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Test Report No. 2623088

Client: Dasso Group, Zhejiang Daocheng Industry Co., Ltd.
No. 458, Linbei Road, Linpu Town, Xiaoshan District
Hangzhou, China 311251

Order: Determination of bending strength, modulus of elasticity in bending
and density on bamboo scrimber decking

Contractor: Entwicklungs- und Prueflabor Holztechnologie GmbH
Laboratory unit Material and Product Testing (WPP)
Zellescher Weg 24
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Engineer in charge: Dipl.-Ing. Jens Gecks



Dipl.-Ing. J. Gecks
Head of Laboratory Material and Product Testing

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1 Terms of Reference

The Entwicklungs- und Prueflabor Holztechnologie GmbH (EPH) was ordered by Dasso Group, Zhejiang Daocheng Bamboo Industry Co., Ltd. Company to carry out the tests for determination of following properties on bamboo scrimber decking:

- Determination of bending strength and modulus of elasticity (MOE) in bending in accordance with EN 408:2010+A1:2012 (four-point-bending test)
- Determination of density in accordance with DIN EN 323:1993 (on bending test pieces)

Based on the test results of bending strength and modulus of elasticity in bending, the characteristic values were calculated according to EN 14358:2016.

2 Test Material

The test material was sent to the laboratory by the Client and received on 8 June 2023. The following test pieces of bamboo scrimber decking were delivered, cut by the Client:

Sample 1: dassoCTECH, colour: brown

40 pcs, dimension: 550 mm x 137 mm x 18,2 mm

Sample 2: dassoXTR, colour: black

40 pcs, dimension: 550 mm x 137 mm x 18,2 mm

After receipt in the test lab, the specimens were stored at normal conditions of 20 °C and 65 % relative humidity. For the test, the test lab sampled 30 test pieces of each product, randomly.

3 Realisation of Tests

Bending strength, MOE in bending

The 4-point bending test (flatwise bending) was performed in accordance with EN 408 at a universal strength testing machine Tiratest 28100 on 30 test pieces of each sample. The distance between the supports was 450 mm. The distance between the upper load application points was 150 mm. The test was performed on 29 and 30 June 2023.

Density

After storage of the test pieces under normal conditions at a temperature of 20 °C and a relative humidity of 65 %, the dimensions and the mass were measured. The density of the test pieces was calculated in accordance with EN 323. The test was performed on 29 and 30 June 2023.

4 Test results

The results are summarized at Tables 1 and 2.

Table 1: Bending strength, MOE, density; **Sample 1** (dassoCTECH)

Test piece No.	Density in kg/m ³	Bending strength in N/mm ²	MOE in N/mm ²
1-1	1315	133,3	16624
1-2	1257	127,2	15932
1-3	1276	139,6	16581
1-4	1260	126,4	14635
1-5	1240	116,0	14705
1-6	1258	127,3	16210
1-7	1277	138,4	15746
1-8	1278	118,8	14567
1-9	1263	132,3	14818
1-10	1277	132,0	16000
1-11	1264	135,2	16050
1-12	1321	135,9	16292
1-13	1241	101,8	11452
1-14	1227	127,6	15212
1-15	1239	131,3	15106
1-16	1209	111,7	14858
1-17	1238	132,1	16857
1-18	1222	115,6	13985
1-19	1224	119,3	12765
1-20	1236	122,9	12804
1-21	1230	121,9	14504
1-22	1228	112,5	12768
1-23	1221	123,9	14513
1-24	1220	130,4	15532
1-25	1252	125,3	13905
1-26	1240	124,9	14157
1-27	1240	125,1	14241
1-28	1261	124,7	13462
1-29	1285	136,0	19166
1-30	1303	143,6	15892
Mean value (n=30)	1253	126,4	14978
Standard deviation	29	9,2	1531
<i>Coefficient of variation</i>	2 %	7 %	10 %
5% percentile	1140*	110	12300
50% percentile	-	-	14800

* Note: The logarithmic standard deviation is less than 5 %; therefore the 5% percentile was calculated with a standard deviation of 5 %.

Table 2: Bending strength, MOE, density; **Sample 2** (dassoXTR)

Test piece No.	Density in kg/m ³	Bending strength in N/mm ²	MOE in N/mm ²
2-1	1206	102,7	19236
2-2	1236	117,5	21722
2-3	1197	94,8	20965
2-4	1215	118,7	21120
2-5	1215	101,8	18741
2-6	1205	109,6	20532
2-7	1189	94,4	20507
2-8	1243	104,0	19832
2-9	1213	99,0	20465
2-10	1209	107,2	21365
2-11	1208	93,1	19937
2-12	1222	83,1	18151
2-13	1203	99,6	20251
2-14	1236	104,2	21058
2-15	1217	97,2	20503
2-16	1212	95,0	19757
2-17	1203	90,9	21203
2-18	1216	102,4	19306
2-19	1216	103,5	20748
2-20	1214	101,3	19724
2-21	1183	90,3	21319
2-22	1204	97,8	20236
2-23	1225	120,6	22336
2-24	1219	107,5	21084
2-25	1203	93,9	18887
2-26	1229	104,6	19512
2-27	1196	100,8	18417
2-28	1213	95,5	20480
2-29	1250	111,1	20167
2-30	1220	103,6	21194
Mean value (n=30)	1214	101,5	20292
Standard deviation	15	8,5	1000
<i>Coefficient of variation</i>	1 %	8 %	5 %
5% percentile	1110*	87	18400*
50% percentile	-	-	20100

* Note: The logarithmic standard deviation is less than 5 %; therefore the 5% percentile was calculated with a standard deviation of 5 %.

5 Evaluation

Test results are summarized at Table 3.

Table 3: Test results

Sample	Bending strength (mean) in N/mm ²	Bending strength (5 % percentile) in N/mm ²	MOE (mean) in N/mm ²	MOE (50 % percentile) in N/mm ²	MOE (5 % percentile) in N/mm ²	Density (mean) in kg/m ³	Density (5 % percentile) in kg/m ³
1 dassoCTECH	126,4	110	14978	14800	12300	1253	1140
2 dassoXTR	101,5	87	20292	20100	18400	1214	1110

The percentile values are calculated from 30 measurements each, based on sections 3.2 (strength, MOE (5%) and density) and 3.3 (MOE 50 %) of the standard.



Dipl.-Ing. J. Gecks
engineer in charge