

Test report

-Translation-

Document No.: (1103/530/21 - A) – Hir of August, 26, 2022

Customer: Knauf Ltd. & Partner
EW2 Ataqa Industrial Zone
Plot No. 258:268 & 290:302
Suez
EGYPT

Order Date: Aug. 01, 2021

Order Ref.: Purchase Order Number 4502505045-L95

Order received: Nov. 11, 2021

Subject: Initial type testing of gypsum plasterboards acc. to EN 520

Test basis: DIN EN 520:2009

Samples received: March 22, 2022

Sampling: By the client

Sample identification: **Gypsum plasterboard type 12.5 GKB, Type A**

Test date: April 18 – August 23, 2022

This Test report covers 5 pages, incl. cover sheet, and 2 annexes.

This document is the translated version of Prüfbericht 1103/530/21-A dated 2022/08/26. The legally binding text is the aforementioned German Prüfbericht (Test Report).



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1 Background

With the letter of Aug. 01, 2021, Knauf Ltd. & Partner, Egypt, commissioned MPA Braunschweig to perform tests for determination of the material properties of the gypsum plasterboards according to EN 520.

This test report describes and analyses the performed tests.

Mean values established on the basis of the test results are listed in the summary of the test report.

2 Test material

The client himself had removed the board material to be tested from his production lot. The board material was marked on its rear side. The material arrived at the MPA Braunschweig test laboratory on March 22, 2022 and was then stored in the laboratory so that it was protected against atmospheric influence.

Members of the MPA Braunschweig staff removed specimens of the required dimensions from the board material for the different tests and stored these specimens in conditioned atmospheres until their mass remained constant.

The board material of **type 12.5 GKB, Type A** is a gypsum plasterboard, 12.5 mm thick, which is made from gypsum and cartoon.

3 Board material testing; preparation; testing proper; evaluation

3.1 Board marking

On their rear sides, the gypsum plasterboards were marked with the following black inscription:

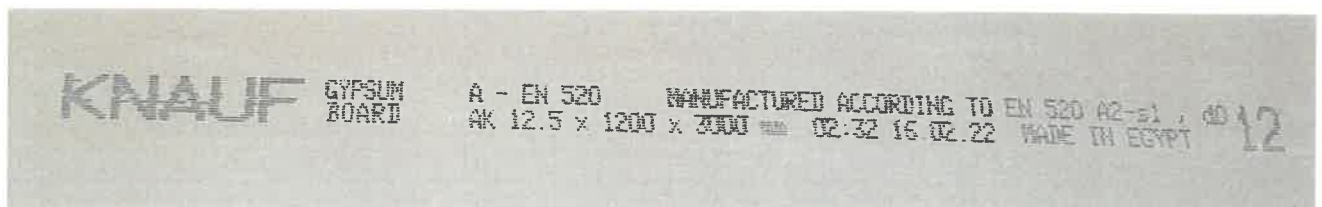


Fig. 1 Rear face marking on the boards, **type 12.5 GKB, Type A**.



Fig. 2 Lateral marking (Detail) on the boards, **type 12.5 GKB, Type A**.

3.2 Testing dimensions and edge profiles according to DIN EN 520

Dimensions

The gypsum plasterboards have the nominal dimensions 1,200 mm wide, 3,000 mm long and 12.5 mm thick. The accepted tolerances are 0 to -4 mm for the width; 0 to -5 mm for the length; and ± 0.5 mm for the thickness.

Dimensional testing produced the following mean values, see annex 3:

- Width: 1,197 mm
- Length: 2,997 mm
- Thickness: 12.3 mm

All dimensions are thus within the accepted tolerances.

Squareness

The requirements for squareness are complied with. The accepted tolerance for this board is 3.0 mm. Actual deviations were for the plasterboard 0.3 mm on an average (see annex 3).

Taper profile

When measuring tapered edges, each reading must remain within the following limits:

- Taper depth: between 0.6 mm and 2.5 mm
- Taper width: between 40 mm and 80 mm

These conditions are complied with (taper depth: 42 mm to 45 mm, taper width: 1.28 mm to 1.66 mm). For details, see annex.

3.3 Testing for bending strength according to DIN EN 520

For determining the bending strength, the MPA Braunschweig staff prepared the specimens so that the specifications in DIN EN 520 were complied with, and the specimens were then stored in a drying

cabinet at 40 °C until their mass remained constant. A hydraulic bending test machine with a maximum load of 20 kN was used for testing the bending strength. The specimens were placed on the parallel supports (spaced 350 mm) of the test machine so that the specimens, which had been cut along the longitudinal axis of the board, came to rest on the supports with their faces pointing downwards, while the faces of the specimens cut across the longitudinal axis pointed upwards. The test load was applied at a rate of 250 N/min in the middle between, and in parallel with the supports. The deformation in the middle of the specimens was recorded with a displacement sensor.

The mean values of the collapse loads are:

Longitudinal direction (L) = 561 N (Minimal requirement 550 N, all 3 samples fulfilled)

Transverse direction (T) = 227 N (Minimal requirement 210 N, all 3 samples fulfilled)

The mean values of the deflection are:

Longitudinal direction (L) = 12.3 mm

Transverse direction (T) = 10.1 mm

4 Summary

The Materials Testing Institute MPA Braunschweig was commissioned by Knauf Ltd. & Partner, Egypt, to perform tests for determination of the material properties of their **type 12.5 GKB, Type A** gypsum plasterboard material.

The mean values of the material properties were determined on the basis of tests performed in compliance with DIN EN 520. Results are listed in Table 1 below.

Table 1 Overview of properties. Bold marked are those values that do not comply with.

Type of board		type 12.5 GKB, Type A
Board thickness	[mm]	12.5
Dimensions	[mm]	1,197 × 2,997 × 12.3
Edge profile	[mm/m] [mm] [mm]	Tapered edge Squareness 0.3 Taper width 42 mm to 45 mm Taper depth 1.28 mm to 1.66 mm
Collapse load parallel with the fibre	[N]	561
Collapse load perpendicular to the fibre	[N]	227
Weight per unit area (Gypsum)	[kg/m ²]	8.6

Braunschweig, dated August, 26, 2022

Ass. Head of Test Laboratory

Dipl.-Ing. (FH) Hartmann Albers



Engineer in charge

i.A.

Dipl.-Ing. Sandra Hirschfeld

Client: **Knauf Egypt** Document No: **1103/530/21**
 Boardtype: **GKB-A** Checker: **Fr. Schwarz**
 Nominal size: **3000** x **1200** x **12,5** mm³ **GKB** tapered boarder
 rear side marking: **Knauf Gypsum Board A-EN 520 AK 12.5 x 1200 x 3000 mm** manufactured according to **en 520 A2-s1, c0** Made in **Egypt**, 02:32 16.02.22 Test material received: 22.03.22

dimensions in as-required:

board number:	length			width				thickness							average value [mm]		
	1 [mm]	2 [mm]	3 [mm]	1 [mm]	2 [mm]	3 [mm]	4 [mm]	5 [mm]	6 [mm]	7 [mm]	8 [mm]	9 [mm]	10 [mm]	11 [mm]		12 [mm]	
1	2997	2997	2997	1197	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1197
2	2997	2996	2996	1197	1197	1197	1197	1197	1197	1197	1197	1197	1197	1197	1197	1197	1197
3	2996	2997	2997	1197	1197	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1197
average value:																	1197

squareness and taper profile:

board number:	squareness			taper width				taper depth				average value [mm]
	Δ1 [mm]	Δ2 [mm]	R _w [mm/m]	1 [mm]	2 [mm]	3 [mm]	4 [mm]	1 [mm]	2 [mm]	3 [mm]	4 [mm]	
1	0,5	0,0	0,2	44	42	41	39	1,25	1,28	1,26	1,34	1,28
2	1,05	0,00	0,4	43	41	41	42	1,63	1,79	1,65	1,55	1,66
3	0,20	0,10	0,1	45	46	44	44	1,28	1,65	1,52	2,14	1,65
average value:			0,3									1,63

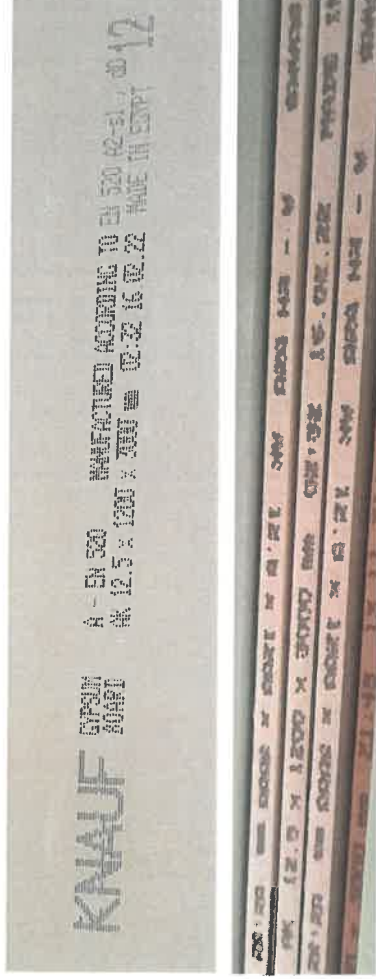
test equipment:

measuring tape: **BMI (Inv.-Nr. 5969)**
 side gauge: **300 mm (MPA-186)**
 taper profile counter: **Mehr Digital Meßuhr 1075 (MPA-055)**
 scales: **Sartorius (P 34000 P, Inv.-Nr.: 04011035)**
Sartorius (Inv.-Nr. 232020027)
 climatic cabinet: **Halle I, EG, Heraeus (Can-Bus : DL 02) (mks)**
 Cobb-processor : **Halle I, Raum 006 (Can-Bus:DL 006)**

weight per unit area, density, collapse load, deflection & modulus of elasticity:

test material number:	length [mm]	width [mm]	weight air-dry [g]	weight dry 40° C [g]	weight per unit area [kg/m ²]	effective span [mm]	collapse load FU [N]	deflection S _{max} [mm]
1 L	400	300	1011	1009	8,4	350	555,7	9,7
1 T	400	300	1052	1050	8,7	350	228,3	8,6
2 L	399	300	1007	1006	8,4	350	570,5	11,9
2 T	401	300	1053	1052	8,7	350	222,9	7,2
3 L	400	300	1007	1005	8,4	350	557,2	15,4
3 T	398	301	1047	1044	8,7	350	228,7	14,5

average value: **8,6**



summary of test results

board number:	dimension		thickness [mm]	squariness R _w [mm/m]	taper profile		weight per unit area [kg/m ²]	collapse load	
	length [mm]	width [mm]			width [mm]	depth [mm]		in longitudinal direction (L) [N]	in transverse direction (T) [N]
1	2997	1197	12	0,21	41,5	1,28	8,6	556	228
2	2996	1197	12	0,44	41,8	1,66	8,6	571	223
3	2997	1197	12	0,13	44,8	1,65	8,6	557	229
average value:	2997	1197	12,3	0,26	42,7	1,53	8,6	561	227
DIN EN 520 requirements	2994 bis 3000	1196 bis 1200	± 0,5 mm	3,0	40 bis 80	0,6 bis 2,5	keine	≥ 550	≥ 210
meet:	yes	yes	yes	yes	yes	yes	-----	yes	yes