



# SEALS FOR TUNNEL CONSTRUCTION

Sealing profiles for modern tunnelling methods

NO MATTER WHAT  
**THE FUTURE** HOLDS





# DATWYLER TUNNEL SEALS

Sealing profiles for modern tunnelling methods

The Datwyler Group is an international multi-niche player dedicated to industrial component supply and distribution of engineering and electronic components. Our activities concentrate on attractive niches that offer opportunities to increase value added and sustain profitable growth. The Group’s four divisions – Technical Components, Pharma Packaging, Cabling Solutions and Sealing Technologies – are focused on the manufacturing, pharmaceutical and datacom industries. Our strategy is built on delivering innovative solutions and positioning ourselves as a competent development partner for our customers. With more than 40 operating companies, sales in over 80 countries and over 5'000 employees, the Datwyler Group generates approximately EURO 1'070 million in revenue. Datwyler has been listed on the main board of the SIX Swiss Exchange since 1986 (security number 3048677).

Datwyler is specialized in developing and manufacturing custom designed seals and gaskets to fit the needs of specific engineering and tunnelling projects. With the acquisition of the business

unit profiles of PHOENIX Dichtungstechnik GmbH, Datwyler has created a strong position in the global market and has become the leading supplier with more than 451 tunnelling references.

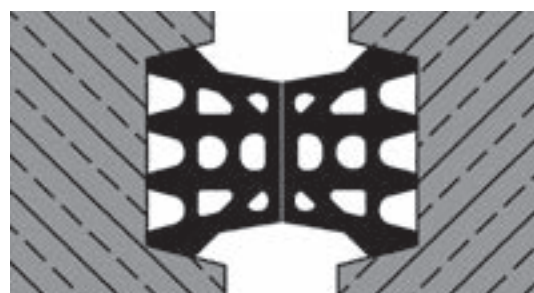


Due to permanently changing and increasing requirements from project to project Datwyler continues to be innovative and therefore follows a long and successful tradition.

## THE HISTORY OF DATWYLER

<b>1915</b>	Adolf Dätwyler takes over the executive board of the Swiss „ Draht-und Gummiwerke Altdorf“	<b>1996</b>	Foundation of Datwyler Rubber & Plastics USA
<b>1958</b>	Foundation of Datwyler Holding AG, Peter und Max Dätwyler take over the operative management	<b>2000</b>	Foundation of the Sales Office Datwyler Rubber s.r.o. in Czech Republic
<b>1973</b>	Commissioning of the Gummifabrik Schattdorf	<b>2003</b>	Foundation of Datwyler Rubber in Ukraine
<b>1976</b>	Foundation of Datwyler GmbH Germany	<b>2006</b>	Take over 100 % of the Joint Venture in Czech Republic
<b>1977</b>	Foundation of Datwyler SAS France	<b>2007</b>	Selling of the Business Unit Surface Products
<b>1990</b>	Construction of a third production facility for Safety and precision parts for the automobile industry at Schattdorf	<b>2008</b>	Foundation of Dätwyler Rubber in Mexico
		<b>2012</b>	Acquisition of the business unit profiles of PHOENIX Dichtungstechnik GmbH





Segment Gasket



Drainage Joint Seals

## ELASTOMER SEALS FOR TUNNEL CONSTRUCTION

For decades, Datwyler has been delivering a broad range of sealing profiles for various tunnel building techniques.

Datwyler engineers have developed reliable sealing systems for the various applications such as segments for tunnel boring machines (TBM) and shield driven tunnels, various types of jacking pipe and for tunnel refurbishment. The latest development is a seal that is anchored into the concrete during the tunnel segment production process. This system will make segment production and gasket installation easier and faster without the added cost of the adhesive application.

## REFERENCES

Seals by Datwyler are in successful service in over 451 tunnels on five continents. Our rubber seals keep tunnels watertight, thus contributing significantly to uninterrupted operation, protection of electromechanical equipment and of course long service life of the tunnel.



Road



Rail



Metro



Cable/Service



Water/Sewer















# SEGMENT GASKETS

Datwyler segment gaskets were first used in 1969 on the New Elbe Tunnel in Hamburg and are now available in more than 50 different cross-sections to cover the entire range of today's various kinds of projects. Metro tunnels, River crossing tunnels, Road and Railway tunnels, Cable tunnels, Waste water and Water supply tunnels all around the world can be found on a long list of more than 450 successful reference projects. In addition to the standard program shown here Datwyler can offer various tailor-made solutions.

During many years of deep involvement and close cooperation with the largest construction companies Datwyler has set-up an international standard for product testing at their various plants inclusive of regular internal quality control audits, all of which are accepted by many international partners and consultants.

DATWYLER SEGMENT GASKETS COMPLY WITH STUVA TESTING GUIDELINES

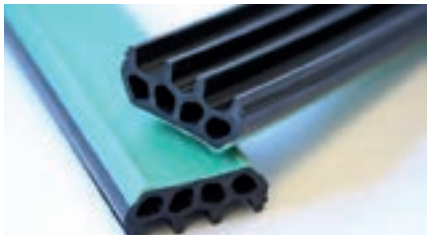
## Standard geometries

M 385 72	1'002'831	M 385 41A	86-259
 Groove 20 x 7,5 mm	 Groove 20 x 7,5 mm	 Groove 26 x 10 mm	 Groove 26 x 10 mm
M 389 03	190-830	M 385 87A	1'002'032
 Groove 33 x 10 mm	 Groove 33 x 8 mm	 Groove 36 x 12,5 mm	 Groove 36 x 11,5 mm
1'001'809	M 385 73	ALL STANDARD CROSS-SECTIONS HAVE BEEN TESTED ACCORDING TO THE STUVA STANDARDS	
 Groove 39 x 13 mm	 Groove 44 x 12 mm		

## Technical options



Mono EPDM Segment Gasket



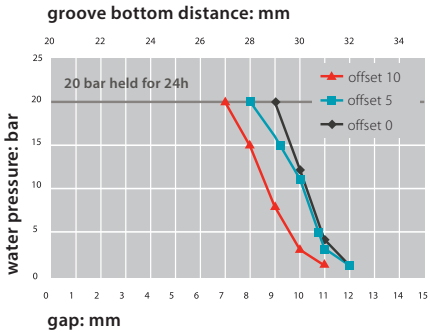
CoexSwell integrated with hydrophyllic contract surface



CoexSlide with integrated sliding surface

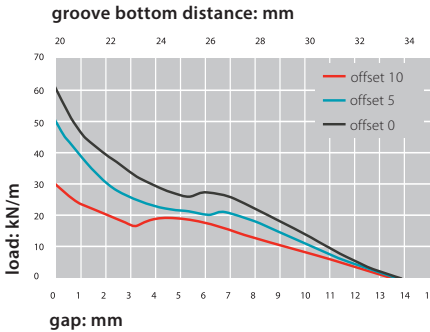
## Performance

### WATERTIGHTNESS DIAGRAM FOR PROFILE 86-259



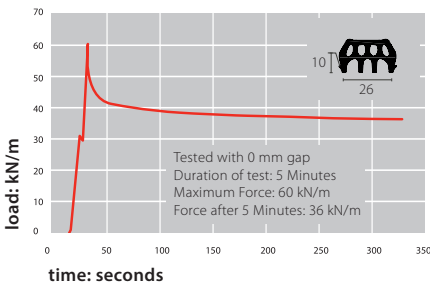
Tightness of seal in relation to various offsets and gaps at joint

### LOAD DEFLECTION DIAGRAM FOR PROFILE 86-259



Strength of seal in relation to various offsets and gaps at joint

### SHORT TERM RELAXATION



Loss of residual stress of seal after segment installation

## Innovations

Based on many years of solid experience in tunnel construction Datwyler can offer tunnel gaskets which are directly anchored into the segment.

As a forward-looking technology Datwyler gaskets that are directly anchored in the concrete segment offer a variety of remarkable advantages:

- Shortened process in the segment factory due to time savings for correction of imperfections and cleaning of the groove area
- Remarkable higher adhesion between gasket and concrete (no detachment while installing the keystone)
- Saving costs for adhesive and adhesive application equipment as well as time for mounting the gaskets
- Higher tightness because of maximizing the distance for the water between gasket and concrete

### M 385 66 anchored



Groove  
26 x 10 mm

Anchored within the concrete, this option offers an array of advantages with regard to safety and installation. These seals do not require adhesive and therefore they also save on labour costs and negate the need for environmental precautions to be taken.

### M 389 12 composite



Groove  
26 x 10 mm

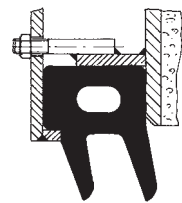
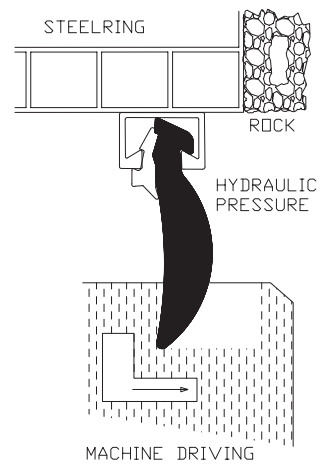
The "Composite Seal" combines two different sealing technologies – a compression seal and a hydro-swelling strip. Using this system the capsulated hydro-swelling strip offers additional safety without the typical disadvantages.

## SEALS FOR TUNNEL BORING MACHINES

Datwyler offers a variety of seals for the actual TBM, as well as for sealing the shafts at the critical moments of the entry, or at the exit of the TBM.

Datwyler profiles for TBM's are in use world-wide. Whether used for pipe-jacking or shield driven tunnels – our seals provide the required safety.

### STARTING SEALS

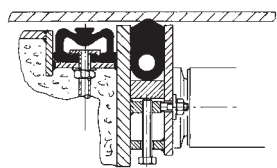


#### Starting seals

Starting seals are used to seal the gap between the excavation line and TBM (tunnel boring machine). Starting seals are mounted on a special support frame.

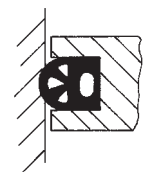
For greater watertightness, several starting seals can be installed in series. Datwyler provides starting seals and filler profiles for various pressure ranges.

### EMERGENCY SEAL

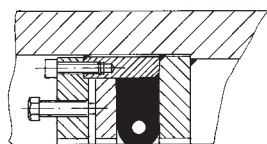


Seal for Intermediate Jacking Station

### CAISSON DOOR SEAL



### CUTTING WHEEL OFFSET



### SHIELD JOINT SEAL



## DATWYLER STARTING SEALS FOR A SAFE ENTRY OF THE TBM



## OUR LONG STANDING COMPETENCE PARTNER



Precise and tailor made ring vulcanization of these special seals must be carried out by skilled engineering experts guaranteeing a smooth assembly and maximum sealing performance on site. Our long standing partner Theodor Cordes GmbH & Co.KG of Westphalia, Germany, having 50 years experience in providing sealing solutions for concrete shafts and pipes has also become a specialist in manufacturing TBM and pipe jacking seals.

Cordes offers consulting service and supplies true to size gaskets made of all well-

known and worldwide proven "Datwyler Profiles". If necessary Cordes also provides on-site vulcanizing and assembly as well as repair service. In such case please contact directly:

#### CORDES TUBES & SEALS GMBH & CO.KG

Herr Dipl.-Ing. Karl-Heinz Spell  
Im Südfeld 3 | D-48308 Senden-Börsensell  
P +49-(0)2536-9939-14  
F +49-(0)2536-9939-20  
E [spell@cordes.de](mailto:spell@cordes.de)  
[www.cordes.de](http://www.cordes.de)







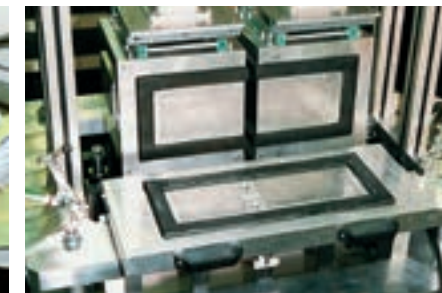
## APPLICATION, TEST METHODS AND MOUNTING TECHNOLOGY AT DATWYLER

It has always been part of our philosophy to assist our customers with maximum support while using our products. Therefore, our

staff takes care of handling instructions on site at the beginning as well as to the completion of a project.



Efficient and successful on-site training everywhere in the world



Test rig for water tightness test



Handling and application instructions by technician

## ADHESIVE G 3000 PLUS (TOLUENE FREE)

This product of Datwyler has been developed to fulfill the high demands when mounting elastomer seals to concrete segments. The glue offers both economical use and safety.

In cooperation with the manufacturer "WIWA", adjusted spraying equipment is available for even more economical use of our adhesive G 3000 Plus.

**PACKAGING AT DATWYLER:**  
**Clear, Environment friendly, Safe**



## SEALS FOR TUNNEL REFURBISHMENT

Leaking joints can limit service and threaten safety. Robust and durable Datwyler profiles are ideal for sealing the joints.

The profiles deflect water in joints in a controlled way, thereby preventing unwanted and damaging entrance of water.

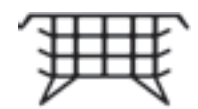
1'002'875



19-978



M 900 99



Datwyler has several sales and representative offices in most parts of the world. Don't hesitate to contact our headquarters and they will guide you to your nearest Datwyler representative.



- Certified according to ISO 9001 and EN ISO 14001 and Cor 1

### **Dätwyler Sealing Technologies**

#### **Deutschland GmbH**

Eisenach Landstraße 70

99880 Waltershausen

T +49 (0) 3622 633 200

E [civilengineering@datwyler.com](mailto:civilengineering@datwyler.com)

<http://sealing.datwyler.com/>

REPRESENTATIVE

