



# TRAFFIC **GUGI**<sup>®</sup>BLOC+

Monolithic, prefabricated linear drainage  
for extreme dynamic loads.



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„Thanks to the prefabricated casting of the channel body, the installation time is shorter and the cost is significantly lower.”

Henry - General Contractor

„With the TRAFFIC **GUGI**®BLOC+ I benefit from the long-term performance of the drainage system.”

Laura - Installation Designer

# Why was TRAFFIC GUGI®BLOC+ developed?

Monolithic, prefabricated linear drainage systems for extreme dynamic loads  
**TRAFFIC GUGI®BLOC+**

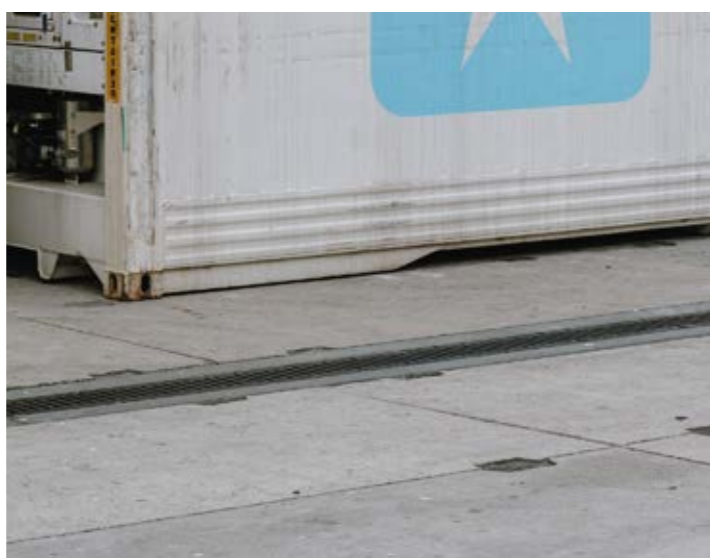
The TRAFFIC GUGI®BLOC+ system was developed in response to the growing demand for drainage systems with the highest resistance to heavy vehicle traffic. There is also a noticeably growing trend towards the use of prefabricated products that minimise the cost of installation services while maintaining the highest quality of drainage channels.

Drainage systems must meet the stringent requirements of building law as well as the individual, often more stringent, requirements of investors, such as ensuring that the drainage channel is leak-proof along its entire length or that the line can be easily inspected.

Based on our many years of experience, both in cooperation with architects, designers, as well as contractors and investors, we decided to create the most durable and efficient product.

Nowadays, there is an increasing focus on sustainable production in order to reduce the carbon footprint. This is why it is also important for investors to select products that are long-lasting and made from renewable raw materials that can be recycled and reused in the future.

All materials used in the manufacture of the TRAFFIC GUGI®BLOC+ prefabricated drainage channel are made from materials that will allow them to be recycled.



Main benefits of TRAFFIC GUGI®BLOC+ for the most demanding sites:



**Durability for daily use under extreme loading conditions**



**Long-lasting product, ensures performance for years**



**Quick and easy installation thanks to monolithic, prefabricated channel body**



**Tested quality and resistance to chemicals and varying weather conditions**



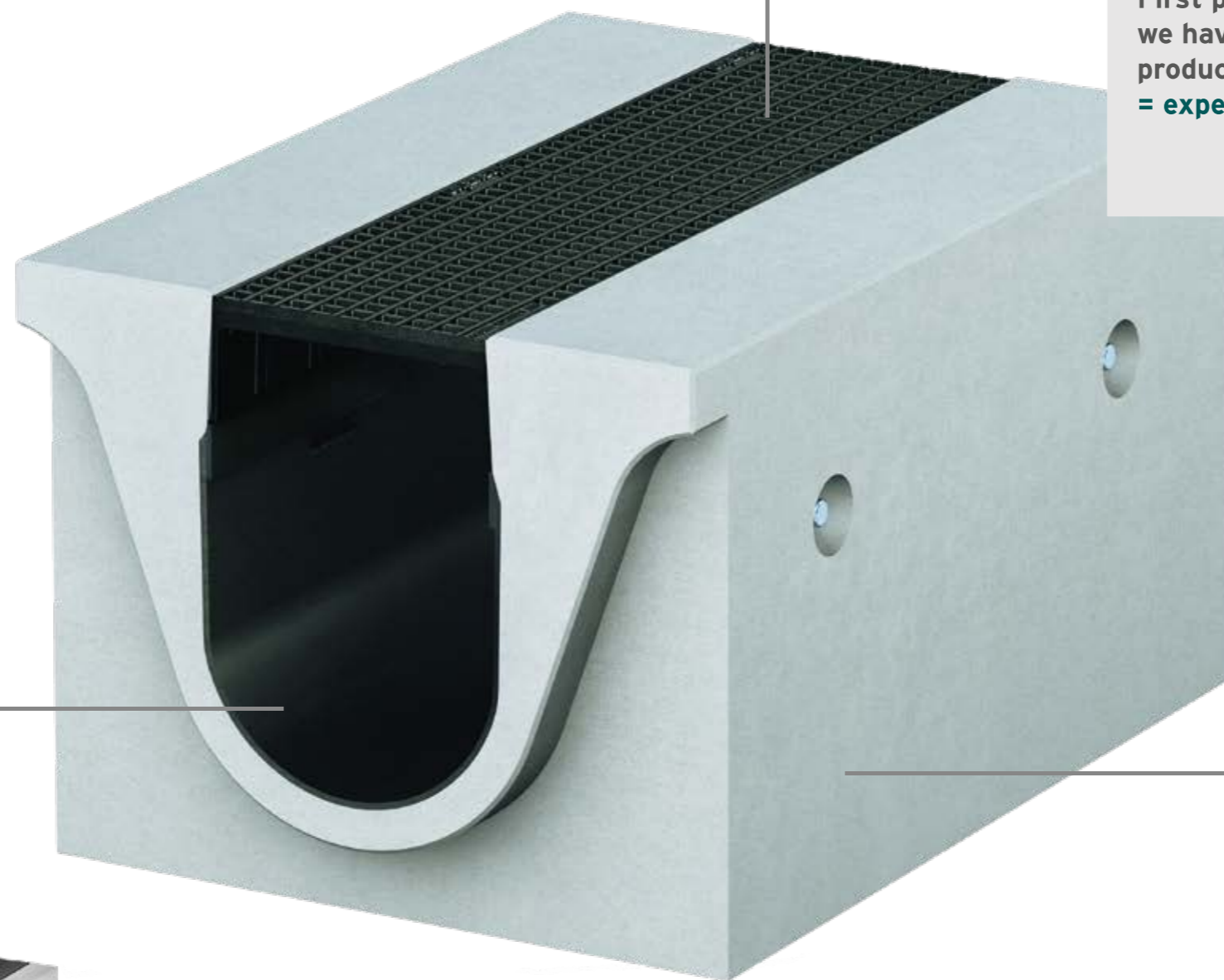
# International technology

## Transformation of prefabricated drainage systems

- JAPANESE MOULDS
- GERMAN TECHNOLOGY
- POLISH PRODUCTION

Consultation with users of our systems and our experience in the production of prefabricated linear drainage systems have enabled us to select the most important strengths from the FASERFIX®KS+, FASERFIX®BIG BL and MONOTEC+ prefabricated channels we have already produced.

The integration of these features in a single product has made it possible to create the strongest drainage channel - the monolithic, prefabricated TRAFFIC GUGI®BLOC+



### FASERFIX®BIG BL

GUGI® inlets cast in ductile iron

Load class F 900

First prefabricated channel body we have produced in Poland, production start 2012 = experience



### MONOTEC +

Chemically resistant and non-absorbent material

Monolithic construction



### FASERFIX®KS+

C50/60 concrete  
52,000 metres of drainage\*

\*Total length of channels sold between 2018 and 2021



## Japanese quality Toyota Mould

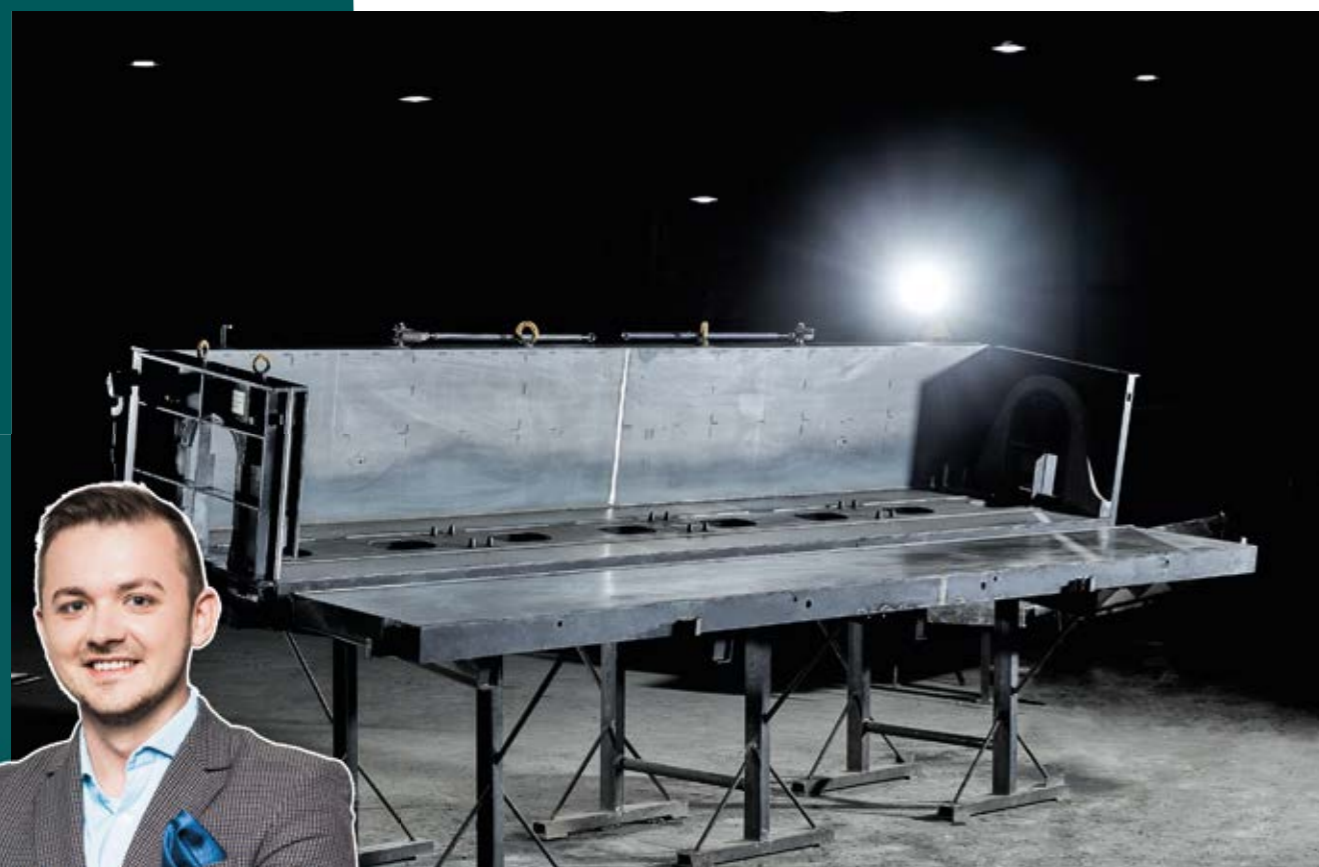
Prefabrication is currently a construction trend with huge potential. The growing demand for modular construction is noticeable on all continents.

One of the main advantages of prefabrication is the quality and repeatability of production. The product development process consists of, among other things, the preparation of the mould and reinforcement, the introduction of the concrete mixture into the mould and the subsequent maturation of the concrete.

With many years of experience in the production of prefabricated drainage systems, we pay particular attention to the quality of both the channels produced and the tools needed to create them.

The production process for precast elements is demanding and the moulds for casting them are intensively used, which is why, when designing the TRAFFIC GUGI®BLOC+ channels we focused particularly on the durability and care of the manufacturing moulds.

Our search for the best quality moulds led us to the Japanese company TOYOTA Kohki, which specialises in the design and manufacture of equipment for precast concrete products.



„We started our search for a manufacturer of moulds (to produce TRAFFIC GUGI®BLOC+ drainage systems) from the European market. However, due to the lack of such a narrowly specialised manufacturer, we extended our search to the international market and so got in touch with the Japanese company TOYOTA Kohki, which made moulds for us to produce TRAFFIC GUGI®BLOC+ channels.”

Jonasz Nastański  
Quality & Product Development Manager HAURATON Polska



Form for the production of a 4-metre section of TRAFFIC GUGI®BLOC+



Form with drainage elements and reinforcement, ready to be poured with concrete



Prefabricated 4 metre channels TRAFFIC GUGI®BLOC+

## Concrete channel body

Modern prefabrication allows efficient production of drainage channels with high, reproducible quality.

Based on our experience in the prefabricated drainage systems FASERFIX®BIG BL, FASERFIX®KS+ and MONOTEC+, we have developed a new drainage channel with an integrated reinforced concrete surrounding TRAFFIC GUGI®BLOC+.

The monolithic body of the channel, integrated into the prefabricated housing, has been adapted to the highest loads in class F900 (according to EN 1433), and is therefore dedicated for use on the most demanding facilities. No linear drainage has been available for such facilities that can cope with the long-term exposure to the har-

shest conditions. Concrete C50/60 XF4, XA3 grade HSR cement was used for the production, which was reinforced with steel reinforcement.

The current trend in the production of prefabricated solutions allows for shorter installation times and a reduction in the number of workers needed to carry out the work onsite.

The concrete's resistance to weather conditions and de-icing agents ensures a long service life of the product.



Various connection options for drainage sections	Frost resistance
High abrasion resistance	Quick locking installation
Concrete reinforced with basalt aggregate	100% watertight immediately after installation
Concrete class C50/60	Highest resistance to dynamic loads

The prefabricated TRAFFIC GUGI®BLOC+ linear drainage channel is prepared under controlled conditions, so during installation you can be sure that the concrete surrounding will be durable, constructed in accordance with the technical requirements of the project. Sinking the channel body into the concrete effectively excludes the possibility of separation of the grating from the body and thus protects vehicles from possible damage.

A major advantage of prefabricated linear drainage is the ability for quick replacement of damaged sections of existing drainage installations without the need for on-site concrete surrounding and taking the facility out of service. Installation work can even be carried out in winter without any problems.

Due to the unique way in which the individual drainage channels are connected via a connection lock, TRAFFIC GUGI®BLOC+ can be used successfully for express installation or replacement.

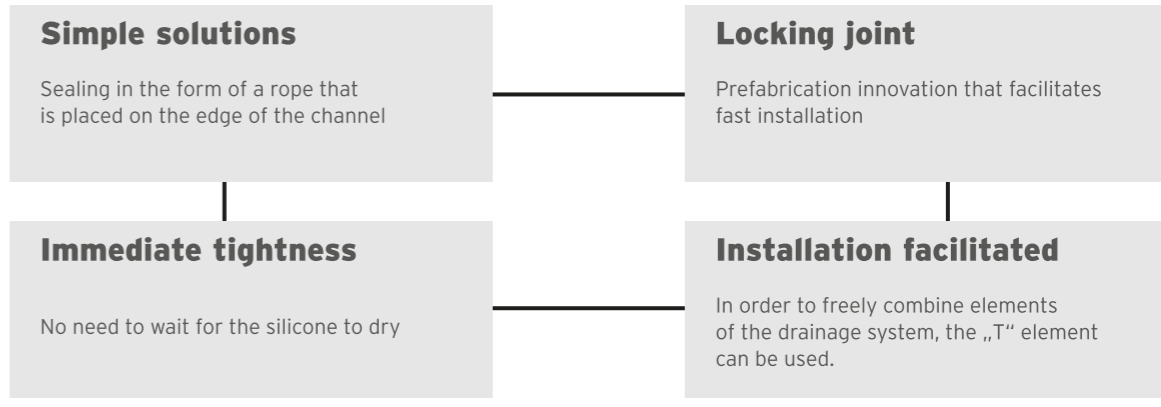


# „T“ element use options

The TRAFFIC GUGI®BLOC+ drainage system is available in 4 and 1 metre elements. The construction of a linear drainage system with TRAFFIC GUGI®BLOC+ is facilitated by the choice of different ways of connecting the individual elements.

The standard connection is to lay a channel with a „female“ lock and then fit another with a „male“ lock to it. Both the 4 metre and 1 metre channels end with a „female“ lock on one side and a „male“ lock on the other. Trash box elements are also fitted with „female“ and „male“ locks.

A special „T“ element is also available to connect two identical channel walls together. The perfect fit of the channel walls using the locking method results in immediate water tightness over the entire length of the drainage line. If, in the future, a section of the existing drainage line needs to be replaced, a so-called repair element can be used, the walls of which have not been fitted with connecting locks. Thanks to its flat finish, the single section can be installed in the replacement area without any problems.



**Components available:**

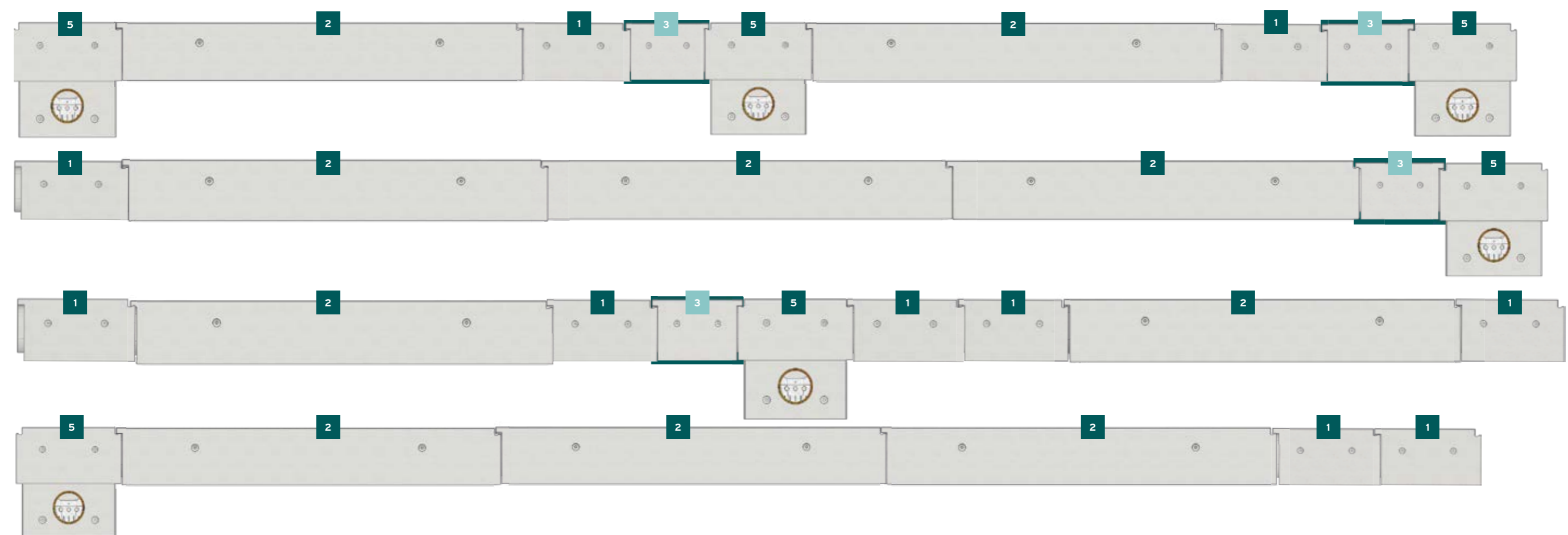
<p>1 m and 4 m long channels</p>	<p>The „T“ element</p>	<p>Trash box top element</p>	<p>Trash box</p>
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**Connection options**

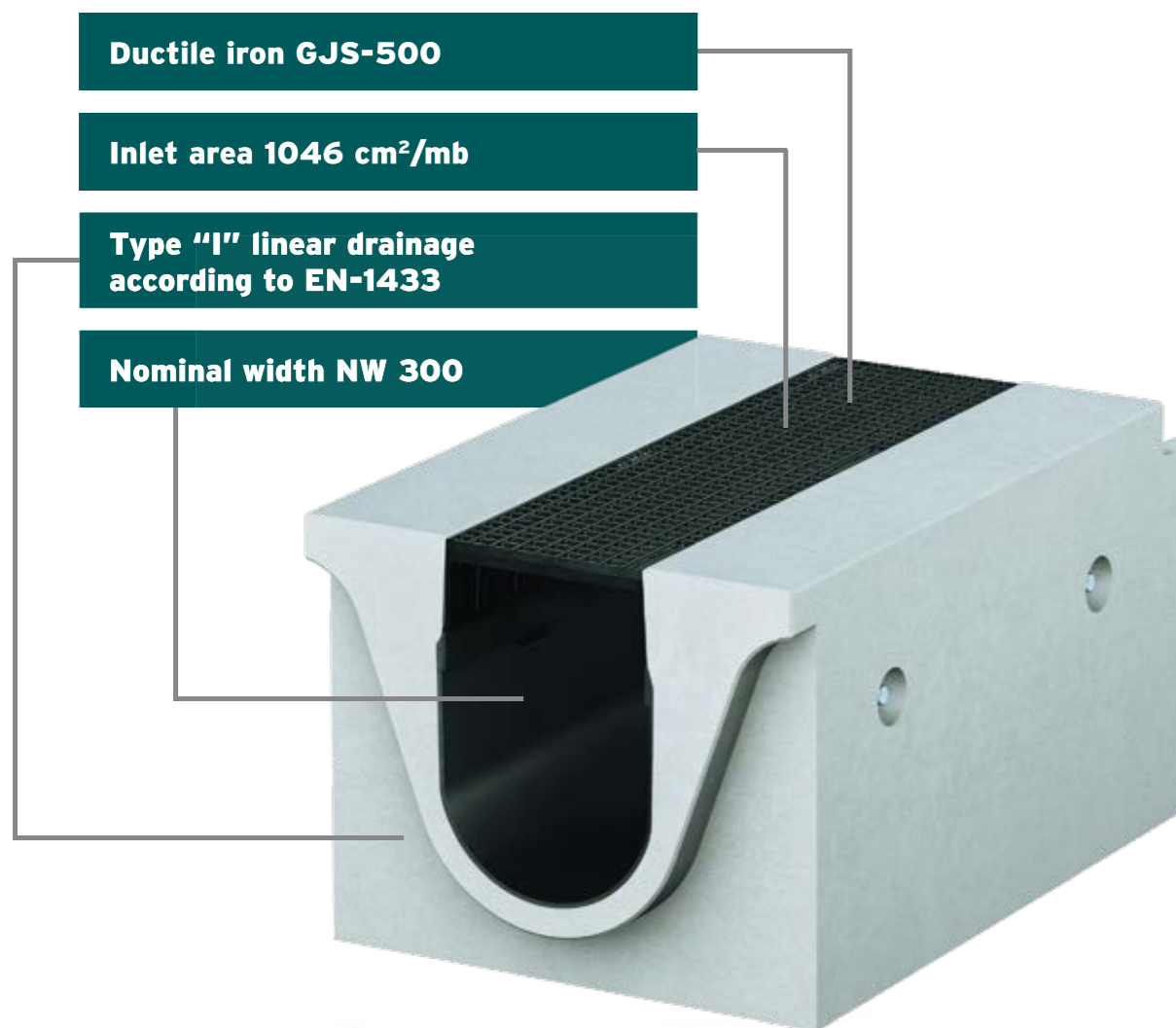
System connection with a lock

Meeting of unidirectional channel walls - application of the „T“ element

**„T“ element in drainage systems - use options**



## Monolithic drainage with GUGI® grid inlet



The TRAFFIC GUGI®BLOC+ drainage body is integrated into the prefabricated housing. The upper surface of the monolithic drainage is made of materials that provide high strength and high abrasion resistance.

The grated inlet surface, which is visible from above, has been formed from iron, thus increasing the strength of the drainage body. The cast-iron element was embedded in the reinforced concrete channel walls using horizontal perforated anchors along the entire length of the drainage system on both sides with additional steel ribbing. This connection ensures a stable integration of all the elements of the monolithic body and protects them from displacement.

GJS-500 cast iron with a compressive strength of 800 N/mm<sup>2</sup> and a tensile strength of 500 N/mm<sup>2</sup> was used for the production of the cast iron element. The inner part (wetted perimeter) of the drainage channel is made of PE-PP with 0% water absorption, frost resistance in accordance with PN-EN 1433 and high chemical resistance. All construction materials of the drainage channels are resistant to surface de-icing agents and airplanes.



All materials used in the manufacture of the TRAFFIC GUGI®BLOC+ prefabricated drainage channel are made from materials that can be recycled.

## Decision of the Polish Air Force Institute of Technology (ITWL)



The Polish Air Force Institute of Technology (ITWL) is a leading research centre in support of military aviation technology, supervised by the Minister of National Defence. As an institution with several decades of experience, it conducts scientific, research and development, implementation and technical-service work related to the operation of aviation technology. It develops, among other things, technologies, test methods, new designs, research programmes, methodologies for the operation of aviation equipment, and expert reports. All these activities increase the reliability of aviation equipment and flight safety.

ITWL cooperates with the largest domestic and foreign companies related to the aviation industry. It also has a dozen of specialised laboratories accredited by the Polish Centre for Accreditation or the Ministry of National Defence.

As part of its activities, ITWL has carried out tests and issued a certificate of approval for the drainage channel TRAFFIC GUGI®BLOC+ for use at airports.

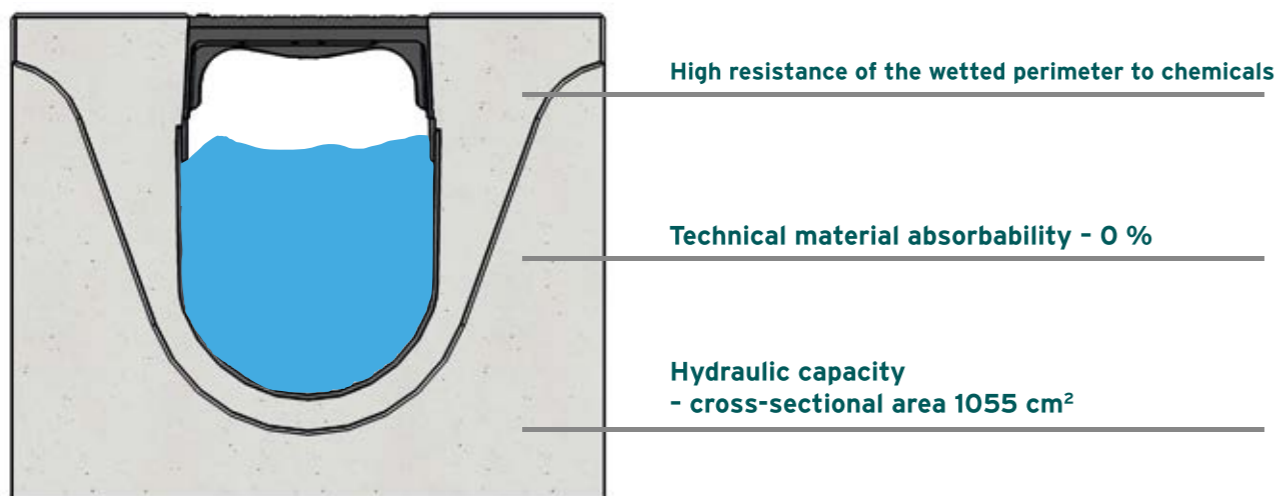
### TRAFFIC GUGI®BLOC+ tests showed:

- **Frost resistance** - F300 after 211 cycles according to NO-17-A204:2015: a. Weight loss -1.3% after 225 cycles in Nordway KF de-icing agent tested according to NO 17-A204:2015 b. Compressive strength 105.4 MPa after 211 cycles with de-icing agent
- **Compressive strength** - 94.1 MPa after 28 days, concrete class C50/60 according to PN-88/B-06250
- **Tensile strength** - 5.8 MPa tested according to PN-EN 12390-6:2011
- **Water absorption** - 3.74% in Nordway KF de-icing agent
- **Resistance to peeling** - 0.005 kg/m<sup>2</sup> in 20% urea solution after 56 cycles
- **Peel strength** - 5.6 MPa after 56 cycles in sodium formate solution according to PN-EN 1542:2000





# Optimised hydraulic channels capacity



The TRAFFIC GUGI®BLOC+ drainage channels offer a very high capacity to quickly drain large volumes of run-off rainwater. The high hydraulic capacity of the channels is particularly important when rainwater is collected from large paved areas and during heavy rain-fall. In addition, the volume of the channels provides an additional retention function.

The inside of the channel is made of the material PE-PP, and therefore has excellent parameters: 0% water absorption, frost resistance in accordance with EN 1433 and high chemical resistance.



Type 010 with a length of 1.0 m

Type 010 with a length of 4.0 m

Channel capacity	10.55 dm <sup>3</sup> x 10 = 105.5 dm <sup>3</sup>	10.55 dm <sup>3</sup> x 40 = 422.0 dm <sup>3</sup>
Hydraulic capacity	105.5 L	422.0 L

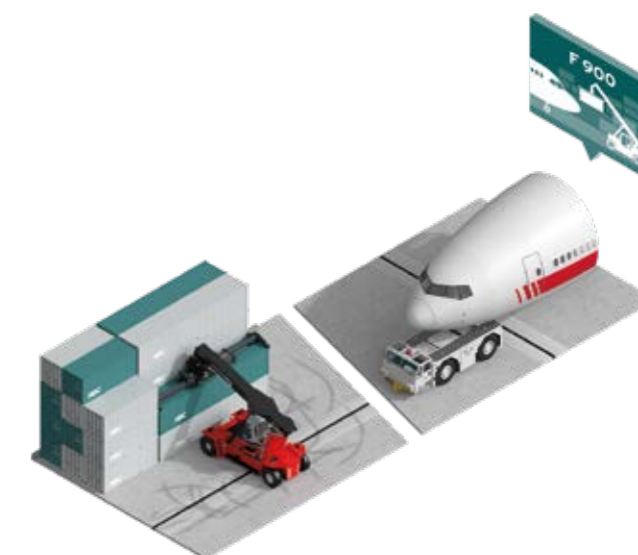
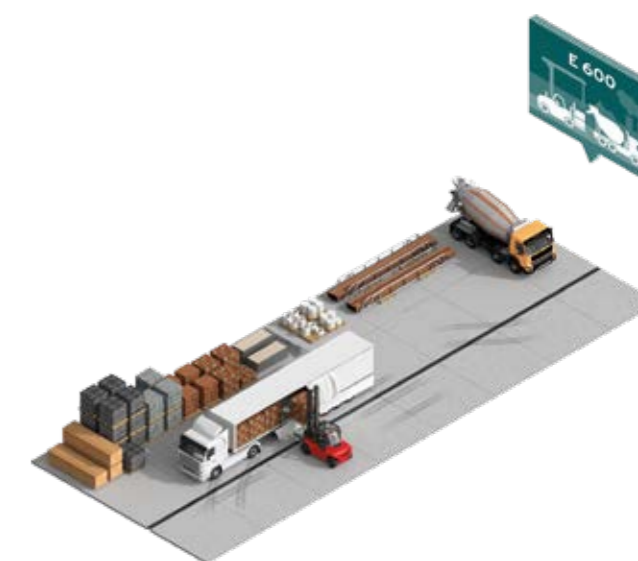
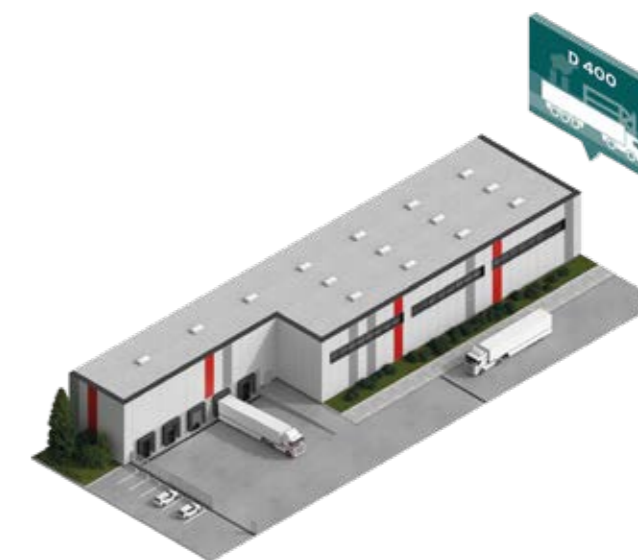
**Assumptions:**  
 Cross-sectional area of the channel is 1055 cm<sup>2</sup> = 10.55 dm<sup>2</sup>, 1 litre is 1 dm<sup>3</sup>, a channel 1 m long is 100 cm then capacity is 10 dm<sup>3</sup>, a 4 m long channel is 400 cm then capacity is 40 dm<sup>3</sup>.



# Application areas

## Drainage for the heaviest loads

- RAILWAY CROSSINGS
- MILITARY INSTALLATIONS
- AIRPORTS
- PORTS
- CONTAINER TERMINALS
- TUNNELS



TRAFFIC GUGI®BLOC+ drainage channels have been developed for areas with extreme static and dynamic loads. The special monolithic construction of the channel body integrated with a prefabricated casing ensures maximum resistance.

The upper surface of the monolithic drainage are made of materials that guarantee high strength and high abrasion resistance. The body of the drainage unit is reinforced with an additional element made of GJS-500 ductile iron with a compressive strength of 800 N/mm<sup>2</sup> and an abrasion resistance of 800 N/mm<sup>2</sup>. This element is anchored in the reinforced concrete channels walls using horizontal perforated anchors along the entire length of the drainage unit on both sides, with an additional steel bracket.

The materials used for the TRAFFIC GUGI®BLOC+ drainage channel are resistant to surfaces and airplanes de-icing agents, and can be therefore suitable for use at airports.

# TRAFFIC GUGI®BLOC+

## System properties and benefits of application

### High-quality components

- High-quality components
- Body made of concrete of grade C50/60 XF4, XA3 reinforced with steel and basalt aggregate.
- Drainage body monolithic, integrated into the prefabricated casing - no visible screws/connections in the surface.
- Inlet socket, made of GJS-500 iron with a compressive strength of 800 N/mm<sup>2</sup> and a tensile strength of 500 N/mm<sup>2</sup>.
- The unique design ensures resistance to the highest dynamic forces.

= LONGEVITY

### Resistance to a variety of conditions

- High resistance of the wetted perimeter to chemicals.
- Frost resistance of concrete - class F300 according to PN-88/B-06250.
- ITWL certificate of suitability of drainage channels for use on airport facilities.

= SAFETY AND QUALITY

### Largest hydraulic capacity among monolithic drainage channels

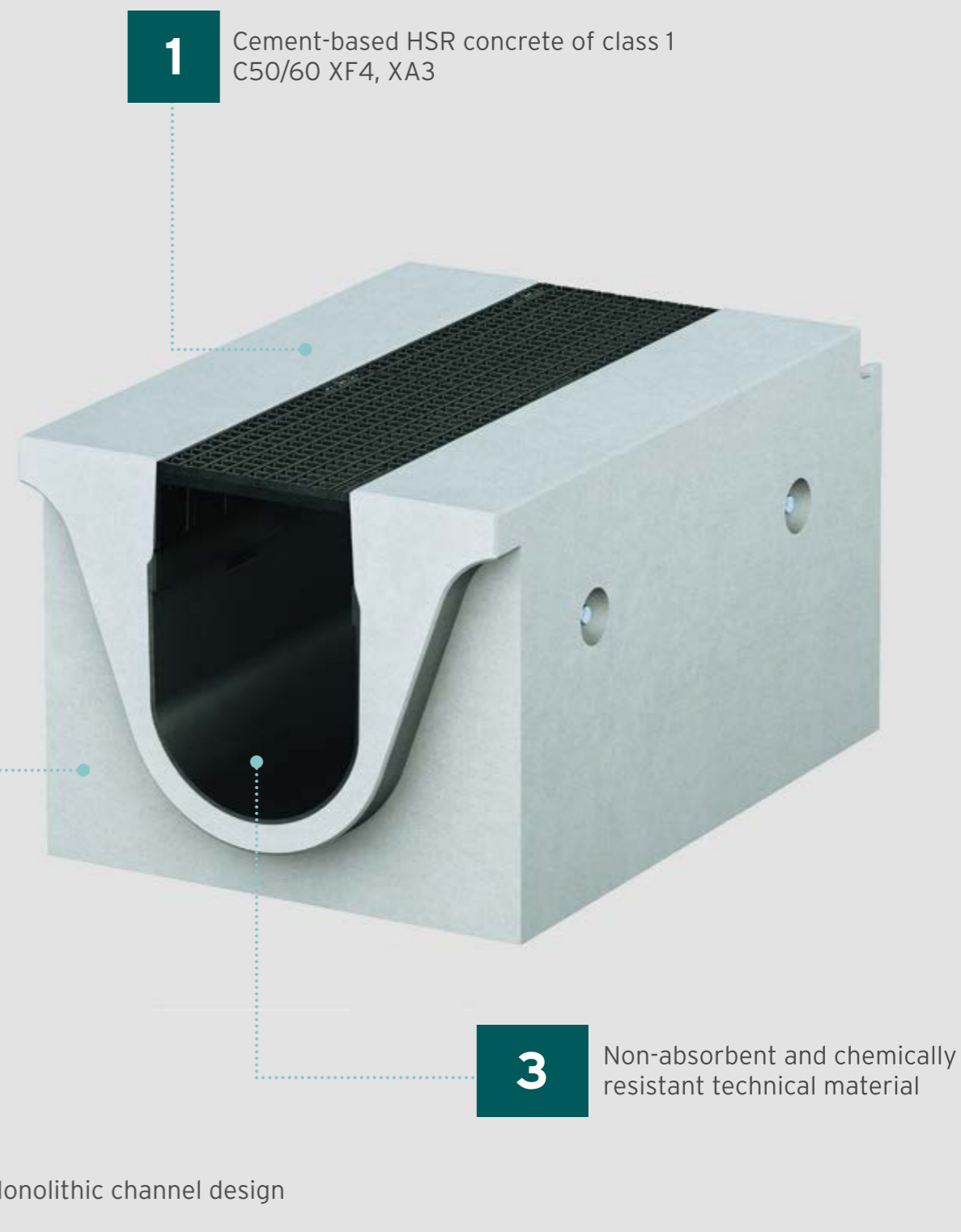
- Dredged channel construction.
- Cross-sectional area of 1055 cm<sup>2</sup>.
- Large inlet area of 1046 cm<sup>2</sup>/mb.

=SAFETY

### Quick installation and modifiable components

- 4 and 1 metre sections.
- Complementary elements available, sections with flat ends.
- Overlap connection and gasket - immediate water tightness.
- 100% watertight immediately after installation of the drainage.

=TIME AND COST SAVING



**1** Cement-based HSR concrete of class 1 C50/60 XF4, XA3

**2** Monolithic channel design

**3** Non-absorbent and chemically resistant technical material

**MONOLITHIC PREFABRICATED LINEAR DRAINAGE CHANNELS**

# TRAFFIC GUGI®BLOC+

Monolithic, prefabricated linear drainage system for extreme dynamics loads.

TRAFFIC GUGI®BLOC+ corresponds to EN 1433 and is applicable for the following classes:



**Class D 400 (load 400kN)**

Suitable for street carriageways, heavily trafficked traffic routes, including heavy vehicles, e.g. car parks, estate roads



**Class E 600 (load 600kN)**

Surfaces exposed to regular truck traffic and high dynamic wheel loads from oncoming traffic, including forklifts, e.g. at industrial facilities, warehouse halls



**Class F 900 (900kN load)**

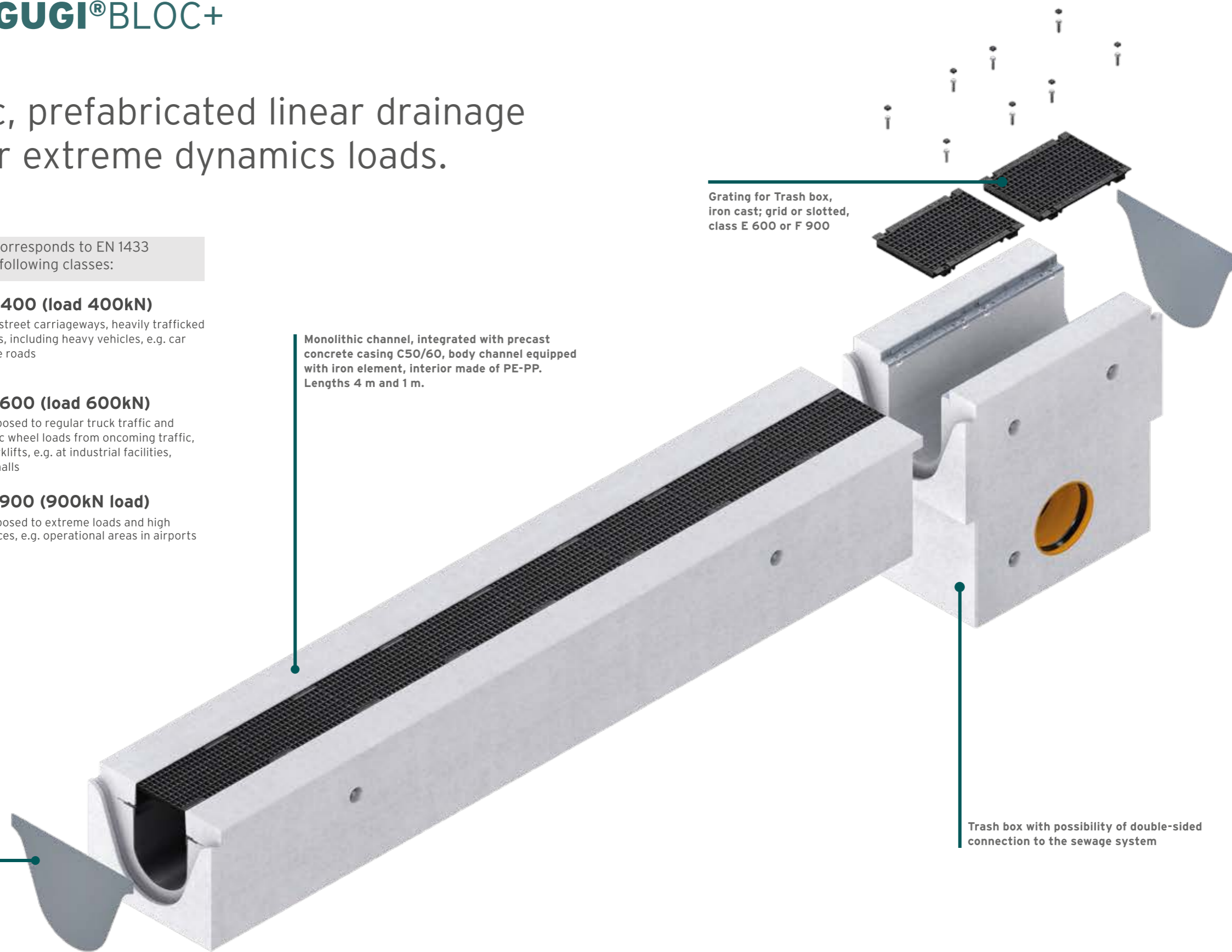
Surfaces exposed to extreme loads and high dynamic forces, e.g. operational areas in airports and ports.

Monolithic channel, integrated with precast concrete casing C50/60, body channel equipped with iron element, interior made of PE-PP. Lengths 4 m and 1 m.

Grating for Trash box, iron cast; grid or slotted, class E 600 or F 900

Trash box with possibility of double-sided connection to the sewage system

End cap, solid



# TRAFFIC GUGI®BLOC+

Monolithic channels with GUGI® grid inlets  
TRAFFIC GUGI®BLOC+ 300, up to cl. F 900



type 010, 1 m



type 010, 4 m



type 010, 1 m, repair element



type 010, 4 m, repair element



type 010, 1 m, T-type

	Length [mm]	Width [mm]	Height [mm]	Surface cross-section [cm <sup>2</sup> ]	Surface inlet [cm <sup>2</sup> /m]	Mass [kg]	No. cat.
type 010	1000	700	575	1055	1046	720.00	10008
type 010	4000	700	575	1055	1046	2 820.00	10009
type 010, repair element	1000	700	575	1055	1046	720.00	10012
type 010, repair element	4000	700	575	1055	1046	2 820.00	10013
type 010, T-type	1000	700	575	1055	1046	720.00	10015

# TRAFFIC GUGI®BLOC+

## Accessories

### Trash box



trash box top element, galvanised frame, repair element



trash box top element, iron frames



ductile iron grating GUGI MW 15/25, black

	Length [mm]	Width [mm]	Height [mm]	Mass [kg]	No. cat.
trash box top element, galvanised frame	1000	700	575	640.00	10014
trash box top element, galvanised frame, repair element	1000	700	575	640.00	10104
trash box 2-part, pre-assembled with galvanised sump, galvanised frame	1000	700	1125	-	10105
tube 2-part, pre-assembled with galvanised sump, galvanised frame, repair element	1000	700	1125	-	10106
trash box top element, ductile iron frames	1000	700	575	640.00	10121
trash box top element, ductile iron frames, repair element	100	700	575	640.00	10122
2 piece Trash box, pre-assembled, with galvanised sump, ductile iron frames	1000	700	1125	-	10123
trash box 2-part, pre-assembled, with galvanised sump, ductile iron frames, repair element	1000	700	1125	-	10124
ductile iron grating, mesh GUGI MW 15/25, black	500	379	40	21.80	4068
ductile iron grating, slotted SW 2 x 136/20, black	500	379	40	23.20	4061
hexagonal bolt with collar for grate fixing, with locking teeth, black zinc pl. M10x50, SW19	-	-	-	0.06	33100

### End caps



end cap, galvanised, for variant

	Length [mm]	Width [mm]	Height [mm]	Mass [kg]	No. cat.
end cap, solid, galvanised	-	692	502	3.75	10107
end cap with ferrule DN 200, galvanised	-	692	502	3.96	10205
end cap with ferrule DN 315, galvanised	-	692	502	5.00	10207

### Other equipment



gasket 20x20mm. in roll

	Length [mm]	Width [mm]	Height [mm]	Mass [kg]	No. cat.
gasket 20x20mm. in roll, 1RMT	-	20	20	0.57	10095



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