



Test report: Bending strength NaturinForm Piazza Pro®

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1 Assignment

On April 9, 2026 NaturinForm commissioned SHR to perform several bending tests on Piazza Pro® decking boards.

According to the principal, the Piazza Pro® is produced using an extrusion method and is made with wood fibres and plastics. The material used for the Piazza Pro® is based on plastics and fibres released at the production of adhesive labels, this extruded part has no cavities.

The boards will be used on balconies, placed on supports with a maximum spacing between the support points of 350 mm.

2 Execution of the test

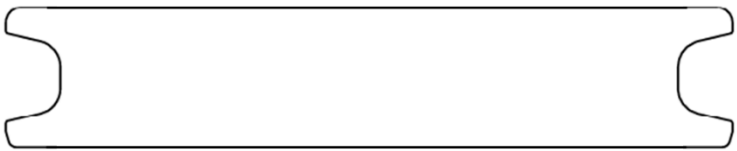
2.1 Identification and description of the samples

For the test, the samples mentioned in table 1, were delivered at SHR on February 24, 2026. The production and selection of the test pieces is carried out by the principal. Cross sections of the samples are given in table 2.

Table 1. Delivered samples.

Amount	Code	Description
10	25.0522-AP 1 to 10	four-point-bending test (L=350 mm) according to EN 408, single profile (b=140 mm), Piazza Pro®
10	25.0522-BP 1 to 10	bending test (L=350 mm) with concentrated load (0.1 x 0.1 m), at midspan on a single profile (b=140 mm). Piazza Pro®

Table 2. Cross section sample.

Piazza Pro®		
Breite:	138,6 mm	
Dicke:	25,5 mm	

2.2 Method

The samples have been tested in a four-point bending configuration according to the principles of EN 408 and using a three-point bending test according to the principles of EN 310. The centre-to-centre distance of the supports is set on 350 mm. The samples have been loaded until failure at a rate of 300 ± 120 seconds per test. The two different loading conditions are given in figure 1 and 2.

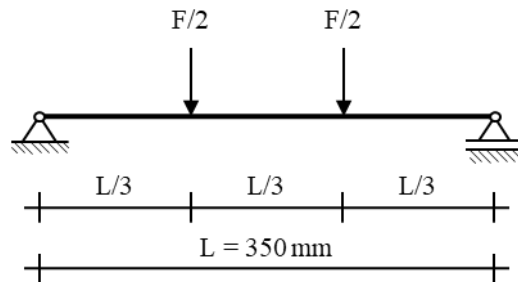
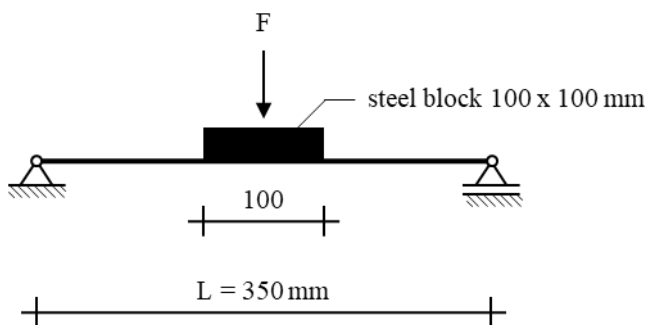


Figure 1. Four-point-bending tests according to the principles of EN 408 (AP).

The four-point-bending test is added to determine the strength of the boards. This property is used to check the uniformly distributed load.



Serie BP:

- load on a single profile

Figure 2. Bending strength with a concentrated load (BP).

The concentrated load is based on loads given in the Dutch National Annex of Eurocode 1, see Appendix 1.

Characteristic values

The characteristic values (5-percentile values) have been determined in accordance with EN 1990:

$$X_k = m_x - k_n \cdot s_x$$

Where:

X_k - characteristic value of stochastic variable m

m_x - sample mean value of n test values: $m_x = \frac{1}{n} \sum_{i=1}^n m_i$

k_n - factor used to calculate characteristic properties, see table 3

s_x - standard deviation:

$$s_x = \sqrt{\frac{\sum (x_i - m_x)^2}{n - 1}}$$

n - number of test values

Table 3. Values of k_n for the 5% characteristic value.

n	3	4	5	6	8	10	15	20	25	30	40	∞
k_n	3.37	2.63	2.33	2.18	2.00	1.92	1.85	1.76	1.75	1.73	1.72	1.64

See also annex D (normative) of EN 1990+A1+A1/C2:2011.

Design value

The design value is determined according to EN 1995-1-1:

$$F_d = \frac{F_k}{\gamma_m} \cdot k_{\text{mod}}$$

Where:

- F_d - design value of a property
- F_k - characteristic value of a property
- k_{mod} - modification factor (depends on climate class, load duration and material)
- γ_m - partial factor for material properties

2.3 Apparatus

Universal test machine Testometric CT 150 kN (calibrated)

SHR/581

Digital caliper Mitutoyo (calibrated)

SHR/434

2.4 Period of the test

The tests were executed on March 25 and April 1, 2026.

3 Results of the test

3.1 Execution of the laboratory test



Picture during testing of 25.0522-AP



Picture during testing of 25.0522-BP

3.2 Test results

The individual test results are given in Appendix 3 for series AP and in Appendix 4 for series BP.

The results have been checked in accordance with the floor loads given in the Dutch National Annex of the Eurocode. An overview is given in table 4.

Table 4. Overview results.

Profile	Load	Safety class	Result
Piazza Pro®	uniformly distributed load ($q_k = 2.5 \text{ kN/m}^2$)	CC1 (dwellings)	passed
Piazza Pro®	uniformly distributed load ($q_k = 2.5 \text{ kN/m}^2$)	CC2 (offices)	passed
Piazza Pro® single profile	concentrated load on $0.5 \times 0.5 \text{ m}$ ($F_k = 3.0 \text{ kN}$)	CC1 (dwellings)	passed
Piazza Pro® single profile	concentrated load on $0.1 \times 0.1 \text{ m}$ ($F_k = 3.0 \text{ kN}$)	CC2 (offices)	passed

The measurement uncertainty of the test results is available on request. Decision rule: When assessing the results, the measurement uncertainty was not taken into account.

4 Discussion

The loading conditions for deckings depends on the situation: balconies at dwellings or balconies at offices. In the first case the concentrated load is distributed over an area of $0.5 \times 0.5 \text{ m}$. In the last case the concentrated load is distributed over an area of $0.1 \times 0.1 \text{ m}$. A summary of the part of the Dutch National Annex is given in Appendix 1 concerning the loading conditions (in Dutch). An overview is given in table 5.

Table 5. Loading conditions on balconies.

	Uniformly distributed load q_k [kN/m ²]	Concentrated load F_k [kN]	Surface of the concentrated load [m x m]
Balconies at dwellings (non-common use)	2.5	3.0	$0.5 \times 0.5 \text{ m}$
Balconies at offices	2.5	3.0	$0.1 \times 0.1 \text{ m}$

5 Conclusion

Commissioned by NaturinForm the Piazza Pro® decking is tested to be used in balconies. The application area of the boards depend on the loading conditions: offices or dwellings.

An overview of the test results is given in table 4 in section 3.2.

Literature

EN 408:2010+A1:2012 Timber structures - Structural timber and glued laminated timber -
Determination of some physical and mechanical properties.

NEN-EN 1990:2002+A1+A1/C2:2011 Eurocode: Basis of structural design.

NEN-EN 1990:2002+A1+A1/C2:2011/NB:2019 National Annex to NEN-EN 1990+A1+A1/C2:
Eurocode: Basis of structural design.

NEN-EN 1991-1-1:2002+C1+C11:2019 Eurocode 1: Actions on structures - Part 1-1: General actions -
Densities, self-weight, imposed loads for buildings.

NEN-EN 1991-1-1+C1+C11/NA:2019 National Annex to Eurocode 1: Actions on structures - Part 1-1:
General actions - Densities, self-weight, imposed loads for buildings.

NEN-EN 1995-1-1:2005+C1:2006+A1/A2:2014 Design of timber structures – Part 1-1: General –
Common rules and rules for buildings.

NEN-EN 1995-1-1:2005+C1+A1/NB:2013 National Annex to NEN-EN 1995-1-1+C1+A1 Eurocode 5:
Design of timber structures - Part 1-1: General - Common rules and rules for buildings
(includes NEN-EN 1995-1-1+C1+A1/C1:2012).

Appendix 1 Floor load according to Dutch National Annex of Eurocode 1

Summary

	Uniformly distributed load q_k [kN/m ²]	Concentrated load F_k [kN]	Surface of the concentrated load [m x m]
Balconies at dwellings (non-common use)	2.5	3.0	0.5 x 0.5 m
Balconies at offices	2.5	3.0	0.1 x 0.1 m

Tabel NB.1 - 6.2 — Gebruiksbelastingen op vloeren, balkons, trappen en bordessen van gebouwen

Klasse van belast oppervlak	q_k kN/m ²	Q_k^b kN
Klasse A (wonen en huishoudelijk gebruik)		
A-gemeenschappelijke vloeren, trappen en balkons	3,0	3
A-niet-gemeenschappelijke vloeren	1,75	3 ^c
A-niet-gemeenschappelijke trappen	2,0	3 ^c
A-niet-gemeenschappelijke balkons	2,5	3 ^c
Klasse B (kantoorruimten)		
B-kantoorruimten	2,5	3
B-omsloten afzonderlijke verkeersruimte	3	3

Klasse van belast oppervlak	q_k kN/m ²	Q_k^b kN
Klasse C (bijeenkomstruimten)		
C-omsloten afzonderlijke verkeersruimte, niet horend bij C5	5	3
C1-tafels	4,0 ^a	3
C2-vaste zitplaatsen	4,0 ^{a c}	7 ^a
C3-zonder obstakels voor rondlopende mensen	5,0	7
C4-fysieke activiteiten	5,0	7
C5-grote mensenmassa's	5,0 ^d	7
Klasse D (winkelruimten)		
D-omsloten verkeersruimten	4,0	7
D1-kleinhandel	4,0	7
D2-warenhuizen	4,0	7
^a Voor ruimten met uitsluitend een onderwijsfunctie waar les wordt gegeven, volstaat een vloerbelasting q_k van 2,5 kN/m ² en Q_k van 3 kN. ^b Tenzij anders vermeld, zijn de afmetingen van de puntlast gelijk aan 0,1 m × 0,1 m. ^c Afmetingen puntlast gelijk aan 0,5 m × 0,5 m. ^d Bij tribunes moet bovendien rekening zijn gehouden met een gelijkmatig verdeelde opwaartse gebruiksbelasting gelijk aan 50 % van de neerwaarts gerichte gebruiksbelasting. Deze belasting brengt het dynamisch effect in rekening dat kan optreden als gevolg van de bewegende massa van mensen (opspringen). De neerwaartse en opwaartse gebruiksbelastingen moeten afzonderlijk als extreme veranderlijke belasting worden beschouwd. Tevens moet bij de neerwaartse gebruiksbelasting op tribunes gelijktijdig rekening zijn gehouden met een veranderlijke gelijkmatig verdeelde horizontale belasting die kan optreden als gevolg van de bewegende mensenmassa. Deze horizontale belasting bedraagt 10 % van de verticale belasting en moet wat betreft de richting zijn beschouwd als een vrije belasting. Door het in rekening brengen van de opwaartse en gelijkmatige verdeelde horizontale belasting als statische belasting wordt voorkomen dat voor tribunes dynamische berekeningen moeten worden gemaakt om het effect van een bewegende mensenmassa te bepalen op de sterkte van de tribune.		

Appendix 2 Product info NaturinForm Piazza Pro®

Piazza Pro

With its compelling robust 360 degree coating and its 25 mm thick full profile, the *Piazza Pro* is the strongest decking board of the Piazza family. Its surface texture is resistant to UV radiation so that its colour remains stable also in the long run. The innovative advanced coating offers enhanced resistance to moisture, stains and scratches – for lasting beautiful surfaces with very low maintenance efforts. The *Piazza Pro* is the perfect decking board for exceptionally high loads in public and heavily frequented areas such as recreational facilities. Its superior strength properties enable the board to be installed with up to 50 cm spacing between the substructure joists.

NaturinForm products have a natural look due to their high wood content of 70 %. They are easy to maintain, splinter-free, weather-resistant and durable. Our material is produced in Europe and is recyclable multiple times.

Format



B: ca. 140 mm
H: ca. 25 mm

Category

co-extruded massive deck,
multicoloured,
can be laid on one side

Surface

embossed wood look

Standard lengths

ca. 4 m / ca. 5 m / ca. 6 m

Weight

ca. 3.90 kg / m

Loadability

ca. 450 kg / dm²

Country of manufacture

Latvia



Care and cleaning

Our products are particularly easy to care for and weatherproof. Compared to conventional timber profiles, they do not need to be oiled or painted and still do not splinter or crack. Cleaning is very easy with water or, in the case of heavy dirt, with our biodegradable special cleaner.

Laying instruction

For 1 m² Piazza Pro you require
ca. 7 decks à 1 m, depending on local conditions ca. 2.5–3 m base profile and
ca. 16 stainless steel brackets with screws.
More details in our laying instructions.

Sustainable material

The core of our co-extruded products consists of 70 % PEFC-certified wood fibres and 30 % pure polymer (PE) with food approval. In production, we use residual fibres from the wood industry and use them to manufacture innovative, durable and recyclable quality products for outdoor use.

Environmentally friendly colours

Colours are achieved with mineral based pigments. These produce an even and durable, as well as natural colour image and are neither harmful to health nor to the environment.

Certificates

Our products are subject to constant quality controls and stress tests.

100% PEFC-certified

PEFC/04-31-2196

Safety of Toys

corresponds to EN 71-3:2019

Durability

Class 1, resistency inspection
against wood-destroying fungi

Evaluation fire behaviour

Class E, very comparable to wood

Evaluation non-slippery

R10

Product features

Standard colours

- 1 Ivory
- 2 Californian Oak
- 3 Royal Elm
- 5 Silver Teak
- 6 Ebony

Maturation process

- a Freshly produced
- b After a few days
- c Fully weathered



Thanks to the all-round protective polymer layer and the associated UV resistance, there is no temporary colour development in our Piazza Pro patio deck.

Straightness deviation	± 1.00 mm / lfm horizontal ± 1.00 mm / lfm vertical	EN 15534-1
Arch	± 1.50 mm / total width / side	EN 15534-1
Density	1.20 g / cm³	ISO 1183
Bending resistance	≤ 2.00 mm with span 400 mm	DIN E 310
Breaking resistance	≥ 3300 N with span 400 mm	DIN E 310
Moisture resistance (boil test)	≤ 0.35 % length variation ≤ 0.50 % width variation ≤ 2.50 % thickness variation ≤ 1.80 % weight variation	EN 15534-1 EN 15534-4
Water retention after storage in water for 28 days	≤ 0.30 % length variation ≤ 0.40 % width variation ≤ 2.00 % thickness variation ≤ 3.00 % weight variation	EN 15534-1 EN 15534-4
Thermic expansion coefficient	–	ISO 11359-2 / DIN 53752
Ignition temperature	420 °C	DIN 51795

Appendix 3 Individual test results: uniformly distributed load

Series:	AP		
Description:	four-point-bending test EN 408		
span	350	mm	
width	140	mm	
profile	Naturinform Piazza Pro®		
Date tests:	1 st April 2026		
Test nr.	F _{max} [N]	F _{max} [kN]	M _{max} [kNm]
1	11 112	11.11	0.648
2	11 301	11.30	0.659
3	10 644	10.64	0.621
4	10 952	10.95	0.639
5	11 273	11.27	0.658
6	11 161	11.16	0.651
7	11 332	11.33	0.661
8	11 174	11.17	0.652
9	10 917	10.92	0.637
10	11 111	11.11	0.648
Min		10.64	0.62
Mean		11.10	0.65
Max		11.33	0.66
St.Dev		0.21	0.01
VC (%)		1.89	1.89
Characteristic values according to NEN-EN 1990 annex D			
n			10
k _n			1.92
M_{Rk}	[kNm]		0.62
Design value according to NEN-EN 1995-1-1			
γ _m			1.30
k _{mod}	(SC:3, medium-term)		0.65
M_{Rd}	[kNm]		0.31



Check: uniformly distributed load		dwelling
q_k	kN/m^2	2.50
q_k	kN/m^1	0.35
γ_q	CC1	1.35
q_d	kN/m^1	0.47
M_{Ed}	$[\text{kNm}]$	0.01

UC	0.02	$\leq$	1.00	OK
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Check: uniformly distributed load		offices
q_k	kN/m^2	2.50
q_k	kN/m^1	0.35
γ_q	CC2	1.50
q_d	kN/m^1	0.53
M_{Ed}	$[\text{kNm}]$	0.01

UC	0.03	$\leq$	1.00	OK
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Appendix 4 Individual test results: Concentrated load: on a single profile

Series:	BP		
Description:	concentrated load: 0.1 x 0.1 m		
span	350	mm	
width	140	mm	
profile	Naturinform Piazza Pro®		
number	single		
Date tests:	25 th March 2026		
Test nr.	F _{max} [N]	F _{max} [kN]	Time [s]
1	10 592	10.59	286
2	10 724	10.72	296
3	10 175	10.18	269
4	9 991	9.99	276
5	10 372	10.37	274
6	9 821	9.82	273
7	10 489	10.49	283
8	10 471	10.47	259
9	9 710	9.71	243
10	10 073	10.07	252
Min		9.71	
Mean		10.24	
Max		10.72	
St.Dev		0.34	
VC (%)		3.32	
Characteristic values according to NEN-EN 1990 annex D			
n		10	
k _n		1.92	
F _{Rk}	[kN]	9.59	
Design value according to NEN-EN 1995-1-1			
γ _m		1.30	
k _{mod}	(SC:3, medium-term)	0.65	
F _{Rd}	[kN]	4.79	



Check: concentrated load on 0.1 x 0.1 m		offices
F_k	kN	3.00
γ_q	CC2	1.50
F_{Ed}	[kN]	4.50

UC	0.94	$\leq$	1.00	OK
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Check: concentrated load on 0.5 x 0.5 m		dwellings
F_k	kN	3.0
q_k	kN/m ²	12.0
q_k	kN/m ¹	1.7
γ_q	CC1	1.35
q_d	kN/m ¹	2.27
M_{Ed}	[kNm]	0.03
M_{Rd}	[kNm]	0.31

UC	0.11	$\leq$	1.00	OK
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