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SECTORAL STANDARD

SHELL BODIES FOR ARTILLERY CARTRIDGES Specifications	OST B 84-748-81 This supersedes OST B 84-748-72 and is valid upto 01.01.1987.

The present standard relates to assembled shell bodies of small calibre artillery cartridges of less than 57 mm calibre and to the component parts of these assembled bodies.

The term "assembled shell body" here means the body of the shell together with rotating bands and other component parts indicated in the design documentation but without the fuse (top or bottom fuse) and without the charging of the (top or bottom) chamber.

Further on in the text, the assembled body is referred to as the "shell".

This standard defines the requirements applicable to shells and their component parts in the course of their manufacture, acceptance inspection, packing, storage and transport. P-2

1. TECHNICAL REQUIREMENTS

1.1. GENERAL REQUIREMENTS

1.1.1. Shells and their component parts must be manufactured in accordance with the requirements of the present standard and to technical documentation approved in the established manner.

1.1.2. The first trial batch of shells produced while mastering production is tested in order to verify conformity of the shells with the requirements of the design documentation and to verify the

tability of the technological process. The trial batch is also imilarly tested when production is resumed after an interruption f over one year. The scope of these tests is the same as the scope f periodic tests.

When production has stabilized itself, periodic tests are arried out in accordance with a schedule covering frequency and cope of testing worked out by the manufacturer and coordinated with he customer's representative. Periodic tests are to be carried out t least once a year.

The scope of periodic testing must be defined in the design ocumentation relating to the shell.

1.1.3. Requirements relating to external appearance of shells nd their parts, other than those envisaged in the design ocumentation are checked with the aid of control specimens.

1.1.4. Metal must be issued to production strictly melt-wise or making bodies which are to be heat treated. Production perations on the body subsequent to heat treatment may be carried ut without melt-wise separation.

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1.1.5. The heat treatment schedule for each melt must be ecided upon by checking the shell bodies for conformity with the equirements of the design documentation. The schedule must be ecided upon before metal is issued to production for bodies which re to be heat treated.

1.1.6. The technological process of heat treatment must not lead o the formation of cracks on the heat treated bodies. Bodies heat-reated with infringement of the technological process are rejected. e-heat-treatment is not allowed. The time interval between the perations of hardening and "tempering" for heat treated shell bodies

is decided upon by the manufacturer but must not exceed 1 hour.

1.1.7. Dimensions which have not been assigned limit deviations in the design documentation must be ensured by the technological process and must be executed to the limit dividations of $\pm \frac{t_2}{2}$ (ie. CM_7 defined in OST 1010).

1.1.8. Rims and edges which according to the design documentation are required to be sharp may be blunted by not more than 0.1 mm.

Rims and edges not specified in the design documentation must be blunted by not more than 0.2 mm in the form of a chamfer or rounding off.

1.1.9. If the raduis of contact or the kind of contact is not specified in the design documentation, the contact or blunting may be executed with a radius or chamfering of not more than 0.2 mm. P-4

1.1.10. Mandatory annexure 1 to this standard contains the (additional) requirements applicable to shells and their component parts whose design documentation has not been formulated in accordance with the ЕСКД (ESKD) (USDD) Unified System of Design Documentation.

1.1.11. Burrs must be removed from shells and their component parts. Deburring may result in blunting the edges and rims to the dimensions indicated in para 1.1.8. of the present standard for specified and unspecified edges and rims respectively.

1.1.12. Shells and their components must not have rolled blisters or contaminations, slag and nonmetal occlusions which affect continuity of metal.

1.1.13. Shells and their component parts which have been inspected for defects affecting continuity of metal (by the magnetic powder method) must not have any external magnetic field.

This must be ensured by the technological process. Shell bodies which have been magnetized with a circular magnetic field need not be demagnetized.

1.1.14. Threading on shells and their component parts must not be frayed or have scratches or burrs on them. If the thread has six or more turns, a cut in the first turn is acceptable. Cuts and crumbling on all the other turns, put together must not exceed one turn in length.

Checking with thread gauge to the full length may be done on the shell bodies, to be followed later by varnishing of the places where it has been damaged in accordance with para 1.3.4 of the present standard.

1.1.15. NO-GO thread gauge may enter:

- upto 3.5 turns of the thread of the top fuse if the threaded portion has 4 threads in all;

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- upto 2.5 turns of the thread of the bottom fuse and of the base itself if the threaded portion has more than 6 turns;

- unless other requirements have been stipulated in the design documentation.

1.1.16. Plain NOGO gauge may enter:

- upto 2 mm of the thread if the threaded portion has more than 6 threads, not counting chamfers in the thread and in the gauge;

- upto 3 mm into the chamber unless other requirements have been stipulated in the design documentation.

1.1.17. If the shell bodies are phosphated, the maximum diameter of guide band and the minimum pitch diameter of threaded portion are specified as dimensions after phosphating.

1.1.18. Phosphating is followed by dehydrogenation achieved by holding at a temperature of 180° to 220°C for 2 hours. The design

documentation must specify the need for dehydrogenation.

1.1.19. Traces of copper are acceptable on phosphated or oxidised surfaces. The extent and nature of such traces are checked with respect to control specimens.

1.1.20. Shell bodies and bases must not have cuts with sharp edges, corrosion, crushed edges of grooves for the bands or of ridges of knurling. Grooves at the rotating bands must not have foreign matter lodged in them. P-6

Individual cuts, dents, nicks, without sharp edges on the external surfaces of bodies, except those of the guide band must not be more than 0.3 mm deep as in the control specimens. Individual cuts, nicks and dents without sharp edgeds on the rotating band must not be more than 0.15 mm deep as in the control specimens.

Cuts without sharp edges, in the chambers of shell bodies and bases must not be more than 0.2 mm deep for 23 and 25 mm shells and not more than 0.5 mm for 37 mm and larger shells as in the control specimens.

Pitting of the edges of knurling scattered at different places are allowed on not more than three teeth. Displacements and undercut in knurling, cuts in knurling, knurling tool marks left on the entire width of the groove at the rotating band and blunting of surface of knurling must not be more than 0.15 mm as in the control specimens.

1.1.21. Tool marks from drill bits are allowed on the internal surface of the base of the shell body, provided the minimum thickness of base is maintained and provided no other requirements are stipulated in the design documentation.

1.1.22. Reduction in the diameters of the cylindrical part and of the guide band below the minimum dimension, specified in the

design documentation for bodies of shells of 23 to 30 mm calibre, must not exceed half the tolerance on diameter over a length not exceeding one tenth of the circumference. Reduction in diameter of the cylindrical part must not exceed 0.5 mm over and above the tolerance over one tenth of the circumference. Even this is allowed only on not more than 5 % of the bodies of shells of calibre 37 mm and over (other than armour-piercing shells).

1.1.23. Ballistic caps must be free from cracks, corrugations with right through holes in the metal, scratches at the places where the ballistic caps have been rolled in. Scratches on other surfaces must not have depth more than 0.3 of the wall thickness.

1.1.24. The joint of the ballistic cap to the shell body must be strong.

The strength of the fixture of ballistic cap must ensure that there is no separation of the two in individual or automatic firing.

1.1.25. Technical requirements applicable to blanks for rotating bands must conform to OST B 84-365-71.

1.1.26. The rotating band must completely fill the groove made for it in the shell body.

The surface of the rotating band adhering to the shell body must have impressions of the profile of knurling and the outline of the bottom of the groove.

The extent of filling of sharp corners of the profile of the groove forthe rotating band is determined with respect to control specimens.

1.1.27. Reduction in diameter of the groove for the rotating band resulting from press-fitting of the rotating band must not be more than 0.1 mm over and above the tolerance. P-8

1.1.28. Bands may be refitted on shell bodies, provided the requirements of para 1.1.27 of the present standard are met.

Shell bodies in which (as a result of removal of the rotating band) the width of the grooves for the rotating band exceeds the dimensions specified in the design documentation by more than half the tolerance, must be formed into a separate group after the band has been refitted. This group must be checked for conformity with the requirements of the design documentation on double the normal sampling scale.

1.1.29. Difference in width of the cylindrical part of the rotating band on diametrically opposite sides must not exceed 1 mm.

1.1.30. Beading on rotating band of the shell body and the undercut of the rotating band during turning must not exceed the tolerances on disposition and width of the rotating band.

1.1.31. Reduction in the diameter of the rotating band must not be more than half the tolerance on diameter over a length not more than one tenth of the circumference.

1.1.32. Traces of copper oxide and of phosphate covering are permissible on the surface of rotating bands made of copper to the extent they are present on the control specimens. Nicks, dents and marks on the surface of the rotating band must not be more than 0.3 mm deep and must not exceed the upper limit for diameter of the band.

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1.1.33. Cuts near the rotating band on the outer surface of shells must not be more than 2 mm wide and the reduction in diameter at the cut must not be more than 0.1 mm over and above the tolerance. This allowance includes the reduction caused while pressing the rotating band into position and the cuts that may be caused while turning the rotating band.

1.1.34. Nicks on the surface of the shell must not be such as to cause bulging of metal.

1.1.35. Tool marks left by the roller and by crimping dies over the length of the fitting of the ballistic cap on the shell body are acceptable.

1.1.36. Accuracy in weighing the shell bodies is 0.5 of a gram.

1.2. ADDITIONAL REQUIREMENTS APPLICABLE TO BUILT-UP ROTATING BANDS

1.2.1. Rotating band must be built up in an atmosphere of gaseous argon conforming to GOST 10157-79 not lower than the first sort.

1.2.2. Copper wire of MT grade conforming to TY 16-501.008-72 must be used for building up metal for rotating bands. The wire diameter may be defined in the technological process unless instructed to the contrary in the design documentation.

1.2.3. Shell bodies, argon gas and the wire must be at the same temperature as the room where the building up operation is being done. This is ensured by holding them at the room temperature for the length of time specified in the technological process. P-10

1.2.4. Shell bodies having traces of corrosion and dirt on them are not accepted for the metal build-up operation. They must be degreased before this operation.

1.2.5. The wire must be got ready for the operation in accordance with the technological process for cleaning copper. The wire surface must be clean and free from dirt and oil.

1.2.6. The total area of individual pores on the surface of the finished built-up rotating band must not exceed 8 sq.mm for 23 and 25 mm calibre shells and 10 sq.mm for shells of 30 mm calibre and larger. The distance between pores must not be less than 1 mm. The diameter of the pores must not be more than 1.6 mm or the area of each pore of other than circular shape must not be more than 2.2 sq.mm. The

distance between pores of diameter less than 1 mm is not standardised.

1.2.7. A layer of copper and traces of copper are permitted on both sides of a machined rotating band of shell bodies having a built-up rotating band and local melting of the material of the body caused as a result of striking the welding arc is also permitted. The extent of this kind of defect must be checked with reference to control specimens. Presence of copper in cartridge grooves in the shell body is not permitted. P-11

1.2.8. Finally machined rotating bands of shell bodies (except for the Navy's ammunition) may have on their surface, steel occlusion as a result of melting of the shell body at the moment the welding arc is struck. Such occlusions must not emerge from the cylindrical surface of the rotating band and their extent must not exceed the value in the control specimens.

1.2.9. Defects in building up metal and in turning may be rectified by rebuilding metal following the same technology as for the first build-up operation. Such rebuilding of metal is not allowed in the case of heat treated shell bodies and bodies having two or more rotating bands.

Rebuilding of metal is done on shell bodies which have no phosphate coating on them. The first buildup must be stripped down to the [illegible] diameter of the body at the place of metal build-up. A layer of copper on the body is permissible at the places where the rotating band has been stripped.

Not more than two metal buildups may be attempted on the same shell body. Shell bodies on which metal has been rebuilt must

be marked "H" (N) in accordance with para 5.1.5. of the present standard. Such marking may be skipped if the bodies are proposed to be hardened.

1.3. REQUIREMENTS OF PROTECTIVE COVERINGS

1.3.1. Metallic and nonmetallic inorganic coatings must meet the requirements of GOST 9.301-78 GOST 9.302-79 and OST B 84-1079-75.

1.3.2. Paint and varnish coatings must meet the requirements P-12 of OST B 84-1384-76 and OST B 84-1152-75.

1.3.3. Damage to metallic and nonmetallic inorganic coatings as a result of transport or mechanical operations of the technological process of manufacture together, must not extend over an area of more than 5 % of the surface of the body. Removal of phosphate or oxide coating from the shell body on both sides of the rotating band to a width of 2 mm is permitted. Removal of these coatings from the entire internal surface and from 30 % of the external surface (but not from the surface of the guide band, cylindrical part and ogival part) is permitted on 5 % of the shell bodies of a batch.

1.3.4. The surfaces of shells and their component parts must be covered in accordance with the requirements of design documentation.

Shellac varnishes may be used if provided for in the design documentation. Their concentrations must be within the range from the lower limit for the ЛШ-10 (LSh-10) grade to the upper limit for the LSh-30 grade as defined in OST B 84-811-73.

Neutral dyestuffs and ethyl cellosolve to GOST 8318-76 may be introduced into the varnish to the extent of 5 to 15 % by weight of the solvent.

1.3.5. Paint and varnish coating need not be applied in the case of supplies from one factory to another by mutual consent of the two factories provided absence of corrosion on the shell bodies and their component parts is ensured by applying metallic and nonmetallic inorganic coatings. Packing in this case, must be such as to ensure preservation of these coatings on the shell bodies and their component parts and must be checked as part of inwards goods inspection by QCD and by the customer's representative. P-13

1.3.6. Paint and varnish applications must conform to the requirements of OST B 84-1384-76.

1.3.7. Duration of storage of shells and their component parts between operations ie, from the time of application of phosphate coating upto the moment of application of paint or varnish coating (varnish, primer coat etc.) must not exceed 6 days, during which period they must be stored in a room at a temperature not lower than 12°C and a relative humidity not higher than 80%.

1.3.8. Spilling of primer and enamel paint on the conical surface of the rotating band on the fore body and on the base of the shell body is acceptable to the extent permitted on the control specimens. Spilling of primer and enamel paint on the cartridge grooves and on the cylindrical portion beyond the rotating band of the shell bodies, however, is not permissible.

1.3.9. The presence of patches in the zone of metal build-up on phosphated shell bodies with built-up rotating bands is permissible in the form of metallized copper of different shades.

2. SAFETY REQUIREMENTS

2.1. Shells and their parts must be manufactured in accordance with the requirements and instructions relating to accident

revention worked out for all kinds of operations requiring bservance of special safety rules. These rules are worked out y the manufacturing establishment and approved by its chief engineer.

2.2. All workers must be instructed on accident prevertion. xcerpts from these instructions must be displayed prominently at ach work place (or section of the shop).

3. ACCEPTANCE RULES

3.1. General requirements relating to the acceptance of shells nd their components must conform to the design and technological ocumentation.

3.2. A batch of shells presented for acceptance must consist f 20,000 numbers. A batch may be formed with a larger or smaller umber of shells if the batch size specified by this standard does ot suit the order quantity. This requires coordination with the ustomer's representative.

Shells intended for testing are not included in the batch ize. The batch size is fixed as 10000 for the first ten batches hile production is being mastered.

3.3. The batch size may be more precisely determined in the echnological process allowing for rational utilisation of the ontainers (filling the last container fully).

3.4. Component parts of shells are formed into batches if they re being supplied to another factory.

3.5. The concession available during acceptance inspection and nwards goods inspection by QCD and the customer's representative P-15 f painted shells and their parts is as follows:

Damage to the enamel paint is acceptable provided the metallic

and nonmetallic inorganic coating does not extend over an area greater than 15 sq.mm on any of the bodies. Even this is acceptable only on not more than 1.5% of the bodies reckoned on the batch size. Each individual instance of damage must not exceed 10 sq.mm. If the shell bodies do not have damage to enamel paint extending over more than 1 sq mm on any of the bodies the number of such bodies may go upto 10 % among the samples selected for inspection.

3.6. Shells and their parts which have been rejected must be isolated. A distinguishing mark, prescribed in the manufacturer's technological process, must be made on shells and their component parts which have been rejected for the criterion of continuity of bottom plate. These must later be collected in a special container.

The procedure for isolation of rejected shells and their component parts must be stipulated in the technological process.

4. INSPECTION METHODS

4.1. The technological process must define the scope and methods of inspection of shells and their component parts such that the requirements of the design documentation and of the present standard would be met.

4.2. Rods, intended for the manufacturer of shell bodies and bottom plates (bases) and requiring check for continuity of the bottom, must be subjected to 100 % inspection using an ultrasonic flaw detector, in accordance with the standards for steel.

4.3. Check of heat treated shell bodies for conformity with the requirements of para 1.1.6 of the present standard is done on three bodies (from each melt) having maximum hardness with the selected heat treatment schedule. The samples are etched in a

0 % aqueous solution of sulphuric acid to GOST 2184-77 at a emperature of 15 to 25°C for 24 hours. No cracks are allowed fter such etching.

4.4. Diameters of rotating bands and guide bands are checked ith GO ring gauges and NOGO snap gauges. Collars of shells having otating bands with collars are checked with ring gauges. The emaining diameters of bands are checked with GO and NOGO ap gauges.

Linear dimensions qualified "max" or "min", "not less than", pto" and "not more than" (except for guide bands and rotating nds) are checked by means of inspection aids ensuring measurement ror no coarser than applicable to the series 12 of maximum rmissible error as defined in GOST 8.051-73. When automatic d semi-automatic measuring aids are used, error in measurement st not exceed the values in series 11 of maximum permissible ror as defined in GOST 8.051-73.

Diameters of rotating bands and guide bands including those alified as "max" and "not more than" are checked using inspection ds designed as described in OST B 84-929-74 and OST B 84-862-74.

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4.5. Chambers of separately charged shell bodies are checked th a gauge for minimum profile of the chamber. "Minimum profile the chamber" here means the profile built up where the depth and amber diameter are a minimum and the radii of contact with e base are maximum.

4.6. Wobbling of the top charging chamber of the shell need t be checked if machining of the two ends was done in one setting.

4.7. Diameters of chambers which have been bored for press- tting the explosive charge may be checked before the ogival part

s formed.

4.8. Shells and their component parts must be checked for onformity with the requirements of para 1.1.12. (metal continuity) s described in OST B 84-460-79 to sensitivity level "Б" (B) s defined in GOST 21105-75.

4.9. Metallic and nonmetallic inorganic coatings (various kinds f plating) are inspected as described in GOST 9.302-79.

4.10. Paint and varnish applications are inspected as escribed in OST B 84-1384-76.

4.11. Hardness of built-up rotating bands is checked as escribed in GOST 2999-75.

4.12. Thread is checked with gauges having tolerance as pecified in GOST B 653-73.

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5. MARKING, PACKING, STORAGE AND TRANSPORT

5.1. MARKINGS ON SHELL BODIES

5.1.1. The following markings are made on shell bodies (unless different marking has been stipulated in the design ocumentation):

i) conventional melt number (only for shell bodies which have een heated treated).

ii) Manufacturer's code;

iii) Year of manufacture;

iv) Seal of inspection of base part for continuity of metal nly for bodies and bases for which such inspection is required be made);

5.1.2. Markings are made on the cylindrical part of shell dies between the guide band and the groove for the rotating band between two guide bands.

If the shell body does not have a cylindrical part, markings re made on the ogival part.

5.1.3. Any one of the types ПО -2 (PO-2) to PO-5 as defined in 0.010.007 may be used for applying the markings. The echnological process must specify the method of applying the arkings.

5.1.4. Marking may be redone if this does not lead to change n dimensions of shell bodies.

Marking must not be altered by superscribing one letter ver another. Double marking does not constitute grounds for ejection.

5.1.5. If production markings have to be applied, this must e done on the ogival part the cylindrical part, on the conical P-19 orebody, on the copper rotating band or on the base of the body. roduction markings must not be combined with the markings listed n para 5.1.1. The marking characters must not be more than 2.5 mm n height.

5.1.6. Bulging of metal at the marking places is permissible ut not beyond the rotating band. No deformation of the internal urface is permitted.

5.2. PACKING

5.2.1. Shells and their component parts are packed in boxes ade to design documentation on packing boxes for cartridges.

Shells and their component part are packed in accordance with he manufacturer's design documentation, ensuring safety of the hells and their component parts during transport.

5.2.3. An accompanying document (consignment note) indicating

e inspector's and packer's names (or codes) must be placed in
ch box containing shells and their component parts. P-20

5.2.4. If the shells and their component parts are manufactured
d used within the same factory, the questions of packing and the
ed for accompanying document are decided upon in the technical
rocess.

5.3. STORAGE

5.3.1. Shells and their component parts accepted by the
stomer's representative and awaiting despatch are stored in the
anufacturer's store under conditions ensuring their safety from
orrosion and mechanical damage.

The customer's representative has the right to check their
ndition before despatch. The manufacturer is bound to
liminate the defects detected.

5.3.2. If there are no requirements in the design documents,
he need and the method of applying preservation, must be defined
n the technological process and coordinated with the customer's
epresentative making sure that the shells and their component parts
re maintained safe during transport and storage upto the time of
harging and assembly of cartridges. P-21

5.4. TRANSPORT

5.4.1. Shells and components packed in accordance with para 5.2.
f the present standard may be carried by any form of transport.

5.4.2. Boxes containing shells and their component parts must
e arranged densely in the vehicles and securely lashed, preventing
ny displacement during transport.

5.4.3. The cargo compartment of the vehicle intended for

transporting shells and their component parts must be clean and in good working order.

5.4.4. After loading the cargo compartment, all the hatches and doors must be closed and sealed with the manufacturer's seal.

If the hatches of the cargo compartment are closed from within sealing need not be done.

6. MANUFACTURER'S GUARANTEE

6.1. The manufacturer guarantees conformity of the shells and their component parts with the requirements of the design documentation and of the present standard, provided the customer observes the conditions of charging and assembly of cartridges in accordance with the requirements of the design documentation and of OST B 84-747-81 and the conditions of storage ensuring safety of the shells and their component parts from corrosion and mechanical damage.

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6.2. The manufacturer guarantees safety of the shells upto the time of charging and assembly of the cartridges in the course of one year and further as part of assembled cartridges during the guarantee period defined in the technical documentation relating to the cartridges.

ANNEXURE 1

Mandatory

Additional requirements applicable to shells and their component parts whose design documentation has not been formulated in accordance with the ЕСКД (ESKD) (USDD) Unified System of Design Documentation.

1. If a dimension has been marked as " ДЛЯ ИНСТРУМЕНТА " (Dlya instrumenta)" ("for tooling"), this means that the dimension given in the drawing must be maintained within the limit deviations by appropriate tooling or by the corresponding technological process. In general, such dimensions are not subjected to 100 % inspection. The technological process must define the frequency of inspection and the inspection procedure for such dimensions.

2. Fillets and chamfers qualified as до(DO) meaning (UPTO) may have a value ranging from 0 to the value shown on the drawing.

3. Dimensions marked " расчетный" ("RASCHETNII") (calculated) are not be checked during inspection; these dimensions are used for designing fixtures and tooling or for working out the technological process.

4. Dimensions marked " Установочный (USTANOVOCHNII") (Setting) are checked on the parts at the time of setting the machine tool or setting the tool on the machine and also from time to time during manufacture.

ANNEXURE 2

For reference

LIST OF STANDARDS AND TECHNICAL DOCUMENTATION REFERRED TO IN THIS STANDARD

Sl. No.	Designation	Title	Page No. Rus.	Page No. Eng.
1.	GOST 8.051-73	Errors permissible in measuring linear dimensions fromito 500 mm	16	14
2.	GOST 9.301-78	Metallic and nonmetallic coatings. Technical requirements	11	10
3.	GOST 9.302-79	Metallic and nonmetallic coatings. Acceptance rules and inspection methods.	11, 17	10 15
4.	GOST B 653-73	Internal thread gauges for holes. Tolerances	17	15
5.	GOST 2184-77	Technical sulphuric acid. Specifications	16	14
6.	GOST 2999-75	Metals and alloys. Vickers hardness test.	17	15
7.	GOST 10157-79	Gaseous and liquid argon	9	8
8.	GOST 21105-75	Testing by the magnetic powder method. Nondestructive testing.	17	15
9.	GOST 84-365-71	Blanks for rotating bands of shell bodies. Types and dimensions. Technical requirements.	7	6
10.	OST B 84-460-79	Shells. Inspection of quality of metal for making component parts of bodies of shells, using a magnetic flaw detector	17	15

Sl. No.	Designation	Title	Page No. Rus.	Page No. Eng.
11.	OST 84-[illegible]81	Cartridges for small calibre artillery. Specifications	21	18
12.	OST 84-[illegible]73	Shellac varnishes and shellac rosin varnishes. Specifications	12	10
13.	OST 84-[illegible]74	Inspection and metrological devices for bands. Tolerances.	17	14
14.	OST 84-[illegible]74	Gauges for checking diameter of guide bands. Tolerances	17	14
15.	OST 84-[illegible]76	Paint and varnish coatings. General technical requirements,	12	10
		Acceptance rules and	13	11
		Inspection methods.	17	15
16.	HO.010.[illegible]	Characters and symbols for superscription on articles. Drawings. Dimensions and tolerances.	18	16
17.	TY 16-[illegible]08-72	Copper wire for bolts and contacts. Specifications	9	8

Format of Revision Register P-26

Rev. No.	Number of sheets (or pages) Revised	Number of sheets (or pages) New	No. of sheets (or pages) in the document	Document No.	Inward diary No. of accompanying document and date	Signature	Date

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SIZED GSOI- QUALITY

STRUCTURAL STEEL OF GRADE 53XM10.

Specification No.

TY14-1-[illegible]-77

(Instead of TY[illegible]-1-[illegible]-79).

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Number: TY 14-1-2232-77

Sheet: 1 of 3

SIZED GOOD-QUALITY

STRUCTURAL STEEL OF GRADE 53XM10.

Specifications.

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The present specifications extend to sized good quality structural steel of grade 53XM10 designated for cold machining.

1. RANGE OF SIZES

1.1 Sized steel is manufactured in bars from 25 to 42mm in diameter of 3a-4accuracy class.

1.2 Bars' length is uniform. Supply of upto 15% of bars' batch mass is allowed to be non-uniform.

1.3 Tolerant deviations of sizes and bars' curvature are in accordance with GOST 7417-75.

2. TECHNICAL REQUIREMENTS.

2.1 The chemical composition of steel of grade 53XM10 should comply with the standards of Table 1.

TABLE 1

Content of elements, percentage									
Carbon	Silicon	Manganese	Chromium	Molybdenum	Aluminium.	Sulphur	Phosphorous.	Nickel	Co.
0.49-0.55	0.17-0.37	0.50-0.80	1.0-1.4	0.15-0.30	0.07-0.15	0.030 max.	0.030 max	0.30 max	0.30 Max

The content of aluminium in steel is optional.

NOTE: 0.006% of boron and 0.10% of titanium are introduced into steel from the calculations(ignoring the melting loss). In this case the residual boron and titanium in steel should be in amounts of 0.001% and 0.03% correspondingly.

2.2 Tolerant deviations from the established standards of the chemical composition is in accordance with GOST 4543-71.

2.3 Bars of sized steel are supplied in an annealed condition. Brinell hardness of steel being supplied should be not more than HB 217 (the imprint's diameter is 4.1mm min). The hardness standard is optional in 20 meltings, after that the standard is

Ci (Mel) — 0.002% Boron

~~In meltings~~, specified.

2.4 Steel's mechanicall properties determined on longitudinal thermally treated test-pieces or test pieces made from thermally treated billets 25mm in diameter should comply with the standard of Table 2.

TABLE 2

Recommended thermal treatment conditions of test-pieces or billets.	Ultimate strength (σ_B, kgf/mm^2) minimum	Percentage necking, ψ, %	Impact strength, a_n kgf.m/sm^2
Hardening (at 870-890°C) in oil with the temperature of (30-80°C). Tempering (at 620-670)°C, holding time 1hr, cooling in oil	100	35	5

The mechanical properties standards are optional in 20 meltings, after that the standards are specified.

2.5 Bars' surface quality should conform to group B of GOST 1051-73.

2.6 Steel's macrostructure should conform to the requirements of GOST 4543-71 for good-quality steel..

3. ACCEPTANCE RULES, TESTING METHODS, MARKING, PACKING ARE in conformity with GOST 4543-71.

NOTE: Prices for the production are being developed by the State Committee of Prices and issued in the price list and in appendices to the same.