

## Quality Standards

According to the European standard EN 13986:2004, wood panels are those permanently incorporated to constructions (civil engineering and civil construction). This standard establishes essential demands for structural products, viewing to comply with determined mechanical resistance and stability levels; protection against fire; hygiene, health and environment; utilization security; protection against noise; energy save and health retention. In the case of the structural products and some non-structural ones, among the tasks demanded by the standard to achieve these essential demands can be mentioned:

- Initial Type testing (ITT)
- Facturing Production Control (FPC) and respective tests
- Factory initial inspection and FPC by an European certification organization
- Continuous FPC inspection, appreciation and approval by an European certification organization

## Panel Grades

### Related to the Use

The CE-Marking considers three plywood (pine and tropical) classes:

- **Class 1 – Dry conditions:**  
Plywood recommended for uses in protected places, without direct contact with water. In most cases, the glue utilized is based in urea-formaldehyde resins.
- **Class 2 – Moist Conditions:**  
Plywood recommended for uses in moist places, capable to resist to weather for short periods of time. In these cases, the glue utilized is based in urea-formaldehyde or phenolic resins.
- **Class 3 – Exterior Conditions:**  
Plywood recommended for uses in highly moist places, capable to resist to weather for long periods of time. In these cases, the glue utilized is based in phenolic resins.

### Related to the Application

Two basic applications are considered for plywood:

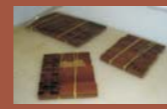
- **Structural:**  
Plywood recommended for permanent construction uses, meaning that are not removed after the construction is finished. These panels are mostly utilized in walls, floorings and roofs.
- **Non-Structural:**  
Plywood recommended for temporary construction uses (moulds, scaffoldings, hoardings, etc.) or as components not submitted to stress (partition walls, doors, etc.), as well as those destined to furniture and flooring manufacturing.

### Plywood Grading According to ABNT

Plywood are graded based on the face and back face quality. Grading criterions consider the defect type, quantity and dimensions, attributed through visual inspection. Plywood grading possibilities are described in the Technical Standards approved in ABNT's CE 31:000.05 ambit.

Controls and Tests	Properties	Use Type	Systems		
			2+		4
			Structural	Non-Structural	Non-Structural
FPC	Control Process Production		X	X	X
	ITT = Product ID	Traction	X	-	-
Compression		X	-	-	
Bending		X	X	X	
Glue Line		X	X	X	
Specific Mass		X	X	X	
Formol Emission (1)		X	X	-	
Others (2)		When Demanded	-	-	-
FPC Rotine Tests	Bending	Internal	X 1 Panel each 1.000 or 8 hours	X 2 Panels per month	X 2 Panels per month
		External	X 1 Panel each 1.000 or 8 hours	X 1 Panel each 10.000	X 1 Panel each 10.000
	Glue Line	Internal	X 1 Panel each 1.000 or 8 hours	X 1 Panel each 5.000	X 1 Panel each 5.000
		Intermediary	X 1 Panel each 1.000 or 8 hours	X 1 Panel each 5.000	X 1 Panel each 5.000
		External	X 1 Panel each 1.000 or 8 hours	X 1 Panel each 2.000	X 1 Panel each 2.000
	Specific Mass	Internal	X 1 Panel each 1.000 or 8 hours	X 1 Panel each 2.000	X 1 Panel each 2.000
Others (2)	When demanded	-	-	-	

## Equipamentos e ensaios



## TECHNICAL CATALOGUE

### Pine Plywood

Since 2003 ABIMCI is the Executive Secretary of the Brazilian Timber Committee (CB-31) from ABNT, responsible for coordinating the elaboration and revision of the Brazilian Technical Standards for the sector's products, as well as for the harmonization of these standards in relation to the international ones.

Study Commissions in the CB-31 ambit are already established for the elaboration, revision and/or harmonization of standards for the following products:

- Plywood
- Wood based panels
- Wooden Doors

### Internacional Certification

In order to exempt the mechanically processed timber industry of contracting international organizations to certify its products, principally those exported, ABIMCI, based in its quality programs, has been developing together with INMETRO the necessary activities for the inclusion of these programs in the SBAC (Brazilian Conformity Evaluation System). The objective is to obtain international recognition for the Brazilian certification.

### Cooperation Agreements

Parallel to the activities developed together with INMETRO, ABIMCI, based on the PNQM, has been celebrating cooperation agreements with international organizations looking forward obtaining the certification of its member companies' products. ABIMCI has a cooperation agreement with BM TRADA Certification, for obtaining the CE-Marking of conformity for plywood to the interested member companies. This certification is, since April 2004, mandatory for exporting these goods to the European Community.

### Certification Advantages

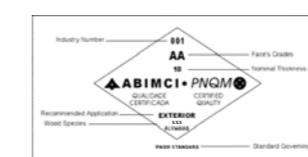
- Maintenance of conquered markets, principally the internacional ones
- Reduction of waste
- Reduction of production costs
- Increase of productivity
- Increase of competitiveness
- Better qualification of the labor force
- Improvement of the company internal culture and organization
- Possibility of entrance in new markets
- Valorization of a Brazilian quality program

### Certification Stamp

Companies that have successfully passed in the certification process are allowed to print at the plywood face or edges the Certification Stamp, considering the standards defined by the CNQM.

The Certification Stamp has the basic information necessary to identify the product, including: producer, grade, dimensions, recommended use, among and other aspects.

### Certification Stamp and PNQM Certificate



### CE Stamp Model Level 2+ and CE / BM TRADA Certificate



### CE Stamp Model Level 4 and ABIMCI Authorization



In 1999, based on a request made by members and in response to a market demand, ABIMCI decided to develop an international system for a pine plywood quality certification. To develop the system it was created the National Program for Plywood Quality - PNQC. Based on the gained experience and considering the members and market demands, the Program was enlarged, being transformed in the National Program for Wood Quality - PNQM. Within this new enlarged scope the Program is now involved with other wood products, including tropical plywood and wooden doors.





### Thickness Tolerances

Nominal Thickness (t)	Unsanded Panels		Sanded Panels	
	Thickness Tolerance	Nominal Thickness Tolerance	Thickness Tolerance	Nominal Thickness Tolerance
3 ≤ t ≤ 12	1,0	+ (0,8 + 0,03 t)	0,6	+ (0,2 + 0,3 t)
12 < t ≤ 25	1,5	-(0,4 + 0,03 t)		-(0,4 + 0,03 t)

Determined uses may have lower tolerances (see specific rules for the type of panel)

### Plywood Properties

#### Information Source

Information related to the physical and mechanical properties here presented are based on tests carried out by the PNQM and CE-Marking members. These tests were carried out in laboratories credence by ABIMCI.

#### Information Source

EN Standards were used in the laboratory tests carried out to determinate the plywood physical and mechanical properties, required by the European Community.

#### Density

Panel Thickness (mm)	Quantity of Plies	Gluing	Density (kg/m <sup>3</sup> )		
			Minimum	Average	Maximum
12	5	Phenolic	476	552	641
18	7	Phenolic	496	557	620

### Results

The test results for the physical and mechanical properties of plywood 12 mm and 18 mm thick are shown on the tables below. These results represent the values obtained in the product characterization tests (Initial Type Testing - ITT, according to EN - 789 and EN Series 300 standards). During the tests was utilized pine plywood for exterior conditions, structural application, unsanded and C+/C quality (commercial name).

For each property are presented, besides the average, minimum and maximum values. These values were calculated considering a standard deviation of 1 (one) in relation to the average.

Results for other plywood thickness are available at [abimci@abimci.com.br](mailto:abimci@abimci.com.br)

#### Static Bending

Panel Thickness (mm)	Number of Plies	Gluing	Static Bending (N/mm <sup>2</sup> )				
			Paralele				
			MOE (Em) <sup>1</sup>	MOR (fm <sup>2</sup> )	MOE (Em) <sup>1</sup>	MOR (fm <sup>2</sup> )	
12	05	Phenolic	Min.	3.100.72	27.38	1.762.90	20.58
			Aver.	5.139.78	45.36	2.590.96	32.05
			Máx.	7.063.29	63.58	4.047.22	45.27
18	07	Phenolic	Min.	3.274.61	28.05	2.167.82	22.08
			Aver.	4.908.06	40.13	3.305.04	33.78
			Máx.	6.413.12	54.88	4.675.40	47.29

<sup>1</sup>Modulus of Elasticity <sup>2</sup>Modulus of Rupture

#### Glue Line Resistance

Panel Thickness (mm)	Quantity of Plies	Gluing	Gluing Quality				
			Boiling (24h)		Boiling (72h)		
			Tension (n/mm <sup>2</sup> )	WF1 %	Tension (n/mm <sup>2</sup> )	WF1 %	
12	5	Phenolic	Min.	0.83	38.33	0.68	34.83
			Aver.	1.25	64.19	1.07	63.93
			Máx.	1.71	91.00	1.47	86.83
18	7	Phenolic	Min.	0.97	57.73	0.84	49.51
			Aver.	1.31	73.91	1.09	70.58
			Máx.	1.67	89.57	1.33	89.93

1WF= Wood Failure

#### Wood Characteristics (Adapted from ABNT)

* Commercial Name	A	B	C	D
Standard Name	I	II	III	IV
Characteristics	Appearance Classes			
Pierce Knots <sup>1</sup> Sound Knot	Accepted 3/m <sup>2</sup>	Accepted until an individual diameter of 15 mm if the accumulated diameter does not surpass 30mm/m <sup>2</sup>	Accepted until an individual diameter of 50 mm	Accepted until an individual diameter of 60 mm
Open Knot and Openings	Practically Absent	Very Small	Small	Accepted, but see note
		6 mm if repaired with filler until 2/m <sup>2</sup>	5 mm if not repaired and 25 mm if repaired with filler until 6/m <sup>2</sup>	40 mm
Crack	Open	1/10	1/3	1/2
		3 mm	Of the panel length, until an individual diameter of 10mm	15 mm
		3/m of the panel width, if correctly repaired with filler	And until a quantity of 3/m of the panel width. All cracks with a diameter of more than 2 mm must be repaired with filler	3/m of the panel width
Sound	Accepted			

* Commercial Name	A	B	C	D
Standard Name	E	I	II	III
Characteristics	Appearance Classes			
Anomalies caused by insects, vegetable parasites and marine xylophages	Not Accept	Not Accept	Vegetable parasites are not accepted. Whole caused by insects and marine xylophages are accepted until 3 mm of diameter vertically to the panel level and until a quantity of 10/m <sup>2</sup>	15 mm of diameter and 60 mm of length, until a quantity of 3/m <sup>2</sup>
Resin and bark included	Not Accept	Accepted until an individual diameter of 6 mm, if correctly repaired with filler		Accepted, but see note
Resin veins		40 mm		
Wood Structure Irregularity	Practically Absent	If very small	Accepted	Accepted
Discoloration that does not damage the wood		Accepted, if of low contrast		Accepted
Blue Stain	Not accept	Not Accept		
Other Characteristics	Practically Absent	To be considered in the most similar category		

Note: the wood characteristics are admitted since they do not compromise the panel utilization  
Pierce Knots: Sound Knots with a diameter of less than 3 mm

### Grading

* Commercial Name	A	B	C	D
Standard Name	E	I	II	III
Defect Type	Appearance Classes			
Open Joints	Not Accept	3 mm	Accepted until an individual diameter of 10 mm	25 mm, unlimited quantity not repaired with filler
		1/m of the panel width pdng repaired with filler more than 1 mm wide	Of the panel width, being 2/m of the panel width, note repaired with filler	
Overlaps	Not Accept	1/m <sup>2</sup>	2/m <sup>2</sup>	Accepted, but see note
Blister		Not Accepted		
Cavities, impression and sallence	Not Accept	Accepted if small	Accepted	
Wrinkles		Accepted if small	Accepted	
Excessive Sanding	Not Accept	Not Accepted	Accepted until an extension of 1% of the panel surface	Accepted until an extension of 5% of the panel surface, but see note
		Accepted If small and occasional	Accepted Until an extension of 5% of the panel surface	Accepted, but see note
Glue Trespass	Not Accept	Iron particles are not accepted		
Strange Particles		Accepted if made adequately and well finished until a quantity of 5/m <sup>2</sup>		
Repairs: 1) Patches 2) Wedges	Practically without defects	Accepted if made adequately and well finished		
3) Synthetic Repair		Accepted inside most similar category		
Defects in the panel edges due to sanding or sawing	Practically without defects	Accepted until 2 mm of the edge	Accepted until 5 mm of the edge	Accepted but see note
Others		To be considered in the most similar category		

Note: manufacturing defects are admitted since they do not compromise the panel utilization  
\*Except for the commercial agreements between buyer and supplier

### How to participate of the CE-MARKING Program

The main steps and more details for PNQM and CE-Marking participation are available at [www.abimci.com.br](http://www.abimci.com.br)

### Participant Companies

For the complete list of PNQM and/or CE-Marking participating companies, as well as certified products, supplying companies and specific results, please access [www.abimci.com.br](http://www.abimci.com.br)