

## Declaration of Performance

1. Round wire, Lost head, clout, ELH, panel, oval, springhead, square twisted, slab, ring shank, cut clasp, cut floor, staple and drywall nails in both galvanised, yellow passivated and plain of the following diameters: 1.0mm, 1.4mm, 1.6mm, 2.0mm, 2.36mm, 2.65mm, 3.35mm, 3.75mm, 4.5mm, 5.0mm, 5.63mm, 6.0mm
2. Purchase Order numbers are attached to each pack to allow for batch identification
3. Round Wire Nails are intended for use in timber structures.
4. Manufacturer: Forgefix Ltd.,  
Botany Business Park,  
Macclesfield Road, Whaley Bridge,  
SK23 7DQ.
5. Tested to EN14592:2008 under systems by: TUV Rheinland (Shanghai) Co. Ltd.  
Notified Body No: NB 0044  
Report Number: 154026238 001
6. Declared Performance for essential characteristics to EN14592:2008
  - a. **Geometry**  
Requirement: EN 14592:2008+A1:2012 Clause 6.1.3.  
Test Sample: 5pcs each type

2.0mm/25mm	Requirement (mm)	Measured Value				
Characteristic		1	2	3	4	5
Length ( <i>l</i> )	≥1.00mm	23.52	24.30	23.99	23.62	24.26
Nominal Diameter ( <i>d</i> )	1.90 ~ 8.00mm	2.00	2.00	2.00	2.00	2.00
Head Cross sectional area ( <i>A<sub>h</sub></i> )	≥10.00mm <sup>2</sup>	20.42	21.06	20.66	20.26	20.42
Thickness of head ( <i>h<sub>t</sub></i> )	≥0.50mm	0.66	0.64	0.67	0.67	0.68
Length of point ( <i>l<sub>p</sub></i> )	≥5.00mm	0.66	0.64	0.67	0.67	0.68

2.65mm/50mm	Requirement (mm)	Measured Value				
Characteristic		1	2	3	4	5
Length ( <i>l</i> )	≥1.33mm	48.84	47.93	47.83	48.50	47.87
Nominal Diameter ( <i>d</i> )	1.90 ~ 8.00mm	2.69	2.69	2.69	2.70	2.69
Head Cross sectional area ( <i>A<sub>h</sub></i> )	≥17.56mm <sup>2</sup>	29.02	29.50	28.83	28.54	28.54
Thickness of head ( <i>h<sub>t</sub></i> )	≥0.66mm	0.90	1.19	0.93	1.28	1.22
Length of point ( <i>l<sub>p</sub></i> )	≥6.63mm	0.66	0.64	0.67	0.67	0.68

## Declaration of Performance

4.50mm/100mm	Requirement (mm)	Measured Value				
Characteristic		1	2	3	4	5
Length ( <i>l</i> )	≥2.25mm	98.43	98.98	98.60	98.89	98.90
Nominal Diameter ( <i>d</i> )	1.90 ~ 8.00mm	4.51	4.52	4.51	4.51	4.51
Head Cross sectional area ( <i>A<sub>h</sub></i> )	≥50.63mm <sup>2</sup>	68.63	67.02	67.75	68.33	67.89
Thickness of head ( <i>h<sub>t</sub></i> )	≥1.13mm	1.74	1.78	1.86	1.76	1.77
Length of point ( <i>l<sub>p</sub></i> )	≥11.25mm	7.41	7.44	6.98	7.07	7.09

### b. Characteristic yield moment

Test Method: EN409:2009

EN14592:2008+A:2012 Clause 6.1.4.2

Test Sample: 10pcs each type

2.65mm	Single Measured Values					
Characteristic	1	2	3	4	5	6
Yield Moment <i>M<sub>y</sub></i> at 45° (Nmm)	99	97	99	98	100	95

2.65mm	Single Measured Values				Characteristic Yield Moment <i>M<sub>y,k</sub></i> (Nmm)
Characteristic	7	8	9	10	
Yield Moment <i>M<sub>y</sub></i> at 45° (Nmm)	99	97	99	98	86

Remark: All tested nails were continually bent up to 45° without their breaking or another failure.  
Characteristic value calculation was carried out according to EN14358:2006

4.5mm	Single Measured Values					
Characteristic	1	2	3	4	5	6
Yield Moment <i>M<sub>y</sub></i> at 45° (Nmm)	6330	5590	5790	5810	6290	6180

2.65mm	Single Measured Values				Characteristic Yield Moment <i>M<sub>y,k</sub></i> (Nmm)
Characteristic	7	8	9	10	
Yield Moment <i>M<sub>y</sub></i> at 45° (Nmm)	6270	6460	5220	6010	5387

Remark: All tested nails were continually bent up to 45° without their breaking or another failure.  
Characteristic value calculation was carried out according to EN14358:2006

## Declaration of Performance

### c. Characteristic withdrawal parameter

Test Method: EN1382:1999

Requirement: EN14592:2008+A1:2012 Clause 6.1.4.3

Test Sample: 5pcs each type for both loading directions

2.0mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )
Sample no.		
1	269	8.41
2	216	6.74
3	289	8.97
4	303	9.46
5	289	9.05
Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		6.09

2.0mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )
Sample no.		
1	313	9.78
2	276	8.63
3	312	9.76
4	264	8.25
5	349	10.9
Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		8.33

Remark: Density of used timber was 535kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation: f<sub>ax</sub> = F<sub>max</sub>/(d<sub>x</sub>l<sub>p</sub>); Dimensions used for calculations: d=2mm, penetration length l<sub>p</sub>=16mm; Characteristic value calculation was carried out according to EN 14358:2006

2.65mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )
Sample no.		
1	469	7.89
2	421	7.08
3	484	8.14
4	587	9.88
5	617	10.38
Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		5.79

2.65mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )
Sample no.		
1	473	7.97
2	370	6.23
3	407	6.84
4	384	6.47
5	473	7.97
Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		5.31

Remark: Density of used timber was 535kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation: f<sub>ax</sub> = F<sub>max</sub>/(d<sub>x</sub>l<sub>p</sub>); Dimensions used for calculations: d=2.7mm, penetration length l<sub>p</sub>=22mm; Characteristic value calculation was carried out according to EN 14358:2006

## Declaration of Performance

4.5mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )	4.5mm	F <sub>max</sub> (N) Load parallel to the grain	Withdrawal parameter f <sub>ax</sub> (N/mm <sup>2</sup> )
Sample no.			Sample no.		
1	1101	6.61	1	779	4.68
2	987	5.93	2	759	4.56
3	1112	6.68	3	780	4.68
4	967	5.81	4	738	4.43
5	948	5.69	5	725	4.36
Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		4.17	Characteristic withdrawal parameter f <sub>ax,k</sub> (N/mm <sup>2</sup> )		3.44

Remark: Density of used timber was 535kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation:  $f_{ax} = F_{max}/(d \times l_p)$ ; Dimensions used for calculations:  $d=4.5\text{mm}$ , penetration length  $l_p=37\text{mm}$ ; Characteristic value calculation was carried out according to EN 14358:2006

#### d. Characteristic head pull-through parameter

Test Method: EN1383:1999

Requirement: EN14592:2008+A1:2012 Clause 6.1.4.4.

Test Sample: 10pcs each type

2.0mm	Single measured values					
Characteristic	1	2	3	4	5	6
F <sub>max</sub> (N)	674	687	665	610	651	663
Head pull-through parameter f <sub>head</sub> (N/mm <sup>2</sup> )	25.70	26.19	25.38	23.25	24.84	25.28

2.0mm	Single measured values				Characteristic head pull-through parameter f <sub>head,k</sub> (N/mm <sup>2</sup> )
Characteristic	7	8	9	10	
F <sub>max</sub> (N)	623	644	716	694	22.73
Head pull-through parameter f <sub>head</sub> (N/mm <sup>2</sup> )	23.77	24.55	27.32	26.49	

Remark: Density of used timber was 430kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 20x20x8mm; Formula used for calculation:  $f_{head} = F_{max}/(d_h^2)$ ; Dimensions used for calculations:  $d_h=5.12\text{mm}$ ; Characteristic value calculation was carried out according to EN 14358:2006

## Declaration of Performance

2.65mm	Single measured values					
Characteristic	1	2	3	4	5	6
$F_{max}$ (N)	1031	816	976	1051	1233	1046
Head pull-through parameter $f_{head}$ (N/mm <sup>2</sup> )	28.00	22.16	26.48	28.54	33.45	28.40

2.65mm	Single measured values				Characteristic head pull-through parameter $f_{head,k}$ (N/mm <sup>2</sup> )
Characteristic	7	8	9	10	
$F_{max}$ (N)	1141	879	1005	851	<b>24.33</b>
Head pull-through parameter $f_{head}$ (N/mm <sup>2</sup> )	30.98	23.85	27.28	23.10	

Remark: Density of used timber was 430kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 55x30x11mm; Formula used for calculation:  $f_{head} = F_{max}/(d_h^2)$ ; Dimensions used for calculations:  $d_h=6.07$ mm; Characteristic value calculation was carried out according to EN 14358:2006

4.5mm	Single measured values					
Characteristic	1	2	3	4	5	6
$F_{max}$ (N)	1031	816	976	1051	1233	1046
Head pull-through parameter $f_{head}$ (N/mm <sup>2</sup> )	28.00	22.16	26.48	28.54	33.45	28.40

4.5mm	Single measured values				Characteristic head pull-through parameter $f_{head,k}$ (N/mm <sup>2</sup> )
Characteristic	7	8	9	10	
$F_{max}$ (N)	1141	879	1005	851	<b>24.33</b>
Head pull-through parameter $f_{head}$ (N/mm <sup>2</sup> )	30.98	23.85	27.28	23.10	

Remark: Density of used timber was 430kg/m<sup>3</sup>, timber was conditioned at the temperature of 25°C and humidity of 55%, dimensions: 65x32x22mm; Formula used for calculation:  $f_{head} = F_{max}/(d_h^2)$ ; Dimensions used for calculations:  $d_h=9.30$ mm; Characteristic value calculation was carried out according to EN 14358:2006

## Declaration of Performance

### e. Characteristic tensile capacity

Test Method: EN1383:1999

Requirement: EN14592:2008+A1:2012 Clause 6.1.4.5

Test Sample: 10pcs each type

2.0mm	Single measured values					
Characteristic	1	2	3	4	5	6
<b>F<sub>max</sub> (kN)</b>	2.588	2.701	2.737	2.505	2.608	2.578

2.0mm	Single measured values				Characteristic tensile capacity $f_{tens,k}$ (kN)
Characteristic	7	8	9	10	
<b>F<sub>max</sub> (kN)</b>	2.547	2.689	2.548	2.634	<b>2.35</b>

Remark: Nails were broken in the shank.

Characteristic value calculation was carried out according to EN 14358:2006

2.65mm	Single measured values					
Characteristic	1	2	3	4	5	6
<b>F<sub>max</sub> (kN)</b>	4.616	4.324	4.043	4.227	3.992	4.034

2.65mm	Single measured values				Characteristic tensile capacity $f_{tens,k}$ (kN)
Characteristic	7	8	9	10	
<b>F<sub>max</sub> (kN)</b>	4.171	4.292	4.037	3.938	<b>3.75</b>

Remark: Nails were broken in the shank.

Characteristic value calculation was carried out according to EN 14358:2006

4.5mm	Single measured values					
Characteristic	1	2	3	4	5	6
<b>F<sub>max</sub> (kN)</b>	9.632	9.021	10.421	10.715	10.827	10.484

4.5mm	Single measured values				Characteristic tensile capacity $f_{tens,k}$ (kN)
Characteristic	7	8	9	10	
<b>F<sub>max</sub> (kN)</b>	9.722	10.244	10.303	9.92	<b>9.11</b>

Remark: Nails were broken in the shank.

Characteristic value calculation was carried out according to EN 14358:2006

7. The performance of the mentioned products is in conformity with the declared performance given below.



Botany Business Park  
Macclesfield Road  
Whaley Bridge  
SK23 7DQ

## Declaration of Performance

This declaration of performance is issued under the sole responsibility of the manufacturer.

Signed for and on behalf of the manufacturer by:  
Anthony Armitt, Purchasing Manager of Forgefix Ltd.

Signature:

A handwritten signature in black ink, appearing to read "A Armitt".

Date:

02/08/2013