

Industrial helmets according to EN397

How are industrial helmets tested according to EN397 and what do the marks in the helmet mean?

What are basic specifications for industrial helmets from EN397?

The basic specifications in EN 397 contain tests for shock absorption, penetration and flame resistance as well for chinstrap anchorage.

What do the tests for shock absorption and penetration resistance involve?

For the shock absorption test a 5 kg round metal object is dropped onto the helmet from a height of 1 m (corresponds to 49 J). The test is deemed passed if the force transferred to the headform is < 5 kN.

In the test regarding penetration resistance a 3 kg sharp-edged object (30°) is dropped from a height of 1 m (corresponds to 29.5 J). The striker is not allowed to touch the headform.

Both tests are carried out on a total of 8 helmets which have each received another pretreatment up to 24 hours before: cold -10°C, heat +50°C, submerged in water, artificial ageing for 4 hours using a xenon lamp.



What does the test for chin straps involve?

In the chin strap anchorage test a continuously increasing tensile force is exerted on the chin straps, the chin strap anchorage should release at a minimum force of 150 N and no more than 250 N. Through this it is ensured that the chin strap holds but the user is not strangled if he gets stuck. All chin straps offered by the manufacturer must be tested with all helmets offered.



What does the test for flame resistance involve?

The test regarding flame resistance includes holding the helmet shell on the burner for 10 seconds. 5 seconds after removing it from the burner there should no longer be a flame burning.



What are additional specifications for industrial helmets from EN397?

Tests at very low temperatures -20°C or -30°C, very high temperatures +150°C, molten metal, lateral deformation and electrical insulation are included in the optional additional specifications in EN 397. The tests are explained in the question about "marks in the helmet shell".

What do the markings or symbols in the helmet shell mean?

The abbreviations "ABS", "PC" or "HDPE" stand for the materials used for the helmet shell.

Year and quarter of manufacture are included in the helmet using different symbols/way of writings depending on the manufacturer. MSA helmets have a "date code" in the form of a circle with arrows towards the year and month of manufacture under the peak. This date is the manufacture date (injection moulding of the shell), not the date of being brought into use. The period between manufacture and first application varies.

The mark "-20°C" or "-30°C" corresponds to the optional EN397 additional test during which the helmet is pretreated in the cold chamber: -20°C or -30°C up to 24 hours withstanding the tests for shock absorption and penetration resistance.

The mark "+150°C" stands for the optional EN397 additional test during which the helmet is pretreated in a temperature control chamber for 60 mins at +150°C. Subsequently it must pass the tests for shock absorption and penetration resistance.

The mark "LD" (lateral deformation) is an EN 397 additional test regarding lateral deformation. During this test the helmet is placed between two steel plates and exposed increasing lateral compressive forces of up to 430 N. The requirement is that the maximum lateral deformation is < 40 mm and the remaining deformation < 15 mm.

The mark "MM" stands for "molten metal" as an optional EN397 additional test. During this test molten metal is poured onto the helmet shell. The metal is not allowed to penetrate the helmet shell, any helmet shell deformation must remain under < 10 mm and the flames must not continue to burn after 5 seconds.

The mark "440 V AC" is part of an additional EN 397 test that proves protection against short-term, unintentional contact with live wires with alternating currents of up to 440 V. For this test three different situation simulations are reconstructed with the use of 1200 V AC. The requirement is that the leakage current is allowed to be a maximum of 1.2 mA. Helmets with ventilation or conductive surfaces cannot pass these tests.

Older helmets sometimes have a "1000 V" mark in accordance with DIN 4840. These marks are from 1989 and have been replaced with the EN 397 "440 V AC".

The mark with a "symbol: double triangle" is included on helmets which are certified according to the separate standard EN 50365. "Standard for electrically insulated helmets for work on parts under voltages up to an alternating current of 1000 V (AC) or direct current of 1500 V (DC)". In this test 10,000 V are used. Ventilation openings are allowed under certain requirements. Helmets that pass this tests are often known as "electrician's helmets".

An "EX" or "ATEX" symbol on helmets is not an official mark from an EN standard. Some manufacturers still use this to communicate proof of antistatic. For industrial helmets there is no uniform linguistic usage for the terms "conductive" or "antistatic". To provide evidence of antistatics for protective helmets, EN 13463-1 can be consulted: "Non-electric devices for use in potentially explosive areas". A testing method ensures that no brush discharges result which could act as an ignition source for a gas/vapour/air mixture. MSA V-Gard helmets are tested accordingly but not marked because there is no official mark for this. A test report is available as evidence.