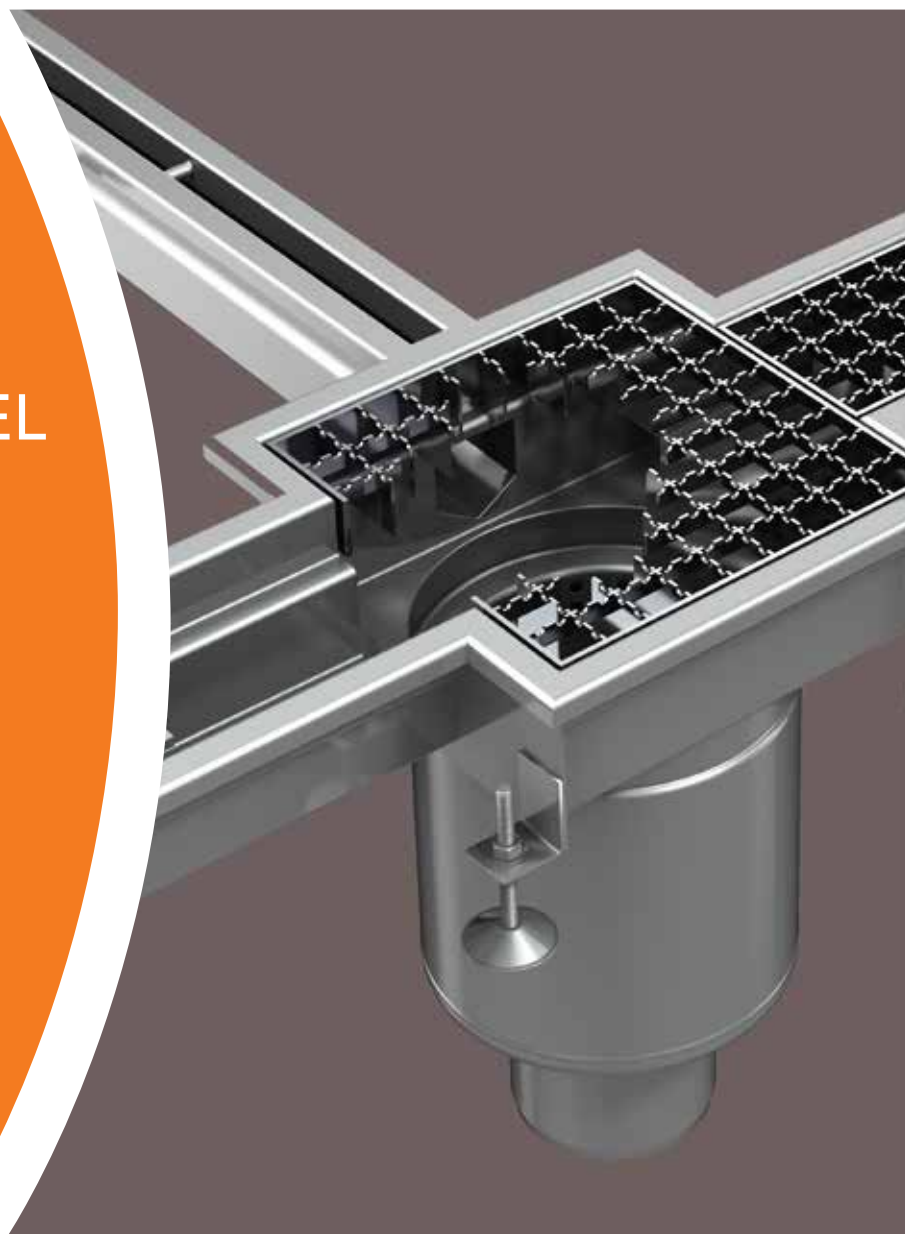




KemDrain™

DESIGN & INSTALLATION GUIDE

316L
STAINLESS STEEL
INDUSTRIAL
FLOOR DRAINS
& LINEAR
DRAINAGE
CHANNELS



KEMDRAIN™ STAINLESS
INDUSTRIAL FLOOR DRAINS
AND LINEAR CHANNELS,
OFFERING ALL THE
BENEFITS OF 316L
STAINLESS STEEL WITH THE
QUALITY, RELIABILITY AND
SERVICE OF MM KEMBLA.

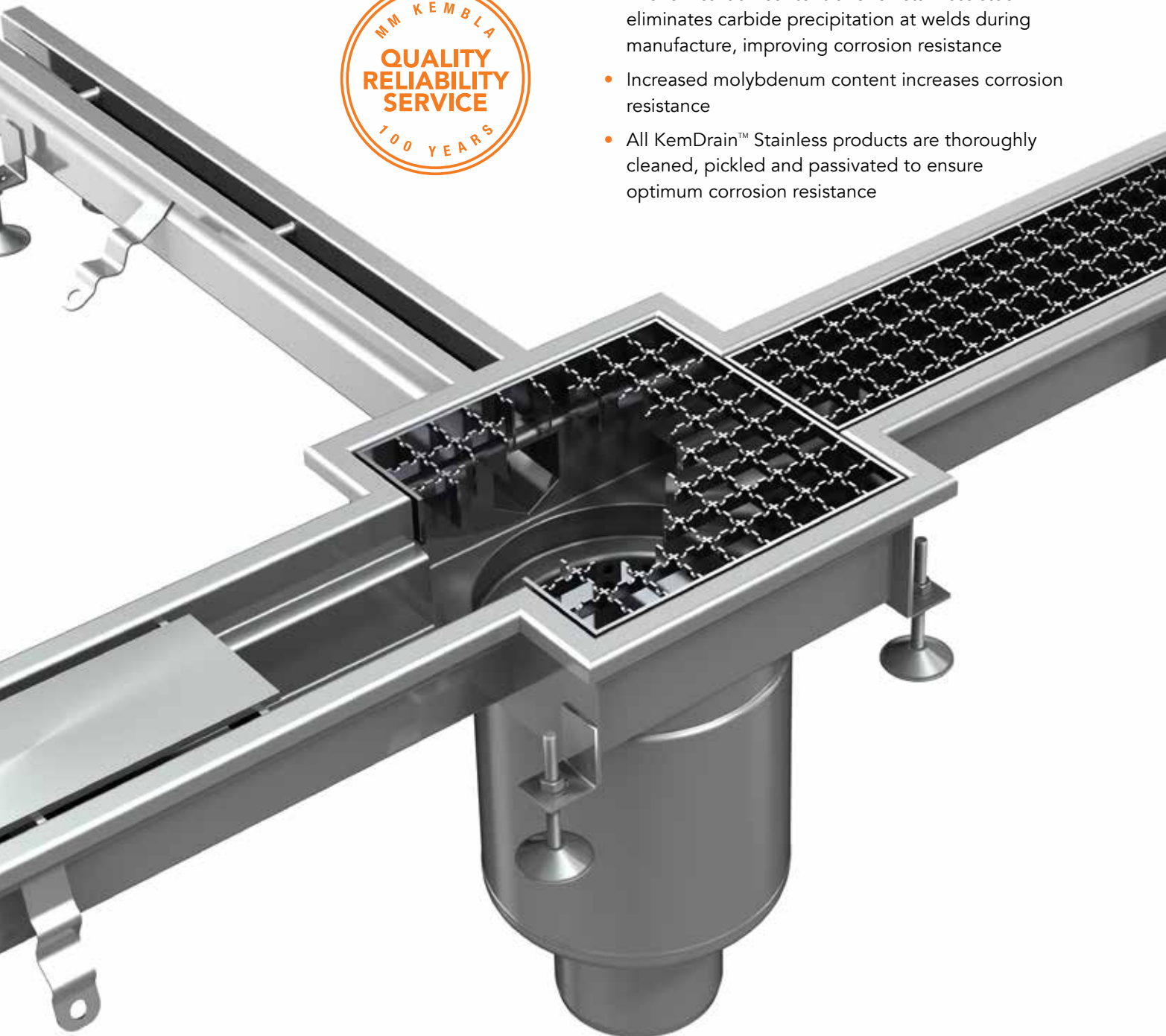


MM Kembla have been providing cost-effective and dependable plumbing and drainage solutions since 1916.

This experience and knowledge has been combined with European engineering to produce KemDrain™ Stainless Drainage solutions. KemDrain™ Stainless offers you peace of mind and the simplicity that you want.

HIGH QUALITY 316L STAINLESS STEEL

- KemDrain™ Stainless products are manufactured using high quality 316L grade stainless steel
- The low carbon content of 316L stainless steel eliminates carbide precipitation at welds during manufacture, improving corrosion resistance
- Increased molybdenum content increases corrosion resistance
- All KemDrain™ Stainless products are thoroughly cleaned, pickled and passivated to ensure optimum corrosion resistance



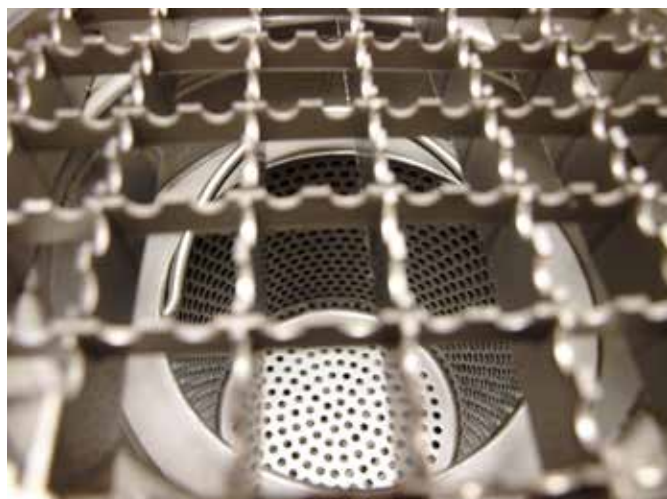
KEMDRAIN™ STAINLESS FLOOR DRAINS

- Fast and easy installation
- Hygienic design features
- Hydraulically efficient
- Strong and durable
- Watermark certified (WM # 23231)
- 1.5 mm 316L sheet material for strength and durability
- Quality TIG welded construction
- 200 mm and 300 mm inlets with square and round tops and 110 mm and 160 mm outlets
- Provision for fixing of optional tamper proof secondary screens in outlets
- Epoxy filled edges are standard on square top drains and solid stainless steel edges are standard on round top drains, ensuring easier installation and improved durability
- A range of grates to suit various traffic conditions including anti-slip
- Optional low profile or deep, high capacity strainer baskets
- Full 75mm seal depth, Watermark compliant, removable water trap option, with easy clean functionality



KEMDRAIN™ STAINLESS LINEAR DRAINAGE CHANNELS

- No on-site welding - Fast and easy installation
- Hygienic design features and hydraulically efficient
- Strong and durable TIG welded 316L stainless steel, 2mm thick for grated channels and 1.5mm for slot channels construction
- Slot drain and grated channels from 110 mm up to 410 mm grate widths
- Fully customised to suit your project
- Drainage fall built-in
- Fast and simple design and approval process
- Epoxy filled edges are standard, ensuring easier installation and improved durability
- Levelling feet and anchorage tabs provided
- A range of grates to suit various traffic conditions including anti-slip and heel safe
- Easy access for cleaning and hygienic design with rounded internal edges, v-profile invert and replaceable gratings
- Integrated strainer baskets and water traps available for the floor drain outlets



LOAD CLASSES FOR GRATINGS

The selection of the grating and associated load class is the responsibility of the designer. When selecting the correct load class of gratings, factors for consideration should include, but not be limited to:

- How will the grating be loaded? Will it have a point load or distributed load?
- Will there be wheel loads, if yes, what wheel type and size?

- What will be the frequency of the load application, several times a day, several dozen times a day or even several hundred times a day?

Please note that the stated load classes are assumed for ideal load conditions (static). In reality the loads on gratings are much more complex (dynamic). If in doubt a higher load class should be considered.

LOAD CLASSIFICATION OF COVERS AND GRATES (Partial Extract of Table 3.1 from AS 3996-2006 Access Covers and Grates)				
Class	Typical Use	Nominal Wheel Loading kg	Serviceability Design Load kN	Ultimate Limit State Design Load kN
A	Areas (including footways) accessible only to pedestrians and pedal cyclists and closed to other traffic (extra light duty)	330	6.7	10
B	Areas (including footways and light tractor paths) accessible to vehicles (excluding commercial vehicles) or livestock (light duty)	2670	53	80
C	Malls and areas open to slow moving commercial vehicles (medium duty)	5000	100	150
D	Carriageways of roads and areas open to commercial vehicles (heavy duty)	8000	140	210

SLIP RESISTANCE FOR GRATINGS

The slip resistance of pedestrian surfaces can be measured using AS4586 and the oil-wet inclining platform test.

Ratings are calculated according to the angle achieved in the test, with R9 classified surfaces achieving the lowest level of grip and R13 classified surfaces achieving the highest level of grip.

The tested ratings are shown in this document with the various grate types.

Classification	Corrected mean overall acceptance angle in degrees
R9	≥6 <10
R10	≥10 <19
R11	≥19 <27
R12	≥27 <35
R13	≥35

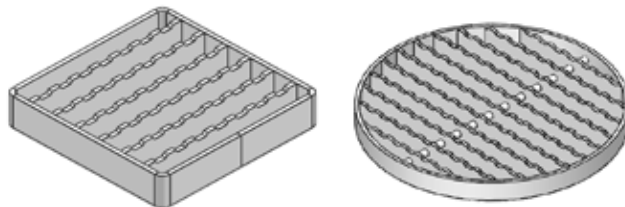


FLOOR DRAINS

FLOOR DRAIN COMPONENTS

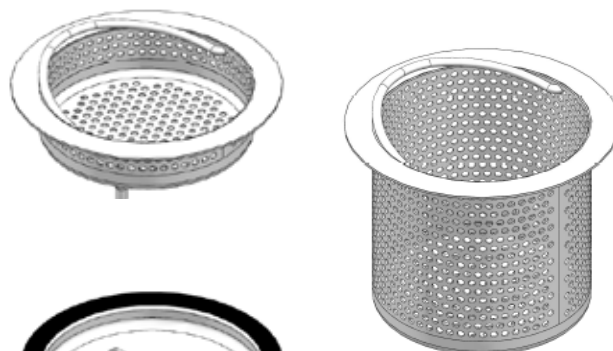
GRATE

Grates are available in various shapes, dimensions and finishes. The gratings are selected according to the loads and location of installation. Grate types include: anti-slip mesh, anti-slip ladder, plate and perforated sheet. Nominal 200 mm and 300 mm sizes are provided in square and round shapes.



WASTE BASKETS

Waste baskets provide point source control of solids, preventing overloading sewers and waste water treatment plants. Use shallow version with internal water trap or deep version by itself. 4mm or 2mm perforations available.



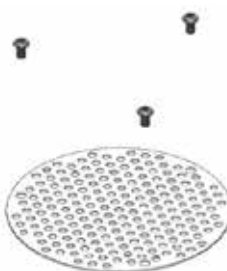
TRAP

KemDrain™ Traps are very functional and easy to maintain. Watermark approved 75 mm water trap depth prevents the discharge of foul odours from the sewer. Easy removal for access to the sewer and quick cleaning. Must be used with shallow waste basket.



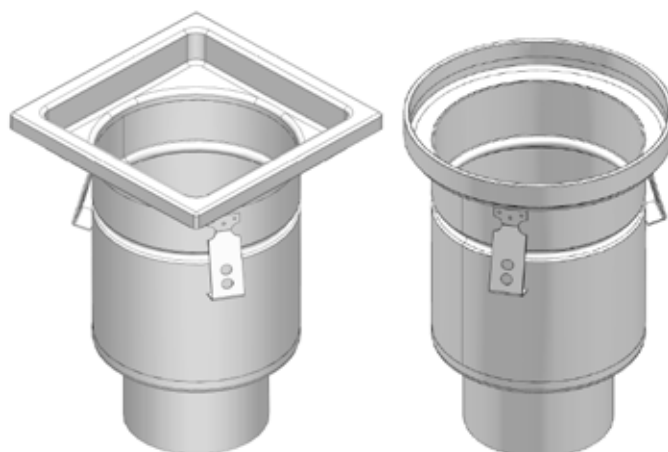
SECONDARY STRAINER

A secondary strainer reduces the risk of unintentional discharge of solids to the sewer during cleaning and maintenance. Welded locking ring and tamper resistant screws secure the secondary strainer in position. 4mm or 2mm perforations available.



BODY

It's round shape and smooth radius bends are hygienic and efficient. Weld joints are ground to remove sharp edges to ensure safe installation and cleaning. Epoxy filled edges are standard on square top drains and solid stainless steel edges are standard on round top drains, ensuring easier installation and improved durability. Nominal 200 mm and 300 mm inlets in square and round shapes are provided.



OUTLETS

DN100 with 110 mm outside diameter and DN150 with 160 mm outside diameter are available.

SQUARE FLOOR DRAINS

200 x 200 SQUARE TOP FLOOR DRAIN

Item Code	W (mm)	DN (mm)	D (mm)	Grate (mm)	H (mm)	H1 (mm)	B1 (mm)	B2 (mm)
X97800	197	110	157	163	218	75	35	120

200 x 200 SQUARE TOP FLOOR DRAIN ACCESSORIES

X97806	REMOVABLE TRAP - WaterMark approved 75mm seal for 157mm body							
X97808	BASKET 4MM perforations - for use with removable trap for 157mm body							
X97809	DEEP BASKET 4MM perforation - for use without trap for 157mm body							
X97812	SECONDARY STRAINER 4MM perforations - for 110MM outlet							
X97855	BASKET 2MM perforations - for use with removable trap for 157mm body							
X97856	DEEP BASKET 2MM perforation - for use without trap for 157mm body							
X97859	SECONDARY STRAINER 2MM perforations - for 110MM outlet							
X97825	GRATE - Anti-Slip Mesh for 200 x 200 Square Top Drain							
X97847	GRATE - Ant-Slip Ladder for 200 x 200 Square Top Drain							
X97827	GRATE - Perforated Sheet for 200 x 200 Square Top Drain							
X97828	GRATE - Solid Plate for 200 x 200 Square Top Drain							

300 x 300 SQUARE TOP FLOOR DRAIN

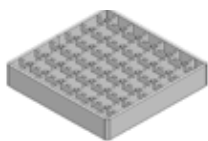
Item Code	W (mm)	DN (mm)	D (mm)	Grate (mm)	H (mm)	H1 (mm)	B1 (mm)	B2 (mm)
X97801	300	110	255	265	244	75	35	135
X97802	300	160	255	265	244	75	35	135

300 x 300 SQUARE TOP FLOOR DRAIN ACCESSORIES

X97807	REMOVABLE TRAP - WaterMark approved 75mm seal for 255mm body							
X97810	BASKET 4MM perforations - for use with removable trap for 255mm body							
X97811	DEEP BASKET 4MM perforation - for use without trap for 255mm body							
X97812	SECONDARY STRAINER 4MM perforations - for 110MM outlet							
X97813	SECONDARY STRAINER 4MM perforations - for 160MM outlet							
X97857	BASKET 2MM perforations - for use with removable trap for 255mm body							
X97858	DEEP BASKET 2MM perforation - for use without trap for 255mm body							
X97859	SECONDARY STRAINER 2MM perforations - for 110MM outlet							
X97860	SECONDARY STRAINER 2MM perforations - for 160MM outlet							
X97829	GRATE - Anti-Slip Mesh for 300 x 300 Square Top Drain							
X97849	GRATE - Ant-Slip Ladder for 300 x 300 Square Top Drain							
X97831	GRATE - Perforated Sheet for 300 x 300 Square Top Drain							
X97832	GRATE - Solid Plate for 300 x 300 Square Top Drain							

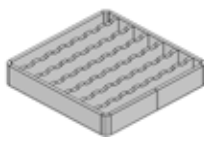
STANDARD SQUARE GRATE OPTIONS

For custom drains and grates contact MM Kembla.



Anti-Slip
Mesh

R13 A



Anti-Slip
Ladder

R12 B



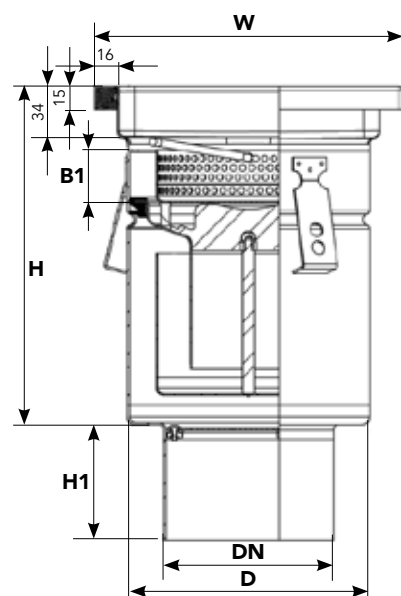
Perforated
Sheet

R10 A

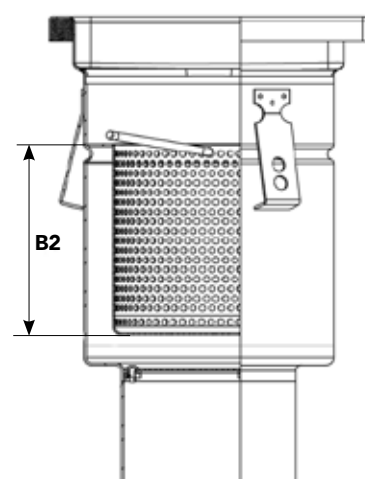


Plate

R10 B



SHALLOW BASKET - WITH TRAP



DEEP BASKET - NO TRAP

ROUND FLOOR DRAINS

200 ROUND TOP FLOOR DRAIN

Item Code	W (mm)	DN (mm)	D (mm)	Grate (mm)	H (mm)	H1 (mm)	B1 (mm)	B2 (mm)
X97803	198	110	157	188	215	75	35	120

200 ROUND TOP FLOOR DRAIN ACCESSORIES

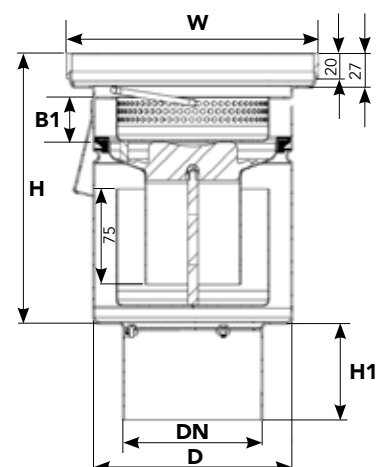
X97806	REMOVABLE TRAP - WaterMark approved 75mm seal for 157mm body							
X97808	BASKET 4MM perforations - for use with removable trap for 157mm body							
X97809	DEEP BASKET 4MM perforation - for use without trap for 157mm body							
X97812	SECONDARY STRAINER 4MM perforations - for 110MM outlet							
X97855	BASKET 2MM perforations - for use with removable trap for 157mm body							
X97856	DEEP BASKET 2MM perforation - for use without trap for 157mm body							
X97859	SECONDARY STRAINER 2MM perforations - for 110MM outlet							
X97834	GRATE - Anti-Slip Mesh for 200 Round Top Drain							
X97851	GRATE - Anti-Slip Ladder for 200 Round Top Drain							
X97833	GRATE - Perforated Sheet for 200 Round Top Drain							
X97836	GRATE - Solid Plate for 200 Round Top Drain							
X97837	GRATE - Sealed Cover for 200 Round Top Drain - requires vacuum handle							
X97838	GRATE - Sealed Cover for 200 Round Top Drain with key bolt							
X97961	VACUUM HANDLE - lifting device for sealed cover							

300 ROUND TOP FLOOR DRAIN

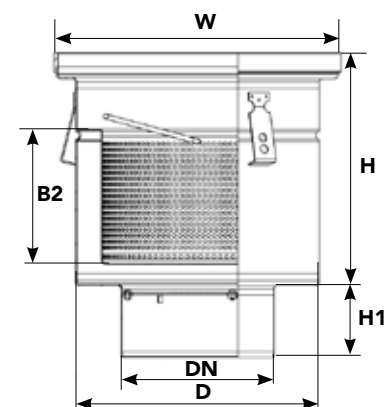
Item Code	W (mm)	DN (mm)	D (mm)	Grate (mm)	H (mm)	H1 (mm)	B1 (mm)	B2 (mm)
X97804	300	110	255	290	239	75	35	135
X97805	300	160	255	290	239	75	35	135

300 ROUND TOP FLOOR DRAIN ACCESSORIES

X97807	REMOVABLE TRAP - WaterMark approved 75mm seal for 255mm body							
X97810	BASKET 4MM perforations - for use with removable trap for 255mm body							
X97811	DEEP BASKET 4MM perforation - for use without trap for 255mm body							
X97812	SECONDARY STRAINER 4MM perforations - for 110MM outlet							
X97813	SECONDARY STRAINER 4MM perforations - for 160MM outlet							
X97857	BASKET 2MM perforations - for use with removable trap for 255mm body							
X97858	DEEP BASKET 2MM perforation - for use without trap for 255mm body							
X97859	SECONDARY STRAINER 2MM perforations - for 110MM outlet							
X97860	SECONDARY STRAINER 2MM perforations - for 160MM outlet							
X97840	GRATE - Anti-Slip Mesh for 300 Round Top Drain							
X97853	GRATE - Ant-Slip Ladder for 300 Round Top Drain							
X97839	GRATE - Perforated Sheet for 300 Round Top Drain							
X97842	GRATE - Solid Plate for 300 Round Top Drain							
X97843	GRATE - Sealed Cover for 300 Round Top Drain - requires vacuum handle							
X97844	GRATE - Sealed Cover for 300 Round Top Drain with key bolt							
X97961	VACUUM HANDLE - lifting device for sealed cover							



SHALLOW BASKET WITH TRAP



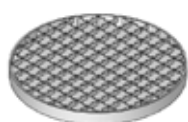
DEEP BASKET - NO TRAP

Vacuum handle
used to remove
sealed cover.
(sold separately)



STANDARD ROUND GRATE OPTIONS

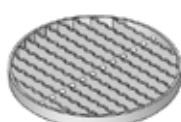
For custom drains and grates contact MM Kembla.



Anti-Slip
Mesh

R13

A



Anti-Slip
Ladder

R12

B



Perforated
Sheet

R10

A



Plate

R10

B



Sealed Cover
with key bolt

R10

B



Sealed
Cover

R10

B

FLOOR DRAIN FLOW RATES

KEMDRAIN FLOOR DRAIN FLOW RATES WITH VARIOUS ACCESSORY OPTIONS

Floor Drain Product (Top/Outlet)	Outlet Size	Option 1	Option 2	Option 3	Option 4
X97800 & X97803 (200/110)	110mm	4.30 l/s	3.35 l/s	3.45 l/s	2.53 l/s
X97801 & X97804 (300/110)	110mm	6.40 l/s	4.90 l/s	5.50 l/s	4.00 l/s
X97802 & X97805 (300/160)	160mm	11.10 l/s	8.10 l/s	8.95 l/s	5.95 l/s

OPTION 1 - Mesh or Ladder Grate & Deep Filter Basket Installed. No Secondary Strainer Screen or trap.

OPTION 2 - Mesh or Ladder Grate, Deep Filter Basket & Secondary Strainer Screen Installed. No trap.

OPTION 3 - Mesh or Ladder Grate, Shallow Filter Basket & Removable Water Trap Installed. No Secondary Strainer Screen.

OPTION 4 - Mesh or Ladder Grate, Shallow Filter Basket, Removable Water Trap and Secondary Strainer Screen Installed.

INSPECTION POINTS

FEATURES

- highly durable
- easy installation
- cover with EPDM seal eliminates odours escaping - screw lock covers
- round shape eliminates installation orientation issues

ROUND TOP 110MM OUTLET INSPECTION POINT

Item Code	W (mm)	DN (mm)	H (mm)
X97814	157	110	150

ROUND TOP 110 MM INSPECTION POINT ACCESSORIES

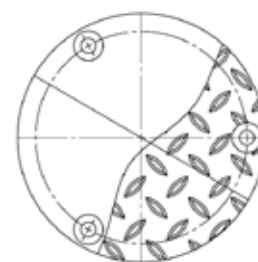
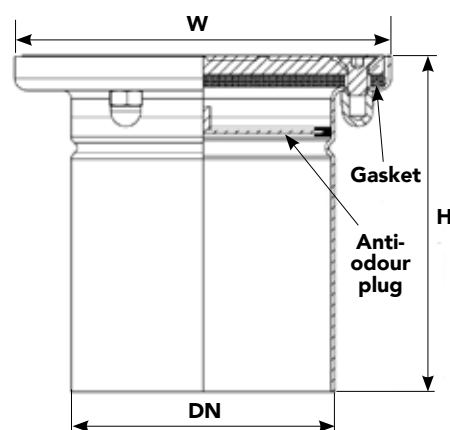
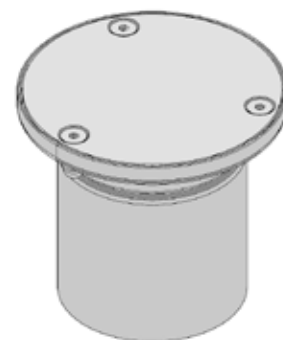
X97815	Smooth plate 8.0 mm thick for 110 mm outlet inspection point
X97816	Anti-slip plate 8.0 mm thick for 110 mm outlet inspection point
X97817	EPDM gasket for 110 mm outlet inspection point
X97823	Set of locking screws (3 pcs)
X97818	Internal plug for 110mm outlet inspection point

ROUND TOP 160MM OUTLET INSPECTION POINT

Item Code	W (mm)	DN (mm)	H (mm)
X97819	201	160	150

ROUND TOP 160 MM INSPECTION POINT ACCESSORIES

X97820	Smooth plate 8.0 mm thick for 160 mm outlet inspection point
X97821	Anti-slip plate 8.0 mm thick for 160 mm outlet inspection point
X97822	EPDM gasket for 160 mm outlet inspection point
X97823	Set of locking screws (3 pcs)
X97824	Internal plug for 160mm outlet inspection point



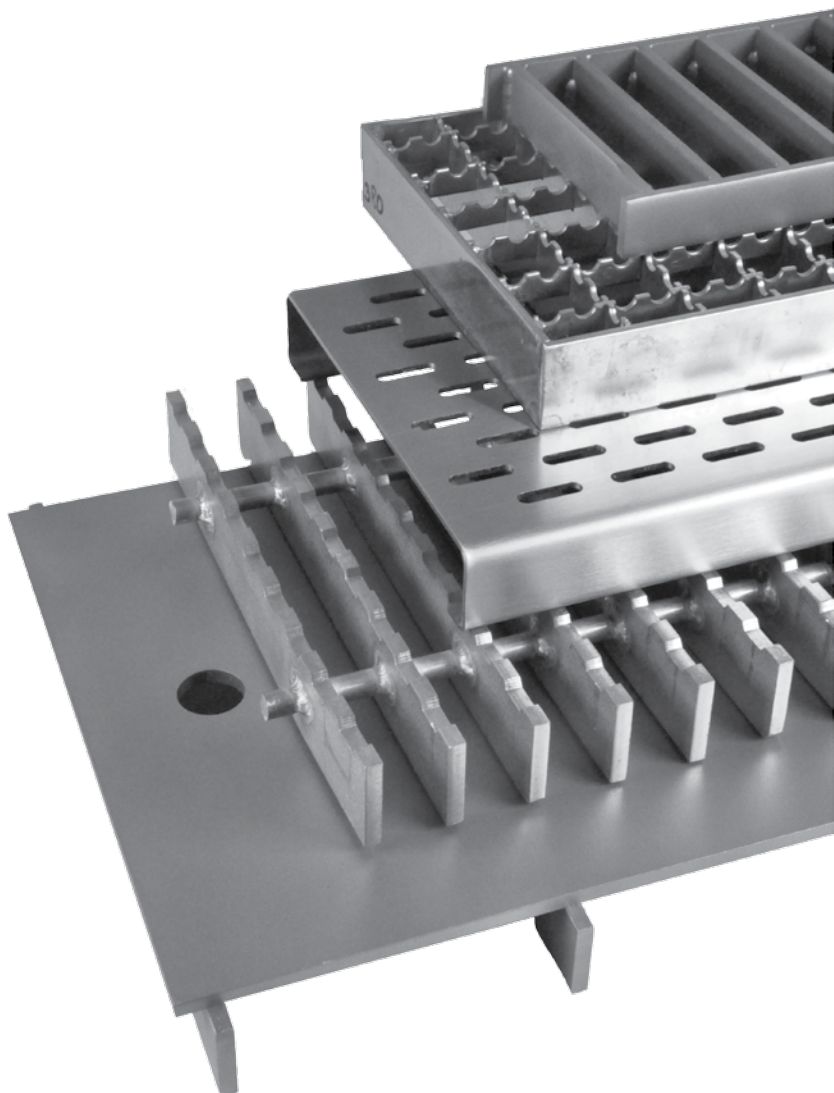
Smooth or Anti-Slip Cover

R10 B

LINEAR DRAINAGE CHANNELS

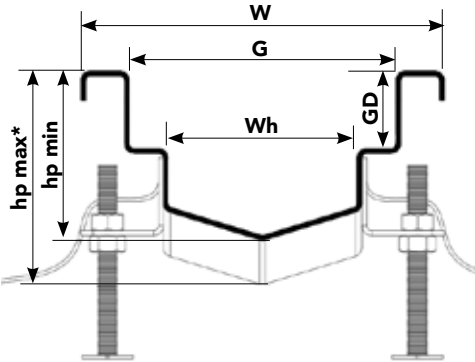
KEMDRAIN™ STAINLESS LINEAR DRAINAGE CHANNELS FEATURES:

- Epoxy infill for edges is standard, making installation easier and the edges more durable
- A range of grates to suit various traffic conditions including anti-slip and heel-safe
- Efficient hydraulic performance with v-profiled inverts as standard
- Each channel has levelling feet and anchorage tabs to assist with fast, trouble-free installation
- No welding on site. Channels up to 4 metres long are supplied as a complete unit. For channels over 4 metres in length the design is modular and sections are joined via provided flange and gasket kits.
- Complete system, no hidden extras
- Factory quality assurance
- Fast and simple design and approval process
- Drainage fall built-in
- Fully customised to suit your project
- Slot drain and grated channels from 110 mm up to 410 mm grate widths
- High quality 316L grade stainless manufacture
- Easy access for cleaning and hygienic design with rounded internal edges, v-profile invert, replaceable gratings, integrated strainer baskets and water traps available for the floor drain outlets
- The inspection opening to the sewer is located in the outlet



LINEAR DRAINAGE CHANNELS

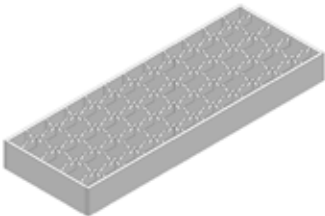
KEMDRAIN TM STAINLESS STANDARD LINEAR CHANNELS						
Product Code	W (mm)	G	Wh	hp min	hp max*	GD
KEMDRAIN TM CHANNEL C150	150	110	80	75	180	30
KEMDRAIN TM CHANNEL C200	200	160	130	75	180	30
KEMDRAIN TM CHANNEL C250	250	210	180	75	180	30
KEMDRAIN TM CHANNEL C300	300	260	230	75	180	30
KEMDRAIN TM CHANNEL C350	350	310	280	75	180	40
KEMDRAIN TM CHANNEL C400	400	360	330	75	180	40



* If greater depth required please contact MM Kembla

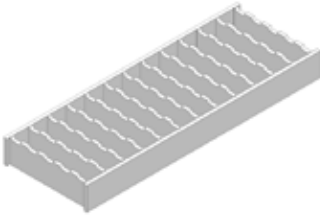
STANDARD CHANNEL GRATING OPTIONS

For custom channels and grates contact MM Kembla.



Anti-Slip Mesh Grating

R13 A



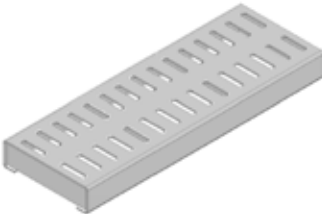
Anti-Slip Ladder Grating

R12 B



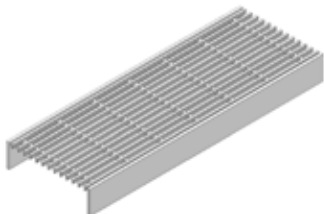
Plate Grating

R10 B



Perforated Sheet Grating

R10 A



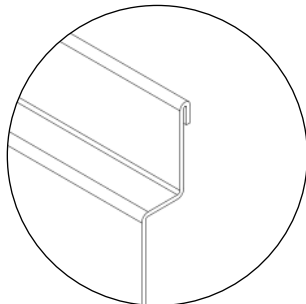
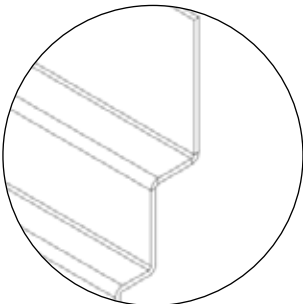
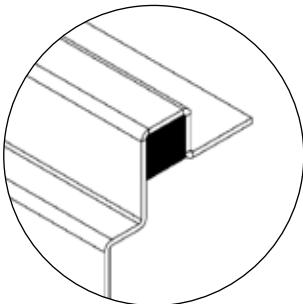
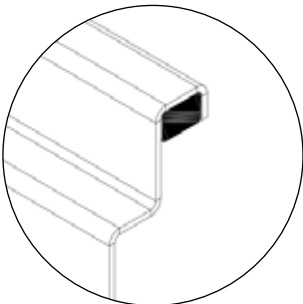
Wedge Wire Heel Safe Grating

R9 A

CHANNEL EDGE FINISHING

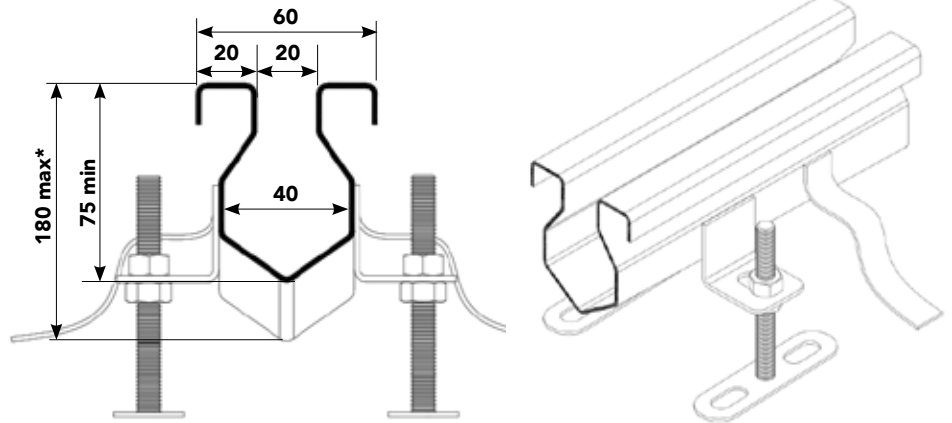
The edge finishing should depend on the flooring type and waste water temperature. Options include:

1. downward flange
(standard)
2. flange
3. raised back edge
4. tightly folded edge



KEMDRAIN™ STAINLESS SLOT CHANNEL

An effective and simple method for draining surfaces where high flow capacity is not required. A perfect solution for rooms with condensate dripping from machinery or A/C systems: bakeries, dairies and swimming pools, as a separation of wet and dry areas.



* If greater depth required please contact MM Kembla



LINEAR DRAINAGE CHANNELS

KEMDRAIN™ STAINLESS STANDARD LINEAR CHANNEL DESIGN

Typical layout of the channel is shown in the figure below. The placement of floor drains and the channel route depends on the flooring design and the amount of water to be drained from the floor. Standard and slot channels can be combined.

The channel route should be decided by the design engineer in cooperation with the process engineer. In case of any technical questions relating to the drainage system, please do not hesitate to contact MM Kembla. The channel outlet may be fitted with a water trap and strainer basket as required.

Horizontal water-proof insulation can be factory integrated into the flange of the floor drain. This solution assures leak tightness in the area of out-flow passage through the floor.

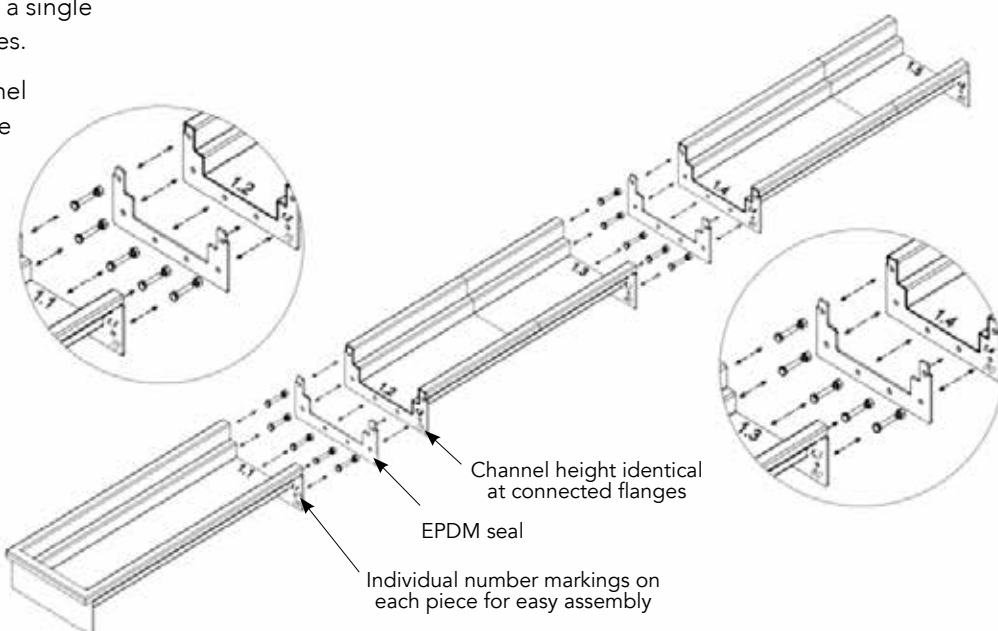
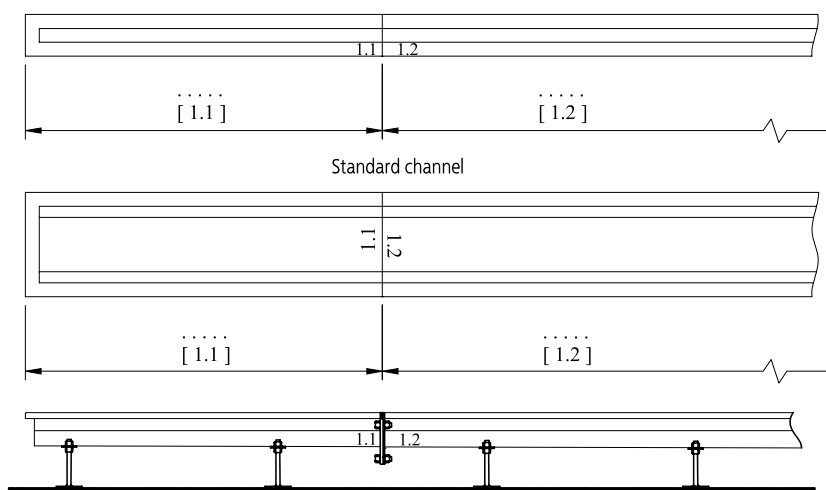
CHANNEL CONNECTION

Channels are divided into sections appropriate for transport, as a standard their length does not exceed 4 meters.

Standard length of a channel with a single outlet should not exceed 10 metres.

At the connection point the channel is approximately 25 mm lower, due to the presence of the flange. It is also possible to weld the channel directly at the construction site.

All channel components are individually numbered to allow easy assembly.

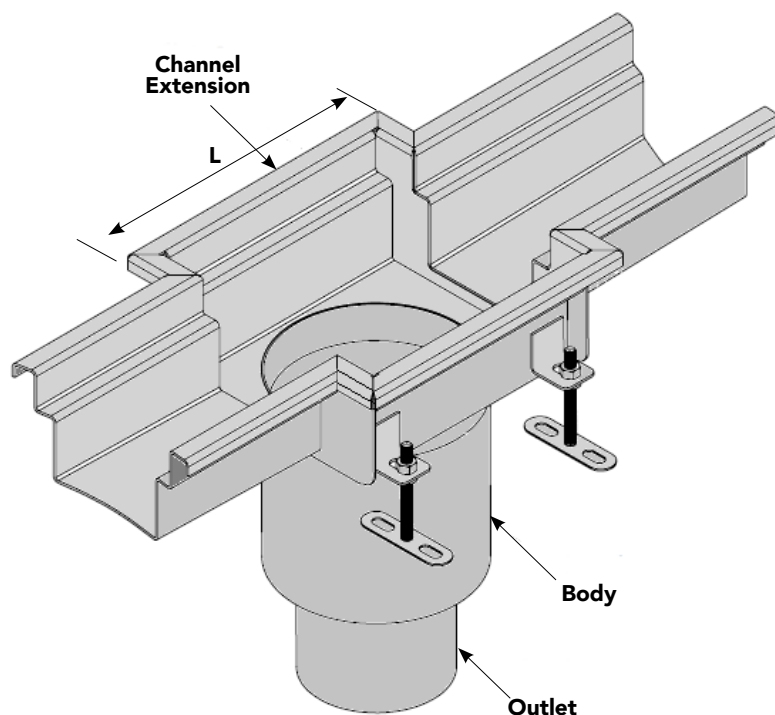


LINEAR CHANNEL OUTLET OPTIONS

The table below shows the standard options available for channel outlets. The quantity and size of outlets will depend on factors including the catchment area, channel size, required flow rates and cleaning frequency where baskets or traps are incorporated.

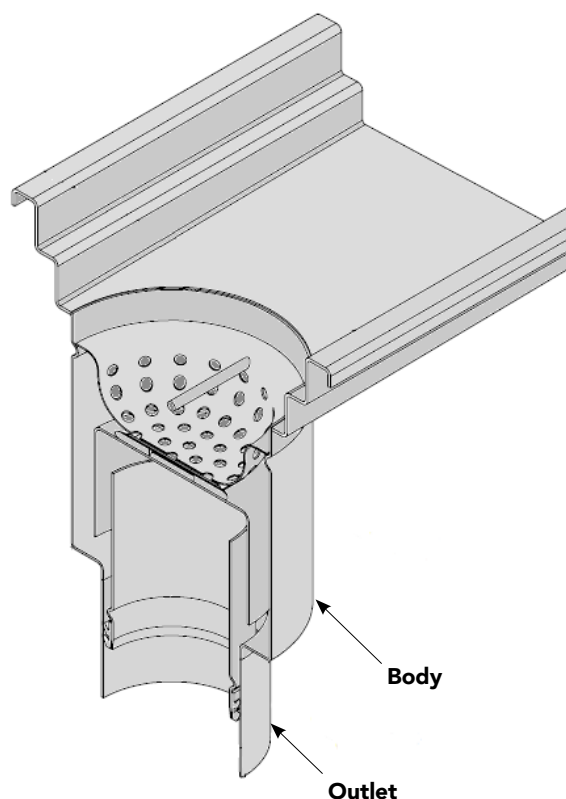
An outlet extension box is required when outlet bodies do not fit within the channel section.

The extension box is always 10 mm deeper than the channel it is connected to. Due to the fact that the grating has bearing elements of one direction only, the extension is asymmetrical, which prevents incorrect installation.



Channel outlet extensions are required for channels as noted in table.

CHANNEL OUTLET EXTENSION			
KemDrain Channel	Outlet Diameter (mm)	Body Diameter (mm)	Extension Size Length x Width (mm)
C60 Slot	110	157	340 x 335
C60 Slot	110	255	340 x 335
C60 Slot	160	255	340 x 335
C150	110	157	340 x 335
C150	110	255	340 x 335
C150	160	255	340 x 335
C200	110	157	340 x 335
C200	110	255	340 x 335
C200	160	255	340 x 335
C250	110	157	340 x 335
C250	110	255	340 x 335
C250	160	255	340 x 335
C300	110	157	Not required
C300	110	255	340 x 335
C300	160	255	340 x 335
C350	110	157	Not required
C350	110	255	Not required
C350	160	255	Not required
C400	110	157	Not required
C400	110	255	Not required
C400	160	255	Not required

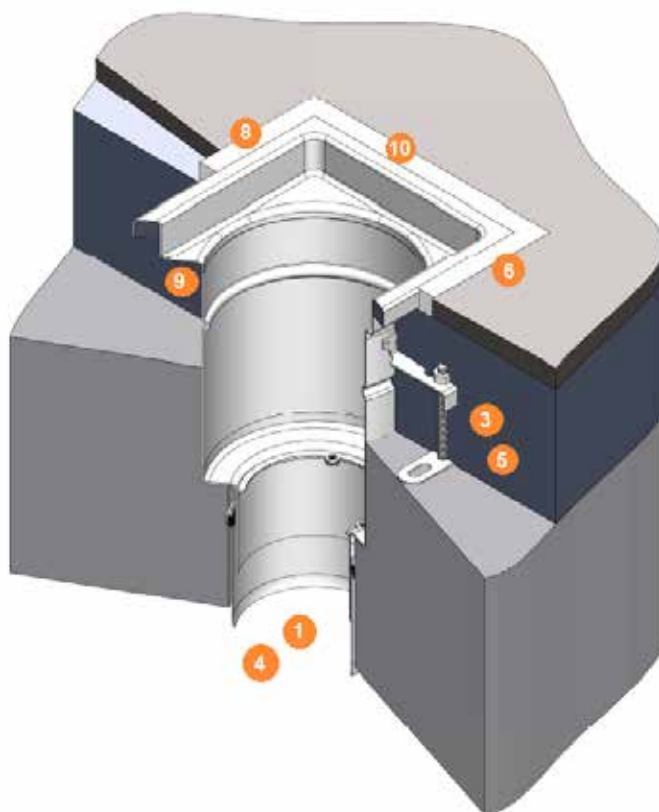


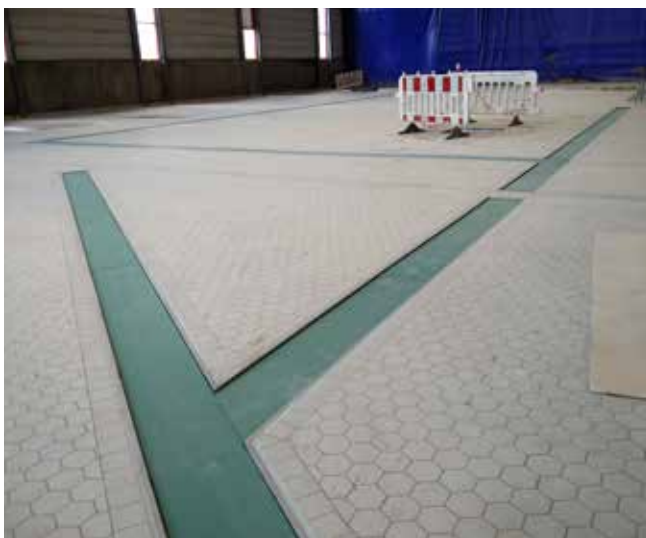
Channel outlet extensions are not required for some wider channels as noted in table.

INSTALLATION

INSTALLATION OF FLOOR DRAINS AND LINEAR CHANNELS

1. Ensure the pipe connection is at the required height.
2. For channels longer than 4 metres, before placement into final position, bolt all parts ensuring EPDM gaskets are installed to create a watertight seal.
3. Gently bend the anchor tabs until they are 90 degrees to the floor drain and/or channel side walls.
4. Install the floor drain/channel outlet to the in-ground pipe system
5. Set the floor drain/channel height and check for level, using the provided levelling feet, ensuring the floor drain/channel is at the correct height. The floor drain/channel surround top surface should be 1-1.5 mm below the desired finished floor level, accounting for epoxy, tiling and so on.
6. Install suitable expansion joint and waterproofing detail around perimeter of floor drain/channel as per designers requirements.
7. Carefully weigh floor drain/channel down so as to prevent movement or floatation during concrete pour.
8. Cover the top of the floor drain/channel to prevent debris and concrete from entering the floor drain/channel and drainage system.
9. During the concrete pour, ensure concrete is carefully placed and compacted to eliminate voids and fully support the floor drain/channel.
10. Seal around the perimeter of the floor drain/channel with sealant as per designers requirements
11. It is recommended to temporarily cover the floor drain channel to prevent construction debris and waste entering the drainage system prior to final commissioning.
12. Once the floor finishing is completed the floor drain channel covering may be removed and internal components including water traps, strainer baskets and grates should be installed.







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LINEAR CHANNELS,
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QUALITY, RELIABILITY AND
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