SLOVENSKI STANDARD
SIST EN 16264:2014

01-oktober-2014

Pirotehnični izdelki - Drugi pirotehnični izdelki - Pritrdilne kartuše

Pyrotechnic articles - Other pyrotechnic articles - Fixing cartridges

Pyrotechnische Gegenstände - Sonstige pyrotechnsiche Gegenstände - Befestigungskartuschen

Articles pyrotechniques - Autres articles pyrotechniques - Partie 2: Exigences

Ta slovenski standard je istoveten z: **EN 16264:2014**

ICS:

71.100.30	Eksplozivi. Pirotehnika	Explosives. Pyrotechnics

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16264

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ICS 71.100.30

English Version

Pyrotechnic articles - Other pyrotechnic articles - Cartridges for powder actuated tools

Articles pyrotechniques - Autres articles pyrotechniques - Cartouches d'outils actionnés par poudre

Pyrotechnische Gegenstände - Sonstige pyrotechnische Gegenstände - Kartuschen für kartuschenbetriebene handgehaltene Werkzeuge

This European Standard was approved by CEN on 8 February 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

This document (EN 16264:2014) has been prepared by Technical Committee CEN/TC 212 “Pyrotechnic articles”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2015 and conflicting national standards shall be withdrawn at the latest by March 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2007/23/EC on the placing on the market of pyrotechnical articles.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The "Permanent International Commission for the Proof of Small-Arms, C.I.P.” has contributed substantially to this standard. The C.I.P. regulations pertinent to cartridges for powder actuated tools have been largely integrated in the present standard and the current states of technology are matched.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard defines the procedures for classifying, testing and labelling of cartridges for powder actuated tools (PAT cartridges), as defined in Clause 3 of this standard.

This European Standard does not apply to pyrotechnic articles containing blasting agents and military explosives except black powder and flash composition.

PAT cartridges contain pyrotechnic composition(s) delivering mainly gases, intended to propel a piston. The piston propels fasteners (e.g. nails) or drives hard marking characters into appropriate materials.

This standard also applies to PAT cartridges sold to persons younger than 18 years, if this is permitted by the member state due to the low hazard of the PAT cartridges.

NOTE PAT cartridges can also be used for hard marking tools. Information on cartridge operated fixing and hard marking tools can be found in EN 15895:2011.

This European Standard applies to the cartridges listed in Table 1.

Table 1 — Lists of the established calibres for PAT cartridges

	Calibre
Rimfire type	22 NC (5,5/16)
	22 (5,6/16)
	22 EX (5,6/25)
	5,7/16
	5,7/25
	6,3/10
	6,3/12
	6,3/14
	6,3/16
	6,8/11
	6,8/18
Centre fire type	9 × 17
	9 × 20
	9 × 27
	38 SP (9 × 29)

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3611, *Geometrical product specifications (GPS) — Dimensional measuring equipment: Micrometers for external measurements — Design and metrological characteristics (ISO 3611)*

EN ISO 9237, *Textiles — Determination of the permeability of fabrics to air (ISO 9237)*

EN ISO 13385-1, *Geometrical product specifications (GPS) — Dimensional measuring equipment — Part 1: Callipers; Design and metrological characteristics (ISO 13385-1)*

ISO 2137, *Petroleum products and lubricants — Determination of cone penetration of lubricating greases and petrolatum*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
acceptance quality limit
AQL
quality level that is the worst tolerable process average when a continuing series of lots is submitted for acceptance sampling

3.2
base material
material into which the fastener or marking punch is driven

3.3
calibre
designation of a cartridge, normally expressed in the form “body diameter / length”

Note 1 to entry: See Scope for applicable cartridge calibres.

3.4
cartridge for powder actuated tools (PAT)
device which contains a minor quantity of primer mix together with a larger quantity of solid propellant used to drive the piston of a fixing or hard marking tool

3.5
single cartridge
loose cartridge
cartridge that is not mechanically attached to other cartridges and is inserted individually in the cartridge chamber (by hand)

3.6
collated cartridge
cartridge that is contained with a number of others in a means of collation, e.g. a plastic collation strip or a metal disc

3.7
cartridge chamber
essentially cylindrical or slightly conical bore which accommodates the cartridge before ignition; located in the rear end of the piston guide of a cartridge operated tool; the dimensions of the cartridge chamber correspond to cartridge calibre

3.8
powder actuated tool
PAT
tool to drive fasteners into a base material by means of a piston powered by the hot combustion gases from a cartridge

3.9
cartridge case
closed container of essentially cylindrical shape made of metal or plastic forming the outer shell of a cartridge and containing a primer or primer mix and propellant

3.10
cartridge type
set of cartridges defined by specific calibre and design, including pyrotechnic compositions and tolerances

3.11
centre fire cartridge
cartridge in which the primer is located in a primer cup (see 3.26)

3.12
coefficients of tolerance
coefficients of tolerance for n measurements with a statistical certainty of 95 % in $K_{3,n}$ 90 % of cases, where $K_{3,10}$ = 2,36 for n=10

3.13
collation
means for attaching several cartridges to each other at regular distances; plastic strips and metal discs are commonly used for collation

3.14
combustion chamber

cavity adjoining to the cartridge chamber in which the combustion of the propellant takes place and consisting of a bore connecting the cartridge chamber with the main cavity of piston guide, the free volume of the piston guide itself behind the piston in its rearmost position, and sometimes a free volume in the concave piston head

3.15
crimp
closed front end of a (metal) cartridge generated by radial deformation of the cylindrical body into tight folds with an essentially star-shaped cross section

3.16
fastener
object intended for use in a cartridge operated fixing tool

Note 1 to entry: The object may be a nail, a threaded stud or similar object that is driven into the base material.

3.17
ignition pin
steel pin guided in a bore in the breech face igniting the primer mix of the cartridge by impacting on the rim of the cartridge bottom or centre primer cup

3.18
lot
consists of a batch of cartridges of the same type, having homogeneous components, manufactured in series production

3.19
piston
essentially cylindrical or shouldered element made of annealed steel, freely movable longitudinally in the cylindrical piston guide (“barrel”) of a cartridge operated tool which is accelerated by the high pressure in the combustion chamber at its rear and impacts on the fastener with its tip

3.20
piston guide
"barrel" of a cartridge operated tool which is essentially the cylindrical bore of a tool and containing the piston

3.21
plunger
slug
brass or semi hardened steel cylinder used in pressure barrel, having different face dimensions to reproduce the additional volume V_a

Note 1 to entry "Slug" is used as a synonym of "plunger" in the context of pressure measurement with a test barrel.

3.22
propellant
mostly nitrocellulose-based powder which fills the cartridge partly or totally, depending on cartridge strength, the hot combustion gases of which accelerate the piston of a cartridge operated tool

3.23
primary pack
package of cartridges of the same calibre and strength (colour), offered for retail sale as a single unit

3.24
primer mix
pyrotechnic composition located in the rim of the cartridge or in the centre primer which ignites the propellant when the ignition pin deforms the rim of the cartridge or the centre primer cup and locally compresses and ignites the primer mix

3.25
pyrotechnic composition
mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these, as a result of a self-sustained exothermic reactions

3.26
primer
device used in centre fire cartridges consisting of a metal cup containing primer mix and an anvil located in the centre

3.27
rim
circumferential outward bulge at the rear end of a cartridge generated by axial deformation of the hemispherical end of the punch-drawn metal blank

3.28
rimfire cartridge
cartridge in which the primer mix is located in the rim of the cartridge case

3.29
test barrel
test equipment used to measure the gas pressure and energy of PAT cartridges

3.30
volume of minimum chamber
V_{ET}
volume of minimum chamber according to Table 3 for measuring appliances (test barrel) is a constant value per calibre as presented in Figure 1

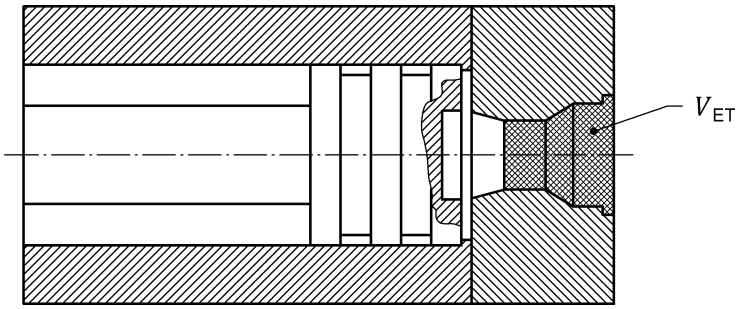

Figure 1 — V_{ET}

3.31
total volume of maximum cartridge
V_C
total volume of maximum cartridge as presented in Figure 2 according to Table 2

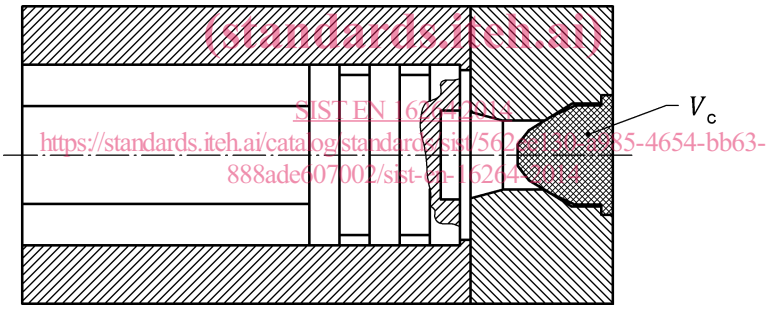

Figure 2 — V_C

3.32
volume of the material of the case
V_m
volume of the material of the case (without primer mix where rimfire cartridges are concerned, with primer where centre fire cartridges are concerned) as presented in Figure 3

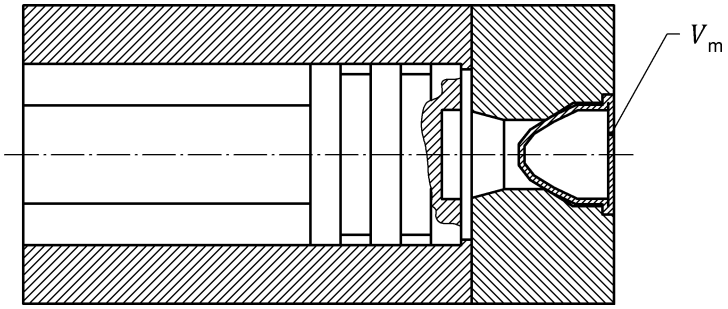

Figure 3 — V_m

3.33
additional volume
V_a
volume between the chamber and the plunger in its extreme position as presented in Figure 4

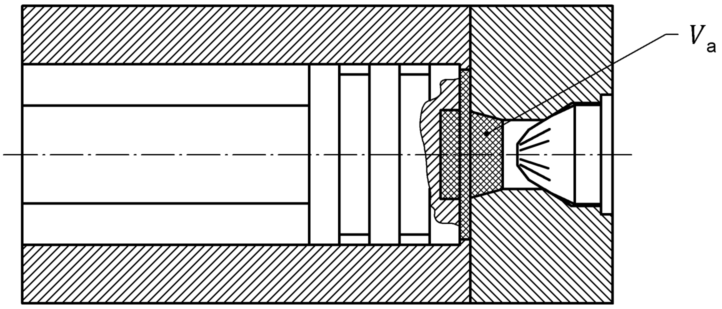

Figure 4 — V_a

3.34
total volume
V_{tot}
total volume of PAT tool $V_{tot} = V_{ET} + V_a$ as presented in Figure 5

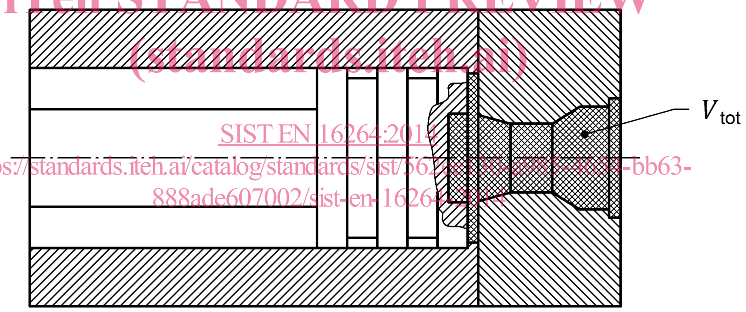

Figure 5 — V_{tot}

3.35
free volume
V_i
volume of free space between the cartridge and the chamber $V_i = V_{ET} - V_C$ as presented in Figure 6

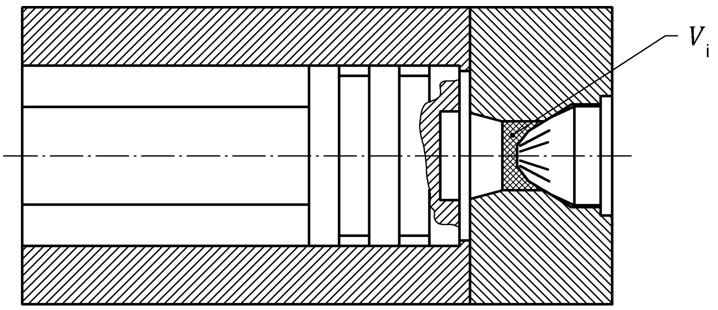

Figure 6 — V_i

3.36
free combustion volume
V_h
free volume in the chamber given by the equation $V_h = V_{ET} - V_m$ as presented in Figure 7

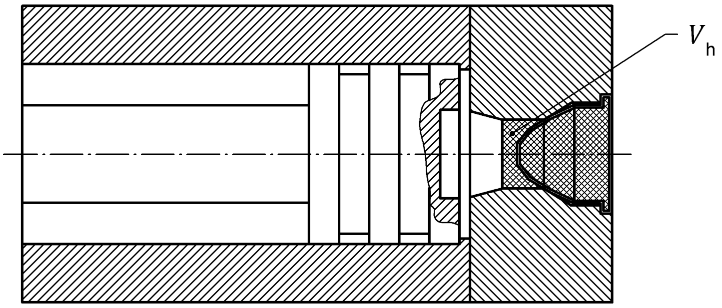

Figure 7 — V_h

3.37
total additional volume
V_A
additional volume given by the equation $V_A = V_i + V_a = (V_{ET} - V_C) + V_a$ as presented in Figure 8

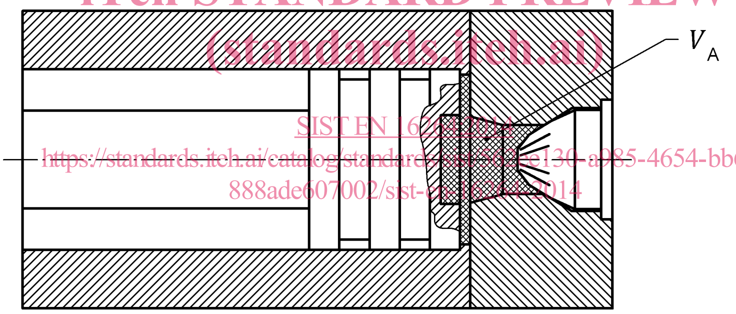

Figure 8 — V_A

3.38
total combustion volume
V_T
volume given by the equation $V_T = V_h + V_a = (V_{ET} - V_m) + V_a$ as presented in Figure 9

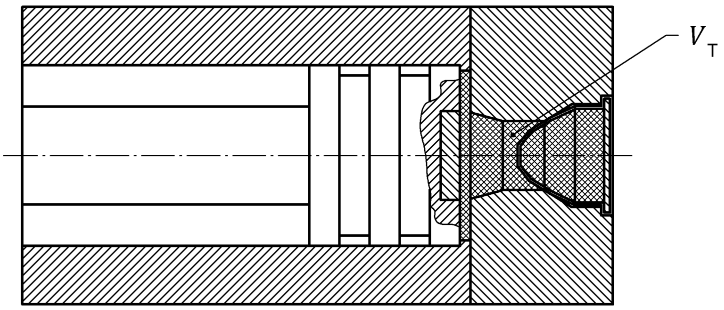

Figure 9 — V_T

4 Standard equipment

The standard equipment described in the following points shall be used during the test; any equivalent equipment with the same or better accuracy may be used alternatively.

4.1 Timing device:

— Type 1: Timing device capable of being read to the nearest 0,01 s.

— Type 2: Timing device capable of being read to the nearest 1 min.

4.2 Calliper:

— Type 1: Flat faced Vernier calliper reading to 0,05 mm (conforming to EN ISO 13385-1).

— Type 2: Micrometer calliper reading to 0,01 mm (conforming to EN ISO 3611).

4.3 Scale:

— Type 1: Minimum capacity 200 g.

— Type 2: Resolution 5,0 mg or better (linearity *e* = 5,0 mg or better).

4.4 Climatic chamber:

— Temperature from – 10 °C up to + (52 ± 1) °C.

— Relative Humidity from 60 % up to (75 ± 5) %.

Several climatic chambers may be used for different tests if these tests require different temperatures and / or humidity.

5 Requirements

5.1 Design documentation

5.1.1 General

The manufacturer or importer shall supply a document which describes the PAT cartridges. This document facilitates the analysis to be done by the notified body to ensure that the article fulfils the Essential Safety Requirements of Directive 2007/23/EC.

5.1.2 Minimum content of documentation

The documentation shall contain the following minimum information:

— Identification and description of the cartridges (name and calibre).

— Identification of the fixing or hard marking tool(s) for which the conformity certificate of the cartridges is applied.

— Net weight of propellant.

— Net weight of primer mix.

— Chemical composition and percentage of substances used in the propellant and the primer mix.

— Pressure level developed by the cartridges, measured as defined in 5.4.

— Energy level developed by the cartridges, measured as defined in 5.5.

— Name and address of the manufacturer or importer.

5.2 Design

5.2.1 General

These tests shall be done to verify that the tested cartridges are in accordance with the Essential Safety Requirements of Directive 2007/23/EC.

5.2.2 Conformity to documentation

The tested cartridges shall be in accordance with the relevant manufacturing documentation. The requirement is considered fulfilled if the manufacturer's documentation contains the minimum content (see 5.1.2) and the article has been successfully tested according to 5.3 and 5.5.

Neither quantitative nor qualitative analyses of the chemical composition shall be required.

5.3 Dimensions

5.3.1 General

The verification of dimensions shall be done to check the important cartridge dimensions from the safety point of view (see Figure 10 a), Figure 10 b), Figure 10 c), Figure 11 and Table 2).

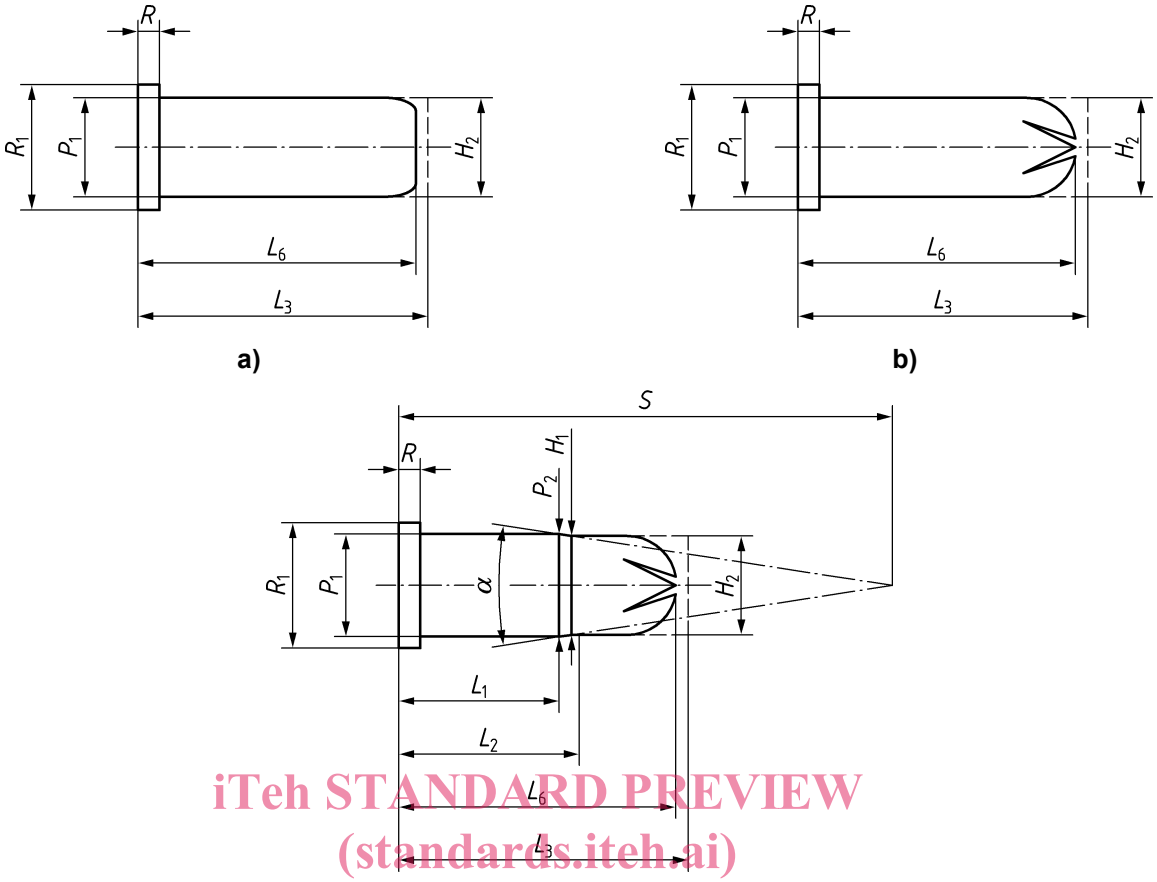

Figure 10 — Dimensions of rim-fire type cartridges

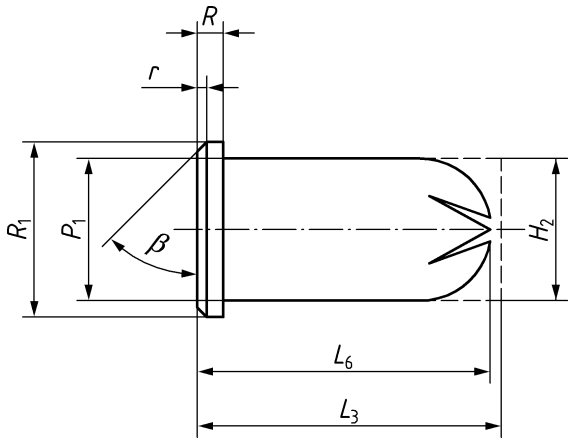

Figure 11 — Dimensions of centre-fire type cartridges

Table 2 — Maximum cartridges dimensions

	CARTRIDGE	L_3	L_6	R	R_1	f	Beta	P_1	P_2	α	S	H_1	H_2	V_C
Rimfire type	22 NC (5,5/16)	15,6	15,3	1,12	7,06			5,74	5,74	17°32'44"	27,64	5,49	5,49	0,39
	22 (5,6/16)	16,2	15,5	1,12	7,06			5,74					5,74	0,35
	22 EX (5,6/25)	25,3	25,1	1,12	7,06			5,74					5,74	0,68
	5,7/16	16,3	16	1,36	7,3			5,74					5,74	0,43
	5,7/25	25,5	25	1,4	7,15			5,74					5,74	0,69
	6,3/10	10,8	10,3	1,25	7,6			6,32					6,32	0,26
	6,3/12	12,8	12,5	1,3	7,6			6,32					6,32	0,33
	6,3/14	14,5	14	1,3	7,6			6,32					6,32	0,38
	6,3/16	16,6	16,3	1,3	7,6			6,32					6,32	0,5
	6,8/11	11,8	11	1,45	8,5			6,86					6,86	0,34
	6,8/18	18,7	18	1,45	8,5			6,86					6,86	0,61
Centre fire type	9 × 17	18,3	18,15	1,35	11,1	0,3	45°	9,58					9,58	1,08
	9 × 20	20,00	19,50	1,35	11	0,50	45°	6,63					9,63	1,48
	9 × 27	27,00	26,00	1,35	11	0,50	45°	9,63					9,63	1,99
	38 SP (9 × 29)	29,2	29	1,47	11,18	0,3	45°	9,63					9,63	2,18

Definition of symbols:

L_3: total length of the cartridge after firing (mm)

L_6: total length of the cartridge before firing (mm)

R: thickness of case rim (mm)

R_1: diameter of case rim (mm)

P_1: diameter at the end of rill or rim (mm)

H_2: diameter of the case at the end of the cylindrical part (mm)

α = Angle of junction cone

V_C: Total volume of maximum cartridge (cm^3)