THE SOCIALIST REPUBLIC OF VIETNAM

QCVN 7: 2010/BKHCN

NATIONAL TECHNICAL REGULATION ON
STEEL FOR THE REINFORCEMENT OF CONCRETE

HA NOI - 2011
1. GENERAL

1.1 Scope of adjustment
This regulation specifies the limit levels of technical requirements to the steels for the reinforcement of concrete, steels for the prestressing of concrete and epoxy-coated steels for the reinforcement of concrete (hereafter, abbreviated of steel for the reinforcement of concrete) and the requirements on quality management of steels for the reinforcement of concrete manufactured at home, imported and circulated on the market.

1.2 Object of application
This regulation applies for the organizations, individuals carrying out the manufacture, import, distribution and use of steels for the reinforcement of concrete, the state agencies for management and the relevant organizations and individuals.

1.3 Explanation of terms
For the purpose of this regulation, the term below shall be understood following:

1.3.1 Product lot: Steels for the reinforcement of concrete that have the same grade and nominal diameter are manufactured in the same phase and on the same technological line.

1.3.2 Goods lot: Steels for the reinforcement of concrete that have the same grade and nominal diameter, the same marking content are imported, distributed and retailed at the same place by an organization or individual.

1.3.3 Grade of steel for the reinforcement of concrete: Grade of steel for the reinforcement of concrete shall be specified in the national standards (TCVN) as following:
- Steel grade of plain bars: CB240-T; CB 300-T;
- Steel grade of ribbed bars: CB300-V; CB400-V; CB500-V.
Note: The first letters “CB” are the abbreviations for the reinforcement of the concrete. The three following numbers represent the specified value of upper yield strength. The last designation “T” is the abbreviation for steel plain bars and “V” – steel ribbed bars.

1.3.4 Nominal cross-section area of steel ribbed bars: the cross-section area corresponds to that of the cylindrical plain bar having the same nominal diameter.
2. TECHNICAL REQUIREMENTS

2.1 Steel for the reinforcement of the concrete

2.1.1 Dimensions, mass per 1m length and permissible deviations are given in Table 1

2.1.2 Grade and mechanical properties of the (steel cylindrical) plain bars shall be in accordance with the specifications of TCVN 1651-1: 2008, *Steel for the reinforcement of the concrete – Part 1: Plain bars* (not apply the ratio $R_{m}/R_{eh} \geq 1.46$ given in Table 5).

2.1.2 Requirements for ribs, grade and mechanical properties of steel ribbed bars shall be in accordance with the specifications of TCVN 1651-2: 2008, *Steel for the reinforcement of the concrete – Part 2: Ribbed bars*.


2.2 Steel for the prestressing of concrete

Appearance of the surfaces, dimensions, mass per 1m length and permissible deviations, mechanical properties of steels for the prestressing of concrete shall be in accordance with the specifications of TCVN 6284: 1997 (ISO 6934: 1991), *Steel for the prestressing of concrete: Part 1: General requirements; Part 2: Cold draw wire; Part 3: Quenched and tempered wire; Part 4: Strand; Part 5: Hot-rolled steel bars with a without subsequent processing*.

2.3 Epoxy-coated steel for the reinforcement of the concrete

Appearance of the surfaces, dimensions, mass per 1 m length and permissible deviations, chemical compositions and mechanical properties of epoxy-coated steels for the reinforcement of the concrete shall be in accordance with the specifications of:

- TCVN 7934: 2009 (ISO 14654: 1999), Epoxy-coated steel for the reinforcement of concrete;

2.4 In the case steels for the reinforcement of concrete manufactured at home, imported according to international standards, area standards, national standards, ASTM standards the requirements of appearance of the surfaces, dimensions, mass per
1m length and permissible deviations, mechanical properties of steels for the prestressing of concrete shall be in accordance with the specifications of international standards, standards, national standards, ASTM standards are declared by makers.

Table 1 - Dimensions, mass per 1m length and permissible deviations

<table>
<thead>
<tr>
<th>Nominal bar diameters $d$ mm</th>
<th>Nominal cross sectional area $A_n$ mm$^2$</th>
<th>Mass per 1m length Requirements $b$ kg/m</th>
<th>Permissible deviations $c$ %</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>28,3</td>
<td>0,222</td>
<td>±8</td>
</tr>
<tr>
<td>8</td>
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<td>±8</td>
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<td>±6</td>
</tr>
<tr>
<td>14</td>
<td>154</td>
<td>1,21</td>
<td>±5</td>
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<td>16</td>
<td>201</td>
<td>1,58</td>
<td>±5</td>
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<td>18</td>
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<td>±5</td>
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<td>±5</td>
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<td>25</td>
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<td>±4</td>
</tr>
<tr>
<td>50</td>
<td>1964</td>
<td>15,42</td>
<td>±4</td>
</tr>
</tbody>
</table>

$a$ $A_n = 0,785 4 \times d^2$.  
$b$ Mass per 1m length = 7,85 $\times 10^{-3} \times A_n$.  
$c$ Permissible deviations refer to single bar.  
1) Diameter $d50$ only for ribbed bars.  
2) Permit to use nominal diameters according to international standards, area standards, national standards, ASTM standards are declared by makers different from diameters in Table 1 but shall not contravene of the concerning specifications in this regulation.
3. TEST METHODS

3.1 Mechanical test methods for steel for the reinforcement and prestressing of concrete shall be carried out according to:


Requirements for the isothermal stress relaxation test in 1000h of steels for the reinforcement of concrete manufactured at home are according to standards are declared by makers.

Requirements for the isothermal stress relaxation test in 1000 h of steels for the reinforcement of concrete imported are according to standards are declared by makers and are demonstrated and committed to have been carried out in import report.

3.2 Test methods for epoxy-coated steel for the reinforcement and prestressing of concrete shall be carried out according to:

- TCVN 7934: 2009 (ISO 14654: 1999), Epoxy-coated steel for the reinforcement of concrete;

3.3 In the case steels for the reinforcement of concrete manufactured at home, imported according to international standards, area standards, national standards, ASTM standards the mechanical test requirements shall be in accordance with the specifications of international standards, area standards, national standards, ASTM standards are declared by makers.

4. MARKING

4.1 Labels shall be marked clear and permanently (no fade away).

4.2 Marking on bundle of bar/coil of wire.
4.2.1 Each bundle of bars or coil of wire rod and wire shall have a label.

4.2.2 Label of inland manufactured steel shall include at least the following informations:

- Name, address of the manufacturer;
- Name of product;
- A reference to the applicable standard;
- Steel grade;
- Mass of bundle of bars or coil ;
- Nominal diameter;
- Lot number (manufactured);
- Date of manufacture (month, year).

4.2.3 Additional label in Vietnamese of imported steel for the reinforcement of concrete shall include at least following informations:

- Name and address of the manufacturer;
- Name of the country manufacturing steel for the reinforcement of concrete;
- Name and address of the import organizations or personal
- Name of product;
- A reference to the applicable standard;
- Regulation conformity mark;
- Steel grade;
- Nominal diameter;
- Lot number (manufactured).
- Date of manufacture (month, year).

4.3 Marking on ribbed bars

There shall be a label on each ribbed bars marked in the process of rolling that includes at least the following content:

- Logo or name or abbreviations of manufacturer;
- Symbol of steel grade.: CB 240 or CB2
  CB  300 or CB3
  CB  400 or CB4
  CB  500 or CB5
- Nominal diameter d ;

For example : TISCO CB240d10 or TISCO CB2d10
4.4 In the case steels for the reinforcement of concrete manufactured at home, imported according to international standards, area standards, national standards, ASTM standards the label test requirements shall be in accordance with the specifications of international standards, area standards, national standards, ASTM standards are declared by makers.

5. QUALITY MANAGEMENT

5.1 Inland manufactured steel for the reinforcement of concrete

5.1.1 Inland manufactured steel for the reinforcement of concrete shall declared on the regulation conformity in accordance with the requirements specified in clauses 2 and 4 of this regulation for every category of steel (steel grade and nominal diameter of steel for the reinforcement of concrete), based on one of :

a) the results of certifying the regulation conformity of the certification organization that is designed/approved by the Directorate for Standards, Metrology and Quality.

b) the test results conformed to this regulation of testing laboratory that is designed by the Directorate for Standards, Metrology and Quality in case manufacture is applying the quality management systems. certified conformity with ISO 9001.

The certification of the regulation conformity shall be carried out according to mode 5: Testing the typical sample and assess the process of manufacture; supervision by mean of testing the sample, taken from the production or on the market, combined with the assessment of the process of manufacture (Mode 5 given in Annex II – content, sequence and principle for using assessment modes of the regulation conformity are published following the Decision N° 24/2007/QĐ-BKHCN of the Minister of Science and Technology) and the regulations for assessment of the conformity given in TCVN 1651: 2008.

5.1.2 Inland manufactured steel for the reinforcement of concrete, before bringing in the circulation on the market shall be attached the stamp of regulation conformity on label of bundle or coil of steel for the reinforcement of concrete.

5.2 Imported steel for the reinforcement of concrete

5.2.1 Steel for the reinforcement of concrete imported by lot shall be verified for the conformity of lot to the requirements specified in Clauses 2 and 4 of this regulation or certified for the regulation conformity in accordance with the requirements specified in the clauses 2 and 4 of this regulation for every category of steel (steel grade and diameter of steel for the reinforcement of concrete) by Mode 7: testing the sample, assess the conformity of product, goods lot (specified in the Decision N° 24/2007/QĐ-BKHCN of the
Minister of Science and Technology on the certifications of standard conformity and regulation conformity).

Imported steel for the reinforcement of concrete shall be inspected by the competent government office on the quality in accordance with the regulation of the circular letter No 17/2009/TT-BKHCN with effective date 18/6/2009, Guideline of inspection at the State level on the quality of imported goods under the management responsibility of the Directorate for Standards, Metrology and Quality.

5.2.2 Imported steel for the reinforcement of concrete, before bringing in the circulation on the market shall be attached the stamp of regulation conformity on label of bundle or coil of steel for the reinforcement of concrete.

5.3 Steel for the reinforcement of concrete circulated on the market

5.3.1 Steel for the reinforcement of concrete circulated on the market shall have the stamp of the regulation conformity and label.

5.3.2 Steel for the reinforcement of concrete circulated on the market shall be subject to the inspection at the State level in accordance with the circular letter No 16/TT-BKHCN with effective date 2/6/2009, Guideline of inspection at the State level on the quality of goods circulated on the market. If necessary, steel for the reinforcement of concrete shall be inspected.

5.4. Certification of the regulation conformity, declaration of the regulation conformity, stamp of the regulation conformity and assessment mode for the conformity

Certification of the regulation conformity, declaration of the regulation conformity, stamp of the regulation conformity and assessment mode for the conformity as specified in 5.1; 5.2; 5.3 of this clause shall be realized according to the regulation for certification of the standard conformity, certification of the regulation conformity and declaration of the standard conformity, declaration of the regulation conformity published following the Decision No 24/2007/QĐ-BKHCN of the Minister of Science and Technology.

5.5. Other cases

5.5.1. Depending on the actual situation, for the case of Mode 5 can not apply to the inland manufactured steel for the reinforcement of concrete, Directorate for Standard, Metrology, and Quality will investigate and have the decision applying the certification of the regulation conformity for lot by mode 7.

5.5.2. Steel for the reinforcement of concrete that have been certified for the regulation conformity by mode 5 in accordance with the requirements specified in clauses
6. RESPONSIBILITIES FOR ORGANIZATIONS AND INDIVIDUALS

6.1. Organizations and individuals that manufacture inland steel for the reinforcement of concrete shall realize certification of regulation conformity and declaration of regulation conformity in accordance with requirements specified in clauses 2 and 4 of this regulation and assure the quality of the steel for the reinforcement of concrete complying with the contents declared; realize the responsibility according to the clause 2 of the Regulation for the certification of standard conformity and regulation conformity published following the Decision No 24/2007/QĐ-BKHCN of the Minister of Science and Technology.

6.2 Organizations and individuals that import steel for the reinforcement of concrete shall realize the verification, certification of regulation conformity in accordance with the requirements specified in clauses 2 and 4 of this regulation; register the inspection at the State level for the quality of imported goods and assure the quality of steel for the reinforcement of concrete in accordance with the requirements specified in clauses 2 and 4 of this regulation.

6.3 Organizations and individuals that distribute and retail steel for the reinforcement of concrete shall be only realized the business of product having adequate quality, stamp of regulation conformity and label conforming to the current regulations.

7. ORGANIZE THE REALIZATION

7.1 Directorate for Standard, Metrology, and Quality is responsible to coordinate the relevant functional bodies conducting and organizing the realization of this regulation. Basing on the requirements of management, Directorate for Standard, Metrology, and Quality bears the responsibility to submit the amendments and modifications to this regulation to the Directorate for Standards, Metrology and Quality.

7.2 When the documents and standards using in this regulation are modified, the most recent editions of those shall be apply. For Standard ISO, ASTM using in this regulation that have been published as the corresponding TCVN, these standard TCVN shall be used.