INTERNATIONAL STANDARD

SMALL AND MEDIUM -VOLUME STEEL CYLINDERS FOR GASES FOR Pp ≤ 19.6 MPa (200 kgf/cm^2)

SPECIFICATIONS

The official edition

PUBLISHING AND PRINTING COMPLEX “STANDARDS PUBLISHING”
Moscow city

Amendment No. 5 was adopted by the International Council for Standardization, Metrology and Certification (protocol No. 12 dated 11/21/1997)

The vote in favor of adopting the amendment was:

Name of the state	Name of the national standards body
The Republic of Azerbaijan	Azgosstandard
The Republic of Armenia	Armgosstandard
The Republic of Belarus	State Standard of the Republic of Belarus
The Republic of Kazakhstan	State Standard of the Republic of Kazakhstan
The Republic of Kyrgyzstan	Kyrgyzstandard
The Republic of Moldova	Moldovastandard
The Russian Federation	State Standard of Russia
The Republic of Tajikistan	Tajikstandard
Turkmenistan	Glavgosinspektsiya “Turkmenstandard”
The Republic of Uzbekistan	Uzgosstandard
Ukraine	State Standard of Ukraine

UDC 66.076.5:669.14:006.354 **Group B66**

INTERNATIONAL STANDARD

SMALL AND MEDIUM -VOLUME STEEL CYLINDERS FOR GASES FOR *P*p ≤ 19.6 MPa (200 kgf/cm^2)

GOST 949-73

Specifications

Instead of GOST 949-57

Small and medium-volume steel cylinders for gases for Pw ≤ 19.6 MPa (200 kgf/sm^2). Specifications

ICS 23.020.30
MCP 14 1200

According to the Decree of the State Committee of Standards of the Council of Ministers of the USSR No. 2717 dated December 19, 1973 the date of entry into force is set

01/01/75

Limitation of validity was cancelled by the Decree of the USSR Gosstandart dated 08/14/1991 No.1352

This standard applies to carbon and alloy steel cylinders of small- volume up to 12 liters and medium-volume from 20 to 50 liters with operating pressure up to 19.6 MPa (200 kgf/cm2), made of seamless pipes and designed for storage and transportation of compressed, liquefied and dissolved gases at temperatures from minus 50 to plus 60 °C.

Product safety requirements* are set out in the pp. 1.2, 1.4, 2.2, 4.1. 4.4, 4.5, 4.6. 4.8.

(Amended version, Ed. No. 4, 5, Amendment).

1a. NORMATIVE REFERENCES

This standard uses references to the following standards:

GOST 2991-85 Non-assembled wooden boxes for cargo weighing up to 500 kg. General specifications

GOST 6357-81 Basic compatibility standards Cylindrical pipe thread

GOST 9454-7S Metals. Test method for impact bending at low, room and elevated temperatures

GOST 9909-81 Basic compatibility standards Tapered threads of valves and gas cylinders

GOST 10006-80 (ISO 6892-84) Metal pipes. Tensile test method

GOST 14192-96 Marking of cargo

GOST 15150-69 Machines, devices and other technical products. Versions for different climatic regions. Categories, conditions of operation, storage and transportation in terms of the impact of climatic factors of the external environment

GOST 18477-79The universal containers. Types, basic parameters and sizes

GOST 21140-88 Packaging. Size system

GOST 22352-77* * Manufacturer's warranty. Establishment and calculation of warranty periods in standards and technical conditions. General provisions

* The amendment is valid only on the territory of the Russian Federation.

**Obsolete on the territory of the Russian Federation.

The official edition **Reprinting is prohibited**

Edition (December 2002) with Amendments No. *1, 2, 3, 4, 5, approved in October 1976, October 1980, February 1982, June 1986, April 2001 (Reference Index 11-76, 1-81, 5-82, 10-86, 6-2001), and the Amendment(Reference Index 8-2002).*

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Reissue (as of May 2008)

GOST 24998-81 Calibers for tapered threads of valves and gas cylinders. Tolerances Rules for the device and safe operation of pressure vessels Section 1a. (We will introduce additionally, Ed. No. 5).

1. **BASIC PARAMETERS AND DIMENSIONS**

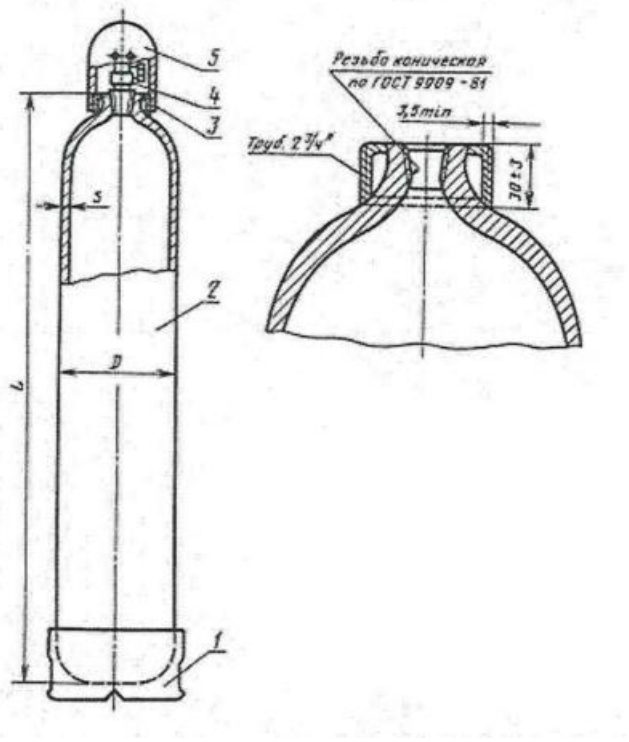
1.1. Cylinders should be made for working pressure of 9.8, 14.7: 19.6 MPa (100, 150, 200 kgf/cm^2) of carbon steel and for working pressure of 14.7 and 19.6 MPa (150 and 200 kgf/cm^2) of alloy steel.

The steel grade is selected by the cylinder manufacturer in accordance with the list of grades given in the Rules for the Design and Safe Operation of pressure vessels.

1.2. The main parameters and dimensions of the cylinders must correspond to those indicated in the drawing and in Table 1. The size of the neck bevel 1. 5x45'.

On agreement with the manufacturer, cylinders may be manufactured with a concave bottom.

Cylinder **Cylinder neck**



1 - bearing shoe; 2 -cylinder body; 3 - cylinder neck; 4 - valve; 5 - protective cap

Резьба коническая по ГОСТ 9909-81	Tapered thread according to GOST 9909-81
Труб. 2 3/4	Pipe2 3/4

Table 1

Dimensions, mm

Cylinder volume, l	Diameter of the cylinder	Wall thickness of cylinders for pressure, MPa (kp/cm2), not less					The length of the cylinder body and the pressure, MPa (kp/cm2)					Mass of cylinders for pressure MPa (kp/cm2), kg				
		carbon steel			alloyed steel		alloyed steel			alloyed steel		alloyed steel			alloyed steel	
		9.8 (100)	14.7 (150)	19.6 (200)	14.7 (150)	19.6 (200)	9.8 (100)	14.7 (150)	19.6 (200)	14.7 (150)	19.6 (200)	9.8 (100)	14.7 (150)	19.6 (200)	14.7 (150)	19.6 (200)
0.4	70	1.6	2.2	2.9	1.6	1.9	165	170	175	165	165	0.6	0.8	1.0	0.6	0.7
0.7							255	260	270	255	255	0.9	1.2	1.5	0.9	1.0
1.0	89	1.9	2.8	3.6	1.9	2.5	240	250	255	240	245	1.2	1.8	2.3	1.2	1.6
1.3							295	305	315	295	300	1.5	2.2	2.8	1.5	1.9
2.0							425	440	455	425	435	2.1	3.1	4.0	2.1	2.7
2.0	108	2.4	3.4	4.4	2.4	3.0	320	330	340	320	325	2.5	3.7	4.7	2.5	3.1
3.0							445	460	480	445	455	3.4	5.0	6.4	3.4	4.3
3.0	140	3.1	4.4	5.7	3.1	3.9	310	325	335	310	320	4.1	6.0	7.9	4.1	5.3
4.0							385	400	415	385	395	5.0	7.3	9.6	5.0	6.5
5.0							460	475	495	460	470	5.8	8.5	11.4	5.8	7.6
6.0							535	555	575	535	550	6.7	9.8	13.1	6.7	8.8
7.0							610	630	660	610	625	7.6	11.1	14.9	7.6	9.9
8.0	140	3.1	4.4	5.7	3.1	3.9	680	710	740	680	700	8.5	12.4	16.6	8.5	11.1
10.0							830	865	900	830	850	10.2	15.0	20.1	10.2	13.4
12.0							975	1020	1060	975	1005	11.9	17.6	23.5	11.9	15.6
20.0	219	5.2	6.8	8.9	5.2	6.0	730	740	770	730		283	32.3	42.0	28.5	
25.0							890	900	935	890		34.0	38.7	50.5	34.0	
32.0							1105	1120	1165	1105		42.0	47.7	62.5	42.0	
40.0							1350	1370	1430	1350		51.5	58.5	76.5	51.5	
50.0							1660	1685	1755	1660		62.5	71.3	93.0	623	

Remarks:

1. The mass of cylinders is indicated without valves, caps, rings and shoes, and is a reference value and nominal for the manufacture of cylinders with limited mass
2. The lengths of the cylinders are indicated as reference and are taken as nominal in the manufacture of cylinders with limited length
3. Approximate weight of the metal cap - 1.8 kg; fibrous composite - 0.5 kg; rings - 0.3 kg, shoe - 5.2 kg

1.1; 1.2. (**Amended version, Ed., No. 4, 5).**

1.3. Cylinders must be made of normal and increased accuracy.

1.4. Cylinders of normal accuracy are manufactured with a volume restriction; cylinders of increased accuracy - by volume and outer diameter or by length and outer diameter.

Limit deviations shall be as specified in Table 2.

Table 2

Maximum deviation	For cylinders of normal accuracy	For cylinders of increased accuracy
By volume:		
for small-volume cylinders	+10%	+5%
for medium-volume	+5%	+5%
By length:		
for small-volume cylinders	—	±6 mm
for medium-volume	—	±15 mm
By outer diameter:		
for carbon steel cylinders	—	±1.0%
for alloy steel cylinders	—	±1.5%
At the transition points from		
for carbon steel cylinders	±2.0%	±1,5%
for alloy steel cylinders	±2.5%	±2,0%

Remark. The curvature of medium-volume cylinders is not more than 0.5% of the length of the cylindrical part of the cylinder.

(Amended version, Ed. No. 5).

1.5 On customer request, alloy steel cylinders can be manufactured with weight limitations. In this case, the mass of the cylinders should not exceed more than 10% of the mass indicated in Table 1.

Examples of symbolic representations:

4-liter cylinder with a pressure of 14.7 MPa (150 kgf/cm^2), made of carbon steel, of normal manufacturing accuracy, for air:

Air cylinder 4—150U GOST 949—73

the same, alloyed steel, precision manufacturing, with volume limitation, without mass limitation, for nitrogen:

Nitrogen cylinder 4p-150L GOST 949—73

the same, normal manufacturing accuracy, with mass limitation, for air:

Air cylinder 4—1150L—1M GOST 949—173

the same, increased accuracy of manufacturing by volume, with mass limitation, for medical oxygen:

Medical oxygen cylinder 4P—150L—M GOST 949—73

the same, increased accuracy of manufacture, cylinder body length 400 mm, with restriction on mass, for nitrogen:

Nitrogen cylinder 4—150L—400—M GOST 949—73

the same, short, 2-liter capacity for pressure 14.7 MPa (150 kgf/cm2), made of carbon steel, precision manufacturing with length limitation, without mass limitation, for air:

Air cylinder K2—150U—330 GOST 949—73

(Amended version, Ed. No. 4).

1.6 At the request of consumers, it is allowed to manufacture cylinders that differ in volume and length from those indicated and Table.1 . The maximum deviations should correspond to Table 2.

(Introduced additionally, Ed. No. 5).

2. REQUIREMENT SPECIFICATION

2.1. Cylinders must be manufactured in accordance with the requirements of this standard and the Rules for the device and safe operation of vessels under pressure, according to working drawings approved in the prescribed manner.

Cylinders should be made of pipes (or a balloon blank part), passed ultrasonic control of metal continuity.

It is allowed instead of ultrasonic inspection of pipes to carry out ultrasonic inspection of the cylindrical part of the cylinders.

(Amended version, Ed. No. 5).

2.1 a. **(Excluded, Revision No. 5).**

2.2. Cylinders must be heat-treated in accordance with the Rules for the Construction and Safe Operation of Pressure Vessels.

The mechanical properties of the cylinder material must comply with those specified in Table 3.

Table 3

Property name	Made of carbon steel	Made of alloy steel
Ultimate tensile strength σ_a H/mm2 (kgf/mm^2), not less	638 (65)	883 (90)
Yield stress $\sigma_ç$ H/mm2 (kgf/mm^2), not less	373 (38)	687 (70)
Stretch ratio $\sigma_ç$, not less	15	10
Impact strength KCU, J/cm^2 (kgf/cm^2), not less at 20 C	29.4 (3)	98.1 (10)

(Amended version, Ed. No. 5).

2.3. Materials of cylinder valve bodies depending on the gas to be filled, as well as the thread direction of the side connector are shown in the appendix. The side fittings of the valves for toxic and flammable gases must be equipped with plug fittings.

(Amended version, Ed. No. 4).

2.4. The outer and inner surfaces of the cylinders must be free of films, cavities, rolls, cracks.

Trenches, hairlines, traces of scale or tools, compacted and open wrinkles on the inner surface of the neck and bottom and other minor defects should not lead the wall thickness beyond the smallest values specified in Table 1.

(Amended version, Ed. No. 1).

2.5. The thread in the neck must be made in accordance with GOST 9909, that being the case:

the outer diameter of the thread in the main plane should be:

for small-volume cylinders-19.2 mm,

for medium-volume cylinders-27.8 mm,

for acetylene cylinders — 30.3 mm;

the number of threads with a full profile should be at least 8, and for small-volume cylinders-at least 7 in a row from the end of the neck;

2-5 spare strings must remain on the valve screwed into the cylinder neck: valves must be installed with the use of a sealant.

(Amended version, Ed. No. 5).

Tables 4 and 5. **(Excluded, Ed. No. 5).**

2.6 On request, cylinders can be manufactured with the agreed dimensions of the outer diameter of the neck.

2.7 A steel ring must be securely fastened to the neck of cylinders with safety caps.

2.8 Rings and safety caps must be compatible.

2.9 In the threads of the tracks and caps, local minor tears and pitting are allowed on no more than one third of the total number of threads and no more than one third of the circumference.

The thread of the rings and caps must comply with GOST 6357.

(Amended version, Ed. No. 5).

2.10 Cylinder shoes, made from a piece of steel pipe, should be tightly mounted on the cylinders with a gap between the bearing plane of the shoe and the bottom of the cylinder at least 10 mm.

2.11 (Excluded, Ed. No. 5).

2.12 Before screwing valves or installing plugs in the neck of cylinder, the inner surface of the cylinders must be cleaned of chips and loose scale. Thin strong oxide layer obtained during normalization as well as individual stains caused by the way the cylinders are cleaned are acceptable.

Small-volume cylinders intended for medical oxygen, as well as on request of consumers, must be completely cleaned of scale.

(Amended version, Ed. No. 5).

2.13 Cylinders for oxygen or hydrogen must be degreased, and without valves must be additionally degreased at the customer. The presence of water and dirt is not allowed in the cylinders.

(Amended version, Ed. No. 2).

2.14 Cylinders must be painted on the outside with oil, enamel or nitro paint. The stamps should be clearly visible after coloring. At the request of the customer, the cylinders may not be painted.

2.15 Cylinders must be completed with the following parts:

a) small-volume cylinders — with valves, and at the customer's request — without valves;

b) acetylene cylinders - with rings, caps; medium-volume cylinders — with rings, caps and shoes;

c) medium-volume cylinders for ammonia, chlorine, phosphene, pseudobutylene, sulfurous anhydride — with valves, rings and caps:

d) medium-volume cylinders, except those specified in subparagraphs *b* and *c* —with valves, rings, caps and shoes.

It is allowed to complete the cylinders with separate parts at the request of the consumer.

(Amended version, Ed. No. 5).

3. ACCEPTANCE RULES

3.1 Each cylinder must be subjected to acceptance tests.

3.2 The cylinders are accepted in batches of up to 400 pieces of the same volume, size and the same heat treatment mode.

3.3 Acceptance tests include;

- hydraulic pressure robustness tests;
- sealing testing by pneumatic pressure;
- tensile test;
- impact bending test;
- thread geometry control;
- external inspection;
- mass determination;
- determination of volume;

(Amended version, Ed. No. 5).

3.4 The tensile test should be carried out on longitudinal short samples. Samples in their calculated part should not be straightened.

3.5. The impact strength test should be carried out on longitudinal samples of type 3 according to GOST 9454. The axis of the incision should be perpendicular to the wide edges of the sample. Cylinders with a wall thickness of at least 5 mm are tested.

3.6 For tensile and impact bending tests, specimens are cut from finished cylinder bodies or witness nozzles, cut from pipes from which this batch of cylinders is made, and heat-treated together with cylinders of this batch, and from alloy steel — also one melt.

It is allowed to complete up to 15% cylinders in a batch of alloy steel with cylinders made of alloy steel of other melts, the batches of which have passed acceptance tests.

At least two samples from the batch are taken for each test.

3.5, 3.6**. (Amended version. Ed. No. 5).**

3.7 If the test results do not meet the requirements of this standard, the tests are carried out on twice the number of samples. The results of the random check are distributed to the entire batch.

(Amended version, Ed. No. 3).

3.8 Acetylene cylinders should be tested for tightness at plants that fill the cylinders with a porous mass.

(Introduced additionally, Ed. No. 3).

4. TEST METHODS

4.1. Pneumatic and hydraulic pressure tests are carried out in accordance with the Rules of the device and safe operation of pressure vessels.

The duration of the tests is not less than 1 min.

Pneumatic tests of cylinders intended for filling with gases whose penetration capacity is higher than that of air should be carried out according to the regulatory and technical documentation.

(Amended version, Ed. No. 4).

4.2. 4.3. (Excluded, Ed. No. 4).

4.4. Cylinders equipped with a chlorine valve, and they are tested with a pneumatic pressure equal to 2.94 MPa (30 kgf/^{cm2}).

(**Amended version, Ed. No. 4).**

4.5. Tensile test — according to GOST 10006. Test speed up to the yield strength and during its passage not more than 10 mm/minute beyond the yield strength — not more than 40 mm/minute

It is allowed to check the mechanical properties of carbon steel cylinders by non-destructive testing methods according to the methodology approved in the prescribed manner.

(Amended version, Ed. No. 5).

4.6. Impact bending test — according to GOST 9454 on longitudinal samples of type 3.

4.7. If the test results do not meet the requirements of this standard, the tests are carried out on twice the number of samples.

If the results of repeated tests are not satisfactory, the entire batch of cylinders is sent for heat treatment a second time.

No more than two repeated thermal treatments are allowed. The additional tempering is not considered a second heat treatment.

4.6, 4.7. **(Amended version, Ed. No. 4).**

4.8. The volume of cylinders with a capacity of up to 12 liters is controlled by limiting templates on the length. The volume of two cylinders from the batch is checked by filling with water and determining the volume or mass of water.

Determination of the capacity of medium-volume cylinders is carried out by filling each cylinder with water and determining the volume or mass of water.

(Amended version, Ed. No. 5).

4.9. The control of the thread in the neck must be carried out with threaded calibers according to GOST 24998. The parameters of the neck bevel are technological and are not subject to control.

(Introduced additionally, Ed. No. 5).

5. MARKING, PACKAGING, TRANSPORTATION AND STORAGE

5.1. Marking of cylinders is carried out in accordance with the requirements of the Rules of the device and safe operation of pressure vessels.

Additionally, data on the type of heat treatment is applied:

N – normalization;

V – hardening with tempering.

5.2. The labels on the cylinders and their coloring are made in accordance with the Rules of the device and safe operation of pressure vessels.

5.1. 5.2. (**Amended version, Ed. No. 5).**

5.3. Cylinders transported without valves must be protected from contamination with polyethylene or nylon plugs.

5.4. Small volume cylinders are transported in containers made according to GOST 18477 without packaging. When shipped by wagon in box cars small cylinders are transported packed in boxes according to GOST 2991 (type 111-1) weighing no more than 200 kg, or stacked to the full capacity of the car. The dimensions of the boxes are according to the normative and technical documentation in accordance with the requirements of GOST 21140.

Medium-volume cylinders are transported without packaging in covered wagons, gondola cars or containers made according to GOST 18477.

It is allowed to transport cylinders in multi-turn means of packaging in open wagons or packages in special cars.

The scheme of placing and securing cylinders on vehicles must comply with the requirements of the Technical Conditions of loading and securing cargo approved by the Ministry of Railways.

(Amended version, Ed. No. 4).

5.4a. Transport marking, including basic, additional and informative inscriptions according to GOST 14192 must be put on one of the sides of each box.

(Introduced additionally, Ed. No. 4).

5.5. The cylinders are transported by all types of transport in accordance with the rules of cargo transportation applicable to each type of transport.

(Amended version, Ed. No. 5).

5.6. Each batch of cylinders must be accompanied by a quality document certifying the compliance of the cylinders with the requirements of this standard, which should indicate:

the name of the manufacturer and its location (city or agreed address); the symbolic notation of the product;

the number of cylinders and their numbers;

results of hydraulic and pneumatic tests:

the designation of this standard.

(Amended version, Ed. No. 4).

5.7. Storage of cylinders - according to group G2 GOST 15150.

5.8. **(Excluded, Ed. No. 5).**

6. MANUFACTURER'S WARRANTIES

6.1. The manufacturer shall ensure compliance of the cylinders with the requirements of this standard if the consumer observes the conditions of operation, transportation and storage, established by this standard.

6.2. The warranty period of operation is 2 years from the date of commissioning of the cylinders. The commissioning period is in accordance with GOST 22352.

(Amended version, Ed. No. 5).

Section 7. **(Excluded, Ed. No. 4).**

APPENDIX

MATERIALS OF THE CYLINDER VALVE BODY AND THE DIRECTION OF THE THREAD OF THE SIDE FITTING

Gas name	Valve body material	Side thread direction	Gas name	Valve body material	Side thread direction
Nitrogen	Brass	Right	Methane	Brass	Left
Ammonia	Steel	Right	Propane and other	Steel or brass	Left
Argon	Brass	Right	Sulphurous anhydride	Steel	Right
Bhutan	Brass or steel	Left	Carbon dioxide	Brass	Right
Butylene	Brass	Left	Phosgene	Steel	Right
Hydrogen	Brass	Left	Freon	Steel or brass	Right
Air	Brass	Right	Chlorine	Steel	Right
Helium	Brass	Right	Chloromethyl	Brass	Left
Oxygen	Brass	Right	Chloroethyl	Brass	Left
Xenon	Brass	Right	Ethylene	Brass	Left

Remark. When ordering cylinders for gases not listed in the table, the customer must specify the type of valve in the order.

The editor *E.G. Goverdovskaya*
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Amendment No. 5 GOST 949-73 Small and medium-volume steel cylinders for gases for P<19.6 MPa (200 kgf/cm^2). Specifications

Adopted by the International Council for Standardization, Metrology and Certification (Protocol No. 12 of 21.11.97)

Registered by the Technical Secretariat of the ICS No. 2891

The vote in favor of adopting the amendment was:

Name of the state	Name of the national standards body
The Republic of Azerbaijan	Azgosstandard
The Republic of Armenia	Armgosstandard
The Republic of Belarus	State Standard of the Republic of Belarus
The Republic of Kazakhstan	State Standard of the Republic of Kazakhstan
The Republic of Kyrgyzstan	Kyrgyzstandard
The Republic of Moldova	Moldovastandard
The Russian Federation	State Standard of Russia
The Republic of Tajikistan	Tajikstandard
Turkmenistan	Glavgosinspektsiya “Turkmenstandard”
The Republic of Uzbekistan	Uzgosstandard
Ukraine	State Standard of Ukraine

(For the continuation, see P.10)

The introductory part. Delete the last paragraph.

Supplement the standard with section-1a (before section 1):

"1a. Normative references

This standard uses references to the following standards:

GOST 2991-85 Wooden boxes for cargo weighing up to 500 kg. General specifications

GOST 6357-81 Basic norms of compatibility. Cylindrical pipe thread

GOST 9454-78 Metals. Test method for impact bending at reduced, room and elevated temperatures

GOST G 9909-81 Basic norms of compatibility. Tapered threads of valves and gas cylinders

GOST 10006-80 Metal pipes. Tensile test method

GOST 14192-96 Marking of cargo

GOST 15150-69 Machines, devices and other technical products. Versions for different climatic regions. Categories, conditions of operation, storage and transportation in terms of the impact of climatic factors of the external environment

GOST 18477-79 The universal containers. Types, basic parameters and sizes

GOST 21140-88 Packaging. Size system

GOST 22352-77* Manufacturer's warranty. Establishment and calculation of warranty periods in standards and technical conditions. General provisions

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* Obsolete on the territory of the Russian Federation.

(For the continuation, see P.11)

GOST 24998-81Calibers for tapered thread of valves and gas cylinders. Tolerances

Rules for the design and safe operation of pressure vessels."

Paragraphs 1.1. 1.2, 1.4 should be stated in a new version;

"1.1. The cylinders must be manufactured for a working pressure of 9.8: 14.7: 19.6 MPa (100, 150.200 kgf/cm^2) made of carbon steel and for a working pressure of 14.7 and 19.6 MPa (150 and 200 kgf/cm^2) made of alloy steel.

The steel grade is selected by the cylinder manufacturer in accordance with the list of grades given in the Rules for the Design and Safe Operation of pressure vessels.

1.2. The main parameters and dimensions of the cylinders must correspond to those indicated in the drawing and in the Table 1 The size of the neck bevel is 1.5x45."

In agreement with the manufacturer, cylinders may be manufactured with a concave bottom.

1.4. Cylinders of normal accuracy are manufactured with a volume restriction; cylinders of increased accuracy - by volume and outer diameter or by length and outer diameter.

Limit deviations shall be as specified in Table 2.

Table 2

Maximum deviation	For cylinders of normal accuracy	For cylinders of increased accuracy
By volume:		
for small-volume cylinders	+ 10%	+ 5%
for medium-volume cylinders	+ 5%	+ 5%
By length:		
for small-volume cylinders	—	±6 mm
for medium-volume cylinders	—	±15 mm
By outer diameter:		
for carbon steel cylinders		±1.0%
for alloy steel cylinders	—	±1,5%
At the transition points from the cylinder		
for carbon steel cylinders	+2.0%	±1,5%
for alloy steel cylinders	±2,5%	±2,0%

Remark — The curvature of the cylinders of the average volume — not more than 0.5 % of the length of the cylindrical part of the cylinder."

Add section 1 with paragraph-1.6:

"1.6. At the request of consumers, it is allowed to manufacture cylinders that differ in volume and length from those indicated and Table.1 The maximum deviations should correspond to Table 2."

(For the continuation, see P.12)

Paragraph 2.1 should be stated in a new version:

2.1 Cylinders must be manufactured in accordance with the requirements of this standard and the Rules for the device and safe operation of vessels under pressure, according to working drawings approved in the prescribed manner.

Cylinders should be made of pipes (or a balloon blank part), passed ultrasonic control of metal continuity.

It is allowed instead of ultrasonic inspection of pipes to carry out ultrasonic inspection of the cylindrical part of the cylinders."

Exclude paragraph 2.1a.

Paragraph 2.2 should be stated in a new version:

"2.2. Cylinders must be heat-treated in accordance with the Rules for the Construction and Safe Operation of Pressure Vessels".

The mechanical properties of the cylinder material must comply with those specified in

Table 3.

Property name	Made of carbon steel	Made of alloy steel
Ultimate tensile strength σ_a H/mm2 (kgf/mm^2), not less	638 (65)	883 (90)
Yield stress $\sigma_ς$ H/mm2 (kgf/mm^2),	373 (38)	687 (70)
Stretch ratio $\sigma_ς$, not less	15	10
Impact strength KCU, J/cm^2 (kgf/cm^2), not less at 20 C	29.4 (3)	98.1 (10)

Paragraph 2.5. The second paragraph. Replace the words: "in the plane of the end" with "in the main plane";

the fifth paragraph should be stated in a new version:

"for acetylene cylinders-30.3 mm";

the sixth paragraph after the words "not less than 7" shall be added with the words: "in a row from the end of the neck."

Paragraph 2.9 should be supplemented with a paragraph:

"The threads of the rings and safety caps must comply with GOST 6357".

Exclude paragraph 2.11.

Paragraph 2.12. The second paragraph. Replace the words: "by special order" to "by order".

(For the continuation, see P.13)

Paragraph 2.15. Subparagraph b) should be stated in a new version:

"b) acetylene cylinders - rings, caps: medium-volume - rings, caps and shoes".

Paragraph 3.3 should be stated in a new version:

"3.3. Acceptance tests include:

- hydraulic pressure robustness tests;
- sealing testing by pneumatic pressure;
- tensile test;
- impact bending test;
- thread geometry control;
- external inspection;
- mass determination;
- determination of volume."

Paragraph 3.5. Replace the words: "type V" with "type 3 according to GOST 9454".

Paragraph 3.6 should be stated in a new version:

"3.6. For tensile and impact bending tests, specimens are cut from finished cylinder bodies or witness nozzles, cut from pipes from which this batch of cylinders is made, and heat-treated together with cylinders of this batch, and from alloy steel - also one melt.

It is allowed to complete up to 15% cylinders in a batch of alloy steel with cylinders made of alloy steel of other melts, the batches of which have passed acceptance tests.

At least two samples from the batch are taken for each test."

Paragraphs 4.5, 4.8 should be stated in a new version:

"4.5. Tensile test - according to GOST 10006. Test speed up to the yield strength and during its passage not more than 10 mm / minute beyond the yield strength - not more than 40 mm / minute.

(For the continuation, see P.14)

It is allowed to check the mechanical properties of carbon steel cylinders by non-destructive testing methods according to the methodology approved in the prescribed manner.¬

4.8. The volume of cylinders with a capacity of up to 12 liters is controlled by limiting templates on the length. The volume of two cylinders from the batch is checked by filling with water and determining the volume or mass of water.

Determination of the capacity of medium-volume cylinders is carried out by filling each cylinder with water and determining the volume or mass of water."

Add paragraph 4 - 4.9:

"4.9. The control of the thread in the neck must be carried out with threaded calibers according to GOST 24998. The parameters of the neck bevel are technological and are not subject to control."

Paragraphs 5.1, 5.2 (delete table 5). 5.5 set out in a new version:

"5.1. Marking of cylinders is carried out in accordance with the requirements of the Rules of the device and safe operation of pressure vessels.

Additionally, data on the type of heat treatment is applied:

N-normalization;

V-hardening with tempering.

5.2. The labels on the cylinders and their coloring are made in accordance with the Rules of the device and safe operation of pressure vessels.

5.5. The cylinders are transported by all types of transport in accordance with the rules of cargo transportation applicable to each type of transport."

Exclude paragraph 2.11.

Paragraph 6.2 should be stated in a new version:

"6.2. The warranty period of operation is 2 years from the date of commissioning of the cylinders. The commissioning period is in accordance with GOST 22352."

(Reference Index No. 6, 2001)

ICS 23.020.30
Group B66

to GOST 949-73* Small and medium- volume steel cylinders for gases for Pp ≤ 19.6 MPa (200 kgf/cm^2). Specifications

Where	Printed	Should be
The introductory part.	-	Product safety requirements are set out in the pp. 1.2, 1.4, 2.2, 4.1. 4.4, 4.5, 4.6. 4.8.

* The amendment is valid only on the territory of the Russian Federation.

(Reference Index No. 8, 2002)