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European Technical Assessment

ETA 23/0275
of 30.11.2023



General part

Technical Assessment Body issuing the ETA: ITeC	
ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)	
Trade name of the construction product	Hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D
Product family to which the construction product belongs	20 – Structural metallic products and ancillaries
Manufacturer	CEMENGAL P&G S.A. Calle de Antonio López, 247-249, 2ª planta F ES28041 Madrid Spain
Manufacturing plant(s)	According to Annex N kept by ITeC.
This European Technical Assessment contains	7 pages and Annex N, which contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available.
This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of	European Assessment Document 200017-00-0302 <i>Hot rolled products and structural components made of steel grades Q235B, Q235D, Q345B and Q345D</i> . Edition April 2015.
This ETA replaces	ETA 23/0275 issued on 16.05.2023

General comments

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

Specific parts of the European Technical Assessment

1 Technical description of the product

The products are uncoated hot rolled sections/profiles with various shapes (H, I, channels and angles) and flat products (plate and sheet) made of the weldable steel grades Q235B, Q345B and Q345D. The maximum thickness covered by this ETA for the products made of Q235B, Q345B and Q345D is 40 mm.

The steel grades are similar to the structural steel grades according to EN 10025-2 listed in the following table.

Steel grade according to the EAD 200017-00-0302	Comparable steel grade according to EN 10025-2	
	Designation according to EN 10027-1	Designation according to EN 10027-2
Q235B	S235JR	1.0038
Q345B	S355JR	1.0045
Q345D	S355J2	1.0577

Note: Class Q345 of the EAD 200017-00-0302 (which comes from Chinese standard GB/T 1591-2008) has recently been converted into equivalent Q355 (according to the new version of Chinese Standard, GB/T 1591-2018), though both Q345 and Q355 still coexist at the time of issuance of this ETA.

Table 1.1: Comparison of steel grades.

Due to the manufacturing process the steel grades deviate from EN 10025-2 as follows:

- The minimum yield strength R_{eL} and the ultimate strength R_m differ from those specified in EN 10025-2.
- The chemical composition differs from the analysis specified in EN 10025-2.

The product characteristics must be identified on the basis of the Inspection document "type 3.1" according to EN 10204 (to be furnished by the supplier).

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The hot rolled products and therewith executed structural parts made of the steel grades Q235B, Q345B and Q345D are intended for use in welded, bolted or riveted steel or composite structures.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary. Thus, use, maintenance, repair is not required during the intended working life; the thermo-mechanically hot rolled long steel products made of weldable fine grain structural steel can be dismantled and recycled but are normally not intended for re-use.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals, notably in accordance with the provisions of EN 1090-2:2018.

The provisions made in this ETA are based on an assumed working life of at least 100 years for the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D. These provisions are based upon the current state of the art and the available knowledge and experience.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and reference to the methods used for its assessment

Performance of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D related to the basic requirements for construction works (hereinafter BWR) were determined according to EAD 200017-00-0302. Essential characteristics of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D are indicated in table 3.1.

Basic Works Requirement	ETA section	Essential characteristic	Performance
	3.1	Chemical composition	See section 3.1
	3.2	Yield strength	See section 3.2
	3.2	Tensile strength	See section 3.2
	3.2	Elongation at fracture	See section 3.2
	3.3	Impact toughness value	See section 3.3
BWR 1	---	Weldability	No performance assessed
Mechanical resistance and stability	---	Improved deformation properties perpendicular to the surface	No performance assessed
	---	Formability	No performance assessed
	---	Suitability for hot-dip zinc-coating	No performance assessed
	---	Surface properties	No performance assessed
	---	Internal soundness	No performance assessed
	---	Dimensions, tolerances on dimensions and shape, mass	No performance assessed
BWR 2			
Safety in case of fire	3.4	Reaction to fire	Class A1 (see section 3.4)
BWR 7			
Sustainable use of natural resources	---	Durability	No performance assessed

Table 3.1: Performance of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D.

3.1 Chemical composition

The chemical composition of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D has been assessed according to EN 10025-2:2004, clause 8.3.3 and 9.1. The tests have been performed in accordance with EN 10025-2:2004, clause 10.1. The results are shown in table 3.2.

Steel grade	Percent by weight (%)													
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Nb ≤	V ≤	Ti ≤	Cr ≤	Ni ≤	Cu ≤	N ≤	Mo ≤	Al ≤
Q235B	0,20	0,35	1,40	0,045	0,045	---	---	---	0,30	0,30	0,30	0,008	---	---
Q345B	0,20	0,50	1,70	0,035	0,035	0,07	0,15	0,20	0,30	0,50	0,30	0,012	0,10	---
Q345D	0,18	0,50	1,70	0,030	0,025	0,07	0,15	0,20	0,30	0,50	0,30	0,012	0,10	0,015

Table 3.2: Chemical composition of the products of the steel grades Q235B, Q345B and Q345D.

3.2 Yield strength, tensile strength and elongation at fracture

Yield strength, tensile strength and elongation at fracture of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D has been assessed according to EN 10025-1 and EN 10025-2. The tests have been performed in accordance with EN 10025-2:2004, clause 10.2. The results are shown in table 3.3.

Steel grade	Nominal thickness t (mm)	Lower yield strength R_{eL} (MPa)	Tensile strength R_m (MPa)	Elongation at fracture $L_0 = 5,65 \cdot \sqrt{S_0}$ (%)
Q235B	$t \leq 16$	235	370 - 500	26
	$16 < t \leq 40$	225		
Q345B	$t \leq 16$	345	470 - 630	20
	$16 < t \leq 40$	335		
Q345D	$t \leq 16$	345	470 - 630	21
	$16 < t \leq 40$	335		

Table 3.3: Mechanical properties of the products of the steel grades Q235B, Q345B and Q345D at ambient temperature.

3.3 Impact strength

Impact properties of the hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D has been assessed according to EN 10025-2, clause 7.3.2. The tests have been performed in accordance with EN 10025-2:2004, clause 10.2. The results are shown in table 3.4.

Steel grade	Nominal thickness t (mm)	Impact toughness value K _v (J)
Q235B	t ≤ 16	≥ 27 at +20 °C
	16 < t ≤ 40	
Q345B	t ≤ 16	≥ 34 at +20 °C
	16 < t ≤ 40	
Q345D	t ≤ 16	≥ 34 at -20 °C
	16 < t ≤ 40	

Table 3.4: Impact toughness value of the products of the steel grades Q235B, Q345B and Q345D at the indicated temperature.

3.4 Reaction to fire

Reaction to fire of hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D according to Commission Delegated Regulation (EU) 2016/364 and EN 13501-1 is Class A1 without need of testing according to Decision 96/603/EC as amended.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 98/214/EC of the European Commission¹, as amended by 2011/596/EC, the system of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table applies.

Product	Intended use(s)	Level or class	System
Hot rolled products and structural components made of steel grades Q235B, Q345B and Q345D	To be used in metal structures or in composite metal and concrete structures	--	2+

Table 4.1: Applicable AVCP system.

¹ Official Journal of the European Union (OJEU) L80/46 of 18/03/1998.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

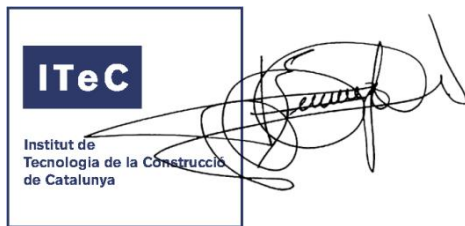
All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC², with which the factory production control shall be in accordance.

Products not manufactured by the kit manufacturer shall also be controlled according to the Control Plan.

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then they shall be subject to suitable checks/tests by the kit manufacturer before acceptance.

Any change in the manufacturing procedure which may affect the properties of the product shall be notified and the necessary type-testing revised according to the *Control Plan*.

Issued in Barcelona on 30 November 2023
by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart
Technical Director, ITeC

² The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.