



European Technical Approval ETA-11/0322

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

Vorgefertigte Bauteile aus den Stahlsorten Q235B, Q235D, Q345B und Q345D

Prefabricated structural components made of steel grades Q235B, Q235D, Q345B and Q345D

Zulassungsinhaber
Holder of approval

Andritz Energy & Environment GmbH
Waagner-Biro-Platz 1
8074 RAABA/GRAZ
ÖSTERREICH

Zulassungsgegenstand
und Verwendungszweck
*Generic type and use
of construction product*

Vorgefertigte Bauteile aus warmgewalzten Erzeugnissen aus den Stahlsorten Q235B, Q235D, Q345B und Q345D

Prefabricated structural components from hot rolled products made of steel grades Q235B, Q235D, Q345B and Q345D

Geltungsdauer:
Validity: vom
from
bis
to

9 September 2011

9 September 2016

Herstellwerk
Manufacturing plant

Herstellwerk 1
Manufacturing plant 1

Diese Zulassung umfasst
This Approval contains

8 Seiten einschließlich 2 Anhänge
8 pages including 2 annexes

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
 - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998⁴, as amended by law of 31 October 2006⁵;
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

¹ Official Journal of the European Communities L 40, 11 February 1989, p. 12
² Official Journal of the European Communities L 220, 30 August 1993, p. 1
³ Official Journal of the European Union L 284, 31 October 2003, p. 25
⁴ *Bundesgesetzblatt Teil I 1998*, p. 812
⁵ *Bundesgesetzblatt Teil I 2006*, p. 2407, 2416
⁶ Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of the products and intended use

1.1 Definition of the construction product

The construction products are prefabricated structural steel components with a maximum thickness of 100mm. They are made of uncoated hot-rolled plates of the weldable steel grades Q235D and Q345D and/or hot-rolled profiles of the weldable steel grades Q235B, Q235D, Q345B and Q345D. The steel grades are similar to the structural steel grades according to EN 10025-2 listed in Table 1. Due to the manufacturing process the steel grades deviate from EN 10025-2 as follows:

The minimum yield strengths R_{eH} and the ultimate strengths R_m differ from those specified in EN 10025-2.

The chemical analysis differs from the analysis specified in EN 10025-2.

Table 1 – Comparison of steel grades

Steel grade according this ETA	Comparable steel grade according EN 10025-2	
	Designation according EN 10027-1	Designation according EN 10027-2
Q235B	S235JR	1.0038
Q235D	S235J2	1.0117
Q345B	S355JR	1.0045
Q345D	S355J2	1.0577

1.2 Intended use

The prefabricated structural components of the steel grades Q235B, Q235D, Q345B and Q345D are intended for use in welded, bolted or riveted steel structures.

The provisions made in this European technical approval are based on an assumed working life of the products of the steel grades Q235B, Q235D, Q345B and Q345D of 100 years, provided that the conditions laid down in section 5.1 for the maintenance/repair are met. 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.

2 Characteristics of the products and methods of verification

The assessment of the fitness of the products of the steel grades Q235B, Q235D, Q345B and Q345D for the intended use in relation to the requirements for mechanical resistance and stability and safety in case of fire in the sense of the Essential Requirements No. 1 and No. 2 has been made in accordance with section 3.2 of the Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.

Concerning Essential Requirement No. 2 (Safety in case of fire) the following applies:

The assessment of the resistance to fire performance is only relevant to the assembled structure which is not part of the ETA.

The products of the steel grades Q235B, Q235D, Q345B and Q345D are considered to satisfy the requirements of performance class A 1 of the characteristic reaction to fire, in accordance with the provisions of the EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that decision.

Concerning Essential Requirements No. 1 (Mechanical resistance and stability) the following applies:

The material properties given in Annex 1 and Annex 2 were determined by tests with every steel grade (as far as necessary) or confirmed by inspection certificate 3.1 according to EN 10204.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the Decision 99/92/EC of the European Commission⁷ system 2+ of the attestation of conformity applies.

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer:
 - (1) initial type-testing of the product;
 - (2) factory production control;
 - (3) testing of samples taken at the factory in accordance with a prescribed test plan.
- (b) Tasks for the approved body:
 - (4) certification of factory production control on the basis of:
 - initial inspection of factory and of factory production control;
 - continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.⁸

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

⁷ Official Journal of the European Communities L 80 of 18.03.1998

⁸ The control plan is a confidential part of the European technical approval and only handed over to the approved bodies involved in the procedure of attestation of conformity. See section 3.2.2.

3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of prefabricated structural components made of hot-rolled steel products in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

3.2.2 Tasks for the approved bodies

The approved body shall perform the

- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in written reports.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

3.3 CE marking

The CE marking shall be affixed on the accompanying commercial documents. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate for the factory production control,
- the number of the European technical approval,
- the name of the product,
- the information on regulated characteristics of the product (nominal values).

4 Assumptions under which the fitness of the products for the intended use was favourably assessed

4.1 Manufacturing

The products of the steel grades Q235B, Q235D, Q345B and Q345D are manufactured in accordance with the provisions of the European technical approval using the manufacturing process as laid down in the technical documentation.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

4.2 Design

Unless not otherwise specified in this European technical approval and the Annexes referred to, the rules for the comparable steel grades according to Table 1 given in EN 1993 and EN 1994 are used for the design.

For the design of components of steel structures made of steel grades Q235B, Q235D, Q345B and Q345D the characteristic values given in Table 2 are taken into account.

Table 2 – Characteristic values of yield strength and tensile strength

	Steel grade	Product thickness t [mm]	Yield strength $f_{y,k}$ [N/mm ²]	Tensile strength $f_{u,k}$ [N/mm ²]
1	Q235B Q235D	$t \leq 16$	235	360
2		$16 < t \leq 40$	225	
3		$40 < t \leq 100$	215	
4	Q345B Q345D	$t \leq 16$	345	470
5		$16 < t \leq 35$	325	
6		$35 < t \leq 50$	295	
7		$50 < t \leq 100$	275	

4.3 Fabrication and installation

Unless not otherwise specified in this European technical approval and the Annexes referred to, the fabrication and installation is carried out in accordance with EN 1090-2:2008. The specific characteristic of the steel grades Q235B, Q235D, Q345B and Q345D is taken into account.

4.3.1 Additional rules for welding

For the execution of welded connections the additional rules given in Annex 1 are taken into account.

5 Indications to the manufacturer

It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1, 2, 4.2 and 4.3 (including Annexes referred to) is given to those who are concerned. This information may be given by reproduction of the respective parts of the European technical approval.

5.1 Use, maintenance, repair

The rules of EN 1090-2:2008 apply.

Georg Feistel
Head of Department

beglaubigt:
Ulbrich

Table 3 – Mechanical properties of the steel products

Steel grade	Nominal thickness t [mm]	Upper yield strength ReH [MPa]	Tensile strength Rm [MPa]	Elongation at fracture $L_0 = 5,65 \cdot \sqrt{S_0}$ [%]	Impact toughness value [J]
Q235B	t ≤ 16	235	370 - 500	26	27
	16 < t ≤ 40	225		25	
	40 < t ≤ 100	215		24	
Q235D	t ≤ 16	235	370 - 500	26	27 at -20°C
	16 < t ≤ 40	225		25	
	40 < t ≤ 100	215		24	
Q345B	t ≤ 16	345	470 - 630	21	34
	16 < t ≤ 35	325			
	35 < t ≤ 50	295			
	50 < t ≤ 100	275			
Q345D	t ≤ 16	345	470 - 630	22	34 at -20°C
	16 < t ≤ 35	325			
	35 < t ≤ 50	295			
	50 < t ≤ 100	275			

¹⁾ The values given in this Table are valid at ambient temperature as far as not otherwise specified

Additional rules for welded parts

For parts to be welded the carbon equivalent value CEV shall not exceed the values given in Table 4. The carbon equivalent value CEV shall be determined according to EN 10025-1.

Table 4 – Maximum for Carbon Equivalent Value (CEV)

Steel grade	Nominal thickness t [mm]		
	t ≤ 30	30 < t ≤ 40	40 < t ≤ 100
Q235B	0,36	0,36	0,38
Q235D	0,35	0,35	0,38
Q345B	0,43	0,45	0,45
Q345D	0,43	0,45	0,45

Prefabricated structural components from hot rolled products made of steel grades Q235B, Q235D, Q345B and Q345D

Mechanical properties
Carbon equivalent value CEV

Annex 1

Table 5 – Chemical analysis of the products made of the steel grades Q235B and Q235D

Steel grade	Percent by weight						
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	N ≤	Cu ≤
Q235B	0,20	0,35	1,40	0,045	0,045	0,014	0,60
Q235D	0,17	0,35	1,40	0,035	0,035	—	0,60
1)	+0,02	+0,05	+0,10	+0,005	+0,005	+0,002	+0,05

1) acceptable deviations of product analyses from limit values of ladle analyses

Table 6 – Chemical analysis of the products made of the steel grades Q345B and Q345D

Steel grade	Percent by weight									
	C ≤	Mn	Si ≤	P ≤	S ≤	V	Nb	Ti	Cu	Al ≥
Q345B	0,20	1,00–1,60	0,55	0,040	0,040	0,02–0,15	0,015–0,060	0,02–0,20	0,60	---
Q345D	0,18	1,00–1,60	0,55	0,030	0,030	0,02–0,15	0,015–0,060	0,02–0,20	0,60	0,015
1)	+0,02	+0,10	+0,05	+0,005	+0,005	+0,02	+0,01	+0,01	+0,05	-0,005

1) acceptable deviations of product analyses from limit values of ladle analyses

Prefabricated structural components from hot rolled products made of steel grades Q235B, Q235D, Q345B and Q345D

Chemical analysis

Annex 2