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## Forgings made of structural carbon and alloy steel

General technical specification

IS: 8479-70 ✓

INDICATIVE DRAWINGS

FOR REFERENCE ONLY

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Modification NO.3 GOST 8479-70 Forgings made of structural carbon and alloy steels of Group B05  
Technical Specifications.  
Introduction period is established by the decision of state committee of USSR on standards from 23.06.86 No. 1671.

From 01.01.87

Point 1.1. Replace words: <<depending on the purpose>> by <<according to the types of tests>>.  
Point 1.3 Add the note: <<Note. Group of quality on forgings according to results of ultrasonic inspection established in correspondence with GOST 24507-80>>  
Point 1.7. Replace the reference: GOST 7062-67 by GOST 7062-79  
Point 1.9. Second paragraph. Delete the words: <<for all groups>>;  
Table 2. Name of column <<category of strength>>, add with code KII: Kgf/mm<sup>2</sup>  
For category of strength KII 215, replace the value of ultimate strength: 400 by 410;  
For category of strength KII 685, replace the value of yield point: 675 by 685;  
Add table with notes - 3, 4: <<3. According to the agreement between manufacturer and customer, it is permitted to determine instead of yield point ( $\sigma_{0.2}$ ), physical yield point ( $\sigma_T$ ) with the observance of norms for ( $\sigma_{0.2}$ ), specified in table 2>>.  
4. For thickness (diameter) of forging, take its calculated cross section for heat treatment>>  
Point 1.16 after words <<in rough form and>> add with word: <<(or)>>; after words <<(roughing, reaming etc)>> write down in new edition: <<According to the agreement between customer and manufacturer it is permitted only preliminary heat treatment of forging. It is permitted not to heat treat the forging of group >>  
Point 1.20. Replace the words: <<(with calculation of positive deviation)>> by <<(with calculation of positive deviation for external diameter and negative-for inside dimensions and cavities)>>  
Point 2.3. Table 4. Note 2 add with words: <<in this case hardness is additional delivery characteristic>>  
Point 2.7. Replace references: GOST 12357-66 by GOST 12357-84, GOST 12364-66 by GOST 12364-84, GOST 12365-66 by GOST 12365-84  
Point 2.7 Write down the last paragraph in new edition:  
<<During this, sample should pass all heating, including for forging or stamping and also simultaneously with forging of this batch- heat treatment>>  
Point 2.12 after the words: <<from body of forging>> add with words: << in such a way that their axis would be located>>.  
Point 2. 13 after the words <<samples are cut>> add with words: <<in such a way that their axis would be located>>  
Point 2.19 add with paragraph: <<while it is impossible to carry out testing on brinell device, it is permitted to determine the hardness by other devices, ensuring accuracy  $\pm 10\%$  of hardness number HB>>  
Point 3.2. Place in new edition: <<3.2 for forging with weight up to 10 kg, it is permitted to mark the batch on tag>>  
Point 3.3. Place fourth paragraph in new edition: << quantity of forgings in batch and their weight (for V group - forging number)>>  
Annexure. Name of column <<category of strength>> add with code KII: Kgf/mm<sup>2</sup>;  
Category of strength KII 275 and KII 345 for diameters from 500 to 800 mm add with grade of steel: 15 X1M1Φ,  
Category of strength KII 275 for diameters from 100 to 300 mm and from 300 to 500 mm; KII 315 for diameters up to 100 and from 100 up to 300 mm; KII 345 for diameters from 500 up to 800 mm; KII 395 for diameters from 100 to 300 mm, from 300 to 500 mm and 500 to 800 mm; KII 440 for diameter from 100 to 300 mm and from 300 to 500 mm; KII 490 for diameter from 100 to 300 mm add with grade of steel: 34 XM (34XMA)

(HYC No. 9 1986)

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THE STATE STANDARD OF USSR

Forging made of structural carbon and alloy  
Steel  
General technical specification  
OKII 41 2100

GOST  
8479-70\*

Supersedes  
GOST 8479-57

Introduction period is established by the decision of State Committee on Standards of council Ministers of USSR from 15 January, 1970 No. 59.

from 01.01.71

**Non-observance of Standard is dealt according to rules.**

This standard pertains to forgings of general purpose with diameter (thickness) up to 800 mm made of structural carbon, low-alloyed and alloyed steel, manufactured by forging and hot stamping.

Standard establishes groups of forgings and basic technical requirements for acceptance and their delivery.

Standard does not change the existing standards and technical specifications by separate form of forgings, to which special requirements on method of production, quality of surface, use of special form of heat treatment etc. are given.

(Amended edition, Amendment No.1)

**1. Technical requirement**

- 1.1 Forgings should be manufactured in accordance with the requirements of this standard according to drawings, approved in established order and standard technical documents on specific production. Forgings depending on purpose are divided in to groups, specified in table 1
- 1.2 Relation of forging to one group or another is carried out by user, the number of group is specified in technical requirements on drawing of part.
- 1.3 According to the requirement of customer, delivery of forgings should be carried out with additional tests, not given in this standard (checking for hairline cracks, sample according to)

Republished (July 1982) with Modifications No. 1 and 2, approved in March 1977, December 1982, established 5874 31.12.81 (HYC 5-77,3-82)

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Group of forgings	Type of tests	Condition of group setting the batch	Delivery characteristic
I	Without testing	Forgings made of one or different grade of steel	-----
II	Determination of hardness	Forgings made of same grade of steel, passed heat treatment jointly	Hardness
III	Determination of hardness	Forgings made of same grade of steel, passed heat treatment as per same grade.	Hardness
IV	1. Tensile test 2. Determination of impact strength 3. Determination of hardness	Forgings made of same grade of steel, passed heat treatment jointly.	Yield point Relative reduction in area Impact strength
			-----
V	1. Tensile test 2. Determination of impact strength 3. Determination of hardness	Each forging is accepted individually	Yield point Relative reduction in area Impact strength
			-----

INDICATIVE DRAWINGS

1. Deleted.
2. Forgings, passed heat treatment jointly in conveyer furnace, are considered forgings subsequently loaded into the furnace without break.
3. Customer has a right to assign other combinations of delivery characteristics for forgings of IV and V groups, instead of those established in table 1
4. It is permitted to determine the hardness of forgings of V group on samples for mechanical tests.

**(Amended edition, Amendment No. 1 and 2)**

Baumann, ultrasonic and periscopical inspection, determination of value of residual stress, yield point at working temperatures, determination of impact strength at operating and minus temperatures, macro and micro analysis of steel structure, bending test, determination of grain size etc. During this forgings also relates to one of the groups: II, III IV and V in accordance with table 1

Type, volume, norms and methods for additional testing are specified in forging drawing or indent.

**(Amended edition, Amendment, No., 1)**

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1.4 (Deleted, Amendment No.2)

1.5 Following can be used as initial material for manufacturing the forgings:

Ingots, cogged ingots (blooms), forged or rolled blanks, and similarly blanks from setting with continuous casting of steel (YHPC) and different forms of rolling.

1.6 Forgings are manufactured from carbon, low-alloyed and alloyed steel and according to chemical composition should correspond to the requirements of GOST 380-74, GOST 1050-74, GOST 19281-73, GOST 4543-71 and other existing standards or technical specifications.

Recommended grades of steel depending on the diameter (thickness) of forgings and required category of strength after final heat treatment are given in annex 1.

(Amended edition, Amendment No.1)

1.7 Dimensions of forgings should consider machining allowances, tolerances on dimensions and overlap on forgings, manufactured with forging on presses according to GOST 7062-67, manufactured by drop forging according to GOST 7829-70 and manufactured by hot stamping/hot die forging according to GOST 7505-74 and similarly overlap on sample for inspection tests.

It is permitted for forgings with weight of more than 100 T, manufactured by forging on presses, to establish allowances and overlaps in standard technical documents on specific forging.

(Amended edition, Amendment No. 2)

1.8 (Deleted, Amendment, No.1)

1.9 According to the mechanical properties of forging, supplied after final heat treatment are divided into categories of strength. Categories of strength, which correspond to their norms of mechanical properties, determined during testing on longitudinal samples and norms of hardness are given in table 2.

Norms of hardness for forgings of II and III group and category of strength for forgings of IV and V groups are established according to the agreement between the manufacturer and the customer. Grade of steel for all groups is established according to the agreement between the manufacturer and customer and is specified in drawings of parts and forging.

According to the requirement of customer, ultimate tensile strength should be higher than those specified in table 2 for assigned categories of strength, not more than:

120 MPa (12 Kgf/mm<sup>2</sup>) with required  $\sigma_B$  less than 600 MPa (60 Kgf/mm<sup>2</sup>),

150 MPa (15 Kgf/mm<sup>2</sup>) with required  $\sigma_B$  600-900 MPa (60-90 Kgf/mm<sup>2</sup>),

200 MPa (20 Kgf/mm<sup>2</sup>) with required  $\sigma_B$  more than 900 MPa (90 Kgf/mm<sup>2</sup>),

(Amended edition, Amendment No.2)

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Table 2

Categories of strength	Mechanical Properties, not less than													Hardness according to Brinell (on surface of forging)		
	Yield point $\sigma_{0.2}$	U.T.S. $\sigma_B$	Relative elongation $\delta_5$ in %				Relative reduction in area $\psi$ , in %				Impact strength KCU J/m <sup>2</sup> x 10 <sup>4</sup> (Kgf. m/cm <sup>2</sup> )					
			Diameter (thickness) diameter of forging of round section													
	MPa (Kgf/mm <sup>2</sup> )	Up to 100	Above 100 to 300	Above 300 to 500	Above 500 to 800	Up to 100	Above 100 to 300	Above 300 to 500	Above 500 to 800	Up to 100	Above 100 to 300	Above 300 to 500	Above 500 to 800	Hardness HB No.	$d_{ind}$ in mm	
KП 175	175 (18)	355 (36)	28	24	22	20	53	47	45	40	64 (6.5)	59 (6.0)	54 (5.5)	49 (5.0)	101-143	5.85-5.00
KП 195	195 (20)	390 (40)	26	23	20	18	53	50	45	38	59 (6.0)	54 (5.5)	49 (5.0)	44 (4.5)	111-156	5.60-4.80
KП 215	215 (22)	430 (40)	24	20	18	16	53	48	40	35	54 (5.5)	49 (5.0)	44 (4.5)	39 (4.0)	123-167	5.35-4.65
KП 245	245 (25)	470 (48)	22	19	17	15	48	42	35	30	49 (5.0)	39 (4.0)	34 (3.5)	34 (3.5)	143-179	5.00-4.50
KП 275	275 (28)	530 (54)	20	17	15	13	40	38	32	30	44 (4.5)	34 (3.5)	29 (3.0)	29 (3.0)	156-197	4.80-4.30
KП 315	315 (32)	570 (57)	17	14	12	11	38	35	30	30	39 (4.0)	34 (3.5)	29 (3.0)	29 (3.0)	167-207	4.65-4.20
KП 345	345 (35)	590 (60)	18	17	14	12	45	40	38	33	59 (6.0)	54 (5.5)	49 (5.0)	39 (4.0)	174-217	4.55-4.10
KП 395	395 (40)	615 (63)	17	15	13	11	45	40	35	30	59 (6.0)	54 (5.5)	49 (5.0)	39 (4.0)	187-229	4.40-4.00
KП 440	440 (45)	635 (65)	16	14	13	11	45	40	35	30	59 (6.0)	54 (5.5)	49 (5.0)	39 (4.0)	197-235	4.30-3.95
KП 490	490 (50)	655 (67)	16	13	12	11	45	40	35	30	59 (6.0)	54 (5.5)	49 (5.0)	39 (4.0)	212-248	4.15-3.85

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Continuation of Table 2

Categories of strength	Mechanical Properties, not less than													Hardness according to Brinell (on surface of forging)		
	Yield point $\sigma_{0.2}$	U.T.S. $\sigma_B$	Relative elongation $\delta_5$ in %				Relative reduction in area $\psi$ in %				Impact strength KCU $J/m^2 \times 10^4/Kgf. m/cm^2$					
	MPa (Kgf/mm <sup>2</sup> )		Diameter (thickness) diameter of forging of solid section													Hardness HB No.
		Up to 100	Above 100 to 300	Above 300 to 500	Above 500 to 800	Up to 100	Above 100 to 300	Above 300 to 500	Above 500 to 800	Upto 100	Above 100 to 300	Above 300 to 500	Above 500 to 800			
KII 540	540 (55)	685 (70)	15	13	12	10	45	40	35	30	59 (6.0)	49 (5.0)	44 (4.5)	39 (4.0)	223-262	4.05-3.75
KII 590	590 (60)	735 (75)	14	13	12	10	45	40	35	30	59 (6.0)	49 (5.0)	44 (4.5)	39 (4.0)	235-277	3.95-3.65
KII 640	640 (65)	785 (80)	13	12	11	10	42	38	33	30	59 (6.0)	49 (5.0)	44 (4.5)	39 (4.0)	248-293	3.85-3.55
KII 685	675 (70)	835 (85)	13	12	11	10	42	38	33	30	59 (6.0)	49 (5.0)	39 (4.0)	39 (4.0)	262-311	3.75-3.45
KII 735	735 (75)	880 (90)	13	12	11	—	40	35	30	—	59 (6.0)	49 (5.0)	39 (4.0)	—	277-321	3.65-3.40
KII 785	785 (80)	930 (95)	12	11	10	—	40	35	30	—	59 (6.0)	49 (5.0)	39 (4.0)	—	293-331	3.55-3.35

**Note :**

- Categories of strength are denoted by letters KII and digits, indicating yield point.
- (Deleted, Amendment, No.2)

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1.10 According to the agreement between the manufacturer and customer for forgings of group IV and V, increased norms of plastic properties and impact strength can be assigned in comparison with those specified in table 2. In this case, additional letter C (Special) is added with the category of strength and the required characteristics are noted down on the forging drawing.

(Amended edition, Amendment No. 1 and 2)

1.11 According to the determination of mechanical properties of forging on cross-sectional tangential or radial samples, it is permitted to decrease the norms of mechanical properties in comparison with those given in table 2 to values specified in table 3.

Indices of mechanical properties	Permissible reduction in norms of mechanical properties in %			
	For cross-sectional samples	For radial sample	For tangential samples	
			Forgings with diameter up to 300 mm	Forgings with diameter above 300 mm
Yield strength	10	10	5	5
Ultimate tensile strength	10	10	5	5
Relative elongation	50	35	25	30
Relative reduction in area	40	35	20	25
Impact strength	50	40	25	30

**Note :** For ring type forgings, manufactured by rolling, norms of mechanical properties, obtained during testing of tangential samples, are set according to the norms for longitudinal samples.

1.12 Example of conventional codes

Forgings of group I:

*Gr. I GOST 8479-70*

Forgings of group II (III) with hardness HB 143-179:

*Gr. II (III) HB 143-179 GOST 8479-70*

Forgings of group IV (V) with category of strength KII 490:

*Gr IV (V) KII 490 GOST 8479-70;*

Forgings of group IV with category of strength KII 490, relative reduction in area is not less than 50%, impact strength KCU not less than  $69 \text{ J/m}^2 \times 10^4$  (7 Kgf/cm<sup>2</sup>).

*Gr. IV-KII 490C-ψ ≥ 50-KCU ≥ 69 GOST 8479-70*



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Forging of group IV with category of strength KII 490 Ultimate Tensile Strength  $\sigma_B$  not less than 655 MPa, relative elongation  $\delta_5$  is not less than 14 % and impact strength KCU not less than  $64 \text{ J/m}^2 \times 10^4$

*Gr. IV-KII 490- $\sigma_B \geq 655$ - $\delta_5 \geq 14$ -KCU  $\geq 64$  GOST 8479-70*

**(Amended edition, Amendment, No., 2)**

- 1.13 Cracks, overlapping, flaws and sand should not be on the surface of forgings. On unprocessed surface of forgings, nicks from slag/scales and dents and similarly shallow cutting or dressing of defects are permitted under the condition that the depth of specified defects does not exceeds the limits of smallest permissible dimensions of forgings according to GOST 7062-79 or according to standard technical documents for forgings with weight more than 100 T. Defects are not permitted on surfaces of forgings, which are subjected to caulk. Separate defects are permitted without removing their depth, determined by final cutting or by dressing on the machined surfaces of forgings does not exceed 75 % of actual one sided non-machining allowance for forgings, manufactured by forging, and 50% for forgings, manufactured by stamping.

**(Amended edition, Amendment, No.2)**

- 1.14 On forgings made of carbon and low-alloy steel with depth of surface defects, which exceeds actual one-sided machining allowance, it is permitted to remove the defects by shallow cutting with subsequent welding. Permissible depth of welding should be agreed with the customer.
- 1.15 Forgings should not have hairline cracks, crack grain boundary cracks, whose absence is guaranteed by manufacturing plant. Forgings, in which above mentioned defects are detected, are broken and all remaining forgings of this batch can be considered as suitable only after individual inspection.
- 1.16 Mode of heat treatment is established by manufacturing plant Forgings are subjected to heat treatment in rough form and after preliminary machining (roughing, reaming etc.). According to the agreement between the customer and manufacturer, forgings are supplied after preliminary heat treatment.

**1.14-1.16 (Amended edition, Amendment No. 1)**

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1.17 Forgings, which have undergone straightening in cold or hot condition after heat treatment, should be subjected to tempering for removal of internal stresses.

Forgings of group I, II and III can be supplied without subsequent tempering with guarantee of manufacturing plant for requirement properties after straightening.

1.18 According to the agreement of both sides, the forgings are subjected to dressing to remove the slag/scales.

Method of dressing is specified in drawing or conditions of indent

1.19 (Deleted, Amendment No.1)

1.20 Weight of forgings, determined according to GOST 7062-91, should not exceed the calculated weight, determined according to maximum sizes of forging (based on positive deviation).

(Amended edition, Amendment No. 2)

**Method of testing**

2.1 Batch is completed by manufacturing plant from forgings manufactured according to same drawing. Conditions of completing the batch are given in table 1.

Forgings, made of same grade of steel according to different drawings, close to configuration and dimensions are permitted to add in batch.

(Amended edition, Amendment, No.1)

2.2 Each forging should be subjected to visual inspection without using the magnifying devices, if, according to the condition of indent other method of inspection is not provided.

2.3 For each group of forgings with exception of group I volume of required tests is established and specified in table 4

**Table 4**

Group of forgings	Type of tests	Qty. of forgings from batch, subjected to testing.
I	Without testing	-----
II	Determination of hardness	5% from batch but not less than 5 pcs.
III	Determination of hardness	100 %

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 Cont. of Part 1  
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Group of forgings	Type of tests	Qty. of forgings from batch, subjected to testing.
IV	1. Tensile test	Up to 100 pcs- 2pcs., above 100 pcs – 1%, but not less than 2 pcs. (Forging with lower and upper limits of hardness)
	2. Determination of impact strength	
	3. Determination of hardness	
V	1. Tensile test 2. Determination of impact strength 3. Determination of hardness	100%

**Note :**

- Quantity of forgings of group II which are subjected to testing can be increased according to the agreement with customer
- For forgings of IV groups, it is permitted to carryout determination of mechanical properties on forgings without lower and upper limits of hardness but with norms of hardness, which are located within the limits of assigned categories of strength.
- For forgings of IV groups, it is permitted to carryout the determination of mechanical properties on same forging with number of forgings in batch up to 20 Pcs, if differences in imp. on hardness of whole batches should not exceed 0.30 mm for KII 18-KII45 and 0.20 mm for KII 50-KII 80

INDICATIVE DRAWINGS

- Volume of checking the forgings, supplied after preliminary heat treatment, is specified in drawing of forgings.

**(Amended edition, Amendment No. 1 and 2)**

- 2.4 Sampling for determining the chemical composition of metal for forging is carried out according to GOST 7565-73.
- 2.5 Chemical analysis of metal for forgings is carried out according to GOST 22536.077- GOST 22536.13-77; GOST 12344-78, GOST 12345-80; GOST 12346-78, GOST 12347-77, GOST 12348-78, GOST 12349-66, GOST 12350-78, GOST 12351-81, GOST 12352-81, GOST 12353-78, GOST 12354-81, GOST 12355-78, GOST 12356-81, GOST 12357-66 GOST 12361-66, GOST 12362-79, GOST 12363-79, GOST 12364-66, GOST 12365-66, GOST 18895-73.

During manufacturing of forgings from metal, melted, in manufacturing plant, the chemical composition of steel is determined by melting analysis of forging sample.

During manufacturing of forgings from rolled stock and ingots of grade of steel and chemical composition are established by documents about quality of manufacturing plant of metal.

**(Amended edition, Amendment, No. 2)**

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2.6 Mechanical properties of forgings are determined by longitudinal, cross-sectional and radial samples. Type of sample, if it is not specified in drawing of part, is established by manufacturer.

**(Amended edition, Amendment, No. 2)**

2.7 Samples for determining the mechanical properties of forgings of group V are cut from overlaps, left out on each forging, and of group IV from overlap for samples or from body of forgings, for which additional number of forgings are made.

It is permitted to cut the specimens for mechanical tests of forgings of group IV from sample of same or large section, separately forged from the metal of same melting and according to mode, analogous for forgings.

In this case sample should be heat treated with forgings of the given batch.

2.8 Form, dimensions and location of overlap for samples are determined by forging drawing. Dimensions of overlap for samples should be sufficient for the preparation of all required specimens.

During manufacturing of one forging from an ingot, the overlap for samples should be from the side of feeder part metal head.

On forgings, types of shaft and strakes with length above 3 m, with appropriate indication on drawing of forging, overlap for samples should be provided from two ends.

2.9 Overlap for samples from forgings made of alloyed steel should be separated by cold method, and from forgings made of carbon and low-alloyed steel-according to the observation of manufacturing plant.

2.10 Specimens for mechanical tests, subjected to additional heat treatment or any other heating are not permitted.

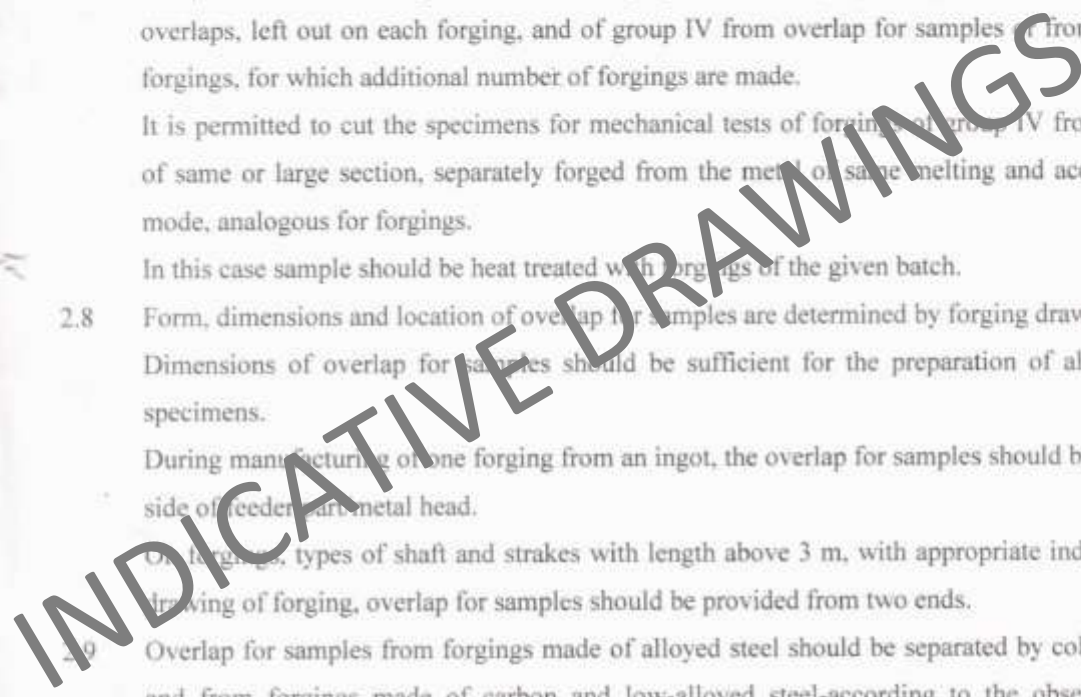
2.11 During manufacturing of several parts from same forging, one sample is taken according to the results of testing by which acceptance of all parts manufactured from this forging is carried out

2.12 Specimens for mechanical tests of forgings of cylindrical and prismatic form are cut from overlap or from the body of forging at a distance of 1/3 of radius or 1/6 of diagonal from external surface of forging.

2.13 During cutting of specimens from hollow or reamed forgings with wall thickness up to 100 mm, specimens are cut at a distance 1/2 of wall thickness of forging, and while thickness more than 100 mm- at a distance 1/3 of wall thickness of forging from the external surface.

During manufacturing of cross-sectional and tangential specimens, their axis should pass at the same distance as for longitudinal specimens.

**(Amended edition, Amendment No. 1)**



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- 2.14 Place for cutting of samples from forgings of non-cylindrical and non-prismatic forms in the absence of appropriate instructions on drawing of part is established by manufacturing plant.
- 2.15 Blanks for specimens can be taken from forgings (not from overlap) by the means of cut by core drill or grooving, obtained during machining of forgings.
- 2.16 Quality of specimens for mechanical tests from each sample should be: one- for tensile, two- for impact strength.
- 2.17 Manufacturing of specimens and tensile test are carried out according to GOST 1497-73 on specimens of five-fold length with diameter of calculated part 10 mm. Specimens of five-fold length may be used with diameter of calculated part of 6 or 5 mm.
- 2.18 Manufacturing of specimens and tests on impact strength are carried out according to GOST 9454-78 on specimens of type 1
- 2.19 Determine Brinell hardness as per GOST 9012-90
- 2.20 While obtaining unsatisfactory results of mechanical tests at least in one of the indices, then repeated test is carried on doubled the quantity of specimens, taken from the same batch of forgings.  
If after repeated testing, positive indices are obtained, entire batch of forgings is considered suitable.  
If after repeated testing even in one of the samples gives unsatisfactory indices, batch of forgings is subjected to repeat heat treatment.
- 2.21 Number of repeated heat treatment should not be more than two.  
Additional tempering is not considered as heat treatment and number of tempering is not limited. After each heat treatment or additional tempering the batch of forging is tested as produced again.  
Third heat treatment in the form of improvement is permitted on large forgings, in case when normalization with tempering does not ensure the required mechanical properties.
- 2.20, 2.21 (Amended edition, Amendment No.1)**
- 2.22 (Deleted, Amendment No. 1)**
- 2.22 The rules of sampling should be used for verification test by the user for quality of blanks and corresponding to their requirements of this standard and methods of testing, specified above.

### 3. MARKING, TRANSPORTATION AND STORAGE

- 3.1 Place of marking is specified in the drawing of forging.  
Marking should be clear and contain information, specified in table 5.

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Groups number	Type of marking			
	Q.C. stamp	Drawing number of part	Melt number and grade of steel	Forgings number
I	Specified	Specified	-	----
II	- do-	- do-	Specified	----
III	- do-	- do-	- do-	----
IV	- do-	- do-	- do-	----
V	- do-	- do-	- do-	Specified

**Note :** Type of marking of the die-forged forgings to be according to the agreement between the customer and manufacture.

**(Amended edition. Amendment No. 1)**

3.2 Marking on tags is permitted for small forgings.

3.3 Each batch of forgings or forging is accepted by quality control and is accompanied by documents about quality in which following is indicated:

Name or trademark of manufacturing plant;

order number;

quantity of forgings in batch and their weight; drawing number;

grade of steel and code of standard or technical specification.

chemical composition;

melting number;

forgings group;

Category of strength for IV and V groups or standards of hardness for forging of groups II and III and code of this standard;

Type of heat treatment;

Results of tests, provided by this standard;

Results of additional tests, provided by forging drawing or condition of indent.

**Note :** Content of accompanying documents on forgings, manufactured by volumetric die forging/stamping, established according to the agreement between the customer and manufacturer.

3.4 Forgings should be stored in dry closed storage premises.

It is permitted to store the forgings under shed or on piers.

3.5 **(Deleted, Amendment No. 1)**

Note :- These Drawings are only for reference. Actual Drawings may be different and shall be issued at the time of procurement

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**Grades of steel depending upon the diameter (thickness) of forgings and required category of strength**

Category of strength	Diameter (Thickness) of forging in mm			
	Up to 100	From 100 to 300	From 300 to 500	From 500 to 800
КП 175	15*, 20*, 25, CT 3*	CT3*, 15*, 25*, CT5*	20*, 25*, 30*, CT5*	20*, CT5*, 30*, 35*
КП 195	CT 3*, CT3ГCP*, 15*, 20*, 25*, 15X*, 20X, 15XM*	CT3*, CT15XM*, 20*, 25*, 30*, CT5*, 15X*, 20X*, 12X1MΦ*	CT5*, 25*, 30*, 35*, 20X*, 22K*	CT5*, 30*, 35*, 22K*
КП 215	20*, 25*, 10Г2*, 20X*, 15XM*, 12X1MΦ*	20*, 25*, 30*, 35*, 20X*, 15XM*, 10Г2*, 22K*, 16ГC*, 12X1MΦ*	30*, 35*, 40*, 10Г2*, 22K*, 12X1MΦ*	30*, 35*, 40*, 22K*, 1XГ2*, 12X1MΦ*
КП 245	25*, 30*, 35*, CT5, 20X*, 12X1MΦ*, 15XM*, 20ГC*	25, 30*, 35*, 40*, 45*, 20X, 12XM*, 15XM*, 16ГC*, 20ГC*, 12X1MΦ*	30*, 35*, 40*, 45*, 40, 25ГC*, 35XM*, 12X1MΦ*	45*, 25ГC*, 40X*, 35XM*
КП 275	35*, 40*, 45*, 20X*, 25ГC*, 15XM*	25, 35, 40*, 50*, 20X, 25ГC*, 12XM*, 15XM*, 35Г2*, 35XM*	40, 45, 40X*, 25ГC*, 15XM*, 35XM*	40, 40X, 25ГCA
КП 315	35, 45*, 50*, 40X*, 45X*, 15XM*, 50Г2*, 35XM*	40, 45, 40X*, 55*, 50Г2*, 35XM*, 40XH*, 20X	45, 45X*, 40X, 40XH*, 38XГH, 34XH1M	40X, 45X*, 45X, 40XH*, 38ГH*
КП 345	40, 45, 15X, 40X*, 50Г2*, 45X*, 50X*, 15XM*, 35XM*, 38XГH*	45, 15XM, 20X, 40X, 45X*, 50X*, 50Г2*	40X, 45X*, 40XH, 50X*, 38XГH	45X, 50X, 38XГH, 35XM

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Category of strength	Diameter (Thickness) of forging in mm			
	Up to 100	From 100 to 300	From 300 to 500	From 500 to 800
КП 395	45, 30X, 40X, 50Г2*, 15XM, 30XMA, 40XH, 30XГС*, 34XH1M*, 18XГТ	35X, 40X, 45X, 35XM, 35XM, 40XΦA, 40XH, 38XГH, 15X1M1Φ, 34XH1M*	40X, 45X, 40XH, 35XM, 38XГH, 40XΦA	40X, 35XM, 38XГH
КП 440	40X, 35XM, 40XH, 38XГH, 25X1M1Φ*, 34XH1M, 30XMA, 15XM	40X, 45X, 35XM, 40XH, 30XMA, 35XMA, 25X1M1Φ, 34XH1M, 45XHM*	40X, 35XM, 40XH, 34XH1M, 38XГH, 45XHM	40XH, 34XH1M, 45XHM*, 38X2H2MA, 40XH2MA
КП 490	55, 55X, 35X, 40X, 45X, 15XM, 35XM, 30XГСА, 30XMA, 38XM, 38XГH, 40XH, 25X1MΦ	40X, 45X, 35XM, 40XH, 40XH, 30XГСА, 35XГСА, 38XГH, 25X2M1Φ, 25X1M1Φ, 20X1M1Φ1ГP, 34XH1M, 40XH2MΦA, 45XHM*	34XH1M, 30XH2MΦA, 40XH2MA, 45XHM	34XH1M, 40XH2MA
КП 540	38XC, 40XH, 40XΦA, 30XГH, 34XH1M, 25X1M1Φ, 30XГСА	45X, 50X, 35XH, 40XH, 30XHMA, 40XΦA, 35XГСА, 38XГH, 34XH1M, 40XH2MA	34XH1M, 40XH2MA	45XHM
КП 590	45X, 38X, 38XГ, 35XГСА, 35XM, 40XH, 45XH, 38XГH, 20XH3A, 25X1MΦ, 30XГСА	50X, 34XHMA, 40XH, 25X1M1Φ, 38X2M1OΛ, 35XHMA, 30XГСА, 34XH1M, 20X1M1Φ1ГP, 25X2M1Φ, 40XH2MA, 34X1MA, 45XHM	34XH1M, 40X2H2MA, 45XHM	40XH2MA, 45XHM
КП 640	45X, 50X, 45XH, 30XГСА, 35XГСА, 34XH1M	34XH1M, 40XHMA, 34XH3M*	34XH3M, 38XH3MA, 40XH2MA, 40X2H2MA	38XH3MA, 38X3MΦA, 34XH3M, 35XH1M2ΦA, 36X2H2MΦA



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Category of strength	Diameter (Thickness) of forging in mm			
	Up to 100	From 100 to 300	From 300 to 500	From 500 to 800
КП 685	30ХГТ, 30ХГСА, 20ХН3А, 20Х1М1Ф1ТР, 20ХН3А, 25Х2М1Ф*, 34ХН1М, 34ХН3М*	50ХФА, 25Х1М1Ф, 25Х2МФ1, 34ХН3М*, 34ХН1М, 38ХН3МА*, 38ХН3МФА*, 40ХН2МА	34ХН3М*, 38ХН3МА*, 38Х3МФА*, 38ХН2МА, 38ХН4МА, 45ХНМ	38ХН3МА, 38ХН3МФА, 34ХН3М, 36Х2Н2МФА
КП 735	34ХН1М, 40ХН2МА, 34ХН3М*, 40Х2Н2МА, 38Х2Н2МА	34ХН3М*, 40ХНМА, 38ХН3МА, 38ХН3МФА*, 18ХН4МА	34ХН3М, 38ХНМА, 36Х2Н2МФА	34ХН3М, 38ХН3МФА
КП 785	18Х2Н4ВА, 38ХН3МФА*, 34ХН3МА*, 38Х2Н2МА, 40ХН2МА	34ХН1МФА, 34ХНМА, 36Х2Н2МФА, 38ХН3МФА, 40ХН2МА, 38Х2Н2М	34ХН3МА, 38ХН3МФА, 38ХН3МА, 36Х2Н2МФА	-----

**Note :** Symbol << \* >> denotes that steels in normalized condition, in other grades of steel correspond to the category of strength, ensured by hardening and tempering.  
(Amended edition, Amendment No. 1 and 2)