



CD/K/047:2009
ICS 91.060.20

EAST AFRICAN STANDARD

Brackets for eaves gutters — Requirements and testing

EAST AFRICAN COMMUNITY

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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Introduction

In the preparation of this East African Standard, the following source was consulted extensively:

BS EN 1462:2004, *Brackets for eaves gutters — Requirements and testing*

Assistance derived from this source and others inadvertently not mentioned is hereby acknowledged.

Draft for comments only — Not to be cited as East African Standard

BRITISH STANDARD

**BS EN
1462:2004**

Brackets for eaves gutters — Requirements and testing

The European Standard EN 1462:2004 has the status of a
British Standard

ICS 91.060.20

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BSi
British Standards

National foreword

This British Standard is the official English language version of EN 1462:2004. It supersedes BS EN 1462:1997 which is withdrawn. Together with BS EN 12200-1:2000 and BS EN 607:1996, it will replace BS 4576-1:1989 which is scheduled for withdrawal September 2007.

This new edition incorporates changes taking account of UK objections with the original version. It specifies both eaves and rafter brackets for use with gutters manufactured to EN 607 *Eaves gutters and fittings made of PVC-U — Definitions, requirements and testing* and EN 612 *Eaves gutters with bead stiffened fronts and rainwater pipes with seamed joints made of metal sheet*. However, roll fronted (bead stiffened) metal gutters of the type specified in EN 612 are not generally used in the UK and stronger brackets than those specified in EN 1462 are required for use with the heavier UK metal gutters.

The UK participation in its preparation was entrusted by Technical Committee PRI/88, Plastics piping systems, to Subcommittee PRI/88/1, Plastics piping systems for non-pressure applications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 14, an inside back cover and a back cover.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 2 September 2005

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ISBN 0 580 46240 4

Amendments issued since publication

Amd. No.	Date	Comments

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1462

September 2004

ICS 91.060.20

Supersedes EN 1462:1997

English version

Brackets for eaves gutters - Requirements and testing

Crochets de gouttières pendantes - Exigences et méthodes
d'essai

Rinnenhalter für Hängedachrinnen - Anforderungen und
Prüfung

This European Standard was approved by CEN on 15 July 2004.

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

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Foreword

This document (EN 1462:2004) has been prepared by Technical Committee CEN/TC 128 "Roof covering products for discontinuous laying and products for wall cladding", the secretariat of which is held by IBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

This document supersedes EN 1462:1997.

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

EN 1462:2004 (E)

1 Scope

This document specifies the requirements for rafter and fascia board brackets intended to support eaves gutters conforming to EN 607 or EN 612.

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.

EN 485-1, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 1: Technical conditions for inspection and delivery*

EN 485-2, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties*

EN 485-3, *Aluminium and aluminium alloys - Sheet, strip and plate - Part 3: Tolerances on dimensions and form for hot-rolled products*

EN 485-4, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 4: Tolerances on shape and dimensions for cold-rolled products*

EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition*

EN 607, *Eaves gutters and fittings made of PVC- U — Definitions, requirements and testing*

EN 612, *Eaves, gutters and rainwater down-pipes of metal sheet — Definitions, classifications and requirements*

EN 754-1, *Aluminium and aluminium alloys — Cold drawn rod/bar and tube — Part 1: Technical conditions for inspection and delivery*

EN 755-1, *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 1: Technical conditions for inspection and delivery*

EN 1652, *Copper and copper alloys — Plate, sheet, strip and circles for general purposes*

EN 1676, *Aluminium and aluminium alloys — Alloyed ingots for remelting — Specifications*

EN 1706, *Aluminium and aluminium alloys — Castings — Chemical composition and mechanical properties*

EN 10025, *Hot rolled products of non-alloy structural steels — Technical delivery conditions*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip for general purposes*

EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes*

EN 10111, *Continuously hot-rolled low carbon steel sheet and strip for cold forming — Technical delivery conditions*

EN 10142, *Continuously hot-dip zinc coated low carbon steels strip and sheet for cold forming — Technical delivery conditions*

EN 10215, *Continuously hot-dip aluminium-zinc (AZ) coated steel strip and sheet — Technical delivery conditions*

EN 10326, *Continuously hot-dip coated strip and sheet of structural steels – Technical delivery conditions*

EN 10327, *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming – Technical delivery conditions*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461:1999)*

3 Terms and definitions

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

3.1

rafter bracket

type of gutter bracket used for fixing a gutter to a rafter

3.2

fascia bracket

type of gutter bracket used for fixing a gutter to a fascia

4 Materials

Gutter brackets shall be manufactured from one of the following materials:

- mild steel conforming to EN 10025 or EN 10111;
- hot-dip zinc coated steel sheet with a minimum grade of DX 51 D and a minimum coating mass of 275 g/m², conforming to EN 10142;
- zinc-aluminium coated steel sheet with a minimum grade of DX 51 D+ZA and a minimum coating mass of 225 g/m², conforming to EN 10326 or EN 10327;
- aluminium-zinc coated steel sheet with a minimum grade of DX 51 D+AZ and a minimum coating mass of 150 g/m², conforming to EN 10215;
- stainless steel conforming to EN 10088-2 or EN 10088-3;
- copper conforming to EN 1652;
- aluminium or aluminium alloy for sheet rolled products conforming to EN 485-1, EN 485-2, EN 485-3 or EN 485-4 in any grade of the 1000, 3000, 5000 and 6000 series;
- aluminium or aluminium alloy for wrought products conforming to EN 754-1 or EN 755-1, and in composition conforming to EN 573-3 (with the exception of those alloys having a mass content of more than 0,3 % of copper or more than 3 % of magnesium);
- aluminium or aluminium alloy for castings conforming to EN 1706 and EN 1676;
- unplasticized polyvinyl chloride (PVC-U) conforming to the requirements given in EN 607 for injection moulded fittings.

EN 1462:2004 (E)

5 Resistance to corrosion

5.1 Gutter brackets of mild steel conforming to EN 10025 or EN 10111 shall be protected from corrosion by one of the following means:

- a) Hot-dip galvanising conforming to EN ISO 1461. Zinc coatings shall conform to the minimum values given in Table 1.
- b) Flexible plastic coating, $\geq 60 \mu\text{m}$ thick, over a zinc coating with an average thickness of $\geq 20 \mu\text{m}$.
- c) Flexible plastic coating, $\geq 60 \mu\text{m}$ thick, with a suitable substrate. When tested in accordance with Annex A, the plastic-coated bracket shall not exhibit any signs of rust or loosening of the coating from the steel.

Table 1 — Minimum zinc coating for mild steel brackets hot-dip galvanized after manufacture

Steel thickness of bracket α (mm)	Thickness of coating	
	Minimum single value (μm)	Average value (μm)
$\alpha > 6$	70	85
$6 \geq \alpha > 3$	55	70
$3 \geq \alpha > 1,5$	45	55

5.2 Gutter brackets of PVC-U shall meet the artificial ageing and colour-fastness requirements detailed in EN 607.

5.3 Gutter brackets shall be manufactured from corrosion-resistant materials according to whether they are intended for use in aggressive atmospheres (Class A – industrial pollution or maritime) or more benign conditions (Class B), as given in Table 2.

Table 2 — Classes of resistance to corrosion

Material of manufacture	Class of resistance to corrosion
Stainless steel, copper, rolled or wrought aluminium or mild steel coated in accordance with 5.1 a) or b)	A
Cast aluminium conforming to EN 1706, with a corrosion resistance grading of A to C inclusive	A
Cast aluminium conforming to EN 1706, corrosion resistance coated in accordance with 5.1c)	A
PVC-U, conforming to EN 607	A
Uncoated cast aluminium conforming to EN 1706, with a corrosion resistance of grade D	B
Mild steel conforming to EN 10025 or EN 10111, coated in accordance with 5.1c), or hot-dip coated mild steel conforming to EN 10142, EN 10326, EN 10327 or EN 10215	B

6 Design

6.1 General

Gutter brackets shall be of such dimensions that the gutters of the shape and size for which they are designed can slide freely through them.

It shall not be possible for gutters to be lifted out of a bracket by strong wind. This shall be achieved either through the design of integral lugs or nibs on the bracket itself or by providing separate clips or springs to attach the gutter to the bracket. Clips and springs are not required to be of the same material as the bracket to which they are attached, but shall have a corrosion resistance of Class A, as given in Table 2, if attached to a gutter bracket of corrosion resistance Class A.

Clips and springs shall be manufactured from one of the following materials:

- any of the materials specified in Clause 4;
- polyamide plastic;
- galvanized and prepainted steel sheet having an average coating mass of not less than 275 g/m².

Where both the clip or spring and the gutter bracket are manufactured from metal, care shall be taken to avoid contact between incompatible metals, thereby reducing the risk of electrolytic corrosion.

6.2 Load bearing capacity

Gutter brackets shall be divided into three classes according to their load bearing capacity. When tested in accordance with Annex B, brackets of 80 mm or greater top opening width (i.e. brackets of Classes H and L) shall support the loads given in Table 3 without collapse and without causing permanent deflection exceeding 5 mm at the outer end of the bracket.

Table 3 — Load bearing Classes

Application	Test load (N)	Load bearing Class
Brackets for heavy duty	750	H
Brackets for light duty	500	L
Brackets for gutters below 80 mm top opening width	—	O

6.3 Holes for fastenings

Rafter brackets shall have not less than two holes for fastenings. Where these brackets are designed to be fixed either by nails or screws, the holes shall not be less than 12 x (hole diameter) apart. Where the bracket is designed to be fixed only by screws, the holes shall not be less than seven diameters apart and the bracket shall be marked "S".

Fascia brackets of the heavy-duty load-bearing Class H shall have not less than two holes for fastenings. When these holes are one above the other on the vertical centre line of the bracket, they shall be not less than four diameters apart. When the holes are on each side of the centre line and in the same horizontal plane, they shall be not less than seven diameters apart. When the holes are on each side of the centre line but at different levels, they shall be not less than five diameters apart.

Fascia brackets of the light duty load-bearing Class L shall either have a single hole on the vertical centre line of the bracket or have the same arrangement and spacing of holes for fastenings as for fascia brackets of load-bearing Class H.

All holes shall have a minimum diameter of 5 mm, after application of any corrosion resistance coating.

Minimum diameter spacings between holes shall be measured from centre to centre. Where more than two holes for fastening are to be provided, the minimum diameter spacing shall be taken as that between the two holes which are furthest apart.

7 Designation of gutter brackets for ordering purposes

For ordering purposes, gutter brackets conforming to this document shall be designated by:

- number of this document (EN 1462);
- corrosion resistance Class A or B in accordance with Table 2;
- load bearing Class H, L or O in accordance with Table 3;
- size of the gutter for which the brackets are intended (i.e. the girth for sheet metal gutters conforming to EN 612 or the top opening width for plastic gutters conforming to EN 607).

8 Marking

Gutter brackets conforming to this document shall be marked with the following, minimum information:

- name or logo of the manufacturer;
- load bearing Class H, L or O, in accordance with Table 3;

- c) corrosion resistance Class A or B (for brackets of mild steel only) in accordance with Table 2;
- d) letter "S", indicating suitability for screw fixing (for certain rafter brackets only, see 6.3);
- e) material of manufacture of the bracket, as given in Clause 4 .

Example:

A rafter bracket of mild steel with plastic coating without undercoating of zinc, capable of supporting a load of 750 N and having two holes of 5 mm diameter greater than 35 mm apart should be marked:

Manufacturer's name or logo HBS

NOTE The packaging for the gutter bracket should also indicate which gutter the bracket is designed to fit.

9 Production control

Gutter brackets shall be controlled by the manufacturer during their production process at their place of production. This control based on appropriate sampling rules shall demonstrate the compliance of products with the requirements of this document.

Annex A (normative)

Test method to determine the corrosion resistance of plastic-coated gutter brackets

A.1 Principle

The plastic coating of a test piece of gutter bracket is cut through to produce a number of isolated small squares of coating, and is put in tension by bending the test piece. After soaking for a week in salt water the test piece is examined for rust and loss of adhesion between coating and steel.

NOTE This test is intended as a type or audit test and is not intended for use as a batch release test.

A.2 Apparatus

- a) Three complete, plastic-coated gutter brackets without undercoat of zinc.
- b) Fine, sharp cutting tool such as a small scalpel.
- c) Steel ruler or other suitable guide for cutting.
- d) Round steel bar of $(50 \pm 0,5)$ mm diameter with a length greater than the width of the bracket to be tested.
- e) Non-metallic tank, of sufficient dimensions to contain three gutter brackets, fully immersed in saltwater solution.
- f) Common salt (NaCl).
- g) Purified water.

NOTE Softened water, motor battery quality distilled or de-mineralised water are all suitable.

A.3 Procedure

On the straight part of each bracket, clear of edges and fastening holes, cut 11 parallel lines at approximately 45° to the axis of the bracket and 1 mm to 2 mm apart through the complete thickness of the coating. Across these lines cut another set of 11 lines at right angles to the first set, forming a grid of 100 squares – see Figure A.1. If the bracket is not wide enough to contain this grid, cut two separate grids each of 8 X 8 lines, forming a total of 98 squares. Hone the cutting tool as soon as it shows signs of becoming blunt. When using a scalpel with removable blades, use at least one new blade for each test piece.

Bend each bracket over the (50 ± 5) mm diameter steel bar through $(180 \pm 5)^\circ$ with the grid of cut lines on the outside surface of the bend, creating a total of three test pieces.

Mix a 30 g/l solution of salt in water sufficient to totally immerse the three test pieces when put into the non-metallic tank.

Mark or record the liquid level in the tank and leave for 7 days at a temperature of $(23 \pm 2)^\circ\text{C}$ without further disturbance.

After 7 days, examine the test pieces for and record any signs of rust and loss of adhesion between the plastic coating and the steel.

The solution may be re-used for up to 10 test procedures, provided it remains clear. Any loss of solution due to evaporation shall be replaced with water only (not salt solution) in order to restore the original concentration.

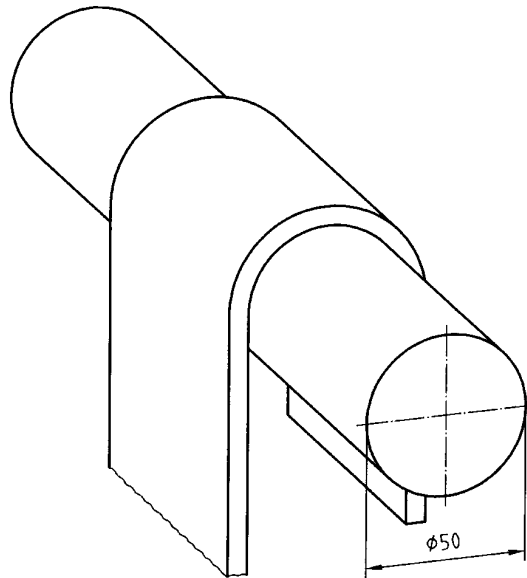


Figure A.1 — Testing and plastic coating

Annex B (normative)

Test method to determine the load bearing capacity of gutter brackets

B.1 Principle

A bracket holding a gutter is subjected to a known load and any permanent deflection after removal of the load is measured.

NOTE This test is intended as a type test.

B.2 Apparatus

- Rigid supporting structure carrying a fixed datum from which measurements can be taken and either three rafters or a fascia board, depending upon the type of bracket to be tested.
- Roller and linkage as shown in Figure B.3.
- Supply of weights, sufficient to create a maximum test load of 750 N.
- Length of gutter compatible with the bracket to be tested, at least 2,2 m long.
- Three gutter brackets, one to be subjected to the test load and two additional brackets to support the gutter.

B.3 Procedure

Cut two holes of 35 mm to 40 mm diameter and (150 ± 3) mm apart in the sole of the gutter. Fix the three brackets to the rafters or to the fascia board with the bracket under test in the centre, and assemble the gutter in the brackets so that it is held level by the two brackets either side of the test bracket, which shall be located sufficiently far from the test bracket that no significant part of the test load is transferred to them see Figures B.1 and B.2. Measure the vertical distance from the datum point to the outer tip of the bracket under test.

Fit the linkage and hang from it sufficient weights so that, together with the mass of the roller and the linkage, the gutter and the bracket is subjected to the test load given in Table 3, according to the type of bracket under test.

After (310 ± 10) s remove the weights, then remove the roller, the linkage and the gutter. At (310 ± 10) s after the removal of the weights, measure the vertical distance from the datum point to the outer tip of the bracket under test. Record the difference between the measurements taken before and after application of the load as the residual deflection.

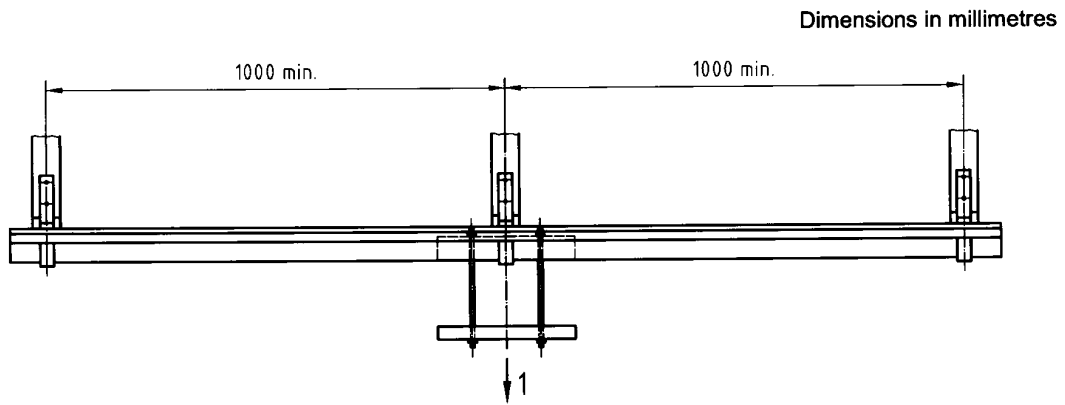
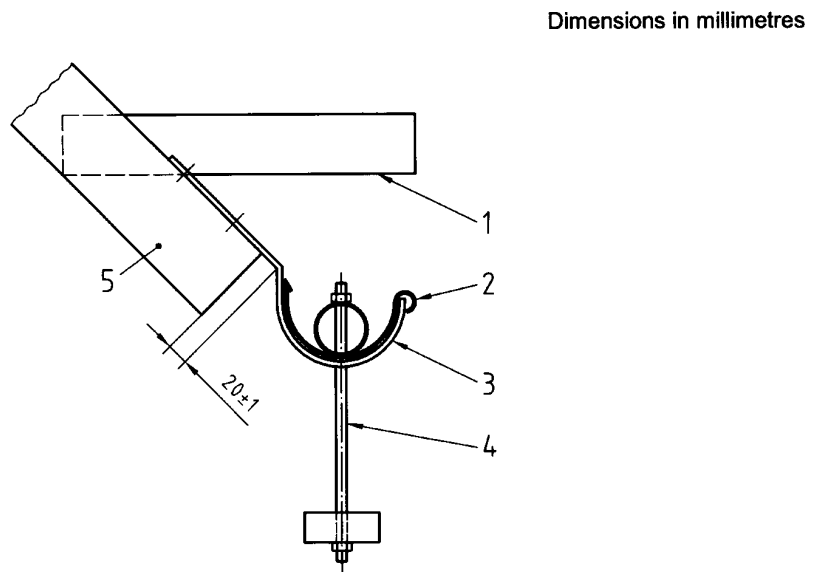


Figure B.1 — View of test arrangement (arrow indicates load direction)



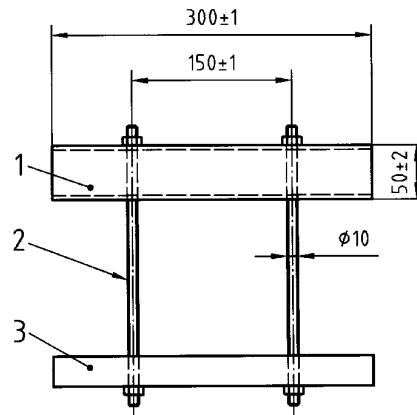
Key

- 1 Datum point
- 2 Gutter
- 3 Gutter bracket
- 4 Linkage and roller
- 5 Rafter

Figure B.2 — Arrangement of rafter brackets

EN 1462:2004 (E)

Dimensions in millimetres



Key

- 1 Steel tube (50 ± 2) mm outer diameter
- 2 Rod, 10 mm diameter
- 3 Steel bar for fastening the test load

Figure B.3 — Linkage and roller

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