----|---|------|-----|---------|--------|--------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | W(B)            | x | L   | x | T(S) |     |         |        |        |     |                                                                                                                                                                         |
|          |                 |   |     |   |      | Ø 5 | 4019346 | kg     |        |     |                                                                                                                                                                         |
| 101501   | 40              | x | 120 | x | 2,0  | 9   | 127018  | 0.066  | 12600  | 200 | ■                                                                                                                                                                       |
| 101502   | 40              | x | 160 | x | 2,0  | 12  | 127100  | 0.088  | 7000   | 100 | ■                                                                                                                                                                       |
| 101562   | 50              | x | 200 | x | 2,0  | 15  | 127117  | 0.137  | 7200   | 150 | ■                                                                                                                                                                       |
| 101503   | 60              | x | 140 | x | 2,0  | 18  | 127025  | 0.115  | 6300   | 150 | ■                                                                                                                                                                       |
| 15102110 | 60              | x | 160 | x | 2,0  | 20  | 127407  | 0.144  | 4800   | 100 | ■                                                                                                                                                                       |
| 101504   | 60              | x | 200 | x | 2,0  | 25  | 127032  | 0.165  | 4800   | 100 | ■                                                                                                                                                                       |
| 101505   | 60              | x | 240 | x | 2,0  | 30  | 127049  | 0.198  | 4800   | 100 | ■                                                                                                                                                                       |
| 15102302 | 60              | x | 300 | x | 2,0  | 38  | 127414  | 0.257  | 1600   | 50  | ■                                                                                                                                                                       |
| 15102136 | 60              | x | 340 | x | 2,0  | 43  | 127421  | 0.291  | 1600   | 50  | ■                                                                                                                                                                       |
| 15102137 | 60              | x | 420 | x | 2,0  | 55  | 127483  | 0.360  | 1600   | 50  | ■                                                                                                                                                                       |
| 15102304 | 60              | x | 500 | x | 2,0  | 63  | 127438  | 0.428  | 900    | 25  | ■                                                                                                                                                                       |
| 101506   | 80              | x | 200 | x | 2,0  | 35  | 127056  | 0.220  | 3500   | 50  | ■                                                                                                                                                                       |
| 101507   | 80              | x | 240 | x | 2,0  | 42  | 127063  | 0.264  | 2400   | 50  | ■                                                                                                                                                                       |
| 101508   | 80              | x | 300 | x | 2,0  | 53  | 127070  | 0.340  | 2550   | 50  | ■                                                                                                                                                                       |
| 101509   | 100             | x | 140 | x | 2,0  | 32  | 127124  | 0.192  | 3500   | 50  | ■                                                                                                                                                                       |
| 101510   | 100             | x | 200 | x | 2,0  | 45  | 127087  | 0.275  | 2400   | 50  | ■                                                                                                                                                                       |
| 101511   | 100             | x | 240 | x | 2,0  | 54  | 127131  | 0.329  | 2400   | 50  | ■                                                                                                                                                                       |
| 101565   | 100             | x | 260 | x | 2,0  | 59  | 127148  | 0.357  | 2550   | 50  | ■                                                                                                                                                                       |
| 101512   | 100             | x | 300 | x | 2,0  | 68  | 127094  | 0.412  | 2550   | 50  | ■                                                                                                                                                                       |
| 101513   | 100             | x | 400 | x | 2,0  | 90  | 127155  | 0.549  | 900    | 20  | ■                                                                                                                                                                       |
| 101514   | 100             | x | 500 | x | 2,0  | 113 | 127162  | 0.686  | 900    | 20  | ■                                                                                                                                                                       |
| 101515   | 120             | x | 200 | x | 2,0  | 55  | 127179  | 0.329  | 2400   | 50  | ■                                                                                                                                                                       |
| 101516   | 120             | x | 240 | x | 2,0  | 66  | 127186  | 0.395  | 2400   | 50  | ■                                                                                                                                                                       |
| 101566   | 120             | x | 260 | x | 2,0  | 72  | 127193  | 0.428  | 1700   | 50  | ■                                                                                                                                                                       |
| 101517   | 120             | x | 300 | x | 2,0  | 83  | 127209  | 0.494  | 1700   | 50  | ■                                                                                                                                                                       |
| 101518   | 120             | x | 400 | x | 2,0  | 110 | 127216  | 0.659  | 675    | 15  | ■                                                                                                                                                                       |
| 101519   | 120             | x | 500 | x | 2,0  | 138 | 127223  | 0.824  | 675    | 15  | ■                                                                                                                                                                       |
| 15102311 | 140             | x | 300 | x | 2,0  | 98  | 127452  | 0.630  | 1200   | 25  | ■                                                                                                                                                                       |
| 101520   | 140             | x | 400 | x | 2,0  | 130 | 127230  | 0.769  | 675    | 15  | ■                                                                                                                                                                       |
| 101521   | 140             | x | 500 | x | 2,0  | 163 | 127247  | 0.961  | 675    | 15  | ■                                                                                                                                                                       |
| 15102312 | 160             | x | 300 | x | 2,0  | 113 | 127346  | 0.720  | 1000   | 25  | ■                                                                                                                                                                       |
| 101522   | 160             | x | 400 | x | 2,0  | 150 | 127254  | 0.879  | 675    | 15  | ■                                                                                                                                                                       |
| 101523   | 160             | x | 500 | x | 2,0  | 188 | 127261  | 1.098  | 675    | 15  | ■                                                                                                                                                                       |
| 101524   | 180             | x | 400 | x | 2,0  | 170 | 127278  | 0.988  | 675    | 15  | ■                                                                                                                                                                       |
| 101525   | 180             | x | 500 | x | 2,0  | 209 | 127285  | 1.236  | 600    | 15  | ■                                                                                                                                                                       |
| 101567   | 200             | x | 300 | x | 2,0  | 143 | 127292  | 0.824  | 480    | 15  | ■                                                                                                                                                                       |



## NAIL PLATES

## GREENLINE 1.5 MM

| Art. No.   | Dimensions [mm] |   |     |   |      | nN  | EAN     | Weight | Pallet | PU  |   |  |
|------------|-----------------|---|-----|---|------|-----|---------|--------|--------|-----|---|--|
|            | W(B)            | x | L   | x | T(S) |     |         |        |        |     |   |  |
|            |                 |   |     |   |      | Ø 5 | 4019346 | kg     |        |     |   |  |
| 10150115   | 40              | x | 120 | x | 1,5  | 9   | 032206  | 0.050  | 12600  | 200 | ■ |  |
| 10150215   | 40              | x | 160 | x | 1,5  | 12  | 032220  | 0.066  | 7000   | 100 | ■ |  |
| 10156215   | 50              | x | 200 | x | 1,5  | 15  | 032244  | 0.103  | 7200   | 150 | ■ |  |
| 10150315   | 60              | x | 140 | x | 1,5  | 18  | 032251  | 0.086  | 6300   | 150 | ■ |  |
| 1510211015 | 60              | x | 160 | x | 1,5  | 20  | 032268  | 0.108  | 4800   | 100 | ■ |  |
| 10150415   | 60              | x | 200 | x | 1,5  | 25  | 032275  | 0.124  | 4800   | 100 | ■ |  |
| 10150515   | 60              | x | 240 | x | 1,5  | 30  | 032282  | 0.149  | 4800   | 100 | ■ |  |
| 1510230215 | 60              | x | 300 | x | 1,5  | 38  | 032299  | 0.193  | 1600   | 50  | ■ |  |
| 1510213615 | 60              | x | 340 | x | 1,5  | 43  | 032305  | 0.219  | 1600   | 50  | ■ |  |
| 1510213715 | 60              | x | 420 | x | 1,5  | 55  | 032312  | 0.277  | 900    | 25  | ■ |  |
| 1510265015 | 60              | x | 500 | x | 1,5  | 63  | 032329  | 0.321  | 1350   | 50  | ■ |  |
| 10150615   | 80              | x | 200 | x | 1,5  | 35  | 032336  | 0.165  | 3500   | 50  | ■ |  |
| 10150715   | 80              | x | 240 | x | 1,5  | 42  | 032343  | 0.198  | 2400   | 50  | ■ |  |
| 10150815   | 80              | x | 300 | x | 1,5  | 53  | 032350  | 0.255  | 2550   | 50  | ■ |  |
| 10150915   | 100             | x | 140 | x | 1,5  | 32  | 032367  | 0.144  | 3500   | 50  | ■ |  |
| 10151015   | 100             | x | 200 | x | 1,5  | 45  | 032374  | 0.206  | 2400   | 50  | ■ |  |
| 10151115   | 100             | x | 240 | x | 1,5  | 54  | 032381  | 0.247  | 2400   | 50  | ■ |  |
| 10156515   | 100             | x | 260 | x | 1,5  | 59  | 032398  | 0.268  | 2550   | 50  | ■ |  |
| 10151215   | 100             | x | 300 | x | 1,5  | 68  | 032404  | 0.309  | 2550   | 50  | ■ |  |
| 10151315   | 100             | x | 400 | x | 1,5  | 90  | 032411  | 0.412  | 900    | 20  | ■ |  |
| 10151415   | 100             | x | 500 | x | 1,5  | 113 | 032428  | 0.515  | 900    | 20  | ■ |  |
| 10151515   | 120             | x | 200 | x | 1,5  | 55  | 032435  | 0.247  | 2400   | 50  | ■ |  |
| 10151615   | 120             | x | 240 | x | 1,5  | 66  | 032442  | 0.296  | 2400   | 50  | ■ |  |
| 10156615   | 120             | x | 260 | x | 1,5  | 72  | 032459  | 0.321  | 1700   | 50  | ■ |  |
| 10151715   | 120             | x | 300 | x | 1,5  | 83  | 032466  | 0.371  | 1700   | 50  | ■ |  |
| 10151815   | 120             | x | 400 | x | 1,5  | 110 | 032473  | 0.371  | 675    | 15  | ■ |  |
| 10151915   | 120             | x | 500 | x | 1,5  | 38  | 032480  | 0.618  | 675    | 15  | ■ |  |
| 1510231115 | 140             | x | 300 | x | 1,5  | 98  | 032497  | 0.473  | 1200   | 25  | ■ |  |
| 10152015   | 140             | x | 400 | x | 1,5  | 130 | 032503  | 0.577  | 675    | 15  | ■ |  |
| 10152115   | 140             | x | 500 | x | 1,5  | 163 | 032510  | 0.721  | 675    | 15  | ■ |  |
| 10152215   | 160             | x | 400 | x | 1,5  | 150 | 032534  | 0.659  | 675    | 15  | ■ |  |
| 10152315   | 160             | x | 500 | x | 1,5  | 188 | 032558  | 0.824  | 675    | 15  | ■ |  |
| 10152415   | 180             | x | 400 | x | 1,5  | 170 | 032589  | 0.741  | 675    | 15  | ■ |  |
| 10152515   | 180             | x | 500 | x | 1,5  | 209 | 032596  | 0.927  | 600    | 15  | ■ |  |
| 10156715   | 200             | x | 300 | x | 1,5  | 143 | 032602  | 0.618  | 480    | 15  | ■ |  |