

Waste chutes T.E.L. 599- Rev-2-09

Performance Requirements and Test Methods

Tested under the guide of European Standard EN 840-5:2004

Extracts and modification's from EUROPEAN STANDARD

EN 840-5 Waste Containers - Part 5: Performance Requirements and Test Methods

1. Scope

This Test Standard defines the test methods for testing the performance of waste chutes. It defines the performance levels to be reached during the tests and on completion of the tests. This test standard applies to builder waste chute systems designed to accommodate discarded waste from a maximum height of 20m.

2. Normative References

This Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

3. Terms and Definitions

Terms for Components of Waste Chutes

3.1 Builder Chute System:

A chute system that allows for the discarding of waste from various floors of a building under construction. The system should be designed to accept general construction waste of maximum weight of 1Kg per item and a maximum size of 200mm X 200mm X 200mm. It is not designed for demolition waste. (e.g. a stone size 100mm X100mm X 100mm with Sp. Gravity of 1.0 weighs 1Kg).

3.2 Maximum Height Safety Level:

The use of a waste chute system should be confined to a maximum of 5 floors drop per stage or 20 meters in overall drop which ever is least.

3.3 Top Section:

The section of a chute system at the top. i.e. first entry point

3.4 Intermediate Section:

A section that is incorporated into the system that allows waste to be discarded at each floor level.

3.5 Chute Section:

The Section's that join, either the Top or Intermediate section, and guides the waste in a vertical fall between each floor of the building.

3.6 Fixing Frame:

A galvanized steel structure that facilitates the securing of the chute system to the building or scaffolding in a secure manner.

3.7 Support Chains/Cables:

Chains or cables that support each section of the chute system between the fixing frames.

3.8 The Standard:

This standard only applies to straight vertical drop systems and is not applicable to any system that incorporates bends or curved drops.

4. Tests

4.1 General:

Before and after the tests a visual inspection of the sample must be done for the purpose of:

- a) Checking that the sample is not damaged or has no visual defect that would render it unusable.
- b) Checking that the manufacturing characteristics of the chute to be tested are those specified in the standards applying to the chute.
- c) Comparing the condition of the chute before and after the execution of the tests.
- d) Checking the stability and structural strength of the entire fixing arrangement. After completion of the tests some deformation of the chute sample section may exist but fracture is not permissible.

4.2 Controls Before The Tests:

4.2.1 Visual aspects:

No obvious damage, cracks, bubbles, large flashes or sharp edges shall be present. No surface defects (unsmooth areas; trails in colour) should from a distance of 1 m by the naked eye be visible.

4.2.2 Colour:

The colour shall be defined and agreed between customer and supplier. For colour measurement, differences and tolerances refer to existing International Standards.

4.3 Controls After the Tests:

Notwithstanding variations in deflection, it should be possible to use the Chute support mechanism after testing.

4.4 Conditions of The Test:

The tests shall be carried out at the following temperatures:

— T1 = (23 ± 5) °C

— T2 = (-18 ± 0/-2) °C.

The minimum duration of conditioning before testing at a test temperature T2 shall be 12 h. If the test has to be carried out outside the room conditioned at T2 it must be carried out within 5 min after taking the test pieces from the conditioned room. If the duration of the tests is more than 5 min, then the container should be kept in the conditioned room for at least 15 min before a new 5 min period of testing. For special purposes a temperature lower than -18 °C or higher than +23 °C can be agreed; in this case it should be indicated in the test report.

4.5 Materials:

Material Properties: Polyethylene

4.5.1 Density: (Raw Materials)

The use of regrind material is not permitted.

Determined in accordance with I.S.O 1183 method A or D. A single resin polymer shall have a density not less than 935kg/m³ and not greater than 940kg.

4.5.2 Melt Flow Rate: (Raw Materials)

The Melt Flow Rate is measured in accordance with ISO 1133 Section 4, must be a maximum of 4g/10min and a minimum 3.5g/10min. Test to be carried out on raw material, used in the manufacture of the product.

4.5.3 Weather Resistance:

The material used in the manufacture of the chute shall be ultra violet light stabilised.

4.6 Quality system

Companies manufacturing to this standard must operate a quality control management system to I.S.O 9001:2000 or equivalent.

4.7 Tests on the chutes

4.7.1 General:

All testing should be carried out on new chutes, or sections of new chutes.

4.7.2 Impact Tests by Falling Mass:

The falling mass test is compulsory for all parts of a Chute system i.e. top, intermediate and chute sections. The ability of sensitive points of the chute to resist impacts at low temperature shall be tested. A cut section 250mm X 250mm shall be taken from the Chute section as defined below and shall be placed on a concrete surface in the horizontal position. There shall be a steel frame between the concrete surface and the chute section so that the complete area of the bottom of the chute section can be deflected during the test. The steel frame shall be 250mm X 250mm Square outside dimension, manufactured from 75mm steel box section. Falling Mass tests shall be carried out using a 5 kg steel cylinder, diameter approx 65 mm, with hemispherical end radius of 32.5 mm. The steel cylinder is guided in a vertical pipe with a slot or with holes in order to allow the air to escape during the drop. The device shall be according to Figure 1.

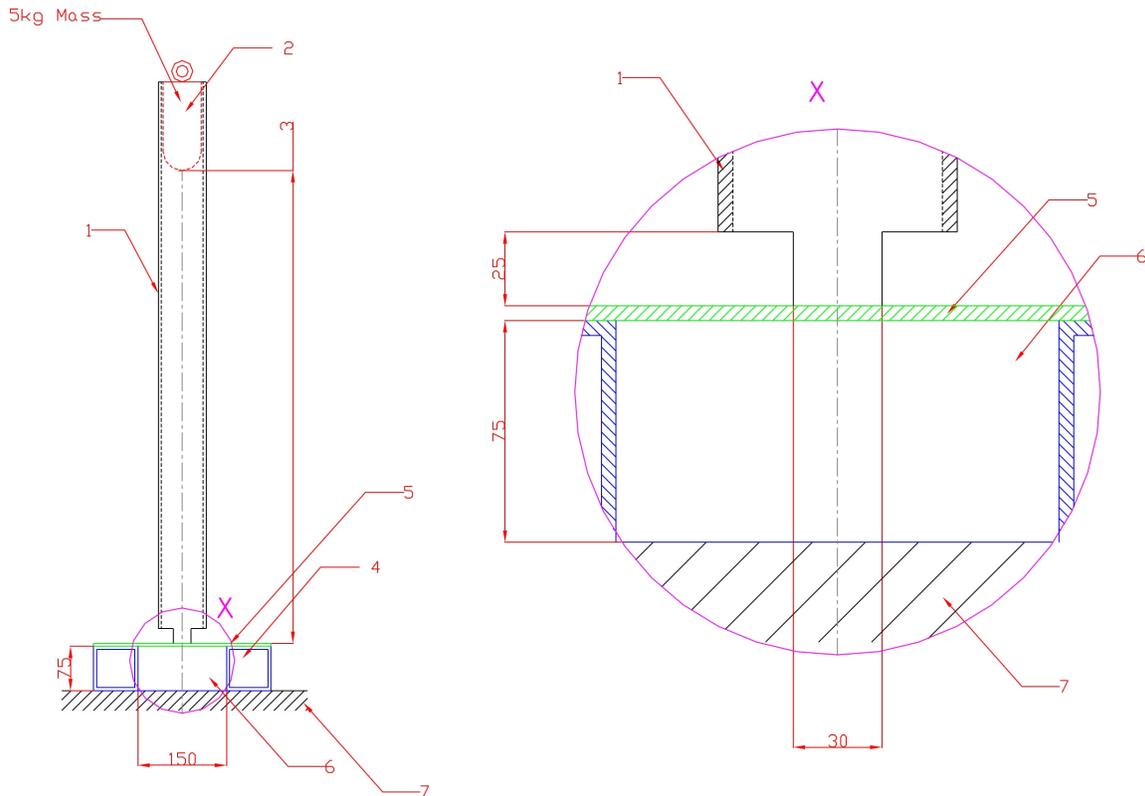


Figure 1 — Device for Ball Drop Test. Dimensions in mm

Key

1. Vertical (plastic) pipe (inside diameter: 70 mm)
2. Steel Cylinder (diameter: approx 65 mm: 1 hemispherical end: mass: 5 kg)
3. Height fall (4.0m)
4. Steel Frame
5. Chute Section
6. Free Room
7. Concrete Surface

The following areas of chute shall be tested by impact tests:

- a) The middle side of the Top Section (see Figure 2) there shall be 2 successive impacts for each impact point defined.
- b) The centre of the straight side of the Chute Section, (see Figure 2)
- c) The flat surface of the Intermediate Section, (see Figure 2)
- d) The bottom side of the Intermediate Section (see Figure 2)
- e) The bottom side of the Chute Section (see Figure 2)
- f) The side wall of the intermediate section (see Figure 2)

After the test the chute should not be fractured on the impact area

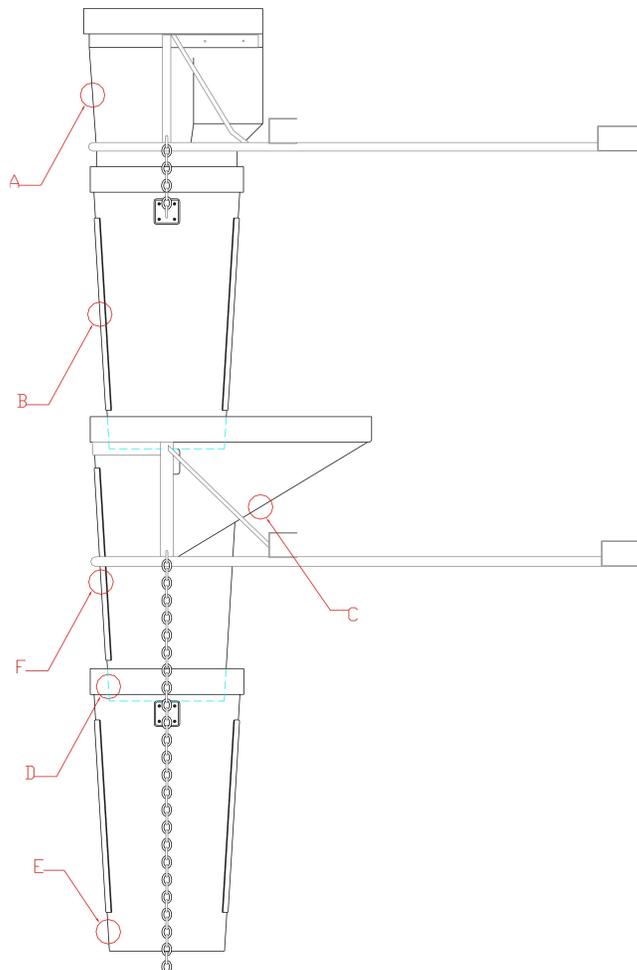


Figure 2 — Impact Points for Falling Mass Test

4.8 Corrosion Test:

The chute support frame should be resistant to corrosion taking into consideration all the parameters in the working environment. It is the responsibility of the manufacturer to use surface treatments or materials, which guarantee this performance. A minimum requirement is that all steel fixing frames shall be hot dip galvanized after manufacture, and other component parts shall meet the requirements of EN ISO 1461.

4.9 Internal Stress-Cracking Tests: (for thermo plastics only)

The following procedure will test the level of internal stress, which can affect some molded plastic parts. Cracks after this test mean use of inadequate material or bad processing conditions. The test shall be carried out under the following conditions:

- tank large enough to allow a sample section 250mm X 250mm taken from any part of a chute section to be submerged.
- water bath with 2 % to 3 % in volume of active part strong detergent e. g. (1) diluted in water;
- bath temperature of $(70 \pm 5)^{\circ}\text{C}$;
- duration of the bath shall be 48 h.

After the test the chute sample shall be rinsed immediately and shall be checked visually only 6 h after the test.

After completing the test no cracks or tears in any part of the sample which could render the chute unsafe to use, should be visible.

(1) A suitable detergent is nonyl-phenol-etoxilate with a number of ethylene oxides (EO) mol greater than or equal to 9.

4.10 Tests on the Support Structure:

The support frame and chains (cables) shall be fixed in position as per manufacturers instructions and suspended at a level 2m above ground level. A 0.5 Ton weight is to be suspended from the bottom two-suspension chains (cables). The weight shall remain in suspension for 30 minutes.

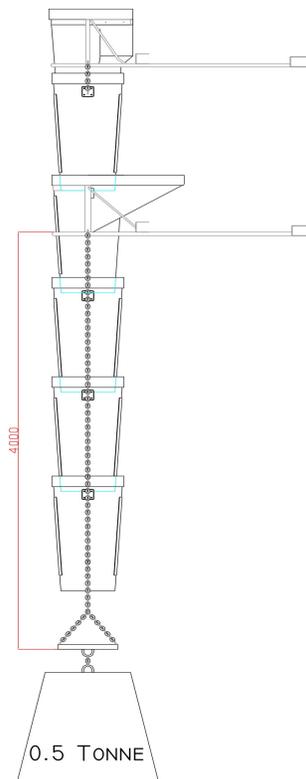


Figure 3 – Test on Support Structure

5. Minimum Test Result:

No failure of any component shall occur. No deformation of any component shall occur. The chute system shall be fully functional after the test.

6. Test Report

The test report shall include the following:

- a) Name and place of the testing body.
- b) Testing date.
- c) Test conditions.
- d) Description of the tested chutes (manufacturer, designation, others).
- e) Number of the chute sections tested.
- f) Type of testing equipments.
- g) Result on each test.