

SUPPORT PEDESTAL
Technical document
DT99043-01

PLOT classification

Conditions for use or marking and graphic charter

Compression test adaptation protocol

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CSTB (Centre Scientifique et Technique du Bâtiment), a public establishment supporting innovation in construction, has five key activities—research and expertise, assessment, certification, tests, and dissemination of knowledge—organised to meet the challenges of the ecological and energy transition in the construction sector. Its field of competence covers construction materials, buildings and their integration into districts and towns.

With over 900 employees and its subsidiaries and networks of national, European and international partners, the CSTB group works for all stakeholders in the construction sector to advance building quality and safety.

MODIFICATION HISTORY

Revision No.	Application date	Modifications
00	08/06/2020	Creation
01	28/01/2021	Part 1: <ul style="list-style-type: none">- Modification to the conditions for obtaining the P classification;- Introduction of the concept of a minimum compression test high temperature of 40°C for the T classification; Part 4: <ul style="list-style-type: none">- Modification of the compression test protocol;- Removal of the reference to off-centre loading on half of the pedestal (1/2);

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Part 1. PURPOSE

The purpose of this document is to describe "PLOT" classification, the marking rules and the compression resistance test protocol adaptation rules as part of QB 43 Support pedestal certification.

Part 2. CLASSIFICATION

1 Definition of classification

As part of QB PLOT product certification, formalised by the QB mark, CSTB is introducing the performance-based PLOT classification, associated with the QB mark, applicable to certified products.

Classification:

- makes it easier for users of the products to recognise the certified characteristics;
- makes the choice of products by users with regard to the planned usages more reliable.

Mandatory certified characteristics

The mandatory certified characteristics used for PLOT classification are:

- Certified compression resistance symbolised by the letter “P”, index 1, 2, 3, 4.
- Maximum recommended height symbolised by the letter “L”, max. index.
- Ability to withstand water retention symbolised by the letter “O”.
- Maximum usage temperature symbolised by the letter “T”, max. index.

A pedestal can be certified for one or more fields of use.

The certified fields of use are identifiable by means of the following classifications:

- Usage classification: “Pavers and tiles”
- Usage classification: “Floor battens”
- Usage classification: “Pavers and tiles” and “Floor battens”

Optional certified characteristics

The optional certified characteristics are:

- Minimum recommended height symbolised by the letter “L”, min. index;
- Minimum usage temperature symbolised by the letter “T”, min. index;
- Slope corrector function or slope corrector accessories symbolised by the letter “S”;
- Made from recycled material, symbolised by the letter “R”.

Certified characteristics						
P	<p>Class “P”, index 1, 2, 3 or 4, expresses the pedestal’s certified compression resistance. This “P” classification is indissociable from the “L” classification and “T” classification. The “P” classification is obtained for a choice of three loading modes (C, 1/4, CL):</p> <p>In the case of pedestals for the “Pavers and tiles” certified usage:</p> <ul style="list-style-type: none"> • C = evenly distributed on the pedestal’s head. • 1/4Ex = off-centre on 1/4 of the pedestal’s head. <p>In the case of pedestals for the “Floor battens” certified usage:</p> <ul style="list-style-type: none"> • CL = with application of a linear load centred on the pedestal axis over a width of 45 mm. <p>Determination of classification: The characteristic compression resistance (Frk) is obtained during admission tests (to receive the classification) and follow-up tests (to maintain the classification). To determine index 1, 2, 3 or 4, Frk is determined by the minimum value obtained in 5 compression tests. This value is compared to the minimum requirements to be achieved for each index (see table below).</p> <p>Conditions to obtain the classification: Perform the test at the maximum height covered by the “L” classification and after a period of conditioning at the 40°C minimum temperature covered by the “T” classification.</p> <p>To confirm a P classification at the maximum height and maximum temperature, the following are required:</p> <ul style="list-style-type: none"> • “Pavers and tiles” configuration: <ul style="list-style-type: none"> ○ The characteristic resistance must be greater than the Frk (C) AND Frk (1/4) criteria. ○ If the Frk (C) and Frk (1/4) do not confirm the same classification, the weakest classification shall be confirmed. • “Floor batten” configuration: the characteristic resistance must be greater than the Frk (CL) criteria. • “Pavers, tiles and floor battens” configuration: <ul style="list-style-type: none"> ○ If the Frk (C), Frk (1/4) and Frk (CL) do not confirm the same classification, the weakest classification shall be confirmed. 					
	Sub-class	Unit	Frk (C)	Frk (CL)	Frk (1/4)	Uses
	P ₁	kN	≥ 4	≥ 3	≥ 2	H: Inaccessible roofs A: Housing, residential, balconies
	P ₂	kN	≥ 5	≥ 4.5	≥ 2.5	H + A + Rooftop terraces accessible to pedestrians and for living rooms
	P ₃	kN	≥ 6	≥ 5	≥ 4.5	H + A + C1: Meeting places, spaces equipped with tables, schools, cafés, restaurants
P ₄	kN	≥ 8	≥ 7.5	≥ 7.5	H + A + C1 + D1: Retail outlets (terrace giving access to the store, etc.)	

L	Class “L”, min or max index, expresses the certified minimum and maximum usage height for the pedestal.		
	<p>The “max.” index for class L is mandatory and corresponds to the maximum adjustment height of the pedestal.</p> <p>This classification is indissociable from the “P” classification and the “T” classification.</p> <p>Determination of classification: The “max.” index corresponds to the adjustment height during admission tests (to obtain the classification) and follow-up tests (to maintain the classification).</p> <p>Conditions to obtain the classification: Perform the compression resistance test at the maximum height covered by the L_{max} classification and after a period of conditioning at the maximum temperature covered by the T_{max} classification.</p>		
	<p>The “min.” index for class L is optional and corresponds to the minimum adjustment height of the pedestal.</p> <p>Determination of classification: The “min.” index corresponds to the adjustment height during admission tests (to obtain the classification) and follow-up tests (to maintain the classification).</p> <p>Conditions to obtain the classification: Perform the compression resistance test at the minimum height covered by the L_{min} classification and after a period of conditioning at the maximum temperature covered by the T_{max} classification.</p>		
Class	Unit	Compliance	Expression
L _{MAX}	mm	Mandatory	MAXIMUM height of the pedestal during the admission and follow-up tests
L _{MIN}	mm	Optional	MINIMUM height of the pedestal during the admission and follow-up tests

O	<p>Class “O” expresses the presence of drainage orifices in the base of the pedestal and the absence of any areas which retain water > 2 mm.</p> <p>This classification is applicable to pedestals whose design and geometry help water drain away after the pedestal is sprayed.</p> <p>Determination of classification: Visual observation of water drainage holes and the absence of any areas which retain water on the base of the pedestal.</p> <p>Conditions to obtain the classification: Demonstrate the efficiency of the drainage holes under the supervision of the auditor by means of a spray test.</p>		
	Class	Expression	
O+	Presence of drainage orifices in the base of the pedestal and the absence of any areas which retain water > 2 mm.		
ND	Not determined		

T	<p>Class “T”, min or max index, expresses the minimum and maximum usage temperature for the pedestal. This classification is indissociable from the “P” classification and the “L” classification.</p>		
	<p>The “max.” index for class T is mandatory and corresponds to the maximum usage temperature for the pedestal.</p> <p>Determination of classification: The “max.” index corresponds to the maximum temperature during admission tests (to obtain the classification) and follow-up tests (to maintain the classification).</p> <p>Conditions to obtain the classification: Perform the compression resistance test after a period of conditioning at the maximum temperature (minimum 40°C) covered by the T_{max} classification and at the maximum height covered by the L_{max} classification.</p>		
	<p>The “min.” index for class T is optional and corresponds to the minimum usage temperature for the pedestal.</p> <p>Determination of classification: The “min.” index corresponds to the minimum temperature during admission tests (to obtain the classification) and follow-up tests (to maintain the classification).</p> <p>Conditions to obtain the classification: Perform the compression resistance test after a period of conditioning at the minimum temperature covered by the T_{min} classification and at the maximum height covered by the L_{max} classification.</p>		
Class	Unit	Compliance	Expression
T _{MAX}	°C	Mandatory	MAXIMUM conditioning temperature of the pedestal during the admission and follow-up tests (40°C and above)
T _{MIN}	°C	Optional	MINIMUM conditioning temperature of the pedestal during the admission and follow-up tests

Certified field of application	
Pavers and tiles	<p>The “Pavers and tiles” class expresses the compatibility of the pedestal with the direct installation of floor coverings and pavers or tiles on the pedestals.</p> <p>This classification is applicable to pedestals with removable or non-removable tabs.</p> <p>Determination of classification: Visual observation of the presence of removable or non-removable tabs on the pedestal’s head.</p> <p>Conditions to obtain the classification: Perform the compression resistance test on the following three configurations: C = evenly distributed on the pedestal’s head. 1/4Ex = off-centre on 1/4 of the pedestal’s head,</p>
Wall plates	<p>The “Floor battens” class expresses the compatibility of the pedestal with the direct installation of floor battens on the pedestals.</p> <p>This classification is applicable to pedestals with removable or non-removable floor batten supports.</p> <p>Determination of classification: Visual observation of the presence of a removable or non-removable floor batten support on the pedestal’s head.</p> <p>Conditions to obtain the classification: Perform the compression resistance test on the following configuration: CL = with application of a linear load centred on the pedestal axis over a width of 45 mm.</p>

<p>Pavers and tiles Wall plates</p>	<p>The “Pavers and tiles” and “Floor battens” class expresses the compatibility of the pedestal with the direct installation of floor coverings and pavers or tiles on the pedestals and the compatibility of the pedestal with the direct installation of floor battens on the pedestals.</p> <p>This classification is applicable to pedestals with removable or non-removable tabs or removable floor batten supports.</p> <p>Determination of classification: Visual observation of the presence of removable tabs or a removable floor plate support on the pedestal’s head.</p> <p>Conditions to obtain the classification: Perform the compression resistance test on the following four configurations:</p> <p>C = evenly distributed on the pedestal’s head. 1/4Ex = off-centre on 1/4 of the pedestal’s head, CL = with application of a linear load centred on the pedestal axis over a width of 45 mm.</p>
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<h1>S</h1>	<p>Class “S” expresses the presence of a slope corrector or compatibility with a slope corrector accessory.</p> <p>This classification is applicable to pedestals whose slope can be adjusted by the pedestal itself or by means of a slope correction accessory.</p> <p>Determination of classification: Visual observation of a slope correction device.</p> <p>Conditions to obtain the classification: None.</p>
<p>Class</p>	<p>Expression</p>
<p>S+</p>	<p>Presence of a removable or non-removable slope corrector device (accessory).</p>
<p>ND</p>	<p>Not determined</p>

<h1>R</h1>	<p>This classification is applicable to pedestals providing proof of the use of recycled material and the recycled material content for their manufacture, and the traceability of the recycled raw materials.</p> <p>Determination of classification: Based on presentation of proof during the audit.</p> <p>Conditions to obtain the classification: Demonstrate the origin of the recycled raw materials by providing material certificates in accordance with standards EN 15343, EN 15344 and EN 15345; provide proof of the traceability of the raw material batches; provide proof of an internal recycling approach for production waste.</p>
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Part 3. CONDITIONS FOR USE OR MARKING AND GRAPHIC CHARTER

1.1 On packaging, on communication media and on documents

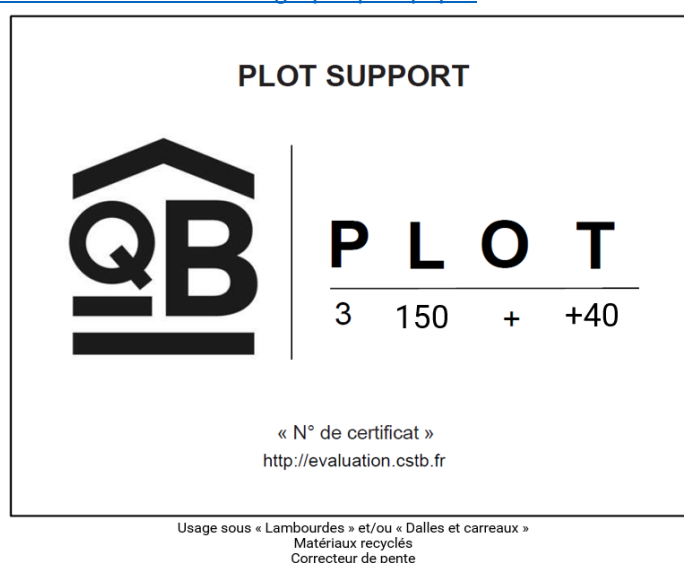
The PLOT classification, associated with the QB mark:

- makes it easier for users of the products to recognise the certified characteristics;
- makes the choice of products by users with regard to the planned usages more reliable,

A classification can be used if, and only if, the corresponding characteristic is certified and therefore exclusively if the classification appears on the certificate of the relevant product.

PLOT classification marking associated with the QB mark must comply with the QB graphic charter (cf. Page 9 – Other Classifications) available on:

<https://evaluation.cstb.fr/doc/certification/charte-graphique-qb.pdf>



1.2 On the product (when technically possible)

The QB logo can be marked during injection with a specific date stamp directly on the component parts of the certified pedestal. It must include the QB logo and the reference system number “43”.

Date stamp diameter (mm)	QB logo minimum dimensions (mm)
6	3x3
8	4x4
12	5x5



Date stamps according to size – 6, 8 and 12 mm in diameter

The manufacturer submits the specific “QB” date stamp for approval to CSTB and can only use it for manufacture of the certified pedestals.

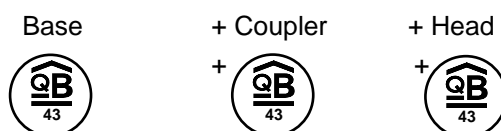
A pedestal can be composed of three or more components.

When they are pre-mounted at the factory, only one of these components needs be marked with the QB logo.

If the pedestal can be dismantled or if it is assembled in-situ, the various components must be marked with a code combining the QB logo with a part number.

Example:

QB logo:



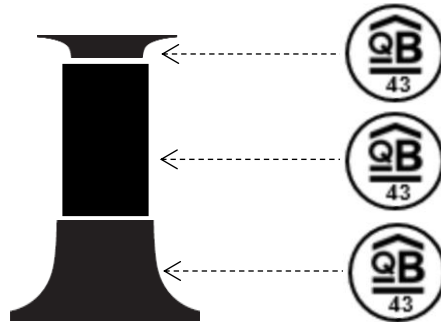
NOTE: If there is a code for identifying the product, the code must be given to CSTB.

If the product is manufactured in several factories, marking shall be supplemented by an identification of the manufacturing unit.

If it is not possible to mark the product, the conditions of application on the packaging or on the accompanying documents must be given to CSTB.

Marking	Location				
	On the base	On the coupler	On the head	On the accessories (spacer tab, floor batten support)	On the installation tools
QB logo	Yes	Yes	Yes	Yes, if technically possible	No
The holder's name or logo	Yes	Yes	Yes	Yes, if technically possible	Yes, if technically possible

Example:



Part 4. COMPRESSION TEST PROTOCOL

1 Principle

The compression resistance test involves applying a force to determine the characteristic resistance (F_{rk}) of the whole pedestal to compression.

2 Test specimen

The test specimen is composed of a whole pedestal, i.e. the assembly of the base, the head, any couplers and if necessary locked with a locking key.

Each test is carried out on five pedestals.

3 Packaging

The pedestals are conditioned for between 24 to 72 hours maximum in the following temperature and relative humidity conditions:

- Low temperature = $(-30 \pm 5)^{\circ}\text{C}$ to reach a temperature of $(-20 \pm 5)^{\circ}\text{C}$ when the load is applied;
- High temperature = $(+50 \pm 5)^{\circ}\text{C}$ to reach a temperature of $(+40 \pm 5)^{\circ}\text{C}$ when the load is applied;
- High temperature = $(+60 \pm 5)^{\circ}\text{C}$ to reach a temperature of $(+50 \pm 5)^{\circ}\text{C}$ when the load is applied.

For any other high temperature, the report must state the conditioning temperature and the temperature when the load is applied.

The time between removing the pedestal from the enclosure and applying the load must be between 60 and 90 seconds.

One of two parameters that influence the start of the test:

- The drop in temperature in order to reach the target temperature (which may prolong the start of the test); or
- The time between removing the pedestal from the enclosure and applying the load shall be chosen according to the technician's assessment.

The temperature of the pedestal when the load is applied must be controlled and recorded in the test report.

4 Equipment

A test apparatus arranged according to figures 1a, 1b and 2 must be used. The class 1 press (0.1% measured force) and the block must have appropriate dimensions for the test configuration.

5 Operating procedure

The compression tests are performed on whole pedestals, assembled and locked at the maximum height declared by the manufacturer.

The pedestal is placed (without attaching it) on the flat, fixed support of the test apparatus.

The pedestal's head is adjusted to the test height (maximum) intended for the type of pedestal being tested.

For pedestals with tabs which cannot be removed from the head, the openwork shim should be used, positioning it on the pedestal's head.

The load is applied using a block by means of an articulated assembly.

In the "centred" test configuration, the load is applied over the entire surface of the pedestal's head. The centre of the block coincides with the centre of the pedestal's head.

The pedestal is placed under the plate of a press. A test load is applied at a speed of 100 mm ($\pm 10\%$) per minute until failure or until the maximum load is reached.

The movement on the head is measured using the movement of the press's cross-piece.

5.1 Load evenly distributed on the pedestal's head (1/1)

The tests are performed after conditioning. The temperature of the test specimen is checked to start applying the load when the test temperature is reached (cf. Figure 1a).

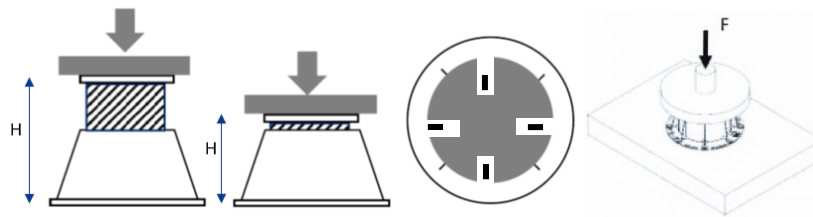


Figure 1a – Application of the centred “Pavers and tiles” load

5.2 Linear load centred on the axis of the pedestal (CL)

The tests are performed after conditioning. The temperature of the test specimen is checked to start applying the load when the test temperature is reached (cf. Figure 1b).

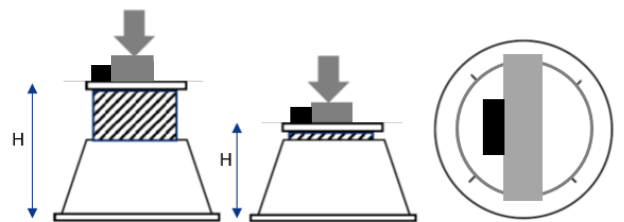


Figure 1b – Application of the centred linear “Floor battens” load

5.3 Off-centre loading on one-fourth of the pedestal's head (1/4)

The tests are performed after conditioning. The block was modified so that its centre is applied to $\frac{1}{4}$ of the surface of the pedestal's head (cf. Figure 2).

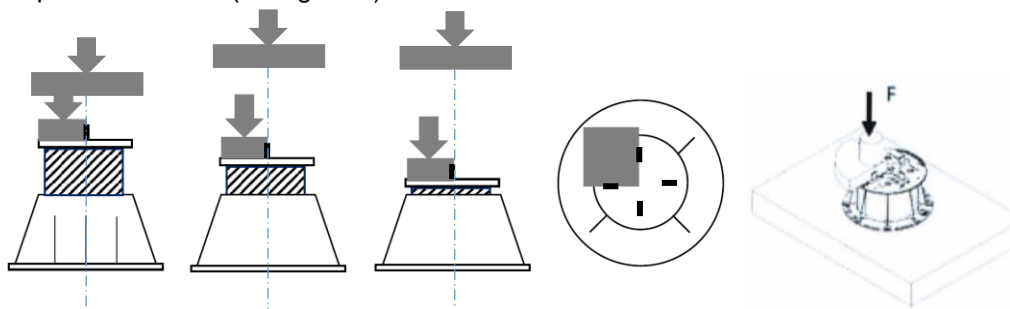


Figure 2 – Application of the load off-centre on one quarter of the pedestal's head

5.4 Centred and off-centre loads on pedestals with slope correctors

Pedestals with slope correctors are tested under the same conditions as those without correctors. A press with a swivel device will be used. The pedestal will only be tested in the centred configuration. The lowest/least favourable classification will be retained between having the corrector or not.

5.5 Storing samples after testing

Tested pedestals shall be identified and stored for one (1) month after testing for analysis should any disputes arise.

6 Expression of the results

The following are calculated based on the five unit values obtained:

- The average value F_R ;
- The standard deviation S ;
- The characteristic value F_{Rk} (minimum value obtained in 5 compression tests).

7 Test report

The report must mention the following for each test:

- Name and address of the applicant;
- Name and address of the certification body;
- Date on which the samples were submitted or taken;
- Test date;
- Identification of the pedestal declared by the applicant: trade reference;
- Number of the production batch, manufacturing date;
- Height tested (= position H of the head in relation to the support on which the pedestal is placed, in mm);
- Pedestal conditioning procedures (duration, temperature and height during conditioning);
- Temperature conditions when the load was applied;
- The configuration of the load (C; Ex1/4; CL)
- Quantified values of the unit load measurements F ;
- The characteristic value F_{Rk} (minimum value obtained in 5 compression tests).
- The deformation mode and failure mode:
 - a. Sinking of the head into the base
 - b. Sinking of the head into the coupler
 - c. Sinking of the coupler into the base
 - d. Shearing of the thread
 - e. Failure of the base
 - f. Failure of the head
 - g. Failure of the stop or locking device
 - h. Bursting of the cylinder by splitting
 - i. Creep of the cylinder (plastic deformation)
- Sampling sheet
- The reference to this document
- Signature and capacity of the responsible person.