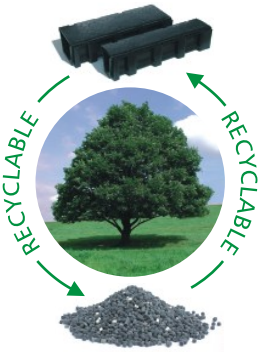
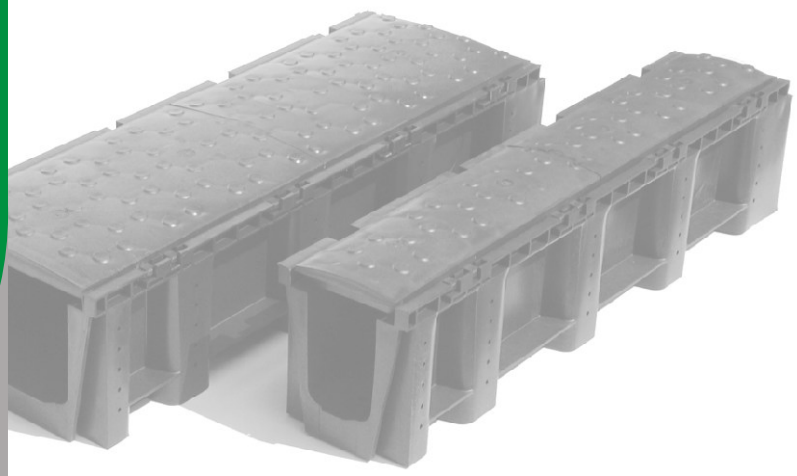
MPO

PLASTIC CABLE DUCT

ECONOMICAL - STABLE - ENVIRONMENTALLY ACCEPTABLE





MULTIPORT
Recycling

FIELDS OF APPLICATION

A secure power supply and data transmission imposes special demands when cable and wiring is being laid or modernised.
Cables must be fully protected. MPO plastic cable duct has been specially developed **for laying signal and communication cables along railway tracks, and at airports, power plants and industrial installations.**

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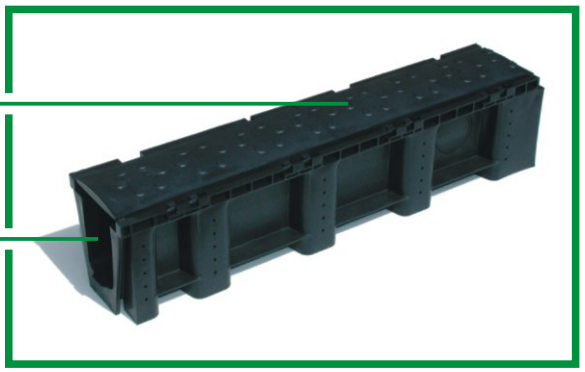
RANGE

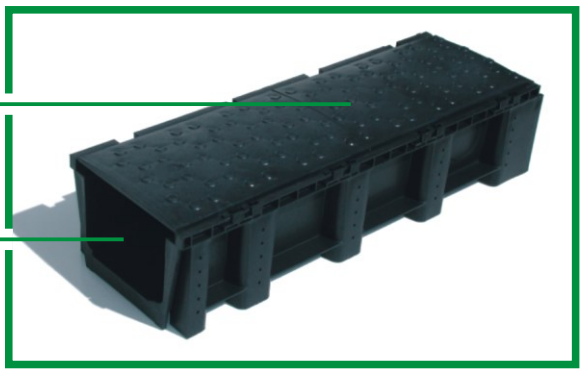
COVER SIZE 1

TROUGH SIZE 1

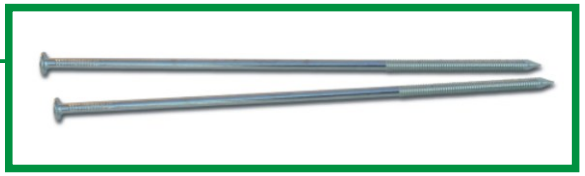


COVER SIZE 2

TROUGH SIZE 2



EARTH NAILS



COVER SECURING SCREW

PIPE SOCKET

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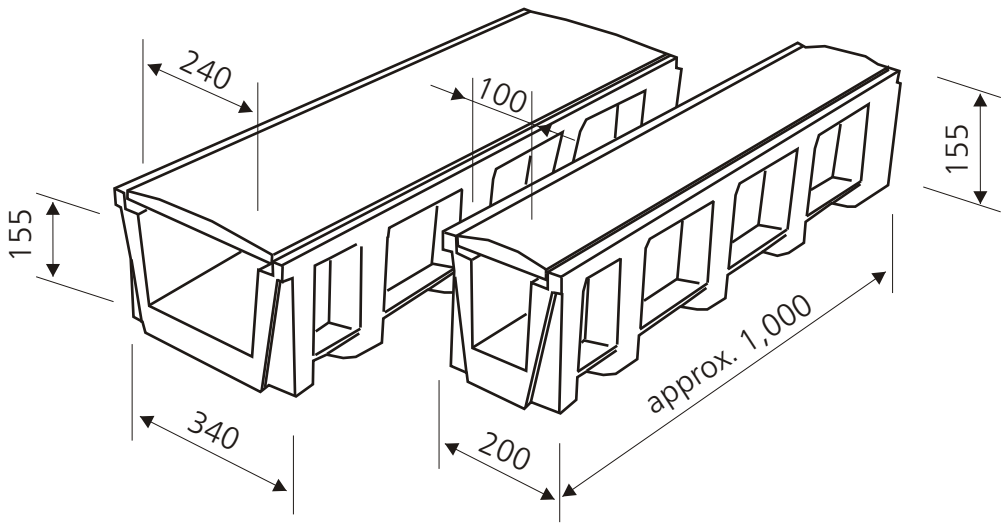
TECHNICAL DATA

	Size 1 i.F.	Size 2 i.F.
Length:	approx. 1,000 mm	approx. 1,000 mm
Width (int./ext.):	100 mm/200 mm	240 mm/340 mm
Height (int./ext.):	155 mm/230 mm	155 mm/230 mm
Weight:	approx. 7 kg	approx. 9 kg
Material:	PP/PE recyclate	
Fire behaviour:	Fire protection class K 1 in accordance with DIN 53438 Part 2	
Therm. characteristics:	Continuous thermal stability from -30°C to +85°C	
Electr. characteristics:	650 KV/cm in accordance with DIN VDE 0303-21	
Licensing:	German Federal Railways Office [=Eisenbahnbundesamt] 21AZ2/1005/1	



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MATERIALS

Characteristics	Test code DIN	Unit of measurement	Testing condition	Characteristic value
Bulk density	ISO 1183	g/cm³		1.08
MFR	ISO 1183	g/10 min	230° C 2,16 kg	9
Flexural strength	ISO 178	N/mm²	+80° C +23° C -40° C	18 27 36
Bending E module	ISO 178	N/mm²	+80° C +23° C -40° C	481 1.371 3.294
Notched impact strength Charpy	ISO 179	kJ/m²	+80° C +23° C -40° C	21 5 2
Surface resistance	IEC 93 VDE 0303 Part 30	Ohm		10^{13}
Disruptive strength	VDE 0303-21	kV/cm		650
UV resistance		years		>8
Recycling capacity				recyclable
Chemical resistance		to	to aqueous solutions of anorg. salts, weak acids and soda solutions, alcohols, oils	
Residue on ignition		%	bei 650° C	35
Combustibility	53438	Stage		K 1

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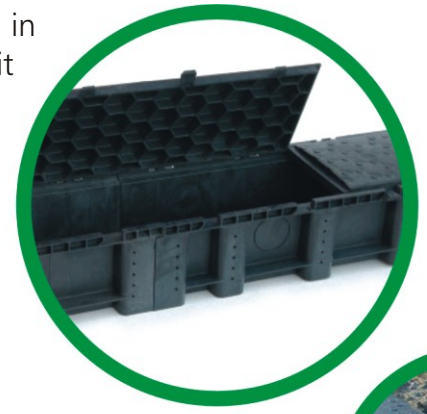
ADVANTAGES OF THE PRODUCT

MPO plastic cable duct is ideal for laying in signal and communications lines underground on railway routes and in power plants and industrial installations. The fact that it can be laid so simply and quickly is particularly useful with short closing times or on difficult ground. Its structural design ensures that it is very stable in spite of its low weight and it provides cables and pipes with effective protection against external influences.



- **Horizontal segments - increase weight substantially when installed**
- **can be laid above ground if earth nails are used**
- **cover can be installed over two troughs**
- **cover can be firmly connected even when open**
- **covers can be opened individually**
- **cables and pipes that have been laid are easily accessible anywhere and at any time**
- **cables and pipes effectively protected against external influences**
- **no earthing or insulation necessary**
- **easy adjustments on-site - with the help of woodworking tools the duct can be angled off as required, junctions can be attached and height differences can be overcome**
- **cable duct can be laid simply and quickly, cutting down closure times for assembly**
- **light weight**
- **stable design**
- **no jointing components**
- **maintenance-free**
- **MPO plastic cable duct is reusable**
- **100% recyclable**
- **highly economical**

MULTIPORT Recycling

# TEST REPORT OF THE FEDERAL RAILWAYS OFFICE
[= EBA = EISENBAHN-BUNDESAMT]

MULTIPORT Recycling

Notice

I. The Type Approval for buried plastic cable ducts of types I and II granted with the Notice – 21.52 lbzb (037/04) of 7 October 2004 is extended as outlined below:

This Notice constitutes an extension of the above Type Approval and shall be valid only in connection with the former. It shall be valid with all its parts unless this Notice specifies otherwise or provides for additional requirements.
The "approved" endorsements are part of this Notice. They shall be included in the execution documents.
The extension of Type Approval shall be limited up to 1 September 2010. It consists of 6 pages and 2 attachments.

II. Object of approval and areas of application

1. Object of approval
The approval is granted for factory-made cable ducts of types I and II with covers for underground laying.

Type	External dimensions			Internal dimensions		
	Length	Width	Height	Length	Width	Height
I	1000 mm	200 mm	230 mm	1000 mm	100 mm	155 mm
II	1000 mm	340 mm	230 mm	1000 mm	240 mm	155 mm

2. Area of application

- The cable ducts are used to provide protection against mechanical damage to buried signal, communication and power cables in connection with railway facilities.
- The cable ducts may be laid in the area of the side path, but not in an area where subjected to railway loads.
- The cable ducts are not passable.
- The cable ducts must not be used within tunnels.

3. Materials

Polypropylene compounds (base material PP with fire-retardant additives)

III. Rules and regulations

The Notice is based on the Technical Construction Regulations or acknowledged rules of technology given below:

[1] DIN 18200:2000-05 – Conformity proof for construction products
[2] VV Bau – Administrative Regulations about construction surveillance in civil engineering, road construction and building construction as well as machinery and equipment

IV. Records

The following records and test reports submitted by the applicant are part of this Notice. They shall be taken into account and shall be valid unless article V. Ancillary Regulations provides for other or additional regulations. Any test comments and red-ink entries in the application documents shall be considered in the execution documents.

[1] Stability proofs
- cable duct covers,
established by Kompetenzzentrum Kunststofftechnik M-V, Wismar, on 27 June 2001 (pages 1 to 22)
- trough
established by REMAPLAN Anlagenbau GmbH (pages 1 to 39)

[2] Design drawings,
prepared by *grunewald tooling*

Plan	Content	No.	Date
General plan	Cable duct size I	001	9 Febr. 2004
General plan	Cable duct size II	002	9 Febr. 2004
Detailed plan	Cable duct size II; separating web	003	9 Febr. 2004

[3] Product description and laying instructions,
prepared by MULTIPORT Recycling GmbH in July 2003 (pages 1 to 9)
[4] Final report on the "Cable Duct" project,
prepared by MULTIPORT Recycling GmbH on 28 March 2001 (pages 1 to 14)
[5] Test report no. 191/200 – Determination of behaviour in fire,
prepared by Kunststoffzentrum Leipzig on 24 Nov. 2000 (pages 1 to 3)
[6] Safety Data Sheet,
issued by Alusuisse Martinswerk GmbH on 18 Oct. 2000 (pages 1 to 5)
[7] Safety Data Sheet,
issued by Sachtleben Chemie GmbH on 29 March 2001 (pages 1 to 4)
[8] "Performance specification for cable ducts made of plastics",
Version 02.07-1; Mannesmann Arcor AG & Co.

V. Ancillary Regulations

The Type Approval shall be linked with the following Ancillary Regulations:

1. Without prejudice to any further regulations, the manufacturer and distributor of the objects of approval shall make available a copy of the Type Approval with all associated technical documents to the user of the objects of approval, and shall point out to the latter that these documents must be present at the place of use.
2. The Federal Railway Office and any organisations commissioned by it shall be entitled to check compliance with this Notice in the manufacturing plant or on the construction site.
3. The manufacturer's product description and laying instructions shall be part of the execution documents. They shall be taken into account and must be available at the place of use.
4. Pertinent regulations and assumptions for calculations
   (1) Dimensioning shall be based on the pertinent regulations, provisions as well as calculation and design loads given in the stability proofs and test reports.
   (2) Construction supervision shall be based on the Administrative Regulation about construction surveillance in civil engineering, road construction, building construction and machinery and equipment (VV Bau).

5. Manufacturing and quality control
   (1) Manufacturing
   The dimensions required for manufacturing shall comply with the type calculation and the associated drawings.
   (2) Quality control
   Quality control – self-control and third-party control – shall be carried out for each manufacturing plant in accordance with DIN 18200. Confirmation of conformity of the construction product with the provisions of this Type Approval and the Technical Regulations shall be given in a manufacturer's Declaration of Conformity on the basis of in-house production supervision, a first examination of the construction product by a recognized certification agency and by regular third-party inspection.
   In-house production supervision shall mean continuous monitoring of production by the manufacturer to ensure that the construction products manufactured are in conformity with the provisions of this Type Approval, the pertinent technical regulations and standards and the quality requirements of Deutsche Bahn AG.

The records shall be kept for the duration of use, but at least for a period of 5 years and submitted to the Federal Railway Office and the third-party surveillance agency on request.
Copies of the results of the first examination and the Declaration of Conformity shall be made available to the approving agency of the Federal Railway Office.

(3) Marking

The manufacturer shall mark the object of approval with the Conformity Mark of the Federal Railway Office in accordance with Attachment 1, indicating the purpose of use, when the manufacturer has ensured in accordance with the certificate issued under DIN 18200, that the construction product manufactured complies with the Type Approval. The U-EBA sign shall be attached to the construction product, or if this turns out to be difficult, to the consignment note.
In addition, the object of approval shall be marked with the manufacturing date and provided with any additional marking required to ensure unambiguous allocation to the test reports.

VI. Reservation

The Type Approval may be revoked if the provisions of this Notice are not complied with. The provisions of the Type Approval may be amended or modified at a later date, in particular if this is required to account for new technological findings.

VII. Notes

1. The Type Approval shall not be used in lieu of the decision in accordance with Section 18 of AEG nor the review of execution documents by the construction supervision of the Federal Railway Office.
2. The Type Approval is granted without prejudice to any third-party rights, in particular private property rights.
3. The Type Approval may not be used in parts. Any publication of extracts shall require the agreement of the approving agency.
4. The orderer/operator may request further requirements and proofs based on the Type Approval.
5. Further requirements may also emerge from the classification of the component (depending on whether repeated tests are required or not). The inspection requirements shall be based on the valid regulations.
6. Extension of the Type Approval shall be applied for not later than 6 months before expiration of the approval period.

VIII. Costs
The costs of this procedure shall be borne by the applicant. The Cost Notice shall be issued separately.

Statement of reasons

Pursuant to Section 3 of the Law about the Federal Railway Traffic Administration (Federal Railway Traffic Administration Act – BEVVG) of 27 Dec. 1993 (Fed. Gazette I p. 2378, 2394) in connection with Section 4 par. 2 of the General Railway Act (AEG) of 27 December 1993 (BGBl I p. 2378, 2396, 1994 I p. 2439), both last amended by the Third Law on the Amendment of Railway Regulations of 27 April 2005 (Fed. Gazette I p. 1138), the Federal Railway Office is responsible for the official release of construction projects, acceptances, tests, approvals, permits and surveillance, for the construction, modification, maintenance and operation of the operating facilities of federal railways.
The Type Approval became necessary since the object of approval had been approved in identical form by the Notice 21.52 lbzb (005/01) in terms of construction supervision, and is going to be used along railway tracks of the German railway network.
The approval was given since the Ancillary Regulations contained in the Notice ensure the public safety and the safety of the railway traffic.
Costs will be charged for this Notice in accordance with Section 3 par. 4 p. 1 of BEVVG in connection with the Regulation about fees and expenses for official acts of the Railway Traffic Administration of the Federal Government (BeGebV of 5 April 2001 Fed. Gazette I, page 562), last amended by the Regulation about the Issuance and Amendment of Railway Regulations of 3 June 2005 (Fed. Gazette I, pages 1566, 1576).

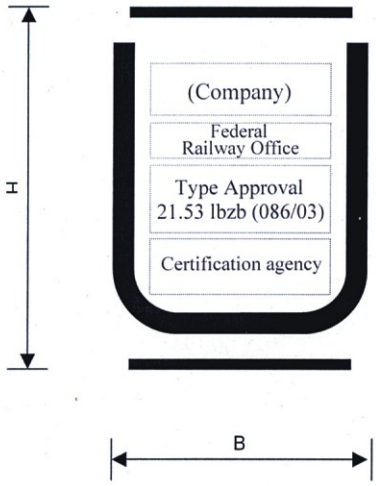
Instruction about legal remedies
Objection against this Notice may be filed within one month after promulgation.
This objection shall be filed in writing or for the record of the Eisenbahn-Bundesamt (Federal Railway Office), Vorgebirgsstraße 49, 53119 Bonn.
This time limit shall be deemed observed if the objection is filed with a branch office of the Eisenbahn-Bundesamt.

By order

Signed: Schollmeier Certified …….. TRAng

Attachment 1 of Type Approval 21.53 lbzb (086/03) of 22 August 2005

Conformity mark of the Federal Railway Office



Dimension ratio (external dimension): W:H (≥4.5 cm : 6.0 cm)

TEST REPORT OF THE MFPA LEIPZIG

MULTIPORT Recycling

MFPA Leipzig GmbH
Prüf-, Überwachungs- und
Zertifizierungsstelle nach
Landesbauordnung (SAC 02)

MFPA Leipzig GmbH
Test, surveillance and certification
agency in accordance with the
State Building Regulations (SAC 02)

Department of Constructive Civil Engineering
Managing director: Dr. Stefan Winter, univ. prof., eng.
Working group: pipe testing

TEST REPORT

No. P 2.4 / 05 – 049

of 22 March 2005
1st of 4 executed copies

Client:	Multiport Recycling GmbH Ernst-Grube-Straße 1 06406 Bernburg
Subject of the order:	Determining the load-bearing capacity after storage at temperatures of 20 °C and -30 °C
Object:	Plastic cable duct consisting of trough and cover, size II

Order of: 10 February 2005 Reference: Mr. Ganz Received: 11 February 2005

Samples received on:	11 February 2005
Sampling:	non-official, by client
Marking:	none
Date of test:	17, 18 March 2005

This test report comprises 3 pages and one attachment.
The test report may not be published in an abridged form. Any publication, even in extracts, shall require the prior written approval of MFPA Leipzig GmbH.

Gesellschaft für Materialforschung und
Prüfungsanstalt für das Bauwesen Leipzig mbH
Managing director:
Dr. Stefan Winter, univ. prof., eng., Dr. Frank Dehn, cert. phys.
Ingolf Kotthoff, cert. phys.
Headquarters: Hans-Weigel-Straße 2b, 04319 Leipzig
Telephone: ++49(0)341/65 82-172
Fax: ++49(0)341/65 82-199

Commercial register: Leipzig local court HRB 17719

Sales tax ident. no. DE 813200649
Bank: Sparkasse Leipzig
Account no. 1100 560 781
BIC: 860 555 92

1 Task

MFPA Leipzig has been commissioned by Multiport Recycling GmbH to determine the load bearing capacity of supplied cable duct elements consisting of trough and cover of size II and made of recycled plastics. The samples are to be tested after storage at temperatures of 20°C and -30°C. Load was to be applied centrally to the cover on an area of 100 mm x 100 mm. The aim of the test was to determine deformation after applying a test load of 2 kN. In addition, the breaking load of the covers was to be determined.

2 Sample material

The sample material was delivered by the client with the following specifications:

- 2 pieces of cable duct of recycled PP/PE, colour grey/black
  Outer dimensions: width 340 mm x height 230 mm x length approx. 1000 mm

- 6 pieces of cover of recycled PP/PE, colour grey/black, to be connected with the trough with the help of a hinged closing mechanism and locked by longitudinal shifting. Upper side with the marking: TPP and a burl-shaped pattern

3 Performance of the load bearing capacity test

Since no test specification for the cable ducts was available, the tests were carried out as described below.

As specified by the client, the samples were to be tested as delivered. Setting in concrete was not required.

The three covers and one trough for testing at 20°C were stored at this temperature 24 hours before the test, and they were also tested at a temperature of 20°C.

The three covers and one trough for testing after storage at a temperature of -30°C were stored for two hours in a refrigeration unit at -30°C. The trough and one cover were taken out of the unit, taken to the test machine in an insulated box and tested without delay. After the test, the trough and the next cover were again conditioned for 2 hours in the refrigeration unit at a temperature of -30°C.

Force was applied in the centre of the covers via a 100 mm x 100 mm steel plate. The marking in the cover was accounted for by introducing a rubber pad. The force measurement was carried out with a load cell. Deformation of the cover was measured with a dial gauge immediately adjacent to the load application areas.

Using a hydraulic test cylinder, the force was continually increased in steps of approx. 0.5 kN/s. The first load step was 2 kN. After the required load step had been reached, deformation was measured at the dial gauge. The results are given in the tables below.

Attachment 1 comprises the pictures demonstrating the test setup.

4 Test result

Test date: 17 March 2005
Samples after storage at 20°C:

Deformation in mm **Test force in kN**	**Sample no. 1**	**Sample no. 2**	**Sample no. 3**
2	4.35	3.90	4.05
5	9.85	9.15	at approx. 4.8 kN breaking of the cover
8	16.30	15.35	--
10	no measurement	At approx. 8.5 kN breaking of the cover	--
12	no measurement, stop of test, no breaking	--	--

Test date: 18 March 2005
Samples after storage at -30C:

Deformation in mm **Test force in kN**	**Sample no. 1**	**Sample no. 2**	**Sample no. 3**
2	3.10	4.30	3.65
5	5.50	7.05	6.20
8	7.65	9.10	at approx. 7.2 kN breaking of the cover
10	9.60	10.70	--
12	at approx. 11.3 kN breaking of the cover	at approx. 11.9 kN breaking of the cover	--

5 Summary

The delivered cable duct elements of recycled plastics were subjected to a load test after storage at temperatures of 20°C and -30°C.

Application of a 2 kN load on an area of 100 x 100 mm² lead to a deformation of approx. 4 mm in the samples after storage at 20°C.

The samples tested after storage at a temperature of -30°C reached a mean deformation of 3.7 mm at 2 kN. After low temperature storage, deformation in the covers was somewhat lower.

Breaking of covers occurred at different load steps. The troughs did not break.

Leipzig, 22 March 2005
MFPA Leipzig GmbH
M. Maske, cert. eng.
Head of the working group 'pipe testing'

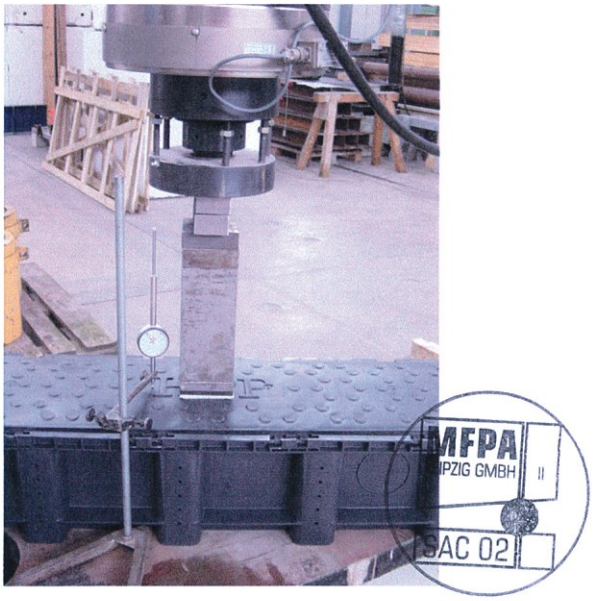


Figure 1: Load test at the cable duct at 20°C

Figure 2: Breaking of the cover, sample no. 1, storage temperature 20°C

Figure 3: View of the broken cover (removed) of sample no. 2, storage temperature -30°C.

TEST REPORT BY OSTTHÜRINGISCHE MATERIALPRÜFGESELLSCHAFT

[= East Thuringian Materials Testing Company]

MULTIPORT Recycling

Deutscher Akkreditierungs Rat
DAR
Reg.-Nr. DAP-PL-1397.00

OSTTHÜRINGISCHE MATERIALPRÜFGESELLSCHAFT
für Textil und Kunststoffe mbH
Breitscheidstraße 97
07407 Rudolstadt-Schwarza

Von der BAM Begutachtungsstelle (BBS) durch das Deutsche Akkreditierungssystem Prüfwesen (DAP) akkreditiertes Prüflaboratorium.
Die Akkreditierung gilt für die in der Urkunde aufgeführten Prüfverfahren.

Multiport Recycling GmbH
Herrn Ganz
Ernst-Grube-Str. 1

D-06406 Bernburg

EINGEGANGEN
07. MRZ. 2003
Erled. .....

Ihre Nachricht vom	Ihre Zeichen	Unsere Zeichen	Tel. Durchwahl	Datum
21.11.02		S. Post	03 672/379 411	03.12.02

Test report

Test report No.	**4.5/860 ENG/02**
Customer	Mr. Ganz
Test object(s)	PP-Recyclat with flame protection for Cable Cover
Sampling	By costumer
Date of sample receipt	25.11.02
Test objectives	Determination of the burning behaviour
Scientific Co-worker responsible for test performance	Mrs. Pass
Test method(s)	Determination of the burning behaviour - DIN 53 438* part 2 (edge combustion)
Notes	no
pages	2
Distribution list	1 copy for customer 1 copy remains in the OMPG

* non accredited method

The results of the measurements and analysis exclusively refer to the specimen tested.

This report has to be copied only completely.
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Bankverbindung KSPK Saalfeld-Rudolstadt
BLZ 830 503 03
Konto-Nr. 441 481

Deutscher Akkreditierungs Rat

Reg.-Nr. DAP-P-01.397-00-97-01

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OSTTHÜRINGISCHE
MATERIALPRÜFGESELLSCHAFT für
Textil und Kunststoffe mbH

2.*Results*

2.1. Determination of burning behaviour according to DIN 53 438 part 2 (edge combustion)

Samples:	plats, pressed
Conditioning	64 h at 23°C± 2°C and (50±5) % relative humidity
Laboratory fume hood:	DIN 50050
Laboratory burner:	DIN 50051 The central axis of the burner tube is at an angle of approximately 45 degrees to the horizontal.
Test Apparatus:	DIN 4102 B2 (Firm WAZAU, Berlin)
edge combustion:	five specimens 90mm x 190mm x 4mm
Test Procedure:	The flame is applyed to the free end at the lower edge of the specimen. Sample is exposed to the flame 15 s. The time recorded from the beginning of the applying of the flame up to the combustion front travel to the 150-mm mark.

Criteria Conditions	Material Classifications edge combustion
The combustion front cease to burn before the 150-mm mark.	K 1
The combustion front travel to the 150-mm mark in more them 20 seconds.	K 2
The combustion front travel to the 150-mm mark in less them 20 seconds.	K 3

Sample = PP-Recyclat with flame protection for Cable Cover

No.	thickness [µm]	time [s] (to the 150-mm mark)	observations	Material Classifications
1	3,97	-	The Combustion front dont pass the 150-mm mark. Material is burning in the sphere of the flame, but cease to burn after 20 - 33 seconds. No burning through a hole, no glowing, does not drip off burning.	K 1
2	3,94	-		K 1
3	3,93	-		K 1
4	3,92	-		K 1
5	3,92	-		K 1

The sample PP-Recyclat with flame protection for Cable Cover exists the fuel examination according to DIN 53438T2 with K1/4mm.

S. Post
Laborleiter

EXAMPLES

SPECIAL PARTS

SAMPLE APPLICATION

MULTIPORT Recycling

EXAMPLES

SAMPLE APPLICATION

SAMPLE LOADING

MULTIPORT Recycling

EXAMPLES

CABLE DUCT PROJECT HSL NETHERLANDS

MULTIPORT Recycling

EXAMPLES

CABLE DUCT PROJECT HSL NETHERLANDS

MULTIPORT Recycling

LAYING INSTRUCTIONS

1. General

The new cable duct has been developed as a result of many years of practical experience. Discussions with responsible site managers and with fitters - who after all are the people who carry out the installation - have shown us in what respects plastic cable duct could be improved.

Horizontal segments are attached to the side walls of the trough.
When the cable duct ditches are filled in, a wedge of earth is formed so that the weight of the troughs increase many times over as soon as they have been installed. This means that the duct is better and more securely seated, even without earth nails.

The ends of the covers overlap, which prevents soiling from outside. But it is still possible to open a single cover in a formation without having to raise the adjacent covers at the same time.
Linear expansion caused by solar radiation is also taken up by the overlapping.
The covers can be placed on one trough or can overlap over two troughs. Advantage:
the duct fits more tightly together.

MULTIPORT Recycling

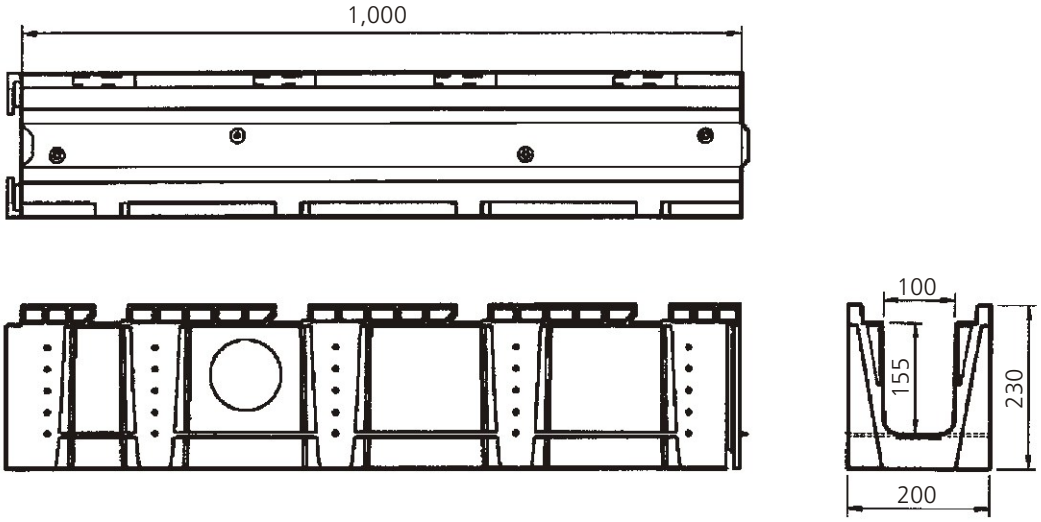
2. Dimensions

The cable duct comes in sizes 1iF and 2iF.

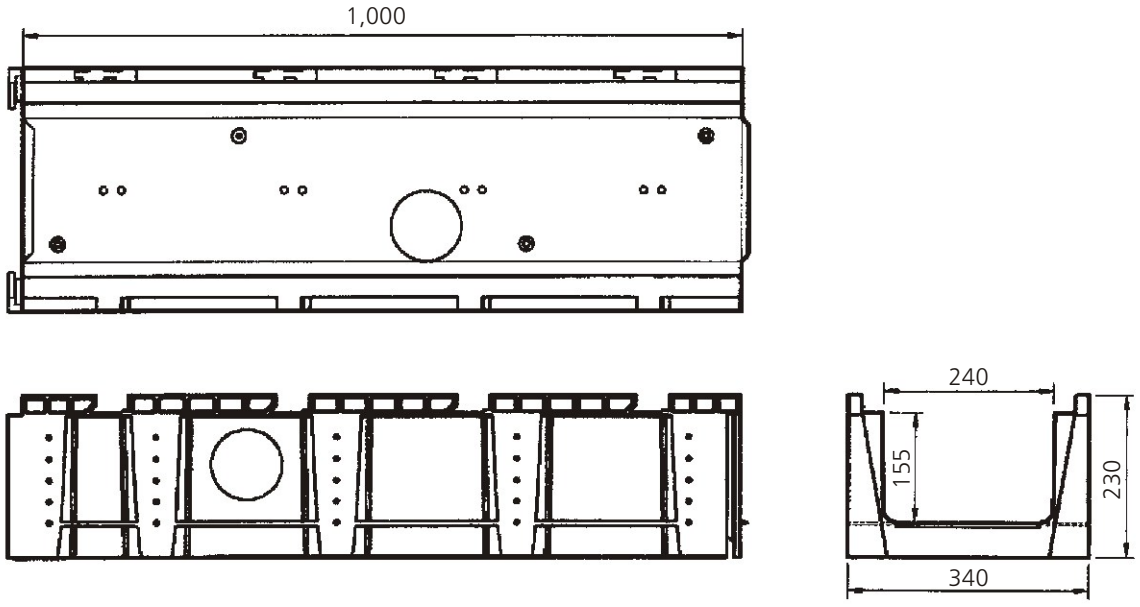
1iF
external (l x w x h): 1,000 x 200 x 230 (mm)
internal (l x w x h): 1,000 x 100 x 155 (mm)

2iF
external (l x w x h): 1,000 x 340 x 230 (mm)
internal (l x w x h): 1,000 x 240 x 155 (mm)

Size 1iF



Size 2iF



MULTIPORT Recycling

3. Weights

The weight of the troughs inc. covers is approx. 7 kg for size 1iF and approx. 9 kg for size 2iF.

4. Material

A PP/PE recyclate is used as material for the troughs and covers. Additives are also included to ensure that they are fireproof and to provide UV resistance.

5. Installation

MPO cable duct is intended for underground installation.

In bypaths the cable duct is laid in accordance with DS 836/1, no gravel is required.
The cable duct must not be used as a gravel boundary.
It must not be laid in areas where it will be subjected to loading from traffic.

Formation work should be carried out in the cable trench and a sand layer of 2 - 7 cm should be introduced if necessary to provide a clean base.
Lean concrete can also be used as a base.
The trough should be filled up to a maximum of 2 cm below its top edge, to prevent gravel, stones, dirt etc. penetrating by flushing into the hinges and slots for the cover opening.
The precise depth of installation depends on the client.

Dirt that appears in the hinges and slots for opening the cover when the cable duct is being installed and the trench being filled should be cleaned by suitable means such as with a broom or a blower. This is essential to enable the cover opening to function properly.
The predetermined breaking points on the sidewalls and on the base (only with size 2iF) can be beaten out for cable exits or entries.

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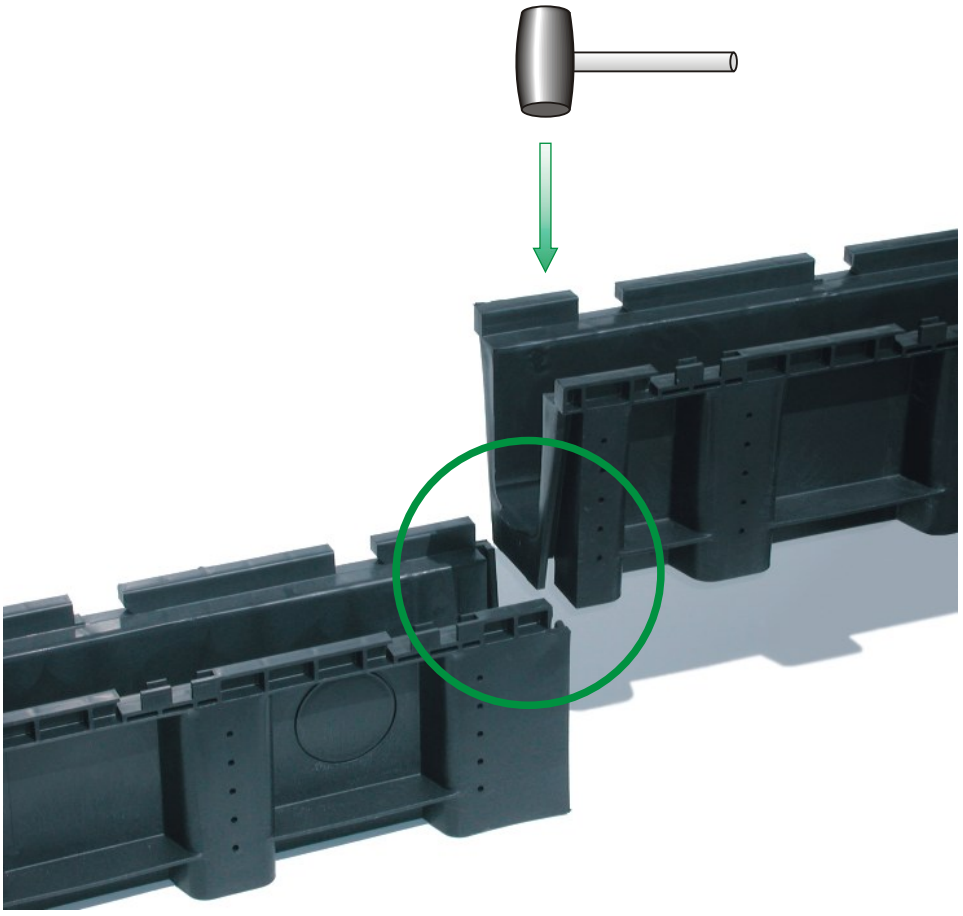
If the trough is installed underground it is generally unnecessary to use earth nails. The horizontal segments on the sidewalls of the trough inhibit lifting.
Earth nails are required for fixing the cable troughs when they are used on the surface.

5.1 Laying troughs

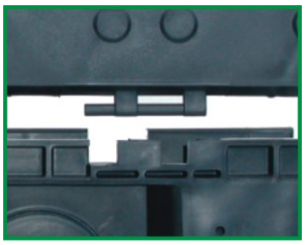
The trough is inserted into the previous trough by pushing together the swallowtail connection. A rubber hammer can be used for joining the troughs.



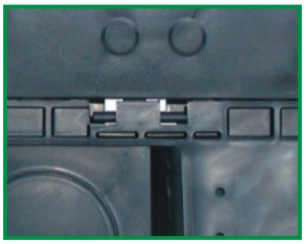
Should it be necessary to circumvent obstacles the cable troughs can be adjusted on-site with simple woodworking tools (such as a saw)or prefabricated angle pieces and offsets can be used.

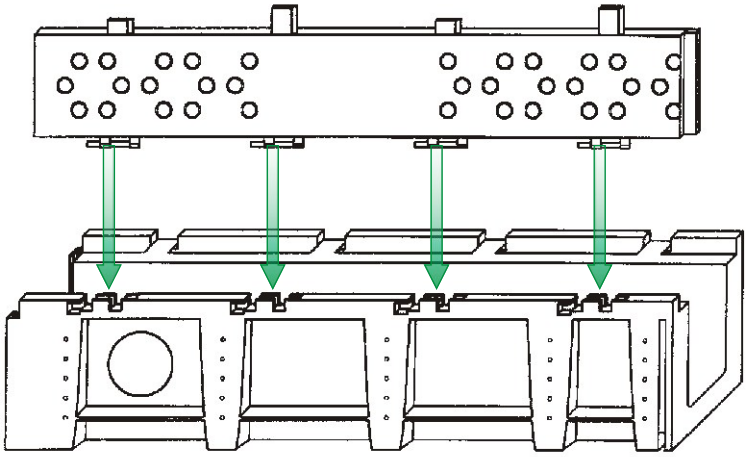
5.2 Laying covers

The cover can be installed over one trough or can overlap two troughs. Overlapping increases the stability of the system both vertically and horizontally. Nevertheless overlapping prevents radii or special components being formed. This is only possible if the cover is only installed over one trough. Both systems can however be applied on a single stretch. A half-cover must be produced and used for this at the joints.

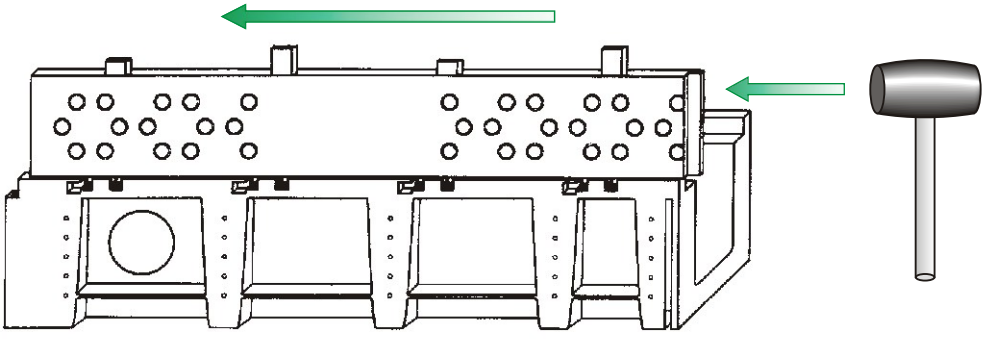


To apply the cover this should first be held vertically over the intended openings.
Then it is pressed into the appropriate slots with the 4 hinges.

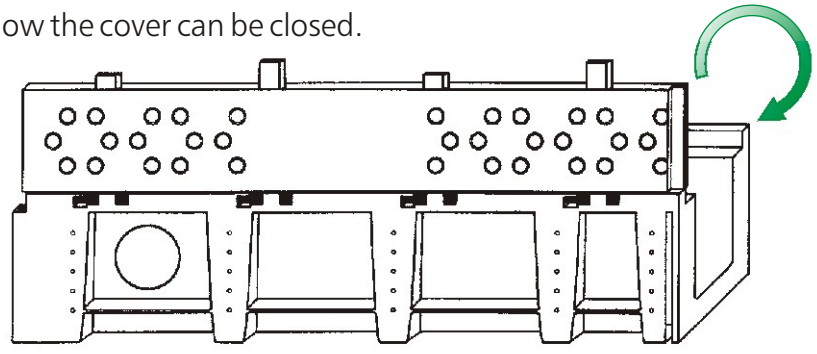




Next the cover is pushed towards the projecting pin until it stops. A rubber hammer can be used to simplify the task.



Now the cover can be closed.



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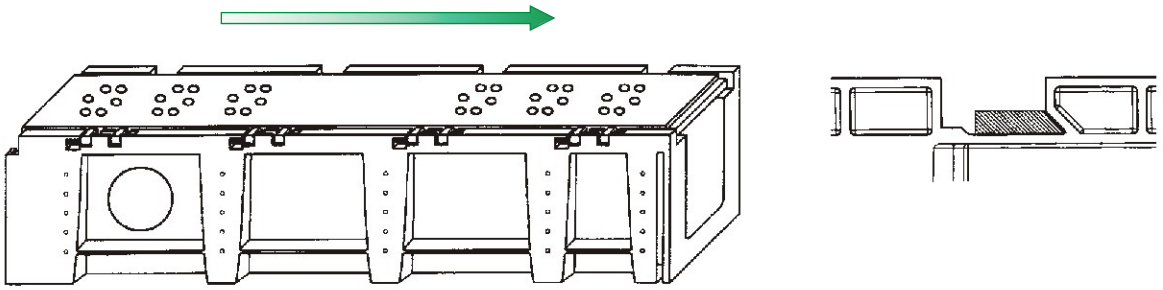
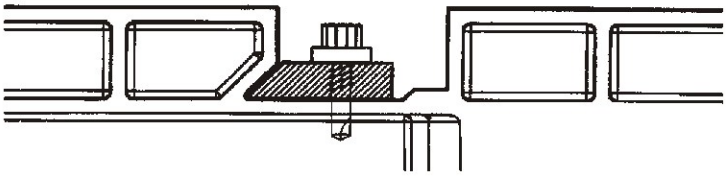
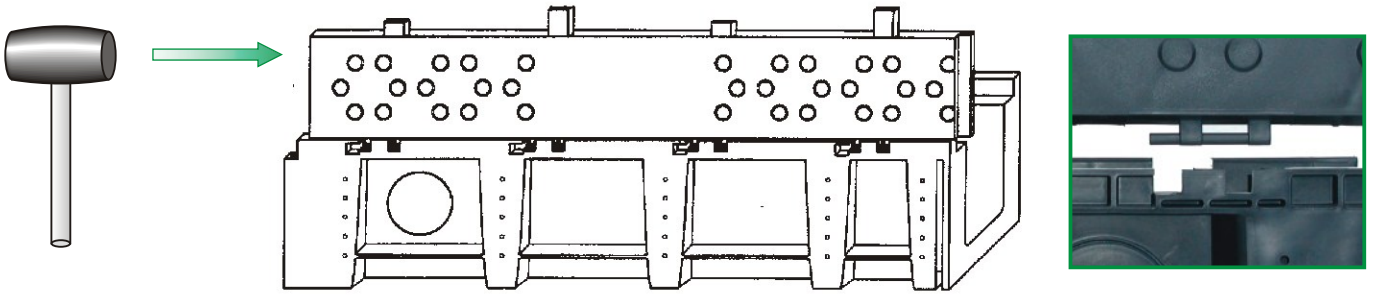
To lock it the cover is now pushed back a little until the 4 side lugs are fixed on the stop.



To secure the cover against being improperly opened it is possible to use a cover securing screw (optional) to link one or two cover lugs. This means that it is no longer possible to open the cover without auxiliary tools.

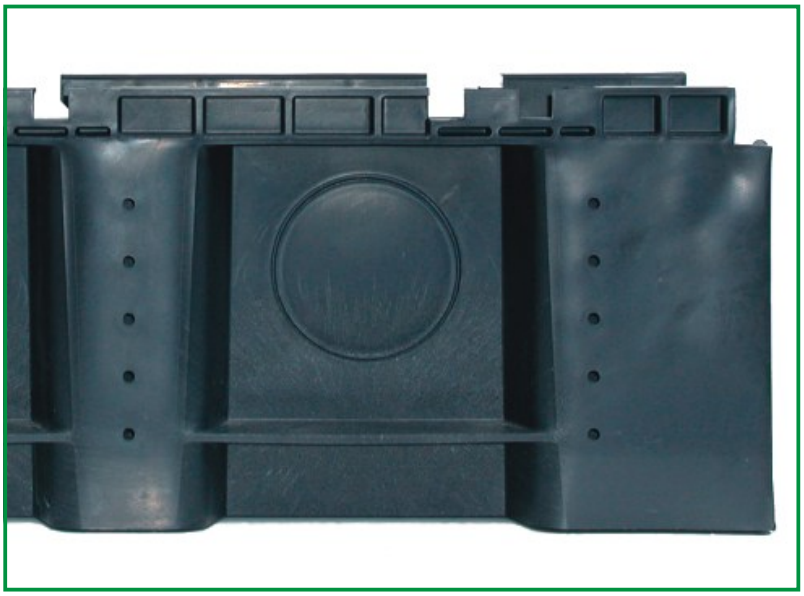


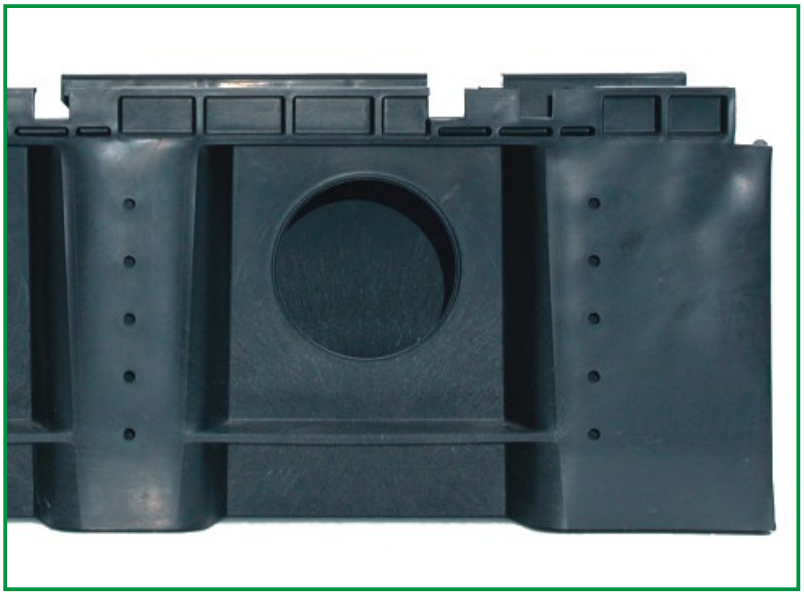
The cover should be placed vertically to separate trough and cover.
It is then forced back in the direction of the open groove with the help of a rubber hammer. It is important to pushed the cover as far as the stop. Should parts of the hinges still be covered by the trough, removing the cover may cause damage.
The cover can now be removed vertically upwards from the groove.



5.3 Outgoing circuits

For circuits entering or exiting laterally the sidewall of every trough has a pre-perforated opening with an external diameter of 100 mm. This can be beaten out with a hammer.





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DECLARATION OF CONFORMITY

EC DECLARATION OF CONFORMITY

Within the meaning of low voltage Directive 2006/95/EC

This is to confirm that the electrical equipment complies with the provisions of the above-named EC directive both in its design and construction and in the version placed on the market by Multiport. This declaration will cease to be valid if any modifications that have not been agreed with Multiport are made to the equipment.

This declaration applies to the following electrical equipment:

Designation	Plastic cable duct for laying signal and communication lines on railway lines, at airports, in power stations and industrial plants
Type	**MPO plastic cable duct size 1 i.F.**
Dimensions	approx length 1000 mm Width (internal/external) 100 mm/200 mm Height (internal/external) 155 mm/230 mm
Fire protection class	K1 in accordance with DIN 53438, Part 2
Approval	German Federal Railway Office 21AZ2/1005/1
National standards, directives and specifications applied:	DIN 18200:2000-05 DIN 53438, Part 2

Technical documentation is available. Instructions for use for the equipment are available in the national language of the user.

Bernburg, 01 October 2009

Herbert Snell
Managing Director

Irina Bremerstein
Operations Manager

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MULTIPORT Recycling

EC DECLARATION OF CONFORMITY

Within the meaning of low voltage Directive 2006/95/EC

CE

This is to confirm that the electrical equipment complies with the provisions of the above-named EC directive both in its design and construction and in the version placed on the market by Multiport. This declaration will cease to be valid if any modifications that have not been agreed with Multiport are made to the equipment.

This declaration applies to the following electrical equipment:

Designation	Plastic cable duct for laying signal and communication lines on railway lines, at airports, in power stations and industrial plants
Type	**MPO plastic cable duct size 2 i.F.**
Dimensions	approx length 1000 mm Width (internal/external) 240 mm/340 mm Height (internal/external) 155 mm/230 mm
Fire protection class	K1 in accordance with DIN 53438, Part 2
Approval	German Federal Railway Office 21AZ2/1005/1
National standards, directives and specifications applied:	DIN 18200:2000-05 DIN 53438, Part 2

Technical documentation is available. Instructions for use for the equipment are available in the national language of the user.

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REFERENCES

Client		Size	Qty [m]	Year
Germany - BV:	Hannover	Gr. I i.F.	500	2006
Germany - BV:	level crossing Nützen	Gr. II i.F.	3200	2006
Germany - BV:	Berlin-Schöneweide	Gr. II i.F.	750	2006
Germany - BV:	Dortmund Düsen	Gr. I i.F.	650	2007
Germany - BV:	Schwedt	Gr. I i.F.	475	2007
Ireland - BV:	Roscommon	Gr. I i.F.	1331	2007
Netherland - BV:	Amsterdam	Gr. II i.F.	1670	2007
Germany - BV:	GE Berlin S-Bahn S9 Schöneweide	Gr. II i.F.	550	2007
Germany - BV:	Dortmund	Gr. I i.F.	1020	2008
Germany - BV:	Kirchheim	Gr. I i.F.	800	2008
Denmark - BV:	Kopenhagen	Gr. I i.F.	700	2008
Germany - BV:	Bad Münster	Gr. I i.F.	500	2008
Germany - BV:	Stadtische Häfen Hannover	Gr. I i.F.	1200	2008
Denmark - BV:	Kastrup	Gr. I i.F.	600	2008
Norway - BV:	Blommenholm	Gr. I i.F.	770	2008
Germany - BV:	Nürnberg / Fürth	Gr. I i.F.	800	2008
Germany - BV:	Werneuchen	Gr. I i.F.	350	2008
Poland - BV:	Danzig	Gr. II i.F.	2500	2008
Denmark - BV:	Kopenhagen	Gr. II i.F.	1000	2008
Spain - BV:	El Cambello	Gr. II i.F.	1150	2008
Turkey - BV:	Izmir	Gr. II i.F.	420	2008
Poland - BV:	Gydnia	Gr. II i.F.	2500	2008

BV = rail link

Date: 01/2009

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