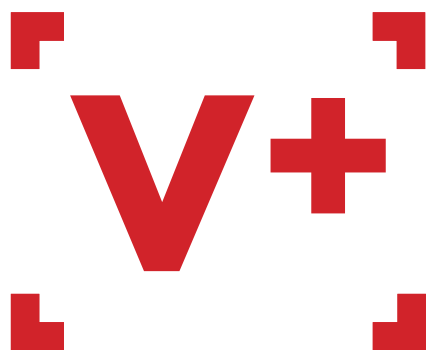


DRAINAGE SOLUTIONS



DRAINAGE EVOLUTION

multiV+
SYSTEM

 **ULMA**

WHO WE ARE



ULMA Architectural Solutions is a member of the **ULMA Group**, a leading industry group in the Basque Country, and also part of the Industrial Division of the **MONDRAGON Corporation**, one of the largest business corporations in Spain and the largest Cooperative Group in the world.

Our expertise and experience in **prefabricated systems for construction** has led us to develop a wide range of products aimed at **four market** segments:

1. ARCHITECTURAL PRECAST
2. DRAINAGE SYSTEMS
3. VENTILATED FACADES
4. EXTERNAL WALL SYSTEM

OUR MATERIAL

COMPRESSIVE STRENGTH

The polymer concrete used in pre-fabricated systems is capable of withstanding compression forces greater than 1000 Kp/cm².

FLUID DRAINAGE

The polymer nature of this material allows for smooth, low-friction surfaces on prefabricated components, which permits a quick drainage of fluids with a virtually no water absorption, as compared to the 5%-10% levels found with traditional concrete.

RESISTANCE TO CHEMICALS PRODUCTS

Polyester resin, one of the components of Polymer Concrete, is a material resistant to a very wide range of chemical products; it is an inert material and therefore does not react when it comes into contact with chemical compounds, no matter what their concentration.

ABRASIVE WEAR

The hardness of silica aggregates ensures good preservation of structures exposed to road traffic, since polymer concrete shows optimal resistance to abrasion.

IMPACT RESISTANCE

The qualities of this material, together with its optimal prefabrication design, increase its capacity to withstand and absorb impact forces, making it highly resistant.

POLYMER CONCRETE is a **high performance** material made up of a **precise** combination of silica and quartz aggregates bonded by polyester resins.

In addition to its **extremely high resistance to compression**, far greater than other traditional concretes, its polymer matrix ensures a high **resistance to most chemical products**. Moreover, the percentage of **water absorption is practically nonexistent**, ensuring its **stability during freeze-thaw cycles**. Its **great impact strength** and **low abrasive wear** are additional features that make polymer concrete the ideal material for the drainage of water and a wide variety of other fluids, even in such demanding environments as the industrial, food, chemical and pharmaceutical sectors.

SUMMARY TABLE OF TESTS PERFORMED

PHYSICAL PROPERTIES	STANDARD	VALUE
Resistance to bending	EN 14617-2	24.1 MPa
Compressive strength	EN 14617-15	117 MPa
Resistance to abrasive wear	EN 14617-4	32.5 MPa
Water absorption	EN 14617-1	0.1%
Density	EN 14617-1	2.1 g/cm ³
Resistance to impact	EN 14617-9	5 J
Coefficient of linear thermal expansion	-	2.15·10 ⁻⁵ °C ⁻¹
Resistance to thermal change	EN 14617-6	23.6 MPa
Resistance to bending after freeze/thaw cycles	EN 14617-5	23.8 MPa
Resistance to chemicals	EN 14617-10	C4



Applications

PEDESTRIAN AREAS

SHOPPING AREAS

PARKING AREAS

multiV+[®] SYSTEM

OPTIMIZED V-SHAPE

Drainage evolution

The evolution of R&D processes and our 20+ years of experience in drainage solutions has enabled us to develop a new line of products better suited to market needs, providing in a single system the advantages of our other lines: the economy of the SELF system, the reduced heights of the MINI range, the 8-point fastening of the F line and the option of cascaded slopes provided for by the U and UK systems.

Applications: System suitable for pedestrian and shopping areas, as well as parking areas for all types of vehicles.

We introduce the optimized solution: multiV+[®]

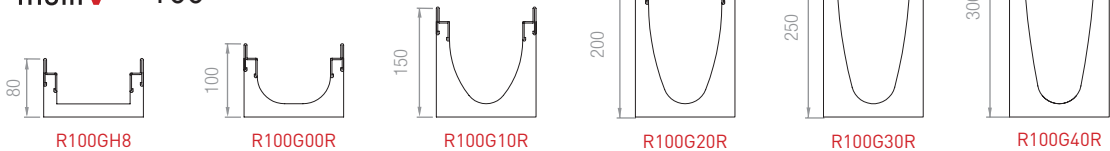
- Optimized V-shaped section
- Rapidlock[®] fastening system
- Mechanical stability, with 8 fastening points
- Multiple fastening options

The multiV+[®] is available in different heights, and up to a load class of D400.

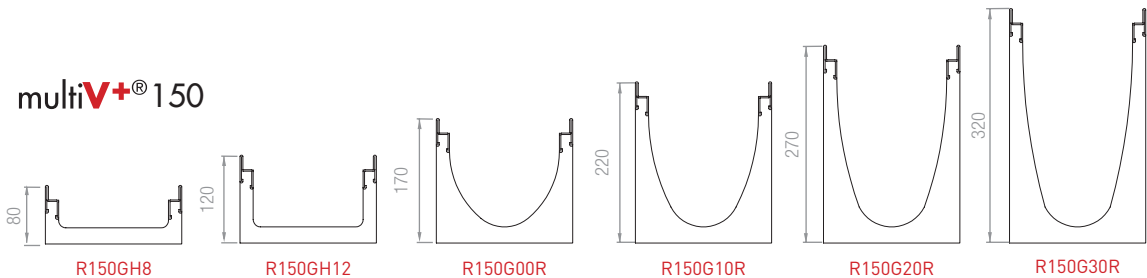


Channels

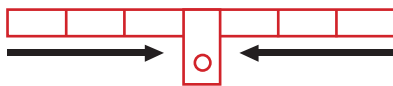
multiV+[®] 100



multiV+[®] 150



Slope Designs



Without slope

multiV+[®] 100
multiV+[®] 150



Cascaded slope

multiV+[®] 100
multiV+[®] 150

ADVANTAGES OF THE multiV+ SYSTEM

1. multiV+ OPTIMIZED V-SHAPED SECTION

Especially designed for channel runs with no longitudinal slope.

+ HIGHER SPEED WITH LOWER FLOWS

+ BIGGER CAPACITY FOR EXTREME FLOWS

The V-shaped design of the multiV+® channels has been developed to drain water faster, improving the self-cleaning effect of the channel. Its optimized cross section, larger than the traditional V-sections currently available on the market, provides bigger hydraulic capacity for extreme flow situations.

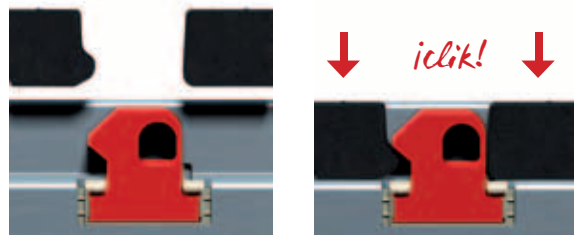


2. rapidlock® FASTENING SYSTEM

The fast and boltless ULMA Rapidlock® fastening system makes possible to connect the grating to the channel body quickly, safely and practically effortlessly.

ADVANTGES:

- One-second fastening
- Tool-free installation
- Save on labour costs
- Easy maintenance



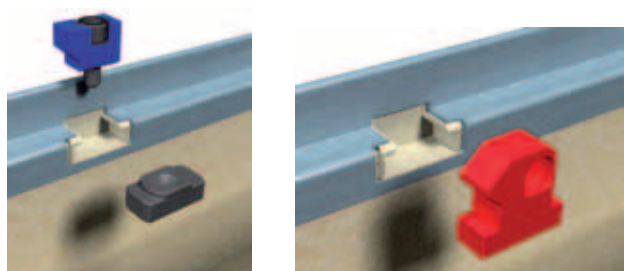
3. MECHANICAL STABILITY, WITH 8 FASTENING POINTS

Its 8-point fastening system provides higher stability and stress distribution throughout the grating and the channel.

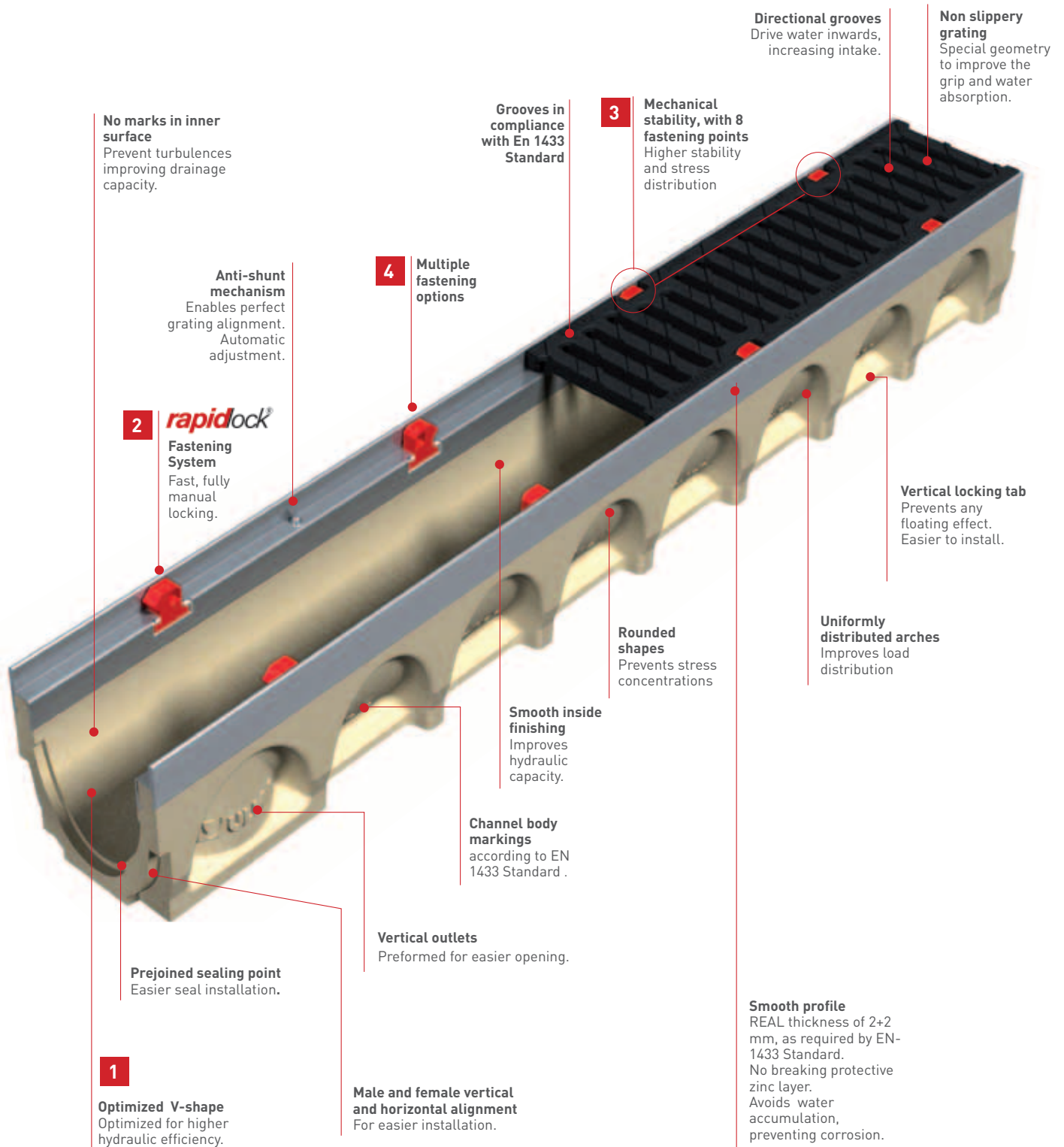
4. MULTIPLE FASTENING OPTIONS

Rapidlock® and screw-fastened systems can be replaced and combined:

- Even with already installed channels.
- No need to replace the grating.
- By simply replacing the fastening components.



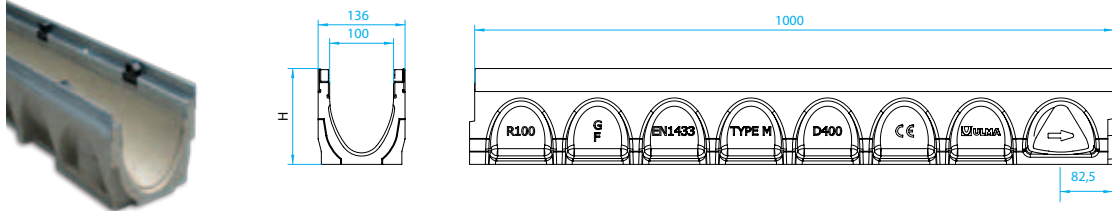
SYSTEM FEATURES



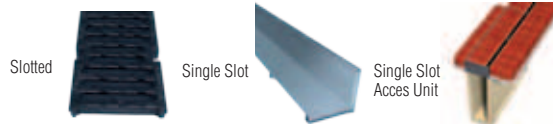
multiV+ 100

LOAD CLASS
UP TO D400
EN-1433 Standard

ULMA Linear Drainage Channel, type multiV+® R100G; External width 136mm, Internal width 100mm, with overall heights between 80 and 300mm; suitable for cascade-type slopes to collect rainwater; sections 1 LM in length; optimized V-shape with self-cleaning effect; especially designed for channel runs with no longitudinal slope; galvanized steel edges for lateral protection; **RapidLock®**, fast, boltless fastening system with 8 fastening points per LM.



Code	L (mm)	Total Height (mm)	Width		Ø Outlet*		Hidraul. Section (cm ²)	PCS (x pallet)
			External	Internal	Vert.	Horiz.		
R100GH8**	1000	80	136	100	110	-	40	90
R100G00R	1000	100	136	100	110	-	56	90
R100G10R	1000	150	136	100	110	-	91,5	75
R100G20R	1000	200	136	100	110	-	133	60
R100G30R	1000	250	136	100	110	-	176	45
R100G40R	1000	300	136	100	110	-	220	45



* Vert. outlets on order. **U shaped section.

GRATINGS

Material	Design	Load Class	Code	L (mm)	Width (mm)	Height (mm)	Units (x ml)
DUCTIL IRON	HEELPROOF SLOTTED SLOTTED	C 250	FNHX100RGCM	500	127	-	2
		D 400	FNX100RGDM	500	127	-	2
GALVANIZED STEEL	SINGLE SLOT ACCES UNIT	D 400	GRL100ROD	1000	131	105 (1)	1
		D 400	GRL100RODMA	500	128	105 (1)	2

(1)The grating height corresponds to the part that extends out from the top edge of the profile.

LOCKING SYSTEM

rapidlock® FAST, BOLTLESS SAFETY LOCKING 8 fastening points per linear meter



SUMP UNITS AND ACCESSORIES TABLE

Code	L (mm)	Height (mm)	Width (mm)	Lateral Outlet (mm)	Front Outlet (mm)	Sump units
AR100G	500	490	136	110/160	110	1

END CAPS



Channel	Code	Type	Ø (mm)
R100GH8	TR100H8C	CLOSED	-
R100G00R	TR10000C	CLOSED	-
R100G10R	TR10010C	CLOSED	-
	TR10010A	OPEN	110
R100G20R	TR10020C	CLOSED	-
	TR10020A	OPEN	110
R100G30R	TR10030C	CLOSED	-
	TR10030A	OPEN	110
R100G40R	TR10040C	CLOSED	-
	TR10040A	OPEN	110

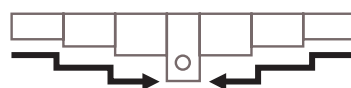
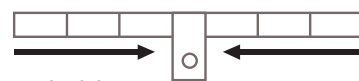


Galvanized Steel bucket
CODE
CR100



Step Units
CODE
CER100

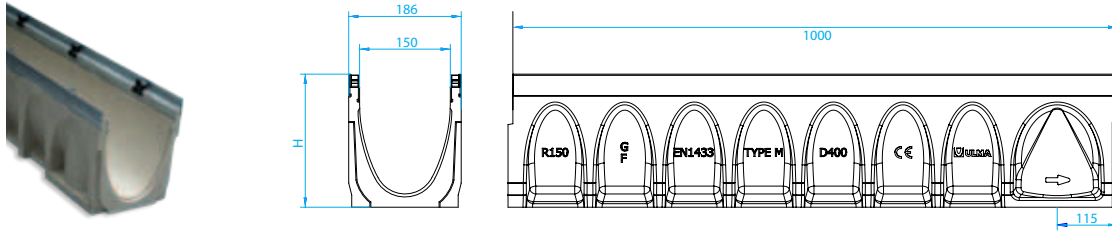
SLOPE DESIGNS



multiV+ 150

LOAD CLASS
UP TO D400
EN-1433 Standard

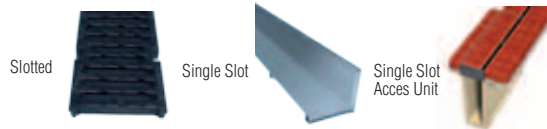
ULMA Linear Drainage Channel, type multiV+® R150G; External width 186mm, Internal width 150mm, with overall heights between 80 and 320mm; suitable for cascade-type slopes to collect rainwater; sections 1 LM in length; optimized V-shape with self-cleaning effect; especially designed for channel runs with no longitudinal slope; galvanized steel edges for lateral protection; **RapidLock®**, fast, boltless fastening system with 8 fastening points per LM.



Code	L (mm)	Total Height (mm)	Width		Outlet*		Hydraul. Section (cm ²)	PCS (x pallet)
			External	Internal	Vert.	Horiz.		
R150GH8**	1000	80	186	150	160	-	60	81
R150GH12**	1000	120	186	150	160	-	119	72
R150G00R	1000	170	186	150	160	-	156	45
R150G10R	1000	220	186	150	160	-	218	36
R150G20R	1000	270	186	150	160	-	283	36
R150G30R	1000	320	186	150	160	-	350	27

* Vert. outlets on order. **U shaped section.

GRATINGS

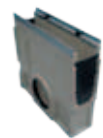


Material	Design	Load Class	Code	L (mm)	Width (mm)	Height (mm)	Units (x ml)
DUCTILE IRON	HEELPROOF SLOTTED	C 250	FNHX150RGCM	500	177	-	2
	SLOTTED	D 400	FNX150RGDM	500	177	-	2
GALVANIZED STEEL	SINGLE SLOT ACCESS UNIT	D 400	GRL150ROD	1000	181	105 (1)	1
		D 400	GRL150RODMA	500	178	105 (1)	2

(1)The grating height corresponds to the part that extends out from the top edge of the profile.

LOCKING SYSTEM

rapidlock FAST, BOLTLESS SAFETY LOCKING 8 fastening points per linear meter



AR150G



SUMP UNITS AND ACCESSORIES TABLE

Code	L (mm)	Height (mm)	Width (mm)	Lateral Outlet (mm)	Front Outlet (mm)	Sump units
AR150G	500	590	186	160/200	110	1

END CAPS



Channel	Code	Type	Ø (mm)
R150GH8	TR150H8C	CLOSED	-
R150GH12	TR150H12C	CLOSED	-
R150G00R	TR15000C	CLOSED	-
	TR15000A	OPEN	110
R150G10R	TR15010C	CLOSED	-
	TR15010A	OPEN	160
R150G20R	TR15020C	CLOSED	-
	TR15020A	OPEN	160
R150G30R	TR15030C	CLOSED	-
	TR15030A	OPEN	160



Galvanized Steel bucket

CODE

CR100



Step Units

CODE

CER150

SLOPE DESIGNS

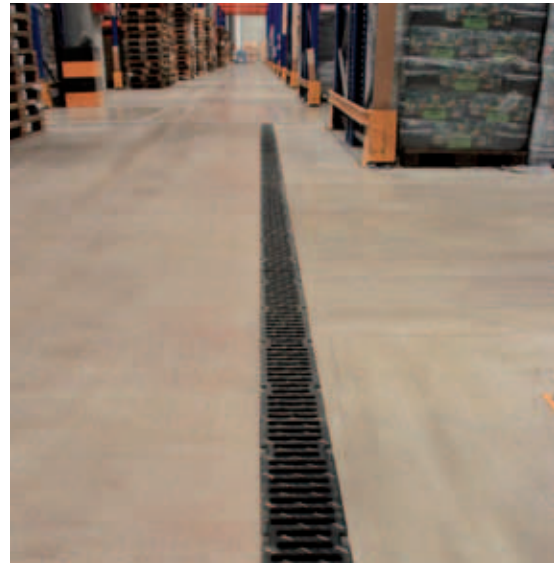


WITHOUT SLOPE



CASCADED SLOPE

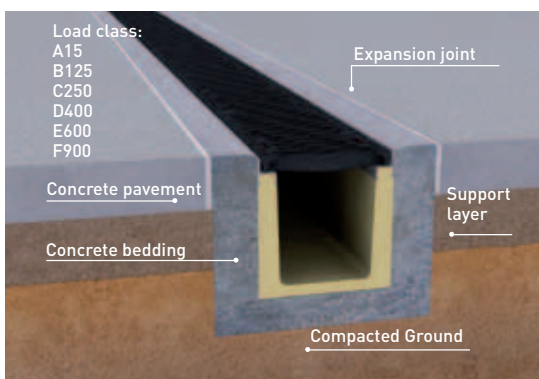
REFERENCE PROJECTS



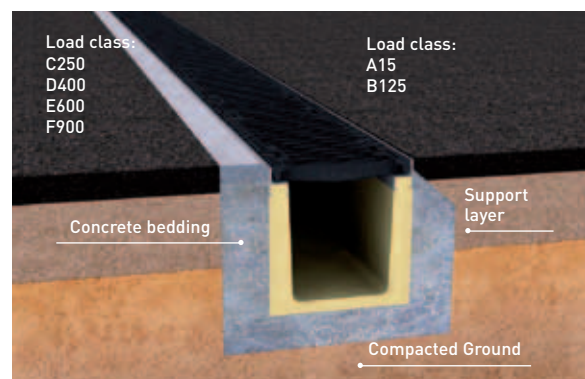
INSTALLATION CONDITIONS

The ULMA Architectural Solutions drainage system has been designed and tested under the strictest premises of the EN1433 Standard, following the constructive details illustrated below.

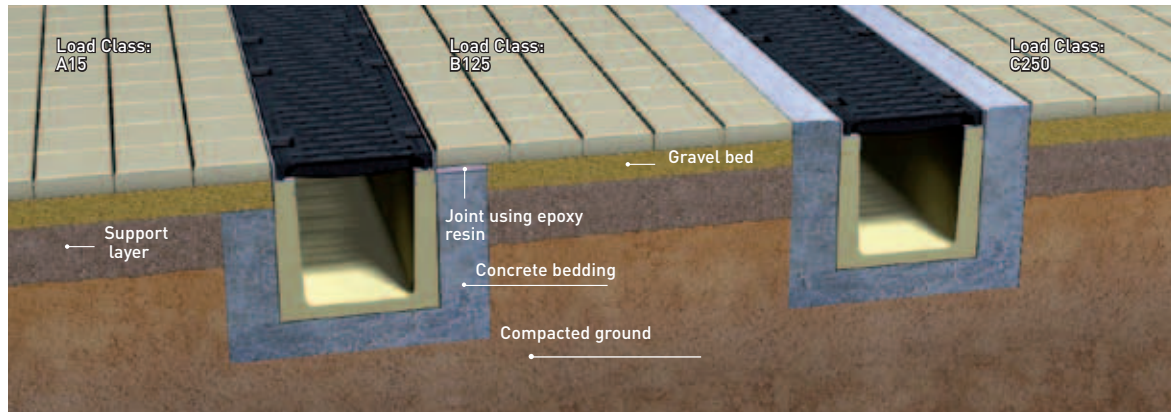
CONCRETE PAVEMENT



ASPHALT PAVEMENT



PAVING

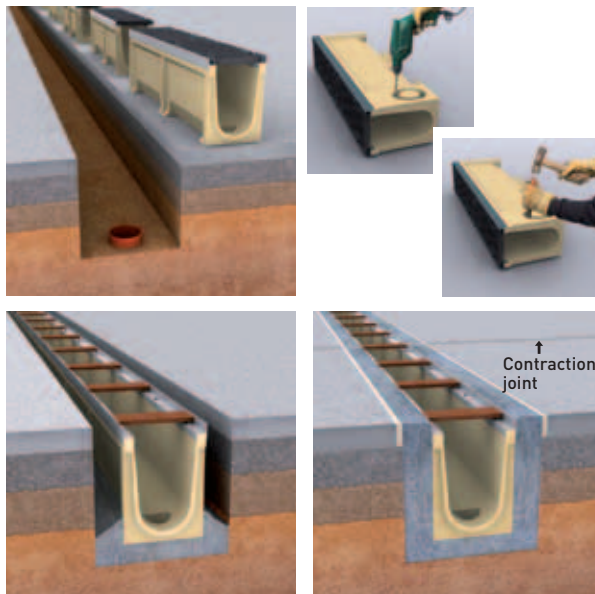
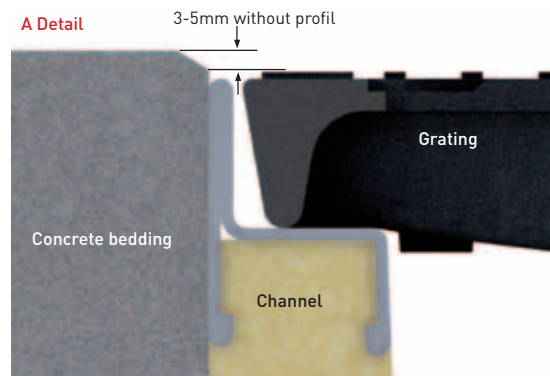
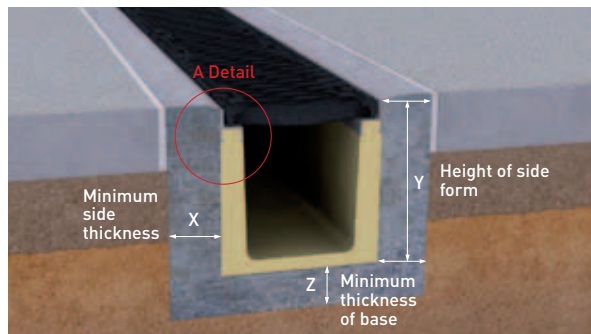


THICKNESS OF CONCRETE BEDDING

Load according to Standard EN1433	Minimum side thickness (mm)	Minimum thickness of base (mm)	Height of side form (mm)	Type of concrete (kg/cm ²)
A15	100	100	At least at a point located at 40mm below the level of the pavement	150
B125	100	100		250
C250	150	150	Up to the level of the wire mesh and the adjoining pavement.	250
D400	150	150		250

In the event of a compaction process being required in the proximity of the channel (e.g. class A15 and B 125 asphalt surface), special care must be taken not to damage the edge and walls of the channel.

Both the surrounding pavement and the concrete bedding must be on a plane between 3 and 5mm above the plane of the top edge of the channel, as recommended in A Detail.



The installation of the channels shall be started at the evacuation point or at the deepest point.

When it comes to opening the pre-marked outlets (vertical or horizontal), it is recommended to mark the perimeter every 5 to 6 cm. with a drill or rotaflex, in order then to carefully open the pre-marked outlet with a hammer and chisel.

The design of the road surface adjacent to the concrete channel / concrete bedding (concrete, asphalt or paving) must include the dilation and contraction joints necessary to prevent any tangential or perpendicular force on the concrete channel / concrete bedding.

It is advisable for the contraction joint perpendicular to the channel to be placed every 6 to 7 metres and to be made to coincide with the union between channels.

Before tipping out the concrete for the concrete bedding place wooden battens or the gratings themselves protected with plastic, in order to prevent deformations which might impede the placement of the gratings.



CE Declaration of Conformity

Manufacturer	ULMA Architectural Solutions
Address	Barrio Zubillaga, 89 Apdo.20 - 20560 Oñati - Gipuzkoa - SPAIN
Product	ULMA MultiV+ R100G/F.....R150G/F
Description	M-type drainage channel for collection and conducting of rainwater in pedestrian and/or road traffic area
Load class	A15, B125, C250 and D400, provided that the manufacturer's installation requirements are met.
Dimensions	L=1000 mm b= 100...150 mm h= 80 a 320 mm
Channel material	Polyester resin concrete
Grating material	Ductile cast iron
Applicable Standard	Construction Products Directive 89/106/CEE Standard EN 1433:2002, Appendix ZA
Notified Body	LGAI, laboratori General d'Assaigs i Investigacions Campus de la U.A.B Apartado 18 - 08193 BARCELONA
File No.	Several. Details provided upon request

Oñati, June 2011

Mikel Izurieta
General Manager



The image features a solid red background with several white, stylized lines that resemble circuit traces or paths. These lines are composed of horizontal segments and diagonal segments that meet at small grey circular dots. The lines are arranged in a way that they seem to flow around the central text. The text "IDEAS MOVE THE WORLD" is centered in a white, bold, sans-serif font. The overall aesthetic is clean, modern, and tech-oriented.

**IDEAS MOVE
THE WORLD**



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