

**HIGH STRENGTH SHAPED STEEL PROFILES**

**Specifications**

**TY 14-11-245-88**

**Edition**

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Present specification covers cold deformed shaped profiles of high strength (further taken as profiles) with solid cross section, meant for manufacturing parts without additional machining or with insignificant additional machining.

*Example of conventional designation:*

Steel profile of good quality manufactured as per drawing 487/1 as per TY 14-11-245-88  
**CΦΠBT 487/1 TY 14-11-245-88**

## **1. Technical Requirements**

Steel profiles of good quality should correspond to the presence specification and drawings.

1.1. Basic parameters and dimensions.

1.1.1. As per the shape and dimension of the cross sectional elements, the profiles are sub-divided into 9 groups.

1.1.2. As per the area of the cross section, the profiles are sub-divided in compliance with those specified in Table 1.

Table 1

Sub group	Cross Section Area, mm <sup>2</sup>		
1	Up to	10	Inclusive
2	Above	10-25	Inclusive
3	Above	25-50	Inclusive
4	Above	50-100	Inclusive
5	Above	100-200	Inclusive
6	Above	200-400	Inclusive
7	Above	400-800	Inclusive
8	Above	800-1500	Inclusive
9	Above	1500-2800	Inclusive
10	Above	2800-5000	Inclusive

1.1.3. Limiting parameters of profile elements.

1.1.3.1. Maximum diameter of circumference is not more than 220 mm.

1.1.3.2. Minimum rounding off radius of internal corners- 1 mm.

1.1.3.3. Minimum rounding off radius of external corners - 0,3 mm.

1.1.3.4. Maximum unspecified rounding of radius - 2 mm.

1.1.3.5. Rounding off radius of internal and external corners with lesser values than those specified above are manufactured if agreed between the parties.

1.1.4. Tolerance zone of dimensions of profile elements should correspond to **JT8-JT12** as per GOST 25346-89

As per the agreement between the parties the tolerance zone can be increased or decreased.

Quality of particular profile is determined by the lowest accuracy class of any element of cross section.

Maximum deviation of dimensions with unspecified tolerance as per class  $t_3$  as per GOST 25670-83.

1.1.5. Profiles are manufactured into bars.

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Profiles with cross section area up to  $250\text{mm}^2$  are manufactured in bars or coils.

1.1.6. Bars are manufactured in:

Standard and (or) multiples of standard length from 1,5 to 6 m;

Non-standard length from 2 to 6 m;

Standard and (or) multiples of standard length from 6 to 8 m – as agreed between the parties.

1.1.7. During supply of profiles, bars of length 1m minimum are permitted in the bar batch of standard or multiples of standard length and for non-standard length- bars of length from 1-2m in quantity 10% maximum from the batch weight.

1.1.8. Maximum deviation of length of bars of standard and multiples of standard length should not exceed the values specified below:

+ 30 mm – For length of bars up to 4 m;

+ 50 mm – For length of bars above 4 m.

1.2. Characteristics

1.2.1. Profiles are manufactured in accordance with the requirements of present specification as per the production cycle and the drawings for particular type of profile, approved in established order.

It is permitted to supply the profiles as per one drawing to several customers and profiles of first group of complexity without preparing the drawing as per the customers order.

1.2.2. Profiles are manufactured from steels of following group:

1.2.2.1. Carbon structural steel of ordinary quality and general purpose as per GOST 380-94;

Carbon steel as per GOST 1050-88;

Low alloy steel for welding structures as per GOST 5781-82;

Alloy steel as per GOST 4543-71, GOST 20072-74, OST 3-98-80;

Spring steels as per GOST 14959-79;

Good and superior machinability as per GOST 1414-75;

For bearings as per GOST 801-78.

1.2.2.2. Tool steel

Carbon steel as per GOST 1435-90;

Alloy steel as per GOST 5950-73;

High speed Tool Steel as per GOST 19265-73.

1.2.2.3. Steels and alloys with special physical properties, corrosion resistant, heat resistant as per GOST 5632-72;

Precision alloys as per GOST 10994-74;

Electro technical un-alloyed steels with standardized coercive force as per GOST 11036-75.

It is permitted to manufacture the profiles from steels of other grades as per the corresponding standard technical document.

1.2.3. The surface of the profile should be free of cracks, scabs, roll marks and depending on the quality, are sub-divided into groups as given in Table 2.

Table 2

Surface quality group	Profile dimension tolerance field	Permissible defects	Maximum depth of the defect
A	JT8 JT9	Separate rolling marks	Fixed as per the agreement
	JT10		1/2 of tolerance field
B	JT10 JT11 JT12	Separate rolling marks, residual scales, dents, ripple marks	Tolerance Field
B	JT10 JT11	Separate rolling marks, residual scales, dents, ripple marks, separate un-rolled bubbles	Tolerance Field
	JT12	Separate rolling marks, residual scales, dents, ripple marks	Tolerance Field
		Separate rolling blisters	Tolerance Field as per JT11

**Note.** Depth of the defect is determined from the actual dimension of the profile.

Oxide films are permitted on the heat-treated surface of the profiles.

Protective coatings are applied on the profile surface after the additional machining at customers end.

For particular/specific type of profiles, it is permitted to confirm/compare the surface rolling characteristics with the approved specimen.

1.2.3.1. As per the requirement of the customer, profiles of quality group A and B are manufactured with standardized surface roughness.

Surface roughness norms are established as per the agreement between the parties.

1.2.4. It is permitted to manufacture profiles with sections of surface and profile elements which are not subjected to cold deformation, if agreed between the parties.

Surface quality of these sections and elements should correspond to the requirements of the GOST 4543-71, GOST 1050-88 or drawing.

1.2.5. As per the requirement of the customer, profiles are manufactured with standardized hardness and mechanical properties. Norms are established as agreed between the parties.

1.2.6. Profiles are supplied in cold hardened or heat treated conditions as agreed between the parties.

1.2.7. As per the requirement of the customer, steel profiles with content of carbon more than 0.3% (as per the lower limit) are supplied with standardizing de-carbonizing layers. Depth of de-carbonized layers are established as per the agreement between the parties.

1.2.8. Curvature of the profiles manufactured into bars should not exceed 2mm in cold hardened condition and 3mm in heat treated condition for 1m length.

If agreed between the parties, the bar profiles are manufactured with curvature of 1, 0.5mm and less on 1m length or with non-standardized curvature.

The total curvature of the bar should not exceed the product of curvatures on 1m length by the bar length, in meters.

As per the requirement of the customer, the profiles in coils are manufactured with standardized curvature. Value of the curvature is established as agreed between the parties.

1.2.9. Twisting of the profiles around the longitudinal axis should not exceed  $3^0$  for 1m length.

The profiles are manufactured with twisting of  $2^{\circ}$ ,  $1^{\circ}$  and less or with non-standardized value of twisting as agreed between both the parties.

1.2.10. Bars are manufactured with single trimmed end. The second end may not be trimmed under the conditions of maintaining the profile parameters at a distance above 75mm from the face. If required by the customer, both ends of the bars are trimmed.

Burrs and also scuffing of bar ends (distorted ends) on sections are permitted if they do not exceed the maximum deviation on length.