



**TEST REPORT**  
**EN 60670-1**  
**Boxes and enclosures for electrical accessories for household and**  
**similar fixed electrical installations**  
**Part 1: General requirements**

Report Reference No. ....: 272761-5b

Date of issue.....: 2014-06-10

Total number of pages.....: 10 pages

CB/CCA Testing Laboratory.....: SGS Fimko Ltd



Address .....: P.O.BOX 30, FI-00211 Helsinki, Finland

Applicant's name .....: Trelleborg Industrial Products Finland Oy

Address .....: Kikkerlöntie 72, FI-38300 SASTAMALA, FINLAND

**Test specification:**

Standard .....: EN 60670-1:2005

Test procedure.....: NCS/FI

Non-standard test method.....: N/A

Test Report Form No. ....: IECEN60670\_1A, modified by SGS Fimko for Multiflanges and Membranes

Test Report Form(s) Originator .....: IMQ/VDE

Master TRF .....: Dated 2007-03, 2011-04

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Test item description .....: Membrane gland



Trade Mark .....: MC

Manufacturer.....: Trelleborg Industrial Products

Model/Type reference .....: GET 3-5, GET 5-7, GET 7-10, GET 10-14, GET 14-20, GET 20-26, GET 26-35, GET 30-45, GET 40-60

IP code .....: IP67

Dimension sheet(s), if any.....: C-Flange SFS 2528  
For cables 3-5, 5-7, 7-10, 10-14, 14-20, 20-26, 26-35, 30-45, 40-60

|   |  |
|---|--|
| <b>Testing procedure and testing location:</b>                        |  |
| <input checked="" type="checkbox"/> <b>CB/CCA Testing Laboratory:</b> | <b>SGS Fimko Ltd</b>   |
| Testing location/ address.....:                                       | <b>Särkiniementie 3<br/>FI-00210 Helsinki, Finland</b>   |
| <input type="checkbox"/> <b>Associated CB Laboratory:</b>             | -  |
| Testing location/ address.....:                                       |  |
| Tested by (name + signature) .....                                    | <b>Heikki Puranen<br/>Testing Engineer</b>  |
| Approved by (+ signature) .....                                       | <b>Kari Heikkilä<br/>Testing Engineer</b>   |
| <input type="checkbox"/> Testing procedure: TMP                       | -  |
| Tested by (name + signature) .....                                    |  |
| Approved by (+ signature) .....                                       |  |
| Testing location/ address.....:                                       |  |
| <input type="checkbox"/> Testing procedure: WMT                       | -  |
| Tested by (name + signature) .....                                    |  |
| Witnessed by (+ signature).....:                                      |  |
| Approved by (+ signature) .....                                       |  |
| Testing location/ address.....:                                       |  |
| <input type="checkbox"/> Testing procedure: SMT                       | -  |
| Tested by (name + signature) .....                                    |  |
| Approved by (+ signature) .....                                       |  |
| Supervised by (+ signature).....:                                     |  |
| Testing location/ address.....:                                       |  |
| <input type="checkbox"/> Testing procedure: RMT                       | -  |
| Tested by (name + signature) .....                                    |  |
| Approved by (+ signature) .....                                       |  |
| Supervised by (+ signature).....:                                     |  |
| Testing location/ address.....:                                       |  |

**Summary of testing:**

Tests performed (name of test and test clause):

All relevant tests performed on samples.

For SFS 4698 test results, see Test Report TR\_272761-1a

For Manufacturing site, see page 3.

Attachment 1 (1 page) Testing and Measuring Equipment

Attachment 2 (1 pages) Photographic documentation

**Testing location:**
**SGS Fimko premises**
**Summary of compliance with National Differences:**
**Complies with Nordic National Differences**
**Copy of marking plate**

See also Photographic documentation in Attachment 2.

**Test item particulars .....**

|     |  |   |  |
|-----|--|---|--|
| 7.1 | Nature of material                                   | <input checked="" type="checkbox"/> 7.1.1 | Insulating   |
|     |  | <input type="checkbox"/> 7.1.2            | Metallic   |
|     |  | <input type="checkbox"/> 7.1.3            | Composite  |
| 7.3 | Type(s) of inlets (outlets)                          | <input checked="" type="checkbox"/> 7.3.1 | With inlets for sheathed cables for fixed installations      |
|     |  | <input type="checkbox"/> 7.3.2            | With inlets for flexible cables                              |
|     |  | <input type="checkbox"/> 7.3.3            | With inlets for plain or corrugated conduits                 |
|     |  | <input type="checkbox"/> 7.3.4            | With inlets for threaded conduits                            |
|     |  | <input type="checkbox"/> 7.3.5            | With inlets for other types of conductors/cables or conduits |
|     |  | <input type="checkbox"/> 7.3.6            | With spouts (hub)  |
| 7.5 | Minimum and maximum temperatures during installation | <input type="checkbox"/> 7.3.7            | Without inlets. Inlet openings are made during installation  |
|     |  | <input type="checkbox"/> 7.5.1            | -5 °C to +60 °C  |
|     |  | <input type="checkbox"/> 7.5.2            | -15 °C to +60 °C   |
|     |  | <input checked="" type="checkbox"/> 7.5.3 | -25 °C to +60 °C   |

**Manufacturing site .....** : Trelleborg Industrial Products Finland Oy

Address ..... : Kikkerläntie 72, FI-38300 SASTAMALA, FINLAND



**Possible test case verdicts:**

- test case does not apply to the test object..... : **N/A**
- test object does meet the requirement..... : **P (Pass)**
- test object does not meet the requirement..... : **F (Fail)**

**Testing .....**

Date of receipt of test item..... : **2013-11-15**

Date (s) of performance of tests..... :

**General remarks:**

This Test report form is based IEC/EN 60670-1:2005 form to be suitable for Multiflanges/Membranes.  
All unnecesasry clauses and parts removed.

The test results presented in this report relate only to the object tested.  
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.  
"(See Enclosure #)" refers to additional information appended to the report.  
"(See appended table)" refers to a table appended to the report.

**Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.**

Throughout this report a comma (point) is used as the decimal separator.

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**General product information:**
**Colour:**

Grey or black

**Material:**

TPE as follows:

Types:

- 1) ELASTRON G300.A50.703.S
- 2) Onflex S FR50A-3S1831 VN7094CF 50 ShA
- 3) Onflex S FR 60A-3E1923 60 ShA
- 4) RTP 2799 S X 113561 E

Colour:

- RAL 7042
- RAL 7035
- BLK UL
- RAL 7035 UL

Manufacturer:

- Elastron
- Polyone
- Polyone
- RTP

Other information, see page 10



| IEC/EN 60670-1 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|          |   |                |          |
|----------|---|----------------|----------|
| <b>8</b> | <b>MARKING</b>  |                |          |
| 8.1      | Boxes and enclosures are marked with:   |                |          |
|          | a) name, trade mark or identification mark of the manufacturer or the responsible vendor.....:  | <b>MC</b>      | <b>P</b> |
|          | Enclosures are marked in addition with:   |                |          |
|          | b) IP code against ingress of solid objects if > IP2X .....   | <b>IP6X</b>    | <b>P</b> |
|          | c) IP code against harmful ingress of water if > IPX0 .....   | <b>IPX7</b>    | <b>P</b> |
|          | IP code is marked on the outside of the enclosure so as to be easily discernible when the enclosure is mounted and wired as for normal use              |                | <b>P</b> |
|          | Information marked on the boxes and enclosures or provided by the manufacturer on the smallest package unit or in the instructions of the manufacturer: |                |          |
|          | e) type reference, which may be a catalogue number .....  | <b>GET ...</b> | <b>P</b> |
| 8.2      | Marking is durable and easily legible   |                | <b>P</b> |
|          | Rubbing test 15 s with water and 15 s with petroleum spirit   |                | <b>P</b> |
|          | After the test: marking still legible   |                | <b>P</b> |

|          |  |                                       |          |
|----------|--|---------------------------------------|----------|
| <b>9</b> | <b>DIMENSIONS</b>  |                                       |          |
|          | Boxes and enclosures comply with the appropriate standard sheets, if any.....: | <b>C-Flange According to SFS 2528</b> | <b>P</b> |

|           |  |  |          |
|-----------|--|--|----------|
| <b>10</b> | <b>PROTECTION AGAINST ELECTRIC SHOCK</b>   |  |          |
|           | In boxes and enclosures assembled, equipped and installed as for normal use in accordance with the manufacturer's instructions: live parts are not accessible        |  | <b>P</b> |
|           | Additional test at (35 ± 2) °C with probe 11 of IEC 61032 on enclosures according to 7.1.1 and 7.1.3 with parts of thermoplastic or elastomeric material applied to: |  |          |
|           | - all places, except membranes or the like, where yielding of insulating material could impair the safety, with a force of 75 N                                      |  | <b>P</b> |

| IEC/EN 60670-1 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|    |                               |  |     |
|----|-------------------------------|--|-----|
| 11 | <b>PROVISION FOR EARTHING</b> |  | N/A |
|----|-------------------------------|--|-----|

|         |   |  |     |
|---------|---|--|-----|
| 12      | <b>CONSTRUCTION</b>   |  | N/A |
| 12.14   | Boxes and enclosures with inlets (outlets) for conduits or spouts (hubs)  |  |     |
|         | Boxes and enclosures classified according to 7.3.4 and conical spouts as in 7.3.6 withstand the tests of 12.14.1, 12.14.2 and 12.14.3   |  | N/A |
| 12.14.1 | Enclosures with inlet spout for conduits: a minimum size piece of conduit pressed for 1 min $\pm$ 5 s with a force of $(100 \pm 2)$ N   |  |     |
|         | During the test: inlet spout prevents further entry of the conduit into the box   |  | N/A |
| 12.14.2 | Pull-out test after the test according to 12.14.1: conduit with the minimum size corresponding to the insert opening loaded for 1 min with a tensile force of $(20 \pm 2)$ N  |  |     |
|         | During the test: conduit not come loose from the inlet spout of the enclosure   |  | N/A |
| 12.14.3 | Resistance to bending strain of an inlet spout: piece of conduit inserted into the inlet spout with a compressible force of $(100 \pm 2)$ N and loaded with a bending moment of 3 Nm for 1 min in six different directions with an interval of $(60 \pm 2)^\circ$ |  |     |
|         | During the test: inlet spout not come loose or damaged and conduit stays within the inlet spout   |  | N/A |

|        |  |  |   |
|--------|--|--|---|
| 13     | <b>RESISTANCE TO AGEING, PROTECTION AGAINST INGRESS OF SOLID OBJECTS AND AGAINST HARMFUL INGRESS OF WATER</b>  |  |   |
| 13.1   | Resistance to ageing   |  |   |
| 13.1.1 | Specimens of insulating and composite boxes and enclosures, seals, grommets and replaceable membranes placed in a heating cabinet at $(70 \pm 2)^\circ\text{C}$ for $(168 \pm 4)$ h and then kept at room temperature for $(96 \pm 4)$ h |  |   |
|        | Greater torque value stated by the manufacturer, if any (Nm) .....   |  | — |
|        | After the test: no harmful deformation or similar damage   |  | P |
| 13.1.2 | Grommets and entry membranes in inlet openings and protecting membranes are reliably fixed and are not displaced by the mechanical and thermal stresses occurring in normal use  |  | P |
|        | Specimens that have been subjected to the treatment specified in 13.1.1 placed in a heating cabinet at $(40 \pm 2)^\circ\text{C}$ for $2\text{ h} \pm 15\text{ min}$   |  |   |



| IEC/EN 60670-1 |   |                                       |         |
|----------------|---|---------------------------------------|---------|
| Clause         | Requirement + Test  | Result - Remark                       | Verdict |
|                | Immediately after this period the tip of test probe 11 of IEC 61032 is applied for $(5 \pm 1)$ s with a force of $(30 - 2)$ N. During the tests: grommets and/or membranes not deformed to such an extent that live parts of any included accessory become accessible |                                       | P       |
|                | Grommets and/or membranes likely to be subjected to an axial pull: axial pull of $(30 - 2)$ N applied for $(5 \pm 1)$ s. During the tests: grommets and/or membranes not deformed to such an extent that live parts of any included accessory become accessible       |                                       | N/A     |
|                | Test repeated on same enclosures fitted with grommets and/or membranes not subjected to any treatment   |                                       | P       |
|                | After the test: no harmful deformation, cracks or similar damage  |                                       | P       |
| 13.1.3         | Grommets and entry membranes in inlet openings of boxes and enclosures classified according to 7.5.2 and 7.5.3: introduction of the cables permitted when the ambient temperature is low  |                                       | P       |
|                | Test on enclosures fitted with grommets and/or membranes not subjected to any ageing treatment kept for 2 h in a refrigerator   |                                       |         |
|                | Test temperature (°C) .....   | -25 °C                                | —       |
|                | Immediately after conditioning: it is possible to pierce any blind grommets and entry membranes and to introduce cables of the maximum diameter intended  |                                       | P       |
|                | After the test: no harmful deformation, cracks or similar damage  |                                       | P       |
| 13.2           | Protection against the ingress of solid objects   |                                       |         |
|                | Enclosures provide a degree of protection against the ingress of solid objects in accordance with the declared IP code .....  | IP6X                                  | P       |
|                | Enclosures mounted as in normal use with screwed glands or grommets fitted with cables as declared by the manufacturer:   |                                       |         |
|                | - type of cable, smallest cross-sectional area (mm <sup>2</sup> ) .....   | Ø 3, 5, 7, 10, 14, 20, 26, 30, 40 mm  | —       |
|                | - type of cable, largest cross-sectional area (mm <sup>2</sup> ) .....  | Ø 5, 7, 10, 14, 20, 26, 35, 45, 60 mm | —       |
|                | Enclosures mounted as in normal use with screwed glands or grommets fitted with conduits as declared by the manufacturer:   |                                       |         |



| IEC/EN 60670-1 |   |                                       |         |
|----------------|---|---------------------------------------|---------|
| Clause         | Requirement + Test  | Result - Remark                       | Verdict |
|                | - smallest diameter or dimensions (mm) .....  | Ø 3, 5, 7, 10, 14, 20, 26, 30, 40 mm  | —       |
|                | - largest diameter or dimensions (mm).....  | Ø 5, 7, 10, 14, 20, 26, 35, 45, 60 mm | —       |
|                | Greater torque value stated by the manufacturer, if the relevant information is provided (Nm) .....   |                                       | —       |
|                | - IP5X: test performed as specified in IEC 60529 category 2 with the drain holes, if any, not opened  |                                       | N/A     |
|                | - IP≤4X: test probe does not pass through any opening other than drain holes  |                                       | P       |
|                | - IP≤4X: test probe applied on drain holes does not touch live parts within the enclosure   |                                       | N/A     |
|                | - IP5X: dust does not cover the whole inner surface   |                                       | N/A     |
|                | - IP6X: there is no dust inside the box or enclosure  |                                       | P       |
| 13.3           | Protection against harmful ingress of water   |                                       |         |
| 13.3.1         | Enclosures with IP>X0 provide a degree of protection against harmful ingress of water in accordance with the declared IP code .....         | IPX7                                  | P       |
|                | Enclosures with screwed glands or grommets fitted with cables as declared by the manufacturer:  |                                       |         |
|                | - type of cable, smallest cross-sectional area (mm²).....   |                                       | —       |
|                | - type of cable, largest cross-sectional area (mm²).....  |                                       | —       |
|                | Enclosures with screwed glands or grommets fitted with conduits as declared by the manufacturer:  |                                       |         |
|                | - smallest diameter or dimensions (mm) .....  | Ø 3, 5, 7, 10, 14, 20, 26, 30, 40 mm  | —       |
|                | - largest diameter or dimensions (mm).....  | Ø 5, 7, 10, 14, 20, 26, 35, 45, 60 mm | —       |
|                | Fixing screws of the cover or cover-plate tightened with a torque equal to 2/3 of the value of Table 4 used for the test of 12.9 (Nm) ..... |                                       | —       |
| 13.3.3         | Immediately after the test no more than 0,2 ml x S (cm²) water in the enclosure (ml).....   |                                       | P       |

| IEC/EN 60670-1 |   |                       |         |
|----------------|---|-----------------------|---------|
| Clause         | Requirement + Test  | Result - Remark       | Verdict |
|                | Specimens withstand an electric strength test specified in 14.3 started within 5 min of the completion of IP test |                       | N/A     |
| 13.3.4         | Immediately after the test: indicator paper still dry   |                       | P       |
| 14             | INSULATION RESISTANCE AND ELECTRIC STRENGTH   |                       | N/A     |
| 15             | MECHANICAL STRENGTH   |                       | N/A     |
| 16             | RESISTANCE TO HEAT  |                       | N/A     |
| 17             | CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND   |                       | N/A     |
| 18             | RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE   |                       |         |
|                | Glow-wire test according to Clauses 4 to 10 if IEC 60695-2-11   | See appended table 18 | P       |
| 19             | RESISTANCE TO TRACKING  |                       | N/A     |
| 20             | RESISTANCE TO CORROSION   |                       | N/A     |
| 21             | ELECTROMAGNETIC COMPATIBILITY (EMC)   |                       |         |
|                | No tests necessary  |                       | —       |

| IEC/EN 60670-1 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|                            |                       |                      |                       |   |                                    |                                    |
|----------------------------|-----------------------|----------------------|-----------------------|---|------------------------------------|------------------------------------|
| 18                         | TABLE: glow-wire test |                      |                       |   |                                    |                                    |
| part under test            |                       | material designation | test temperature (°C) | visible flame and sustained glowing (Y/N) | flames and glowing extinction time | ignition of the tissue paper (Y/N) |
|                            |                       | TPE                  | 650                   | N   | -                                  | P                                  |
| supplementary information: |                       |                      |                       |   |                                    |                                    |

## Other information

| Type:      | Details:  | Material (page 4) |
|------------|---|-------------------|
| GET 3-5:   | Cables Ø 3-5 mm<br>Opening Ø 12 mm<br>Material thickness 1,3 - 5 mm   | 1) 2) 3) 4)       |
| GET 5-7:   | Cables Ø 5-7 mm<br>Opening Ø 16 mm<br>Material thickness 1,3 - 5 mm   | 1) 2) 3) 4)       |
| GET 7-10:  | Cables Ø 7-10 mm<br>Opening Ø 20 mm<br>Material thickness 1,3 - 5 mm  | 1) 2) 3) 4)       |
| GET 10-14: | Cables Ø 10-14 mm<br>Opening Ø 25 mm<br>Material thickness 1,3 - 5 mm | 1) 2) 3) 4)       |
| GET 14-20  | Cables Ø 14-20 mm<br>Opening Ø 32 mm<br>Material thickness 1,3 - 5 mm | 1) 2) 3) 4)       |
| GET 20-26: | Cables Ø 20-26 mm<br>Opening Ø 40 mm<br>Material thickness 1,3 - 5 mm | 1) 2) 3) 4)       |
| GET 26-35: | Cables Ø 26-35 mm<br>Opening Ø 50 mm<br>Material thickness 1,3 - 5 mm | 1) 2) 3) 4)       |
| GET 30-45: | Cables Ø 30-45 mm<br>Opening Ø 60 mm<br>Material thickness 1,3 - 5 mm | 1) 2) 3) 4)       |
| GET 40-60: | Cables Ø 40-60 mm<br>Opening Ø 80 mm<br>Material thickness 1,3 - 5 mm | 3)                |

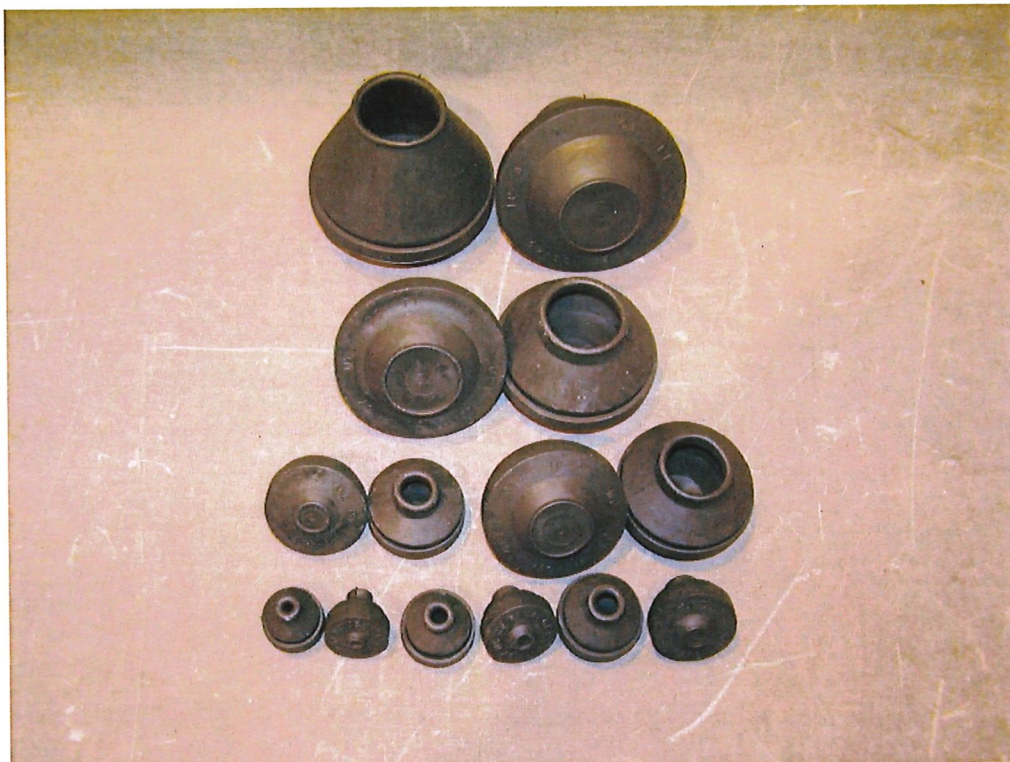


| Testing and Measuring Equipment for SFS 4698:2006 |  |                     |              |         |
|---|--|---------------------|--------------|---------|
| Clause  | Description  | Instrument / Device | Type / Range | Inv. no |
| 9.2   | Heating cabinet                                    | 0..250°C            |              | 4995    |
| 10.2/12.2   | Degree of protection first characteristic numeral  | Test probe series   | IEC 60529    | 4701    |
| 11.2  | Low temperature                                    |                     | Gram         | H4344   |
| 12.2  | Degree of protection first characteristic numeral  | Dust chamber        |              | 1886    |
|   | Degree of protection second characteristic numeral | Tank                | IPX7         | E215    |

Attachment 2: Photographic documentation

Type: GET 3-60

Manufacturer: Trelleborg Industrial Products Finland Oy





Attachment 2: Photographic documentation

Type: GET 3-60

Manufacturer: Trelleborg Industrial Products Finland Oy

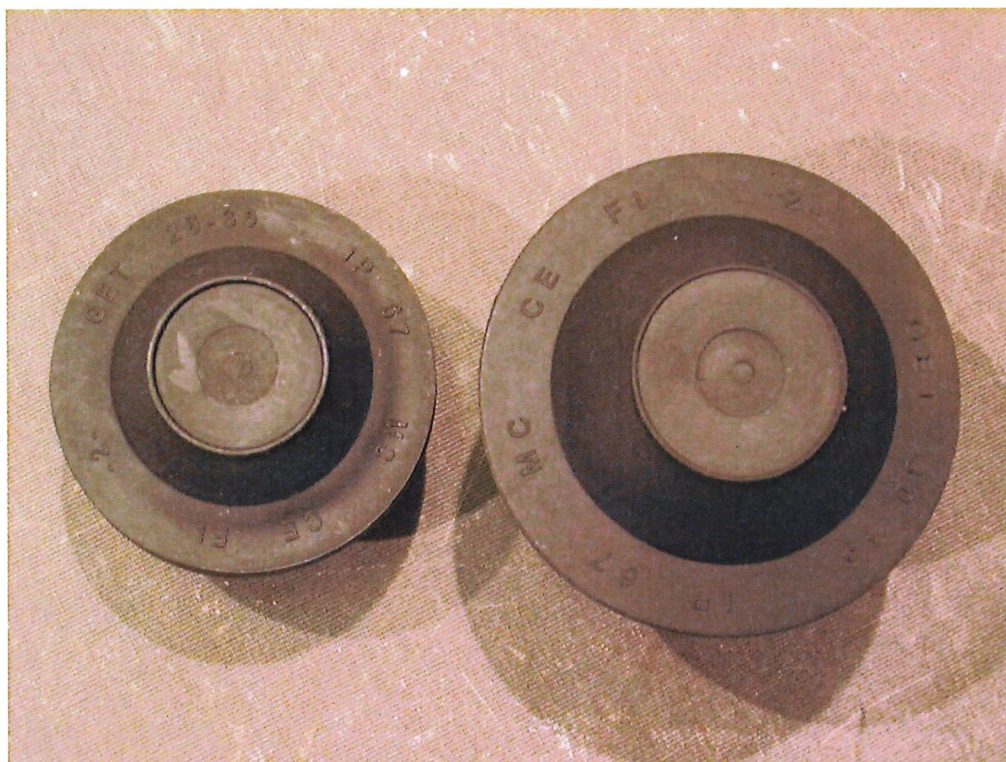
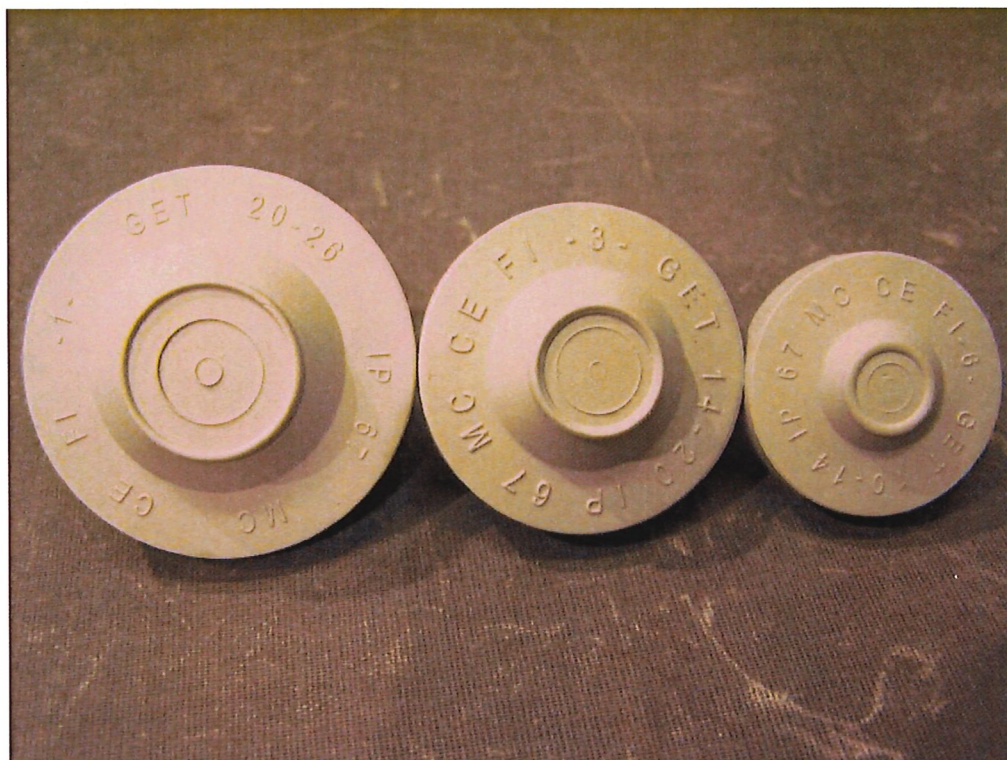




Attachment 2: Photographic documentation

Type: GET 3-60

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