SLOVENSKI STANDARD
oSIST prEN 16054:2010

01-april-2010

Kolesa BMX - Varnostne zahteve in preskusne metode

BMX bicycles - Safety requirements and test methods

BMX-Fahrräder - Sicherheitstechnische Anforderungen und Prüfverfahren

Bicyclette BMX - Exigences de sécurité et méthodes d'essai

Ta slovenski standard je istoveten z: **prEN 16054**

ICS:

43.150	Kolesa	Cycles

oSIST prEN 16054:2010 **en,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16054

February 2010

ICS 43.150

English Version

BMX bicycles - Safety requirements and test methods

Bicyclette BMX - Exigences de sécurité et méthodes d'essai

BMX-Fahrräder - Sicherheitstechnische Anforderungen und Prüfverfahren

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Ref. No. prEN 16054:2010: E

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Foreword

This document (prEN 16054:2010) has been prepared by Technical Committee CEN/TC 333 “Cycles”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

1 Scope

This European standard specifies safety and performance requirements for the design, assembly and testing of BMX bicycles and sub-assemblies intended for use in any type of location such as roads and/or tracks and/or ramps. It applies to specialized types of bicycle designed and equipped for activities such as acrobatic ground manoeuvres, stunting and aerobatic manoeuvres and lays down guidelines for instructions on the use and care of such BMX bicycles.

It applies to BMX bicycles on which the saddle height can be adjusted to provide a minimum saddle height of 435 mm or more.

It applies to:

a) category 1, BMX designed for a rider mass less or equal than to 45 kg;

b) category 2, BMX designed for a rider mass more than 45 kg.

It does not apply to BMX bicycles for the use in sanctioned competition events.

No requirements on lighting set, reflectors and warning devices are specified in this European standard due to the existence of several different national regulations applicable in the European countries.

2 Normative references

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

ISO 1101, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 9633, *Cycle chains — Characteristics and test methods*

3 Terms and definitions

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

3.1
BMX
bicycle designed for use in any type of location such as roads, tracks and/or ramps and equipped with single speed freewheel transmission, no suspension systems or back pedal brake

3.2
free-wheel transmission
gearing mechanism which is designed to disengage the wheel from the pedal mechanism in one direction

3.3
peg
component that provides a foot-stand or platform that allows the rider to stand during aerobatic manoeuvres or to slide on static objects

3.4
rotor
part of the brake system that allows an infinite rotation of the steering system around its axis

3.5
cycle
any vehicle that has at least two wheels and is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals

3.6
bicycle
two-wheeled cycle

3.7
fully-assembled bicycle
bicycle fitted with all components necessary for its intended use

3.8
maximum saddle height
vertical distance from the ground to the top of the seat surface, measured with the seat in a horizontal position and with the seat-pillar set to the minimum insertion depth

3.9
braking distance
distance travelled by a bicycle between the commencement of braking (3.10) and the point at which the bicycle comes to rest

3.10
commencement of braking
point on the test track or test machine at which the brake actuating device operated directly by the rider's hand or foot or by a test mechanism starts to move from its rest position, on the test track this point being determined by the first brake actuating device (front or rear) to operate

3.11
braking force F_{Br}
tangential rearward force between the tyre and the ground or the tyre and the drum or belt of the test machine

3.12
rim-brake
brake in which brake-shoes act on the rim of the wheel

3.13
pedal tread-surface
surface of a pedal that is presented to the underside of the foot

3.14
crank assembly
for fatigue testing it consists of the two cranks, the pedal-spindles (possibly with adaptors), the bottom-bracket spindle, and the first component of the drive system, e.g. the chain-wheel cluster

3.15
visible crack
crack which results from a test where that crack is visible to the naked eye

3.16
fracture
unintentional separation into two or more parts

3.17
wheel-base
distance between the axes of the front and rear wheels of an un-laden bicycle

3.18
wheel
assembly or combination of hub, spokes or disc, and rim, but excluding the tyre

3.19
quick-release device
device to fix or release a part without a tool

3.20
maximum inflation pressure
maximum tyre pressure recommended by the tyre manufacturer for a safe and efficient performance

3.21
exposed protrusion
protrusion which through its location and rigidity could present a hazard to the rider either through heavy contact with it in normal use or should the rider fall onto it in an accident

4 Requirements and test methods

4.1 Numbers and condition of test specimens

In general, for static, impact and fatigue tests, each test shall be conducted on a new test sample, but if only one sample is available, it is permissible to conduct all of these tests on the same sample with the sequence of testing being fatigue, static and impact.

When more than one test is conducted on the same sample, the test sequence shall be clearly recorded in the test report or record of testing.

NOTE It should be noted that if more than one test is conducted on the same sample, earlier tests can influence the results of subsequent tests. Also, if a sample fails when it has been subjected to more than one test, a direct comparison with single testing is not possible.

In all strength tests, specimens shall be in the fully-finished condition.

4.2 Accuracy tolerances and test conditions

4.2.1 Accuracy - Tolerances

Unless stated otherwise, accuracy tolerances based on the nominal values shall be as follows:

Forces and torques	0/+5 %
Masses and weights	±1 %
Dimensions	±1 mm

Angles	±1°
Time duration	±5 s
Temperatures	±2 °C
Pressures	±5 %

4.2.2 Test conditions – Fatigue tests

The shape of the signal is not specified in the standard. However, the intention is for the force to be applied and released progressively.

4.3 Crack detection methods

Standardised methods should be used to emphasise the presence of cracks where visible cracks are specified as criteria of failure in tests specified in this Standard (see 3.15).

NOTE For example, suitable dye-penetrant methods are specified in ISO 3452 series.

4.4 Sharp edges

Exposed edges that could come into contact with the rider's hands, legs, etc., during normal riding or normal handling and normal maintenance shall not be sharp.

4.5 Protrusions

4.5.1 Requirements

4.5.1.1 Exposed protrusions

Any rigid exposed protrusion longer than 8 mm (see *L* in Figure 1) after assembly except:

a) the rim-brake mechanism at the front and rear wheels;

b) a lamp-bracket fitted on the headtube;

c) reflectors;

d) clipless attachment mechanism;

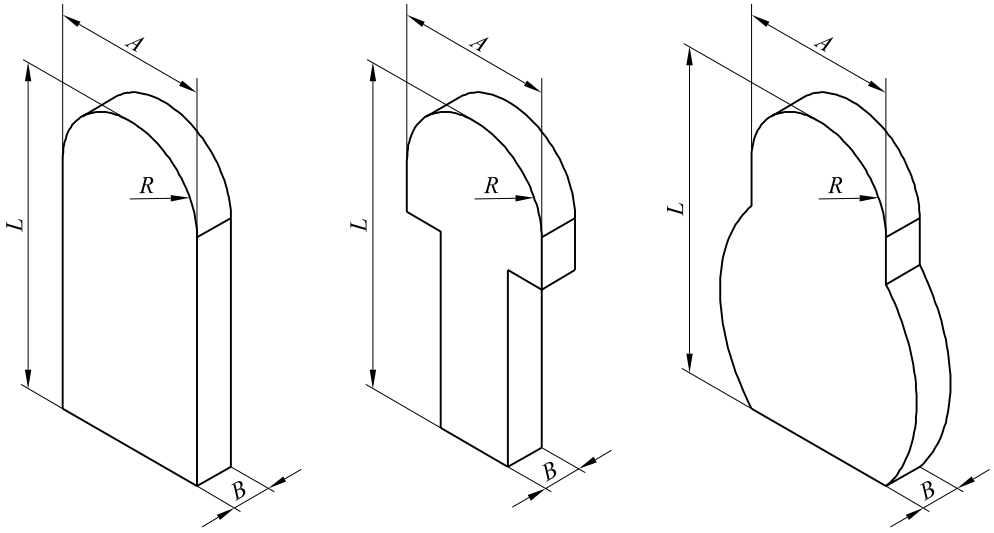
e) chainwheels and sprockets;

f) bottle carrier;

g) brake rotor;

shall terminate in a radius, *R* (see Figure 1), of not less than 6,3 mm. Such protrusions shall have a major end dimension, *A*, not less than 12,7 mm and a minor dimension, *B*, not less than 3,2 mm.

Dimensions in millimetres



Key

R ≥ 6,3
A ≥12,7
B ≥ 3,2

Figure 1 — Examples of minimum dimensions of exposed protrusions (these apply only when *L* is greater than 8 mm)

Dimensions in millimetres

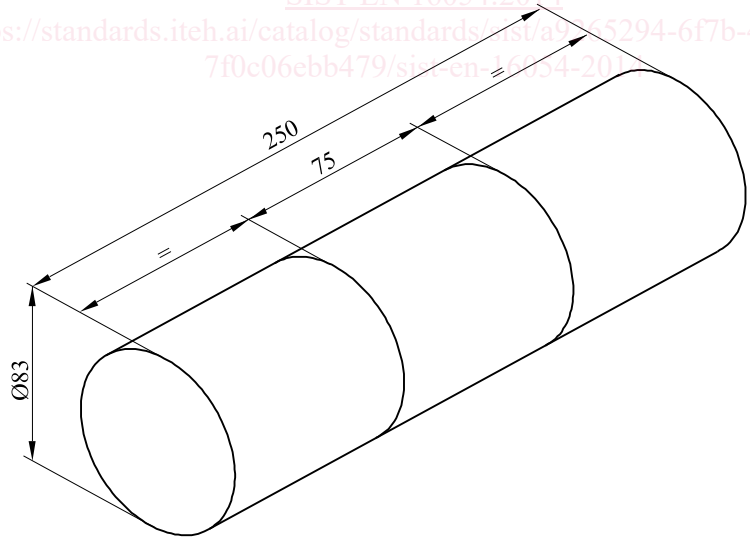


Figure 2 — Exposed protrusion test cylinder

4.5.1.2 Exclusion zone, protective devices and screw threads

There shall be no protrusions on the top tube of a bicycle frame between the saddle and a point 300 mm forward of the saddle, with the exception that outer cable casing no greater than 6,4 mm in diameter and cable guides and outer cable stops made from material no thicker than 4,8 mm may be attached to the top tube.

Foam pads attached to the bicycle frame to act as protective cushions are permitted, provided that the bicycle meets the requirements for protrusions when the pads are removed.

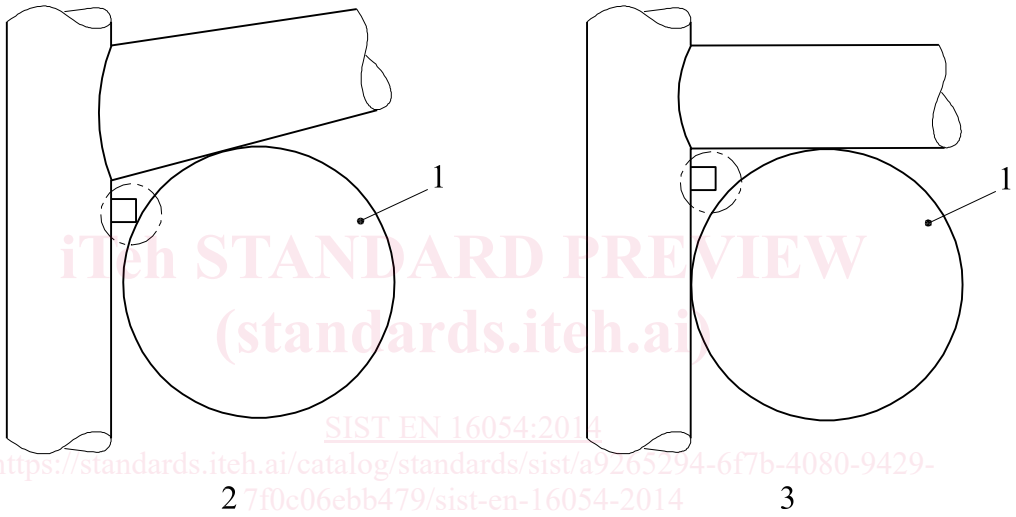
A screw thread that is an exposed protrusion shall be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part.

4.5.2 Test method

Conduct the test with a protrusion test cylinder (which simulates a limb) having the dimensions shown in Figure 2.

Manoeuvre the test cylinder in all possible attitudes towards any rigid protrusion on the bicycle. If the central 75 mm long section of the cylinder contacts the protrusion that protrusion shall be considered to be an exposed protrusion and it shall comply with 4.5.1.1.

Examples of protrusions which need and do not need to comply with the requirements are shown in Figure 3.



Key

1 Test cylinder
2 Protrusion shall comply
3 Protrusion need not to comply

Figure 3 — Examples of protrusions

4.5.3 Pegs

External extremities of the pegs (see Figure 4) shall have a chamfer or a fillet of at least 1,6 mm and an angle from 30° min to 45° max. The dimension *A* shall be at least 1,6 mm.

Dimensions in millimetres

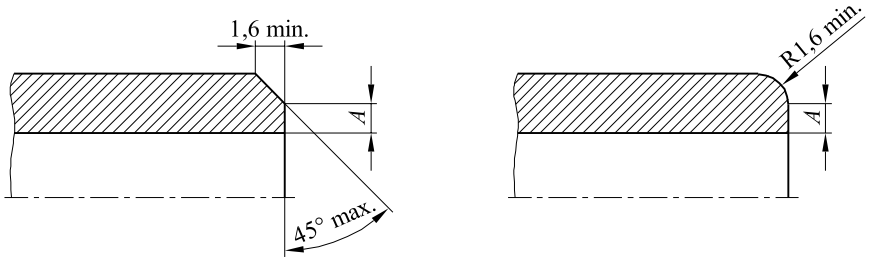


Figure 4 — Peg's extremity

4.6 Security and strength of safety-related fasteners

4.6.1 Security of screws

Any screws used to attach brake-mechanisms to the frame or fork, and the saddle to the seat-pillar shall be provided with suitable locking devices, e.g., lock-washers, lock-nuts, or stiff nuts.

4.6.2 Minimal failure torque

The minimum failure torque of bolted joints for the fastening of handlebars, handlebar stems, seats and seat pillars shall be at least 50 % greater than the manufacturer's recommended tightening torque.

4.6.3 Folding bicycle

Folding bicycles shall meet all test requirements.

Folding mechanisms shall be designed so that the bicycle can be locked for use in a simple, stable, safe way and when folded no damage shall occur to any cables. No locking mechanism shall contact the wheels or tyres during riding, and it shall be impossible to unintentionally loosen or unlock the folding mechanisms during riding.

4.6.4 Quick release devices

No form of quick release system shall be permitted for wheel axle retention.

4.7 Pegs/axles assembly

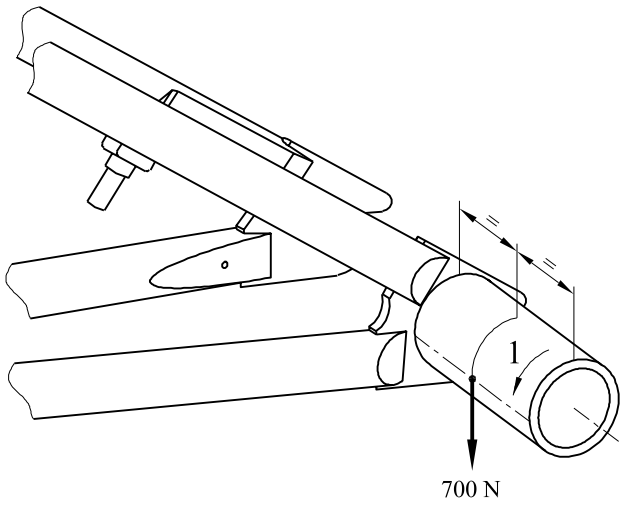
4.7.1 Pegs – Resistance to loosening

4.7.1.1 Requirements

When tested according to test method described in 4.7.1.2, pegs shall not unscrew.

4.7.1.2 Test method

Apply a tangential force of 700 N at the mid point of each peg, in such a way to produce the maximum unscrewing torque as shown in Figure 5. Apply the load for one minute and check if the requirements are met.



Key

1 Unscrewing

Figure 5 — Pegs – Resistance loosening

In case of non circular cross section, apply the tangential load at the longer side.

4.7.2 Resistance to deflection

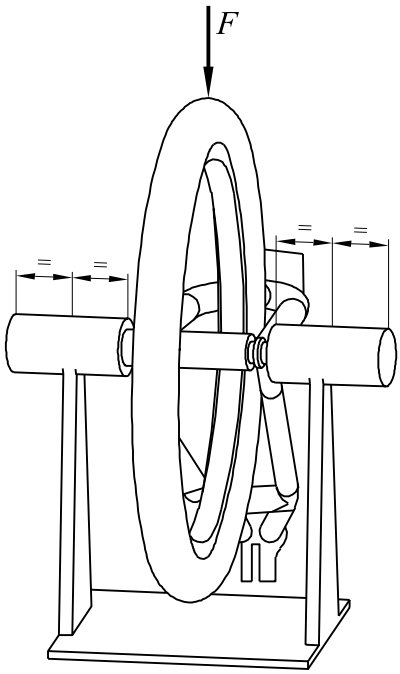
4.7.2.1 Requirements

Pegs shall not show a total deflection under load, greater than 30°(measured on the pegs) to the axle axis when tested according to test method described in 4.7.2.2.

4.7.2.2 Test method

Perform a separate static test on each pair of front and back peg/axle assembly of a complete bike with the pegs supported at their mid point.

Apply a vertical force, F, of 3000 N on the wheel, in a direction normal to the peg longitudinal axis, as shown in Figure 6. Apply the load for one minute and check if the requirements are met before removing the load.



Key

F = 3000 N

Figure 6 — Pegs - Resistance to deflection (example of test configuration)

NOTE Load can be applied in either direction

4.8 Brakes

4.8.1 Braking-systems

A bicycle shall be equipped with at least two independent braking-systems.

At least one shall operate on the front wheel and one on the rear wheel. The braking-systems shall operate without binding and shall be capable of meeting the braking-performance requirements of 4.8.7.

4.8.2 Hand-operated brakes

4.8.2.1 Brake-lever position

The handbrake levers for front and rear brakes shall be positioned according to the legislation or custom and practice of the country in which the bicycle is to be sold, and the bicycle manufacturer shall state in the manufacturer’s instructions which lever operates the front brake and which lever operates the rear brake (see also clause b).

4.8.2.2 Brake-lever grip dimensions

4.8.2.2.1 Requirement

The maximum grip dimension, *d*, measured between the outer surfaces of the brake-lever in the region intended for contact with the rider's fingers and the handlebar or any other covering present shall over a distance of not less than 40 mm as shown in Figure 7, conform to the following:

— for category 2 *d* shall not exceed 90 mm;

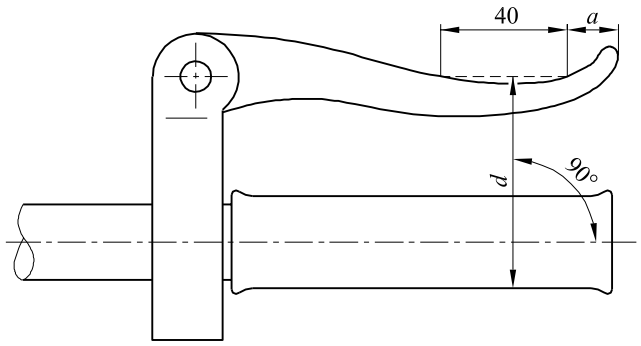
— for category 1 *d* shall not exceed 75 mm.

Conformance shall be established by the method detailed in 4.8.2.2.2.

NOTE The range of adjustment on the brake-lever should permit these dimensions to be obtained.

The dimension *a*, shown in Figure 7 which is used in 4.8.2.3 to establish the position for applying test loads, shall be established by the method detailed in 4.8.2.2.2.

Dimension in millimetres



Key

a Distance between the last part of the lever intended for contact with the rider's fingers and the end of the lever

d Maximum grip dimension

Figure 7 — Handbrake-lever grip dimensions

4.8.2.2.2 Test method

Fit the gauge illustrated in Figure 8 a) and b) over the handlebar-grip or the handlebar (where the manufacturer does not fit a grip) and the brake-lever as shown in Figure 9 so that the face A is in contact with the handlebar or grip and the side of the brake-lever. Ensure that the face B spans an area of that part of the brake-lever that is intended for contact with the rider's fingers without the gauge causing any movement of the brake-lever towards the handlebar or grip. Measure the distance *a*, the distance between the last part of the lever intended for contact with the rider's fingers and the end of the lever (see 4.8.2.1, Figures 7 and 8, and 4.8.2.3).