RWANDA STANDARD

DRS 607-3

First edition

2025-mm-dd

Gully tops and manhole tops for vehicular and pedestrian areas — Specification — Part 3: Gully tops and manhole tops made of steel or aluminium alloys

ICS 93.080.30

Reference number

DRS 607-3:2025

In order to match with technological development and to keep continuous progress in industries, standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

Rwanda Standards Board

P.O Box 7099 Kigali-Rwanda

KK 15 Rd, 49

Tel. +250 788303492

Toll Free: 3250

E-mail: info@rsb.gov.rw

Website: www.rsb.gov.rw

ePortal: www.portal.rsb.gov.rw

Contents

Page

Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by technical committees are ratified by members of RSB Board of Directors for publication and gazettement as Rwanda Standards.

DRS 607-3 was prepared by Technical Committee RSB/TC 47, *Steel*, *aluminium and related products*.

In the preparation of this standard, reference was made to the following standard :

1) BS EN 124-3:2015 Gully tops and manhole tops for vehicular and pedestrian areas — Part 3: Gully tops and manhole tops made of steel or aluminium alloy

The assistance derived from the above source is hereby acknowledged with thanks.

DRS 607 consists of the following parts, under the general title *Gully tops and manhole tops for vehicular and pedestrian areas — Specification*:

— *Part 1: Classification, general design and performance requirements;*

— *Part 2: Gully tops and manhole tops made of cast iron;*

— *Part 3: Gully tops and manhole tops made of steel or aluminium alloys;*

— *Part 4: Gully tops and manhole tops made of steel reinforced concrete;*

— *Part 5: Gully tops and manhole tops made of composite materials;*

— *Part 6: Gully tops and manhole tops made of polypropylene (PP), polyethylene (PE) or unplasticized (vinyl chloride) (PVC-U).*

Committee membership

The following organizations were represented on the Technical Committee on *Steel, aluminium and related products* (RSB/TC 47) in the preparation of this standard.

All City Rwanda Ltd

Asante Steel ® Ltd

Eastern hope Ltd

King Lion Rwanda Investment Ltd

OBOR TECHNOLOGY(RWANDA) LTD

Rwanda Engineering and Manufacturing Corporation (REMCO)

Rwanda Inspectorate, Competition and Consumer Protection (RICA)

S & H Industries Ltd (Rwanda)

TKAE Ltd

Rwanda Standards Board (RSB) – Secretariat

Gully tops and manhole tops for vehicular and pedestrian areas — Specification — Part 3: Gully tops and manhole tops made of steel or aluminium alloys

1 Scope

This Draft Rwanda Standard specifies requirements, sampling and test method for gully tops and manhole tops made of steel or aluminium alloys with a clear opening up to and including 1 000 mm.

It is applicable to manhole tops and gully tops for use in in areas subjected to pedestrian and/or vehicular traffic of class A 15, B 125, C 250, D 400, E 600 and F 900.

This Standard is not applicable to:

- manhole tops and gully tops made of aluminium tread plates for use in carriageways of roads (class D 400) and areas imposing high wheel loads (Classes E 600 and F 900);
- concave gratings for class D 400 installed in carriageways of roads or hard shoulders and concave gratings for classes F 900 and E 600;
- gratings/covers as part of prefabricated drainage channels;
- floor and roof gullies in buildings;
- surface boxes; and
- gully tops and manhole tops which are fabricated in hot working process.

NOTE This Part 3 of DRS 607 is not applicable in isolation, but only in combination with DRS 607-1 and gives guidance for combinations of covers/gratings made of steel or aluminium alloys with frames according to DRS 607-2 and DRS 607-4, DRS 607-5 or DRS 607-6.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

DRS 607-1, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 1: Definitions, classification, general principles of design, performance requirements and test methods*

DRS 607-2, *Gully tops and manhole tops for vehicular and pedestrian areas Part 2: Gully tops and manhole tops made of cast iron*

DRS 607-4, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 4: Gully tops and manhole tops made of steel reinforced concrete*

DRS 607-5, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 5: Gully tops and manhole tops made of composite materials*

DRS 607-6, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 6: Gully tops and manhole tops made of polypropylene (PP), polyethylene (PE) or unplasticized poly(vinyl chloride) (PVC-U)*

RS ISO 22965, *Concrete — Part 2: Specification of constituent materials, production of concrete and compliance of concrete*

ISO 209, *Wrought aluminium and aluminium alloys — Chemical composition*

ASTM B632/B632M-24, *Standard Specification for Aluminium-Alloy Rolled Tread Plate*

ISO 17615, *Aluminium and aluminium alloys — Alloyed ingots for remelting — Specifications*

ISO 3522, *Aluminium and aluminium alloys — Castings — Chemical composition and mechanical properties*

ISO 15510, *Stainless steels — Chemical composition*

RS ISO 22965, *Concrete Part 2: Specification of constituent materials, production of concrete and compliance of concrete*

ISO 630-1, *Structural steels Part 1: General technical delivery conditions for hot-rolled products*

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods*

ISO 3452-1, *Non-destructive testing - Penetrant testing — Part 1: General principles*

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 14554 *(all parts), Quality requirements for welding — Resistance welding of metallic materials*

ISO 14732, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials*

ISO 15609 (all parts), *Specification and qualification of welding procedures for metallic materials —Welding procedure specification*

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in DRS 607-1 apply.

4 Materials

4.1 General

Manhole tops, gully tops and gratings made of steel or aluminium alloys shall be manufactured from the following materials:

a) Steel according to 4.2;
b) Stainless steel according to 4.3;
c) Aluminium alloys according to 4.4.

The minimum thickness of sheet material prior to corrosion protection shall be at least 2.75 mm for C 250 covers and above.

Any element made of the materials specified in 4.1 a) to c) can be used in combination with elements of materials specified in DRS 607 -2, DRS 607 -4, DRS 607 -5 or DRS 607 -6. In such cases the manhole tops or gully tops shall comply with the relevant design and performance and testing requirements as listed in Table 1.

In addition, elements shall comply with the requirements for the material related DRS 607 -2, DRS 607 -4, DRS 607 -5 or DRS 607 -6 as applicable. Each element shall be marked accordingly. The load class to be declared for the combined product shall be to the lower class determined for any constituent element according to the relevant part of DRS 607 series.

EXAMPLE Where a cover is made of steel, class C 250, and the frame is made of PVC-U, class B 125, the manhole top or gully top is marked with DRS 607 -3 and the class to be declared for the combined product is the class of the frame according to DRS 607 -6.

4.2 Steel

4.2.1 General

Steel manhole tops and gully tops shall be made from steel according to ISO 3574 or RS ISO 630-1 and shall be resistant to corrosion. For use in normal conditions corrosion resistance can be ensured, e.g., by hot-dip galvanizing on a clean surface in accordance with 4.2.2. Prior to application of any surface corrosion protection system, manhole tops and gully tops shall be fettled.

4.2.2 Hot dip galvanizing

Where corrosion resistance is achieved by hot dip galvanizing it shall be in accordance with ISO 1461. There shall be no sharp edges resulting from hot dip galvanizing.

After a manhole top or gully top has been hot dip galvanized it can be straightened to overcome any distortion prior to fitting the manhole cover or gully grating in its frame. Any such straightening shall not adversely affect the integrity of the hot dip galvanizing or the structure of the manhole top or the gully top.

NOTE 1 Hot dip galvanization is regarded as corrosion protection system and not regarded as an aesthetic coating.

NOTE 2 Other supplementary coatings can be applied to the hot dip galvanized surface, e.g. coating or paint systems.

4.3 Stainless steel

Stainless steel manhole tops and gully tops for use in normal conditions (see DRS 607-1, 5.1) shall be fabricated from austenitic stainless steel grades 4301-304-00-I,4306-304-03-I ,4307-304-03-I,4401-316-00-I,4404-316-03-I,4432-316-03-I or 4571-316-35-Iin accordance with ISO 15510. For normal conditions of use no surface corrosion protection system shall be required. Appropriate post fabrication finishing processes are required to avoid iron contamination, e.g. welded joints shall be treated by pickle passivation process or shot blasting.

Corrosion protection or another grade of stainless steel should be required if the manhole top or gully top is subject to more severe conditions of use, e.g., in a particularly aggressive chemical environment.

Stainless steel manhole tops and gully tops can be supplied with aesthetic surface finishes, e.g., varnish or paint or cleaning or bead blasting.

4.4 Aluminium alloys

Aluminium manhole tops and gully tops shall be fabricated or cast from aluminium alloys according to ISO 3522, ISO 17615 or ISO 209 for use under "cyclic wet and dry' conditions and a slightly aggressive chemical environment as specified in DRS 607-1, 6.1. Alloys having a declared copper content of less than 0,1 % shall not require additional corrosion protection. Corrosion protection can also be achieved by anodizing according to ISO 7599, Class AA 25. Corrosion protection systems other than anodizing or choice of alloys with specific corrosion resistance shall give corrosion protection equivalent to that of anodizing. Corrosion protection or another grade of aluminium may be required if the manhole top or gully top is subject to more severe conditions of use as given in DRS 607-1, 6.1, e.g. in a particularly aggressive chemical environment.

Aluminium tread plates shall be in accordance with ASTM B632. Their use for manhole tops and gully tops is restricted to classes A 15 to C 250.

4.5 Cover fillings

In the case of covers placed on the market in filled condition the filling shall consist of either:

a) Concrete with a minimum compressive strength class of B35 according to RS ISO 22965-2, at least suitable for use in "cyclic wet and dry" conditions, or
b) Other material complying with the intended use/place of installation expectations and with appropriate relevant Standards at least suitable for use in "cyclic wet and dry" conditions.

In the case of covers placed on the market in unfilled condition and the filling is applied subsequently, the filling materials shall have a minimum performance comparable to concrete or the surrounding pavement materials and shall fulfil the requirements of the appropriate Standards.

5 Requirements

5.1 Design and performance requirements

Manhole tops, gully tops and gratings made of materials according to 4.1 shall meet the design and performance and testing requirements in accordance with DRS 607 -1 as listed in Table 1.

5.2 Covers with fillings

When tested in accordance with DRS 607-1, Clause 9, covers placed on the market filled with concrete or other filling materials and covers designed to be filled and placed on the market unfilled shall comply with requirements of Clause 4 and Clause 5.

Covers of classes A 15 and B 125, designed to be filled, placed on the market unfilled and which are capable of meeting the declared load class only in filled condition, can be filled subsequently on site with concrete in accordance with 4.5. Those covers shall comply with the requirements of Clause 4 and Clause 5 in the condition filled with concrete.

They shall be tested after being filled in accordance with the manufacturer's instructions for filling. The manufacturer's instructions for filling shall be supplied with the product and shall include all information for the filling procedure including the grade of the material used to ensure the declared performance after filling.

Filling materials used after the manhole top or gully top with an unfilled cover has been placed on the market, are subject to selection by the specifier or client. Their performance in service and their durability should be controlled to comply with the intended use/place of installation expectations, and with appropriate relevant Standards.

Table 1 — Design, performance and testing requirements in accordance with DRS 607 -1 for gully tops and manhole tops made of mild steel, stainless steel or aluminium alloys

S/N	Characteristic	Requirements acc. to DRS 607-1 **Clause**	Testing acc. to DRS 607-1 **Clause**	Relevant for class					
				A 15	B 125	C 250	D 400	E 600	F 900
Related to the design									
i.	Vents in covers	7.1	9.4.1	x	x	x	x	x	x
ii.	Clear opening of manhole tops for man entry	7.2	9.4.2	x	x	x	x	x	x
iii.	Depth of insertion	7.3	9.4.3	–	–	–	x	x	x
iv.	Clearance	7.4	9.4.4	x	x	x	x	x	x
v.	Compatibility of seatings	7.5	9.4.5	–	–	–	x	x	x
vi.	Handling of covers and gratings	7.7	9.4.7	x	x	x	x	x	x
vii.	Slot dimensions of gratings	7.8	8.4.8	x	x	x	x	x	x
viii.	Dirt pans and dirt buckets	7.9	9.4.9	x	x	x	x	x	x
ix.	Positioning of covers and gratings	7.10	9.4.10	x	x	x	x	x	x
x.	Flatness of manhole covers and gratings	7.11	9.4.11	–	–	–	x	x	x
xi.	Concaveness of gratings	7.12	9.4.12	x	x	x	x	x	x

xii.	Surface conditions	7.13	9.4.13	x	x	x	x	x	x
xiii.	Manhole tops with sealing features	7.14	Visual inspection of presence of anchors	x	x	x	x	x	x
xiv.	Frame bearing area	7.15	9.4.14	x	x	x	x	x	x
xv.	Frame depth	7.16	9.4.15	–	–	–	x	x	x
xvi.	Opening angle of hinged covers/gratings	7.17	9.4.16	x	x	x	x	x	x
xvii.	Appearance	8.1	Visual inspection	x	x	x	x	x	x
	Related to the performance								
xviii.	Load bearing capacity	8.2	9.3	x	x	x	x	x	x
xix.	Permanent set	8.3	9.2	x	x	x	x	x	x
xx.	Securing of the cover/grating within the frame	7.6	9.4.6	x	x	x	x	x	x
xxi.	Skid resistance	8.4	9.4.13	x	x	x	x	x	x
xxii.	Child safety	8.5	9.5	x	x	x	x	x	x
xxiii.	x To be applied.								

5.3 Material-specific characteristics for gully tops and manhole tops made of mild steel or aluminium alloys

5.3.1 Reaction to fire

Where use of manhole tops and gully tops in accordance with this standard is subject to national regulatory requirements on reaction to fire, their reaction to fire performance shall be declared. Manhole tops and gully tops made of steel or aluminium alloys are classified as Class A1 without the need for testing.

NOTE 1 Steel or aluminium alloys, as homogeneously distributed materials for these products (whether in combination with concrete or not), are considered as material of known and stable performance with respect to the reaction to fire performance as it does not consist of any organic material and consequently does not contribute to fire. Under these conditions it can be considered as Class A1 material.

NOTE 2 The class of reaction to fire performance of manhole tops and gully tops made of steel or aluminium alloys is regarded as the class for the constituent material (e.g., steel or aluminium).

Conversely, where the use of manhole tops and gully tops is not subject to national regulatory requirements on reaction to fire, either the Class A1 (see above) or "No Performance Determined" (NPD) may be declared.

NOTE 3 Where the compatibility of seatings is achieved by the use of cushioning inserts, only a negligible area of the cushioning insert material would be exposed to fire, considering the end use situation. There is no relevance in relation to the reaction to fire performance and embedded cushioning inserts would not be able to ignite or to propagate fire there. Their contribution to fire spread is not of concern, nor is an influence expected on the fire behaviour of the neighbouring

material and the contribution to fire propagation is negligible. Considering these aspects, separate testing and classification of cushioning inserts is not necessary.

5.3.2 Durability

5.3.2.1 General

The materials specified in Clause 4 including their corrosion protection requirements are materials of known and stable performance with respect to their application within the scope of this standard. No further material tests are required for material durability.

The durability of manhole tops and gully tops manufactured from steel, stainless steel or aluminium alloys will depend upon design features and exposure conditions (see DRS 607-1 6.1). The prescribed framework of requirements and test methods for the mandated performance characteristics according to Clause 5 will also reflect the durability of manhole tops and gully tops.

5.3.2.2 Durability of load bearing capacity

Durability of load bearing capacity is ensured by meeting the requirements of DRS 607-1, 8.2 and 8.3, the proportion between test load and maximum load to be expected in service and in conjunction with the stable behaviour of the material specified in Clause 4 covers all relevant effects which may influence the durability of the load bearing capacity.

5.3.2.3 Durability of securing of covers/gratings within the frame

Durability of securing of covers/gratings in the frame against unintended lifting is ensured by using materials with proven resistance against corrosion and passing the test according to DRS 607-1, 9.4.6.

5.3.2.4 Durability of skid resistance

Durability of skid resistance is ensured by meeting the requirements of DRS 607-1, 8.4, in conjunction with the stable resistance of the material itself against loss of grip under normal conditions of use.

5.3.2.5 Durability of effectiveness of child safety characteristics

Durability of the child safety characteristics concerning the resistance of manhole tops and gully tops against the removal by children is ensured by re-inspecting the weight or the locking accessory or the securing feature, as appropriate, is still functional after testing the securing in accordance with DRS 607-1, 9.4.6.

5.3.3 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

5.4 Additional requirements for gully tops and manhole tops made of steel or aluminium alloys

5.4.1 Fabrication

Welds shall be visually inspected for integrity. The specification and qualification of welding procedures for covers shall conform to relevant part of ISO 15609 series. Fabrication of fusion welded component parts of a fabricated manhole top shall be undertaken by a welder approved by the procedures in ISO 9606-1 for steel and ISO 9606-2 for aluminium alloys.

Fabrication of resistance welded metallic components shall conform to the quality requirements of ISO 14554 (all parts). Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanised and automatic welding of metallic materials shall conform to ISO 14732. During approval testing welds shall be evaluated according to ISO 3452-1.

5.4.2 Deflection under load

The maximum deflection under load shall be C0/360 for covers to be filled with brittle materials other than concrete. For covers to be filled with concrete, the maximum deflection under load shall be CO/250. For all other covers according to this standard, the maximum deflection under load shall be declared as mm per mm of clear opening.

6 Testing

6.1 General

Gully tops and manhole tops according to this standard shall be tested as complete units in their intended position of use where the cover/grating is suitably positioned within the frame in accordance with DRS 607-1, Clause 9, as listed in Table 1, and in addition in accordance with

Gully tops and manhole tops consisting of covers with fillings or covers designed to be filled subsequently, shall be tested as follows:

1) Covers placed on the market filled with concrete or other filling materials shall be tested in filled condition
2) Covers placed on the market unfilled shall be tested without filling
3) Covers for the field of application of classes A 15 to B 125 placed on the market unfilled and filled subsequently in accordance with the manufacturer's instructions shall be tested with concrete in accordance with the manufacturer's instructions for filling.

All tested products shall be visually inspected without magnification.

6.2 Testing of deflection under load

Deflection under load shall be tested in accordance with Annex A by applying a test load FD = 1/3 F_T.

7 Assessment and verification of constancy of performance – AVCP

7.1 General

The compliance of gully tops and manhole tops with the requirements of this standard and with the performances declared by the manufacturer in the specification shall be demonstrated by:

- Determination of the product type on the basis of type testing;
- Factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

7.2 Type testing

7.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests (e.g., use of previously existing data, classified without further testing (CWFT) and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third party, when relevant, under the responsibility of a notified product certification body, when relevant.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for the same characteristics for all products within that same family.

NOTE 2 Products can be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

- At the beginning of the production of a new or modified gully top and manhole top (unless a member of the same product range), or
- At the beginning of a new or modified method of production (where this can affect the stated properties), or
- They shall be repeated for the appropriate characteristic(s), whenever a change occurs in the gully top or manhole top design, in the raw material or in the supplier of the components, or in the method of

production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate specifications may be presumed to have the performances declared in the specification, although this does not replace the responsibility on the manhole tops and gully tops manufacturer to ensure that the manhole tops and gully tops as a whole are correctly manufactured and its component products have the declared performance values.

7.2.2 Test samples, testing and compliance criteria

The number of samples of gully tops and manhole tops to be tested/assessed shall be in accordance with Table 2. Characteristics for which the performance is to be declared are written in **bold letters**.

7.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. Test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the gully top or manhole top to which they relate.

7.2.4 Shared other party results

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

- The results are known to be valid for products with the same essential characteristics relevant for the product performance;
- in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

The manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:

- Ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and
- Keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

Table 2 — Number of samples to be tested and compliance criteri

Characteristic	Requirement	Assessment method	No. of Samples[a]	Compliance criteria
for the declared performance:				
Reaction to fire	5.3.1	Classified without testing (CWT)	3	DRS 607-3, 5.3.1, Class A1
Frame bearing area	5.1	DRS 607-1, 9.4.14	3	DRS 607-1, 7.15, calculated value $P_b \leq 7{,}5$ N/mm^2
Load bearing capacity	5.1	DRS 607-1, 9.3	3	DRS 607-1, 8.2, test load for the declared class
Permanent set	5.1	DRS 607-1, 9.2	3	DRS 607-1,8.3, permissible value for the declared class
Securing of the cover/ grating within the frame	5.1	DRS 607-1, 9.4.6	3	DRS 607-1, 7.6, declared method and either weight in kg or value F_v in kN and appropriate h in mm, as applicable
Child safety	5.1	DRS 607-1, 9.5	3	DRS 607-1, 8.5, declared method or weight
Skid resistance of				
a) Covers with				
— concrete surface	5.1	DRS 607-1, 9.4.13 a)	3	DRS 607-1, 8.4.2 a), declared as “concrete surface” for the material used
— raised pattern		DRS 607-1, 9.4.13 b)	3	DRS 607-1, 8.4.2 b), declared as “raised pattern” for the specified raised pattern
— other surface		DRS 607-1, 9.4.13 c)	3	DRS 607-1, 8.4.2 c), for the calculated and declared value of USRV
b) Gratings	5.1	DRS 607-1, 9.4.13 b)	3	DRS 607-1, 8.4.3, declared as “raised pattern” for the specified raised pattern or “slots” the measured slot dimensions
c) Frames with max. horizontal visible width of — ≤ 40 mm or — > 40 mm	5.1	DRS 607-1, 9.4.4	3	DRS 607-1, 8.4.2, determined acc. to the requirement clause and expressed as — “NPD” for ≤ 40 mm or

Characteristic	Requirement	Assessment method	No. of Samples[a]	Compliance criteria
				— method or value for > 40 mm
Durability of				
— **load bearing capacity**[b] against mechanical failure	5.3.2	DRS 607-1, 9.2 DRS 607-1, 9.3	3	DRS 607-3,4.1, DRS 607–1,8.2 and 8.3 declared as “Pass” according to the material used and the test method applied
— **securing**[c] against unintended lifting	5.3.2	DRS 607-1, 9.4.6	3	DRS 607-1, 7.6, declared as “Pass” according to the material used and the test method applied
— **skid resistance** against loss of grip	5.3.2	DRS 607-1, 9.4.13	3	DRS 607-1, 8.4 declared as “Pass” for the declared value of USRV and for the declared method and the material used
— **effectiveness of child safety characteristics**	5.3.2	DRS 607-1, 9.4.6	3	DRS 607-1, 7.6, declared as “Pass” according to the material used and the method declared
for the design:				
Vents in covers	5.1	DRS 607-1, 9.4.1	3	DRS 607-1, 7.1
Clear opening of manhole tops for man entry	5.1	DRS 607-1, 9.4.2	3	DRS 607-1, 7.2
Depth of insertion	5.1	DRS 607-1, 9.4.3	3	DRS 607-1, 7.3
Clearance	5.1	DRS 607-1, 9.4.4	3	DRS 607-1, 7.4
Compatibility of seatings	5.1	DRS 607-1, 9.4.5	3	DRS 607-1, 7.5
Handling of covers and gratings	5.1	DRS 607-1, 9.4.7	3	DRS 607-1, 7.7
Slot dimensions of gratings	5.1	DRS 607-1, 9.4.8	3	DRS 607-1, 7.8
Dirt pans and dirt buckets	5.1	DRS 607-1, 9.4.9	3	DRS 607-1, 7.9
Positioning of covers and gratings	5.1	DRS 607-1, 9.4.10	3	DRS 607-1, 7.10

Characteristic	Requirement	Assessment method	No. of Samples[a]	Compliance criteria
Flatness of manhole covers and gratings	5.1	DRS 607-1, 9.4.11	3	DRS 607-1, 7.11
Concaveness of gratings	5.1	DRS 607-1, 9.4.12	3	DRS 607-1, 7.12
Surface conditions	5.1	DRS 607-1, 9.4.13	3	DRS 607 -1, 7.13
Manhole tops with sealing feature	5.1	Visual inspection of presence of anchors	3	DRS 607-1, 7.14
Frame depth	5.1	DRS 607-1, 9.4.15	3	DRS 607-1, 7.16
Opening angle of hinged covers/gratings	5.1	DRS 607-1, 9.4.16	3	DRS 607-1, 7.17
Appearance	5.1	Visual inspection	3	DRS 607-1, 8.1
Deflection under load	5.4.2	DRS 607-1,6.2	3	DRS 607-3, 5.4.2

a
If one of the 3 samples fails, the specific test can be repeated with 5 new samples. All the 5 samples shall pass the test.

b
The proportion between the test load for the declared class and the maximum load to be expected in service in conjunction with the stable behaviour of the material specified in Clause 4 covers all effects which can influence the durability of the load bearing capacity.

c
Ensured by using materials with proven resistance against corrosion and passing the test according to DRS 607-1, 9.4.6.

7.3 Factory production control (FPC)

7.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the

effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

7.3.2 Requirements

7.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory the manufacturer may delegate the action to a person having the necessary authority to:

- Identify procedures to demonstrate constancy of performance of the product at appropriate stages;
- Identify and record any instance of non-constancy; identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

a) The preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;
b) The effective implementation of these procedures and instructions;
c) The recording of these operations and their results;
d) The use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of nonconformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this Standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

7.3.2.2 Equipment

7.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

7.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

7.3.2.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

7.3.2.2.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

7.3.2.2.5 Controls during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

For components used for the assembly of manhole tops and gully tops, such as cushioning inserts, bolts, etc. not specified in this standard and coating materials, the supplier's documentation shall be checked at every delivery for compliance with the manufacturer's specification. The documents shall be retained for a period of 10 years.

For all materials in accordance with Clause 4, used for the manufacturing process of manhole tops and gully tops, specified in this standard the supplier's documentation shall be checked at every delivery for compliance with the manufacturer's specification.

NOTE For deliveries from suppliers having an established quality management system, the frequency of inspection can be reduced at the discretion of the manufacturer.

Raw materials used for the manufacturing process of manhole tops and gully tops made of steel or aluminium alloys shall be inspected according to Table 3 or Table 4 as applicable.

Table 3 — Material delivery inspection for steel and stainless steel

Aspect of inspection	Method of inspection	Frequency of inspection	Document retention period
Steel	Cert supplier [a]	Every delivery	1 year
Stainless steel	Cert supplier [a]	Every delivery	1 year

[a] Certificate of the supplier:
— deliveries from suppliers having a certified quality insurance system shall be subject to random control;
— deliveries from suppliers having no certified quality insurance system shall be subject to a systematic control for each delivery.

Table 4 — Material delivery inspection for aluminium alloys

Aspect of inspection	Method of inspection	Frequency of inspection	Document retention period
Raw material storage area	Visually	Regularly [b]	-
Aluminium alloys (4.4)	Cert supplier [a]	Every delivery	1 year
Additives	Refer to the order	Every delivery	1 year
Energy for melting:			
Gas	Cert supplier [a]	Regularly/when changed	1 year
Sand for moulds/cores	Cert supplier [a] and sieve analysis	Regularly [b]	1 year

[a] Certificate of the supplier:
— deliveries from suppliers having a certified quality insurance system shall be subject to random control;
— deliveries from suppliers having no certified quality insurance system shall be subject to a systematic control for each delivery.
[b] FPC – Factory Production Control

The following relevant process parameters shall be controlled, measured and documented in accordance with the manufacturer's process instructions:

- Moulds, cores and pouring temperature of melt in the ladle/furnace, where applicable;
- Mechanical properties and dimensions, where applicable. 7.3.2.6.

7.3.2.2.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics for which he declares the performance given in Table 5 in bold letters are maintained. The characteristics and the means of control shall be as given in Table 5.

Table 5 — Product testing of finished products

Characteristic	Requirement	Assessment method	Minimum frequency of inspection (units)	Document retention period
for the declared performance:				
Reaction to fire	5.3.1	Classified without testing	-	-
Frame bearing area	5.1	Calculation acc.to DRS 607-1, 9.4.14	1:5 000 [a]	10 years
Load bearing capacity	5.1	DRS 607-1, 9.3	1:5 000 [a]	10 years
Permanent set	5.1	DRS 607-1, 9.2	1:5 000 [a]	10 years
Securing of the cover/ grating within the frame	5.1	DRS 607-1, 9.4.6	1:5 000 [a]	10 years
Child safety	5.1	DRS 607-1, 9.5	1:5 000 [a]	10 years
Skid resistance	5.1	DRS 607-1, 9.4.13	1:5 000 [a]	10 years
Durability of				
– load bearing capacity	5.3.2	DRS 607-1, 9.2 DRS 607-1, 9.3	1:5000 [a]	10 years
– securing	5.3.2	DRS 607-1, 9.4.6	1:5000 [a]	10 years
– skid resistance	5.3.2	DRS 607-1, 9.4.13	1:5000 [a]	10 years
for the design:				
Vents in covers	5.1	DRS 607-1, 9.4.1 visual inspection	Every cover	5 years
Clear opening of manhole tops for man entry	5.1	DRS 607-1, 9.4.2 Measurement	1:5 000 [a]	5 years
Depth of insertion	5.1	DRS 607-1, 9.4.3 Measurement	1:5 000 [a]	5 years

Clearance	5.1	DRS 607-1,9.4.4 Measurement	1:5 000 [a]	5 years
Compatibility of seatings	5.1	DRS 607-1, 9.4.5 Measurement	1:5 000 [a]	5 years
Handling of covers and gratings	5.1	DRS 607-1, 9.4.7	1:5 000 [a]	5 years
Slot dimensions of gratings	5.1	DRS 607-1, 9.4.8 Measurement	1:5 000 [a]	5 years
Dirt pans and dirt buckets	5.1	DRS 607-1,9.4.9	1:5 000 [a]	5 years
Positioning of covers and gratings	5.1	DRS 607-1, 9.4.10	1:5 000 [a]	5 years
Flatness of manhole covers and gratings	5.1	DRS 607-1, 9.4.11	1:5 000 [a]	5 years
Concaveness of gratings	5.1	DRS 607-1, 9.4.12	1:5 000 [a]	5 years
Surface conditions	5.1	DRS 607-1,9.4.13	1:5 000 [a]	5 years
Manhole tops with sealing feature	5.1	Visual inspection	1:5 000 [a]	5 years
Frame depth	5.1	DRS 607-1, 9.4.15 Measurement	1:5 000 [a]	5 years
Opening angle of hinged covers/gratings	5.1	DRS 607-1, 9.4.16	1:5 000 [a]	5 years
Appearance	5.1	Visual inspection	1:5 000 [a]	5 years
Marking	9	Visual inspection	Every product	5 years
Deflection under load	5.4.2	DRS 607–3, 6.2	1:5 000 [a]	5 years
[a] At least every 6 months.				

7.3.2.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this Standard, the corrective measures taken to rectify the situation (e.g., a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

7.3.2.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of nonconformities in order to prevent recurrence.

7.3.2.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

7.3.3 Product specific requirements

The FPC system shall address this Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

a) The controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan; and/or
b) The verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan.

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters, etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

7.3.4 Initial inspection of factory and of FPC

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of 7.3.2 and 7.3.3 are fulfilled.

During the inspection it shall be verified:

a) That all resources necessary for the achievement of the product characteristics included in this Standard are in place and correctly implemented; and
b) That the FPC-procedures in accordance with the FPC documentation are followed in practice; and
c) That the product complies with the product type samples, for which compliance of the product performance to the specifications has been verified.

All locations where final assembly or at least final testing of the relevant product is performed shall be assessed to verify that the above conditions a) to c) are in place and implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

7.3.5 Continuous surveillance of FPC

Surveillance of the FPC shall be undertaken once per year. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

7.3.6 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 7.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

7.3.7 One-off products and products produced in very low quantity

The manhole tops and gully tops produced as a one-off, prototypes assessed before full production is established, and products produced in very low quantities maximum 10 per year shall be assessed as follows.

For type assessment, the provisions of 7.2.1, 3rd paragraph apply, together with the following additional provisions:

- In case of prototypes, the test samples shall be representative of the intended future production and shall be selected by the manufacturer;
- On request of the manufacturer, the results of the assessment of prototype samples may be included in a certificate or in test reports issued by the involved third party.

The FPC system of one-off products and products produced in very low quantities shall ensure that raw materials and/or components are sufficient for production of the product. The provisions on raw materials and/or components shall apply only where appropriate. The manufacturer shall maintain records allowing traceability of the product.

For prototypes, where the intention is to move to series production, the initial inspection of the factory and FPC shall be carried out before the production is already running and/or before the FPC is already in practice. The following shall be assessed:

- The FPC-documentation; and
- The factory. In the initial assessment of the factory and FPC it shall be verified:
  a) That all resources necessary for the achievement of the product characteristics included in this Standard will be available; and
  b) That the FPC-procedures in accordance with the FPC-documentation will be implemented and followed in practice; and
  c) That procedures are in place to demonstrate that the factory production processes can produce a product complying with the requirements of this Standard and that the product will be the same as the samples used for the determination of the product type, for which compliance with this Standard has been verified.

Once series production is fully established, the provisions of 7.3 shall apply.

8 Designation

Where required for specification and documentation purposes, product designation in accordance with this Standard shall consist of:

a) Name of product (manhole top or gully top);
b) Standard number (DRS 607-3);
c) Load class (see 5.1);
d) Code of the material for Stainless steel (SS), Galvanized Steel (GS), Aluminium (AL);
e) Code related to the number of the parts DRS 607 series to which the cover and the frame complies according to Table 6;
f) Clear opening (CO in mm), e.g. 600 indicates CO = 600 mm;
g) Securing method:
   1) Securing feature (F);
   2) Mass per unit area (W);
   3) Other methods (0);

Table 6 — Designation according to the material of frame and cover/grating

Designation	Cover/grating in accordance with	Frame in accordance with
3/3	DRS 607–3	DRS 607 –3
3/2	DRS 607 –3	DRS 607 –2
3/4	DRS 607 –3	DRS 607 –4
3/5	DRS 607 –3	DRS 607 –5
3/6	DRS 607 –3	DRS 607 –6

h) Skid resistance:
   1) Concrete (CR);
   2) Defined raised pattern (RP);
   3) Measured value of USRV (e.g. 40);
i) Covers placed on the market unfilled (U);

Manhole tops and gully tops consisting of a combination of elements in accordance with DRS 607 -2, and DRS 607 -3, DRS 607 -4, DRS 607 -5 and DRS 607 -6 shall be designated with the number of the standard for which the cover meets the requirements of the relevant standard.

EXAMPLE 1 Designation of a manhole top according to DRS 607 -3, class D 400, cover and frame made of galvanized steel (GS) (3/3); with a clear opening CO 600 mm (600), other securing method (0), skid resistance (RP)

Manhole Top DRS 607 -3 — D 400 – GS – 3/3 – 600 – RP

EXAMPLE 2 Designation of a manhole top according to DRS 607 -3, class A 15, consisting of a combination of a cover made of aluminium (Al) according to DRS 607-3 with a frame made of PP according to DRS 607-6 (3/6), with a clear opening CO 400 mm (400), securing feature (F), skid resistance (USRV 40)

Manhole Top DRS 607 -3 — A 15 – Al – 3/6 – 400 – F – 40

EXAMPLE 3 Designation of a manhole top according to DRS 607 -3, class B 125, cover and frame made of stainless steel (3/3) cover filled with concrete, with a clear opening CO 800 mm (800), securing method mass per unit area (W), skid resistance covered by the concrete surface (CR),

Manhole Top DRS 607 -3 B 125 – SS – 3/3 – 800 –W – CR –

EXAMPLE 4 Designation of a gully top according to DRS 607 -3, class C 250, cover and frame made of steel (3/3) cover filled with concrete, with a clear opening CO 550 mm (550), securing method mass per unit area (W), skid resistance covered by the raised pattern (RP)

Gully Top DRS 607 -3 — C 250 – GS – 3/3 – 550 – W – RP

EXAMPLE 5 Designation of a manhole top according to DRS 607 -3, class B 125, cover and frame made of steel (3/3), with a clear opening CO 600 mm (600), securing feature (F), placed on the market with unfilled cover (U)

Manhole Top DRS 607 -3 — B 125 – GS – 3/3 – 600 – F – U

NOTE 1 In case of covers placed on the market unfilled, the no performance declared (NPD) option is used for skid resistance (see ZA.1).

NOTE 2 The designation provides a standardized pattern of designation from which a rapid and unequivocal description of an item is communicated.

9 Marking

Covers, gratings and frames of manhole tops and gully tops according to this Standard shall be marked as follows:

a) Number of this Standard, i.e., DRS 607-3:2025
b) Appropriate class (e.g., B 125);
c) Name and/or identification mark of the manufacturer;
d) Factory of manufacture which may be in code;
e) Date or week and year of manufacture (coded or not coded);

In addition, gratings, covers and frames of manhole tops and gully tops according to this standard can be marked with:

f) Additional markings relating to the intended application of the user;
g) Product identification (name and/or catalogue number);
h) Nominal mass in kilograms (kg).

Markings a) to f) of covers, gratings and frames shall be clear, permanent and an integral part of it.

All markings shall, where possible, be visible on the upper side (visible from the trafficked area) after the unit is installed. If this is not possible, they may be placed on the underside of the cover or grating.

Markings a) and b) shall always be on the upper side of cover/grating.

Where regulatory marking provisions require information on some or all items listed in this clause, the provisions of this clause concerning those common items are deemed to be met and the information needs not be repeated for the purpose of this clause.

Annex A
(normative)

Test of deflection under load

A.1 Test samples

Gully tops and manhole tops shall be tested as complete units in their condition of service, except for covers delivered unfilled, which shall be tested without filling. Units tested shall be new units that have not been subjected to any other load tests, and shall be randomly selected.

A.2 Deflection test load, F_D

A test load F_D = 1/3 F_T of the test load shown in DRS 607-1 8.2, Table 4, shall be applied for each class for all clear openings.

A.3 Apparatus

A.3.1 Testing machine

The testing machine, preferably a hydraulic test press, shall be capable of applying a load at least 25 % greater than the respective test load for classes A 15 to D 400 and at least 10 % greater than the respective test load for classes E 600 and F 900. A tolerance of ± 3 % of the test load shall be maintained. Except for multiple units, the dimensions of the bed of the testing machine shall be greater than the bearing area of the unit to be tested.

A.3.2 Test blocks

The dimensions and shape of test blocks shall be as shown in DRS 607-1, Table A.1.

A.3.3 Deflection measurement device(s)

The deflection measurement device(s) shall have a measurement range of at least 10 mm with a resolution of at least 0,01 mm and have a maximum overall accuracy of ± 5 %.

A.4 Procedure

A.4.1 Procedure for testing rectangular and circular covers/gratings

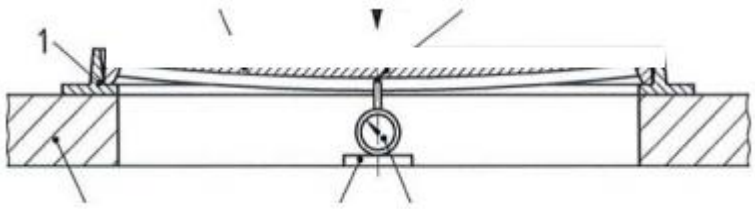
The test sample shall be placed on the test machine bed. The test sample shall be supported on the bed of the test machine in such a way as to ensure that when the cover or grating is deflected under the test load, it shall remain unsupported, and not in contact with the bed of the test machine. The cover or grating of the test sample shall rest normally in its frame.

The test block shall be placed on the geometric centre of the cover/grating with its vertical axis perpendicular to the surface (e.g., see DRS 607-1, Figure A.1).

The test load shall be uniformly distributed over the whole surface of the test block and any irregularities compensated for by means of an appropriate intermediate layer, e.g., softwood, fibre board, felt or similar material positioned between the cover or the grating and the test block. The dimensions of this intermediate layer shall not be larger than those of the test block.

When testing gully tops or manhole tops with a non-flat surface, the contact face of the test block shall be shaped to match the grating or cover. Patterns as defined in DRS 607-1, 8.4, and small deviations from a flat surface do not require a shaped contact face of the test block.

Measurement of deflection shall be made on the underside of the gully grating or manhole cover as shown in Figure A.1 in the same place as the applied test load. The deflection measurement device(s) shall be positioned within ± 5 % of the geometrical centre of the clear opening of the cover or grating.



Key

1 frame 2
2 cover or grating
3 geometric centre
4 bed of testing machine
5 measuring device support
6 measuring device
7 FD deflection test load

Figure A.1 — Measurement of deflection under load

A conditioning load of maximum 1/3 of F_D shall be applied to bed the system in, and may be held for no more than 5 s and subsequently fully released. After the conditioning load is released and before Fa is applied, the deflection measurement device(s) shall be set such that it is in contact with the underside of the manhole top or gully top and (a) reference reading(s) shall be taken. The load F_p shall be applied at a rate of 1 kN/s to 5 kN/s up to 1/3 F_T and maintained for 30 s. The deflection measurement device(s) shall be read again within the next 10 s. The load shall then be released.

A.4.2 Procedure for testing multiple and triangular covers/gratings

In the case of multiple manhole tops or gully tops, each individual unit and each intermediate structural element shall be tested in accordance with the procedure in A.4.1. The location of the test blocks and the deflection measurement device(s) shall be in accordance with DRS 607-1, Figure A.1 and Figure A.2. In the case of double triangular covers or gratings, the test block shall be positioned in the geometric centre, as shown in DRS 607-1Figure A.3.

A.5 Observations and reporting

Record shall be made of all deflection gauge readings, and the differences between the "reference readings" and the equivalent "readings under load" shall be determined. A comparison shall be made between these differences and the requirements of this standard, and a report prepared accordingly.

Bibliography

[1] EN 1253 (all parts), *Gullies for buildings*

[2] EN 1433, *Drainage channels for vehicular and pedestrian areas — Classification, design and testing requirements, marking and evaluation of conformity*

[3] ISO 7599, *Anodizing of aluminium and its alloys — General specifications for anodic oxidation coatings on aluminium (ISO 7599)*

[4] ISO 9001, *Quality management systems — Requirements (ISO 9001)*

Price based on 27 pages