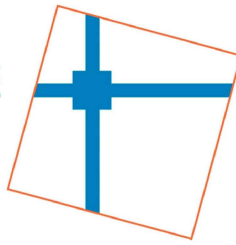


REPORT 3244-01:

MAGOXX[®] - BOARD, DENSITY, MOR AND MOE

Project number: 3224
Author: drs. H. Schinkel
Date: August 24, 2020

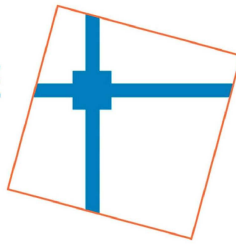
Number of pages: 6



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1. PROJECT DATA

Commissioner : SINH Building Solutions B.V.

Address : Saturnusstraat 60, unit 67
NL - 2216 AH Den Haag

Contact person : Mr. J. Engels

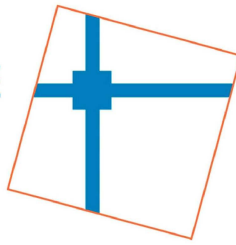
Project : Determination of density, MOR and MOE of MAGOXX®-Board

Project number : 3244

Project manager : drs. H. Schinkel

Date of examination: June - August 2020

Date of report : August 24, 2020



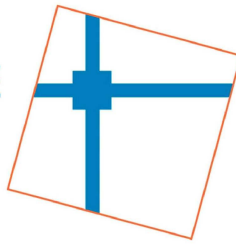
2. INTRODUCTION

BouwTechnologie RDA was commissioned by SINH Building Solutions BV to test Magoxx[®]-board as commercialized by SINH Building Solutions at Den Haag (NL). The mechanical properties shall be determined in accordance with EN 12467:2012+A1:2016 on five specimens, cut with it longest size parallel to the longest dimension of the board and five specimens, perpendicular to the longest dimension of the board.

The 29th of May 2020 SINH Building Solutions B.V. supplied five boards with a thickness of 9 mm. The width of all boards was 1200 mm and the length of the boards was 3000 mm. The boards were marked on their surface:

MAGOXX-CE-ETA 15/0634 NLY01-9mm-09/03/20

BouwTechnologie cut the test pieces for the different tests in accordance with EN 326 and EN 12467, dimensions 300 x 400 mm.



3. DESCRIPTION

According to the cutting plan the samples were sawn by BouwTechnologie RDA. The samples were coded as follows:

Sheet number (1 through 5)

Direction of cutting (P = parallel, L = perpendicular)

Parallel: the longest edge of the sample (400 mm) is parallel to the longest dimension of the sheet. Thus L means that the 400 mm side has been cut perpendicular to the longest dimension of the sheet.

1 or 2 (stands for respectively dry and wet)

The load equipment for the test methods A, B en D is Zwick 1484, latest calibration on July 23, 2020 with report numbers 119840 and 119839.

3.1 Modulus of rupture

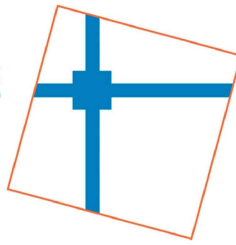
The test of the flexural strength in accordance to EAD-350142-00-1106 clause 2.2.2.9 is based on EN 12467, clause 7.3.2

From each board four samples were cut for this test with the dimension about 300 mm x 400 mm. Two samples have their longest side in the direction of the length and the other two in the direction of the width. After cutting the samples were weighed and measured, then conditioned in ambient laboratory conditions ($23 \pm 5^{\circ}\text{C}$ / $50 \pm 20\%$ RH) during over 14 days. Then they were weighed a second time.

The samples for the wet test were immersed in water for 48 hours. Prior to test they were liberated from excess water, weighed again and subsequently tested.

4. RESULTS

The individual test results of the different tests are given in the tables in the following paragraphs. The average values are the arithmetic means by calculation.



4.1 Modulus Of Rupture

table 1. Test results and determination of the modulus of rupture of the 9 mm boards

sample	load [N]	deformation [mm]	density [kg/m ³]		MOR [N/mm ²]	
			23°C 65%	during test		Average
1P1	636	9,30	1080	1080	12,90	12,54
2P1	618	7,43	1096	1096	12,47	
3P1	596	9,11	1105	1105	12,51	
4P1	600	8,67	1062	1062	11,99	
5P1	678	10,63	1027	1027	12,83	
10,69						
1L1	526	8,31	1080	1080	10,41	8,85
2L1	478	4,18	1111	1111	9,23	
2L1	378	3,96	1106	1106	7,83	
3L1	418	3,71	1091	1091	8,25	
4L1	428	4,88	1060	1060	8,51	
11,23						
1P2	608	14,89	1071	1259	12,09	11,94
2P2	630	13,99	1097	1296	12,07	
3P2	576	16,66	1097	1284	12,22	
4P2	608	15,31	1068	1255	12,31	
5P2	568	13,68	1027	1222	11,03	
11,23						
1L2	560	14,82	1087	1270	11,29	10,51
2L2	564	13,53	1113	1303	10,87	
2L2	500	14,70	1100	1287	10,23	
3L2	534	14,11	1097	1282	10,50	
4L2	506	11,61	1037	1225	9,69	

The average density of MAGOXX-board 9 mm is 1081 kg/m³ (-55 kg/m³; +31 kg/m³ at the climate of 23°C and 65% relative humidity.

Upon immersion under water the sheets take up 17,6 % by weight of moisture.

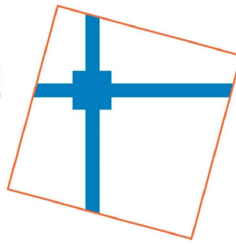
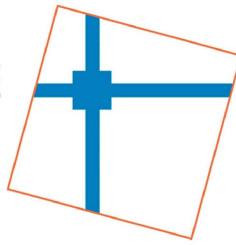


table 2. Test results and determination of the modulus of elasticity in flexure of the 9 mm boards

sample	MOE	sample	MOE	sample	MOE	Sample	MOE
1P1	6880	1L1	5803	1P2	4864	1L2	6141
2P1	6322	2L1	6421	2P2	6038	2L2	6081
3P1	6157	2L1	6836	3P2	4862	2L2	5974
4P1	5997	3L1	6875	4P2	5590	3L2	5790
5P1	6886	4L1	7759	5P2	5914	4L2	4381
Mean value 9 mm dry:		6594		Mean value 9 mm wet:		5564	

The flexural strength of the wet boards is not significantly different from the dry boards. The strength loss is less than 10 %.

There is a difference in strength between the samples tested in the direction of the length or the width of the board. The samples loaded perpendicular to the length direction are significantly stronger.



5. **SUMMARY**

The following table gives the average values of the mechanical tests and their characteristic values which are calculated as the lower 5%-quantile of a panel property

Table 3. Overview of the results of 9 mm board

	Average		Characteristic	
	9P	9L	9P	9L
Thickness [mm]	9,0 – 9,8			
Density [kg/m ³] at 20°C and 65% rel. humidity	1081 kg/m ³ (± 27 kg/m ³)			
Flexural strength [N/mm²] dry / wet				
Modulus of rupture	12,54 / 11,94	8,85 / 10,51	11,77 / 10,84	6,69 / 9,21
	10,69 / 11,23		8,89 / 9,54	
Modulus of elasticity	6449 / 5454	6739 / 5674		
	5546 / 4412			

