Botany Business Park
Macclesfield Road
Whaley Bridge
SK23 7DQ

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 Characteristic	Requirement (mm)	Measured Value				
		1	2	3	4	5
Length *(l)*	≥1.00mm	23.52	24.30	23.99	23.62	24.26
Nominal Diameter *(d)*	1.90 ~ 8.00mm	2.00	2.00	2.00	2.00	2.00
Head Cross sectional area *(A_h)*	≥10.00mm²	20.42	21.06	20.66	20.26	20.42
Thickness of head *(h_t)*	≥0.50mm	0.66	0.64	0.67	0.67	0.68
Length of point *(l_p)*	≥5.00mm	0.66	0.64	0.67	0.67	0.68

2.65mm/50mm Characteristic	Requirement (mm)	Measured Value				
		1	2	3	4	5
Length *(l)*	≥1.33mm	48.84	47.93	47.83	48.50	47.87
Nominal Diameter *(d)*	1.90 ~ 8.00mm	2.69	2.69	2.69	2.70	2.69
Head Cross sectional area *(A_h)*	≥17.56mm²	29.02	29.50	28.83	28.54	28.54
Thickness of head *(h_t)*	≥0.66mm	0.90	1.19	0.93	1.28	1.22
Length of point *(l_p)*	≥6.63mm	0.66	0.64	0.67	0.67	0.68

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4.50mm/100mm Characteristic	Requirement (mm)	Measured Value				
		1	2	3	4	5
Length *(l)*	≥2.25mm	98.43	98.98	98.60	98.89	98.90
Nominal Diameter *(d)*	1.90 ~ 8.00mm	4.51	4.52	4.51	4.51	4.51
Head Cross sectional area *(A_h)*	≥50.63mm²	68.63	67.02	67.75	68.33	67.89
Thickness of head *(h_t)*	≥1.13mm	1.74	1.78	1.86	1.76	1.77
Length of point *(l_p)*	≥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 M_y at 45° (Nmm)	99	97	99	98	100	95

2.65mm	Single Measured Values				Characteristic Yield Moment My,k (Nmm)
Characteristic	7	8	9	10	
Yield Moment M_y 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 M_y at 45° (Nmm)	6330	5590	5790	5810	6290	6180

2.65mm	Single Measured Values				Characteristic Yield Moment My,k (Nmm)
Characteristic	7	8	9	10	
Yield Moment M_y 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

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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 Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	269	8.41
2	216	6.74
3	289	8.97
4	303	9.46
5	289	9.05
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**6.09**

2.0mm Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	313	9.78
2	276	8.63
3	312	9.76
4	264	8.25
5	349	10.9
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**8.33**

Remark: Density of used timber was 535kg/m³, timber was conditioned at the temperature of 25°c and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation: fax = Fmax/(dxlp); Dimensions used for calculations: d=2mm, penetration length lp=16mm; Characteristic value calculation was carried out according to EN 14358:2006

2.65mm Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	469	7.89
2	421	7.08
3	484	8.14
4	587	9.88
5	617	10.38
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**5.79**

2.65mm Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	473	7.97
2	370	6.23
3	407	6.84
4	384	6.47
5	473	7.97
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**5.31**

Remark: Density of used timber was 535kg/m³, timber was conditioned at the temperature of 25°c and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation: fax = Fmax/(dxlp); Dimensions used for calculations: d=2.7mm, penetration length lp=22mm; Characteristic value calculation was carried out according to EN 14358:2006

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4.5mm Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	1101	6.61
2	987	5.93
3	1112	6.68
4	967	5.81
5	948	5.69
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**4.17**

4.5mm Sample no.	F_{max} (N) Load parallel to the grain	Withrawal parameter f_{ax} (N/mm²)
1	779	4.68
2	759	4.56
3	780	4.68
4	738	4.43
5	725	4.36
Characteristic withdrawal parameter $f_{ax,k}$ (N/mm²)		**3.44**

Remark: Density of used timber was 535kg/m³, timber was conditioned at the temperature of 25°c and humidity of 55%, dimensions: 65x40x35mm; Formula used for calculation: fax = Fmax/(dxlp); Dimensions used for calculations: d=4.5mm, penetration length lp=37mm; 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_{max} (N)	674	687	665	610	651	663
Head pull-through parameter f_{head} (N/mm²	25.70	26.19	25.38	23.25	24.84	25.28

2.0mm	Single measured values				Characteristic head pull-through parameter $f_{head,k}$ (N/mm²)
Characteristic	**7**	**8**	**9**	**10**	
F_{max} (N)	623	644	716	694	
Head pull-through parameter f_{head} (N/mm²	23.77	24.55	27.32	26.49	**22.73**

Remark: Density of used timber was 430kg/m³, 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=5.12mm; Characteristic value calculation was carried out according to EN 14358:2006

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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/mm²	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/mm²)
Characteristic	**7**	**8**	**9**	**10**	
F_{max} (N)	1141	879	1005	851	
Head pull-through parameter f_{head} (N/mm²	30.98	23.85	27.28	23.10	**24.33**

Remark: Density of used timber was 430kg/m³, 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=6.07mm; 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/mm²	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/mm²)
Characteristic	**7**	**8**	**9**	**10**	
F_{max} (N)	1141	879	1005	851	
Head pull-through parameter f_{head} (N/mm²	30.98	23.85	27.28	23.10	**24.33**

Remark: Density of used timber was 430kg/m³, 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=9.30mm; Characteristic value calculation was carried out according to EN 14358:2006

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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**
F_{max} (kN)	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**	
Fmax (kN)	2.547	2.689	2.548	2.634	**2.35**

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**
Fmax (kN)	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**	
Fmax (kN)	4.171	4.292	4.037	3.938	**3.75**

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**
Fmax (kN)	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**	
Fmax (kN)	9.722	10.244	10.303	9.92	**9.11**

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.

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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 Armitt Date: 02/08/2013