

# Technical Data Sheet

## Duct Sealing Systems

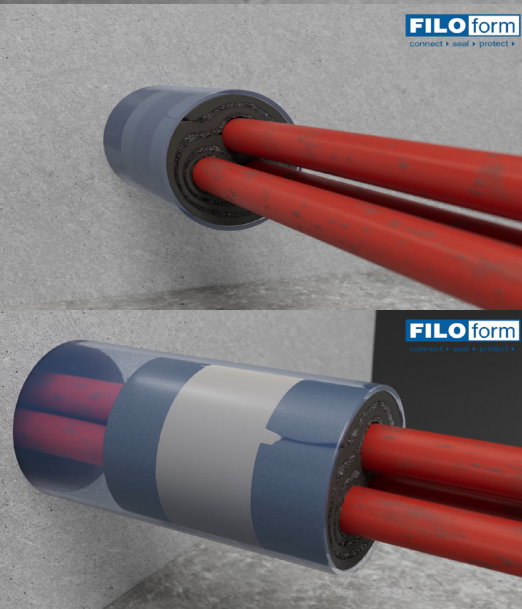
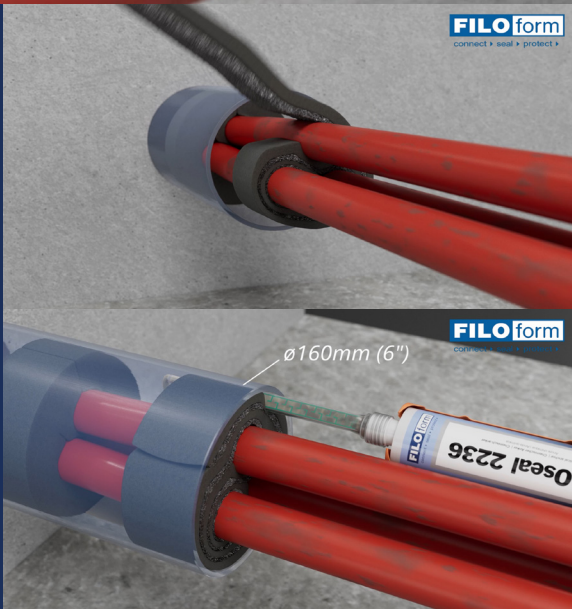
Duct sealing systems MD5 are designed to provide an effective and straightforward solution for gas and watertight sealing of one or multiple cables/conduits in ducts or boreholes. MD5 protects against damage caused by gas and water leaks.

This duct sealing system is highly flexible and can be installed in vertical and horizontal duct or boreholes, and is suitable for boreholes drilled at an angle.



*No more sloppy installations!*

SKU	Productname	Duct diameter (mm)
80345	MD5-110mm	max. 110mm (set for two seals)
80347	MD5-160mm	110-160mm



*Scan the code for instructions!*



### Technical features

The MD5 duct sealing system uses a specially formulated two-component expanding polyurethane resin. The polyurethane sealant is supplied in a two-component cartridge. The two liquid parts are formulated to be mixed at a 1:1 ratio, using the 2K cartridge and mixing nozzle provided. After injecting the resin into the duct, the resin starts expanding by forming CO<sup>2</sup>. During the expansion, the polyurethane resin penetrates all areas between the two foam flanges inside the duct.

MD5 is suitable for all openings regardless of the shape of the duct or borehole and cable configuration. After full curing, the Filoform two-component resin provides a 100% gas and watertight seal and offers excellent mechanical strength & rodent resistance. MD5 duct sealant is compatible with common cable jacket /sheath materials and PE drinking water conduits. The cured duct sealant is an inert solid mass that does not affect any of the materials inside of the duct.

The MD5 system has been designed to support and separate multiple cables in a duct / conduit using our uniquely designed duplex foam, whilst reducing excess expansion of resin out the front of the duct; This ensures a neater, less messy professional finish. The opening of the duct does not need to be completely round.

## Installation

### One box solution

Everything needed to seal one duct end (except a caulking gun).

### Cable Separation

It is vital, to make sure the duplex foam is wrapped around each cable, to create separation from each other and the inside of the duct.

### Running water

The duct & cables must be as dry as possible with no running water and free from any dirt, oil, grease & debris. MD5's resin can cope with small amounts of moisture in the duct or on the cables, but larger amounts of water will reduce the effectiveness.

[Please contact our technical department if you have any questions.](#)

## Cure time

MD5's resin can be installed in temperatures from 5°C (41°F). In colder temperatures, expansion can be slower but will expand and cure over a more extended time.

Expansion time between 8-10 minutes at temperature ranging between 15-20°C.

## Cleaning

Should any un-mixed material spill onto a surface, a solvent wipe can be used to help clean the area.

## Reentering & removal

Properties of Cured resin: Fairly dense structure however can be dug out with a blunt tool & Hammer with some degree of difficulty. (Please note there is between 10-15 cm (4-6") of the expanding resin in each seal depending on the size of duct)

- Remove all of the front foam that is separating the cables with a pair of pliers or cutting tool
- Using a hammer & chisel or similar tool to break the seal around the cable and the inside of the duct
- If there is room and the cables are de-energized, a power tool to speed the process up could be used. Once the seal is broken from the cable, there may be a crust of resin still present on the cable; this is due to the excellent adhesion our resin has.

\*\*The hardest part of removing this seal is the crust that forms when the resin soaks into the foam flange\*\*

## Safety

MD5's specially formulated two-component resin is part of the same chemical/product family of similar electrical and construction industry products. These products have been widely used for decades. As with all two-component resins safety precautions must be understood to handle and install these types of materials.

MD5's resin is contained in a state of the art 2K cartridge, which reduces contact with the raw materials. When the two components are mixed, the resin expands and forms a high density, closed-cell polyurethane foam and is inert and non-toxic when fully cured.

## Storage conditions

The cartridges should be kept in a cool, dry environment and away from direct sunlight. Product shelf life is 18 months, and providing the cap is correctly inserted after use, then remaining product in the cartridge can be used within two months of opening.

## Cable Compatibility

MD5's two-component expanding polyurethane resin (P2236) is suitable for common cable sheaths. When the resin cures, it becomes an inert solid mass that does not affect the cable sheath physically or electrically in regards to the performance of the cable. Neither does it affect HDPE drinking water conduits.

## Specifications & Standards

- Gas and watertight up to 1.5 bar / 21 PSI
- After injecting, the polyurethane sealant will expand and cures/hardens with a high density and a closed cell structure
- Easy and quick installation
- One complete kit - Everything you need except for a standard caulking gun
- Suitable for single & multiple cables
- Compatible with a wide range of cable and conduit materials: PVC & PE sheathed cables, PILC cables, (HD)PE ducts, & PE drinking water conduits
- High mechanical strength, resists ground movement, shocks and vibrations
- Complies with DIN 18322 underground cable laying works - gas & watertight cable and conduit entries into buildings
- Complies with 2011 NEC Articles 225.27, 230.8, 300.5(G), 300.7 (A) on Raceway Seals, and 501.15 (B)(2)

**Technical specification P2236 resin**

<b>Curing properties</b>	<b>Unit</b>	<b>Value</b>
Start time expansion	Seconds	50 - 70
End time expansion	Minutes	8 - 10
Curing time (Tack-Free time)	Minutes	>12

<b>Specifications</b>	<b>Unit</b>	<b>Value</b>
Compressive strength	N / cm <sup>2</sup>	>60
Density	kg / m <sup>3</sup>	90 - 110
Thermal resistance long term	°C	100
Closed cell percentage	%	>90

<b>Thermal stability</b>		<b>Value</b>
Thermal aging, 28d 90°C	no visual damage	V
Form stability, size and visual	%	<1
Compression strength after aging	N / cm <sup>2</sup>	> 40
Weight loss after aging	%	<0,5

<b>Hydrolysis test</b>		<b>Value</b>
Water Absorption, at 40 years, fully immersed	%	<10
Water Absorption 28 days at 90°C	%	< 5
Weight loss max.	%	0,5
Compression strength after Hydrolysis test	N / cm <sup>2</sup>	> 40
Form stability after hydrolysis test	Visual	PASS

<b>Chemical resistance</b>	<b>Unit</b>	<b>Value</b>
0,1N Na SO	30 days	PASS
0,1N NaCl	30 days	PASS
0,1N H SO	30 days	PASS
0,1N NaOH	30 days	PASS
Diesel	30 days	PASS
Gasoline	30 days	PASS
H2S, 200 ppm	5 days, 40°C, 95% air humidity	PASS

<b>Resistance</b>	<b>Unit</b>	<b>Value</b>
Mold	n/a	Good
Rodents	n/a	Good

<b>Shelf life</b>	<b>Unit</b>	
Storage time before use, under restricted conditions	Months	18



Functional tests	Unit	80435 MD5 110mm	80347 MD5 160mm
Gas and water tight 1,0bar	30 days	PASS	PASS
Gas and water tight 2,5bar	7 days	PASS	PASS
Axial tensile force (Pull out strength cable / duct)	Diameter mm x 10 N (100mm/min)	> 1500N	> 2000N
Resistance to bending	cables 45° in 2 directions >250mm no leakage	PASS	PASS
Operating temperature, continuous	°C	-30 up to +100	
Operating temperature, peak	°C	-40 up to +120	
Application temperature	°C	+5 up to 35	

Axial tensile force tests					
Duct size	Duct Material	Cable OD	Cable Sheath	Cable spec.	Result
110mm	PVC	32,32mm	HDPE Black	NA2XS2Y	2334N
110mm	PVC	26,80mm	HDPE Red	BFK 1x70RM	1710N
110mm	PVC	38,46mm	PVC Gray	V-VMvKhsas	3341N
160mm	PVC	27,45mm	HDPE Red	BS 7870-4.10	2751N
160mm	PVC	32,32mm	HDPE Black	NA2XS2Y	2818N
160mm	PVC	29,91mm	HDPE Black	N/A	3210N
160mm	PVC	53,12mm	PVC Gray	V-VMvKhsas	2912N



Bending tests Gas and water tight after bending					
Duct size	Duct Material	Cable OD	Cable Sheath	Cable spec.	Result
110mm	PVC	38,46mm	PVC Gray	V-VMvKhsas	Pass
110mm	PVC	37,67mm	HDPE Red	N/A	Pass
160mm	PVC	38,46mm	PVC Gray	V-VMvKhsas	Pass
160mm	PVC	37,67mm	HDPE Red	N/A	Pass



Gas tightness tests							
Duct size	Duct Material	Cable OD	Cable Sheath	Cable spec.	Nr. of cables in duct	30 days 1,0 bar	7 days 2,5 bar
110mm	PVC	32,32mm	HDPE Black	NA2XS2Y	3	PASS	PASS
110mm	PVC	26,80mm	HDPE Red	BFK 1x70RM	3	PASS	PASS
110mm	PVC	38,46mm	PVC Gray	V-VMvKhsas	1	PASS	PASS
160mm	PVC	27,45mm	HDPE Red	BS 7870-4.10	3	PASS	PASS
160mm	PVC	32,32mm	HDPE Black	NA2XS2Y	3	PASS	PASS
160mm	PVC	29,91mm	HDPE Black	N/A	3	PASS	PASS
160mm	PVC	53,12mm	PVC Gray	V-VMvKhsas	1	PASS	PASS