

Industrial Estate Valdeconsejo, Aneto St., 8-A, 50410  
Cuarte de Huerva (Zaragoza)

## 22AH05074 REPORT

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# TESTS ON PREFABRICATED BOARDS

<ul style="list-style-type: none"><li>• <b>CLIENT</b></li></ul> <p>- Name: ANDARAGON, S.L.U. - Address: Las Norias Industrial Estate, 19-A, Muel (Zaragoza)</p>
<ul style="list-style-type: none"><li>• <b>QUOTATION</b></li></ul> <p>- Name: MECHANICAL CHARACTERISTICS OF FIBRE-REINFORCED BOARDS - Quotation No.: 21AH0428</p>
<ul style="list-style-type: none"><li>• <b>SPECIMENS</b></li></ul> <p>- Specimen reference: 2022/01249 - Date of entry: 19/05/2022</p>
<ul style="list-style-type: none"><li>• <b>TESTS CARRIED OUT</b></li></ul> <p>- Bending strength (ambient conditions), UNE EN 12467 - Behaviour under punctual loads, UNE EN 12430 - Date of test: 02/06/2022</p>
<ul style="list-style-type: none"><li>• <b>STANDARDS USED</b></li></ul> <p>- UNE-EN 12467. Flat boards of fibre-reinforced cement. Product specifications and test methods. UNE EN 826. Thermal insulation products for building applications. Determination of compression behaviour.</p>

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## 1.- PRECEDENTS

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The applicant provides the laboratory with a TABIHAUS® prefabricated panel of 2,600 X 1,200 X 60 mm for a flexural strength test.

The test panel consists of two 8 mm TABIHAUS boards and a 20 mm extruded polystyrene (XPS) core.

**TABIHAUS® panel:** *Composed of TABIHAUS® boards of 8 mm on both sides, composed of Epsom salt reinforced with double mesh of fibreglass, natural longitudinal fibres dispersed in orientation, spherical foam particles, retardants, and liquid waterproofing, adhered to high density XPS (XPS-EN-13164-T3-CS(10/Y)300 DS(70,90)), leaving it in its inner core, by means of the manufacturing process of ANDARAGÓN S.L.U., with bicomponent glues, and double pressing in vacuum and mechanical pressure, in a controlled process in air-conditioned rooms - temperature and humidity.-.*

## 2.- BENDING STRENGTH

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### 2.1.- Test methodology

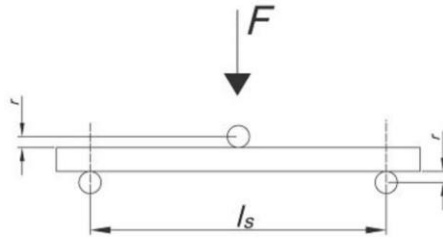
Before the test is carried out, the specimens are conditioned and kept in laboratory conditions for 7-14 days.

Rectangular specimens of suitable dimensions are prepared for the test. These are cut in both longitudinal and transverse directions.

The specimens are placed with their underside resting on two supports and the load is applied by means of a central bar.

The load is applied steadily and is carried out in such a way that breakage occurs between 10 and 30 seconds after the start of the load application.

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*Charging device*

The Modulus of Rupture MOR, in megapascals, is calculated by the following expression:

$$\text{MOR} = \frac{3Fl_s}{2be^2}$$

Where

- F is the breaking load, in newtons
- L<sub>s</sub> is the support spacing, in mm
- b is the width of the specimen, mm
- e is the thickness of the specimen, in mm

The specimen value is calculated as the arithmetic mean of the values, in both directions, of the specimens tested.

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## 2.2.- Results obtained

Transversal direction						
Specimen	L (mm)	b (mm)	e (mm)	Load (kg)	Bending Strength (MPa)	Breakage d. (mm)
T1	560	249	36,01	124	3,2	5,48
T2	560	251	35,67	122	3,1	5,23
T3	560	251	35,59	123	3,2	7,70
T4	560	251	35,55	122	3,2	6,94
T5	560	252	35,66	125	3,2	5,22
<b>Average</b>				<b>123</b>	<b>3,2</b>	<b>6,11</b>

Longitudinal direction						
Specimen	L (mm)	b (mm)	e (mm)	Load (kg)	Bending Strength (MPa)	Breakage d. (mm)
L1	560	255	35,54	153	3,9	8,68
L2	560	255	35,56	153	3,9	6,52
L3	560	252	35,57	166	4,3	8,82
L4	560	251	35,50	146	3,8	7,47
L5	560	250	35,55	156	4,1	7,01
<b>Average</b>				<b>155</b>	<b>4,0</b>	<b>7,70</b>

<b>Modulus of rupture MOR</b>	<b>3,6 MPa</b>
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### **3.- COMPRESSION BEHAVIOUR**

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#### **3.1.- Test methodology**

Prior to the test, the specimens are conditioned for 6 hours at  $23\pm 5$  °C.

To carry out the test, three 100x100 mm square specimens are prepared with the original thickness of the board.

The test consists of applying a load, at a speed of 0.1-d/min, in a direction perpendicular to the face of the specimen until the specimen breaks, giving the compressive strength value, or until a relative deformation of 10 % is reached, thus determining the compressive stress at 10 % relative deformation.

The compressive strength in kilonewtons and the relative deflection in %, corresponding to the maximum achieved (breaking) force or the compressive strength in kilonewtons at 10% relative deflection, are calculated.

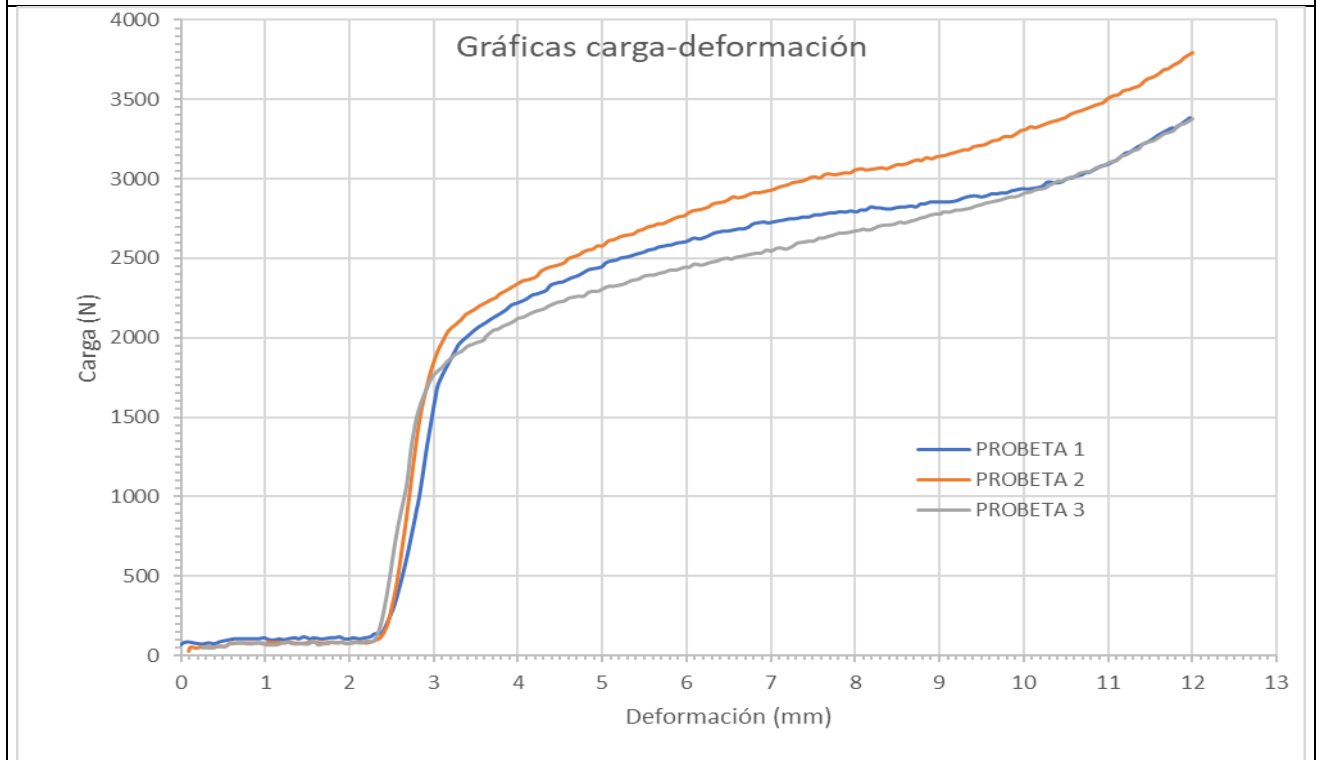
It is also possible to determine the strength and deformation at the elastic limit.

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**3.2.- Results obtained**

Specimen	Strength 10% (N)	Tension 10% (KPa)	Elastic zone Strength (N)	Elastic zone tension (KPa)	Elastic zone def. (mm)	Relative deformation elastic zone (%)
1	2300	<b>230</b>	1680	<b>168</b>	0,75	3,8
2	2440	<b>244</b>	1650	<b>165</b>	0,50	2,5
3	2180	<b>218</b>	1600	<b>160</b>	0,50	2,5
Average	2307	<b>231</b>	1643	<b>164</b>	0,58	2,9

The relative deformation is calculated with respect to the 20 mm thickness of the insulation



  
**Jefe de Ensayos de Materiales**  
Gustavo Royo Lantarón  
Lcdo. C.C. Geológicas



**Zaragoza, 3rd June 2022**  
  
**Vº Bº del Director del Laboratorio**  
Arantxa Mendizábal Aguirre  
Ingeniero Industrial