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FILCOTEN®

FILCOTEN-2017

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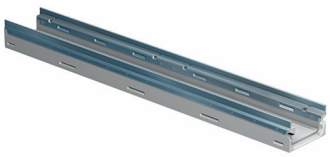
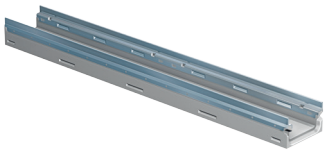
T1560



T1560-3



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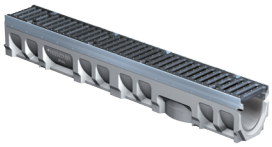

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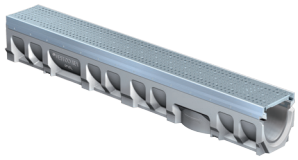

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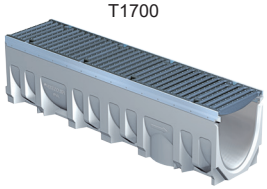

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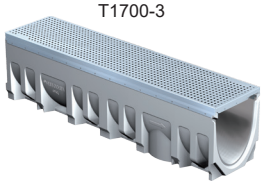

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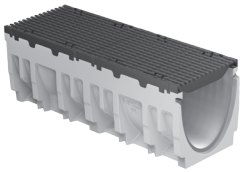

T1500 catch basin

T1700 Catch basin

T1800 Catch basin

Fiber reinforced concrete trench drains

Technology in harmony with nature.

LIT-076

FILCOTEN®
T1500, T1560
T1700, T1800

MIFAB®, Inc. 1321 West 119th Street, Chicago, Illinois 60643-5109, USA • Toll Free 1-800-465-2736, Fax 1-773-341-3049
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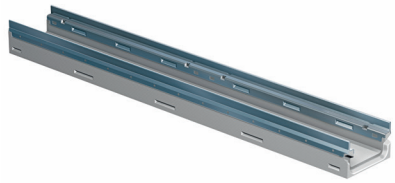

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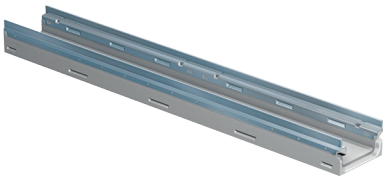

T1560-3
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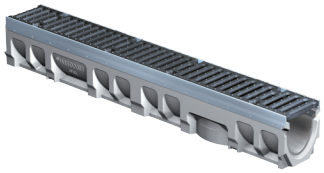

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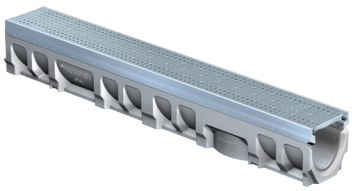

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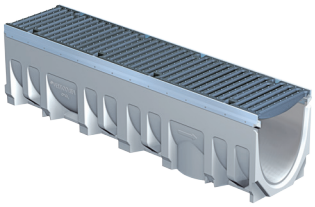

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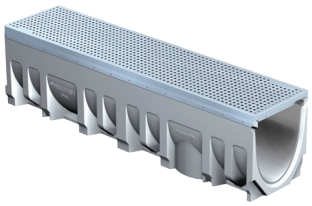
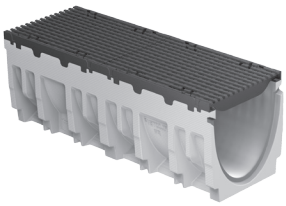


T1700-3
(T1700-3 - Page 14)



T1800
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T1500 catch basin
(T1500-CB620 - Page 11)

T1700 Catch basin
(T1700-CB820 - Page 15)

T1800 Catch basin
(T1800-CB620 - Page 17)

MIFAB®

FILCOTEN®

Innovation without sustainability is not innovation.

Global Champion with family tradition.

In 1961, Friedrich Graspointner founded the concrete factory Graspointner as a family business in Oberwang, Austria. Since then, a lot has changed: the small-scale manufacturer of concrete goods for the local market has grown into a successful, globally active company with 250 employees. The company's fiber re-inforced concrete trench drain products are marketed under the FILCOTEN brand name. MIFAB has been appointed the exclusive distributor of the FILCOTEN fiber re-inforced concrete trench drain products for the USA and Canadian plumbing markets.

Our products are in direct contact with the earth's water cycle.

We have been asking ourselves the question of how advancement and sustainability can be combined for many years. We therefore set one additional goal when developing FILCOTEN®:

"It should be really environmentally friendly."

Our success and quality gets around

all over the world. Our drainage systems, railway construction regulating components and traffic systems ensure dry, safe streets and efficient railway tracks on almost all continents. And our development has not come to an end:
We strive daily to further improve our products and thereby win new, satisfied customers all over the world.

We are very proud of the fact that we were very much able to achieve this. FILCOTEN® is completely neutral for the environment from the manufacture through to full recycling, and does not have any negative effects on humans or nature.

Our energy mix also makes clear that we are serious when it comes to sustainability. We don't use fossil fuels for the most part, relying instead on renewable energies.

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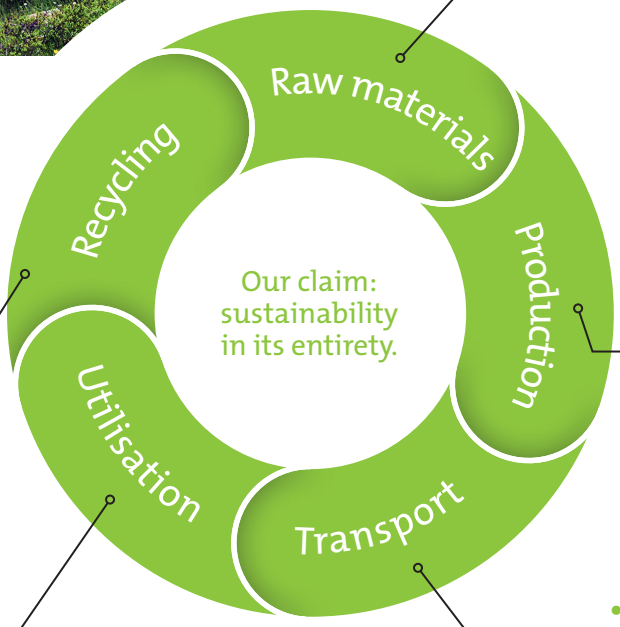
BG energy mix:

1.23 %	other eco-energy
2.59 %	oil and its products
3.18 %	natural gas
3.53 %	solid or liquid biomass
4.23 %	wind energy
85.24 %	water power

It´s not just FILCOTEN® which is enviromentally friendly - our energy mix is too.



- Economical handling of mineral raw materials
- Not using plastic resins, hardening agent or solvents
- no chemical harm to employees or the environment
- low exposure to dust and noise
- better carbon footprint for each body achieved by a low weight (comparable with concrete)
- no harmful effects to humans or nature
- long service life, thereby conserving resources
- 100 % recyclable *(tested by the soil and building materials testing facility in Linz, Austria)*

Strong
but gentle to the environment:

MIFAB® FILCOTEN®

Impact strength and environment-friendliness are just two of the many features which make FILCOTEN® unique.

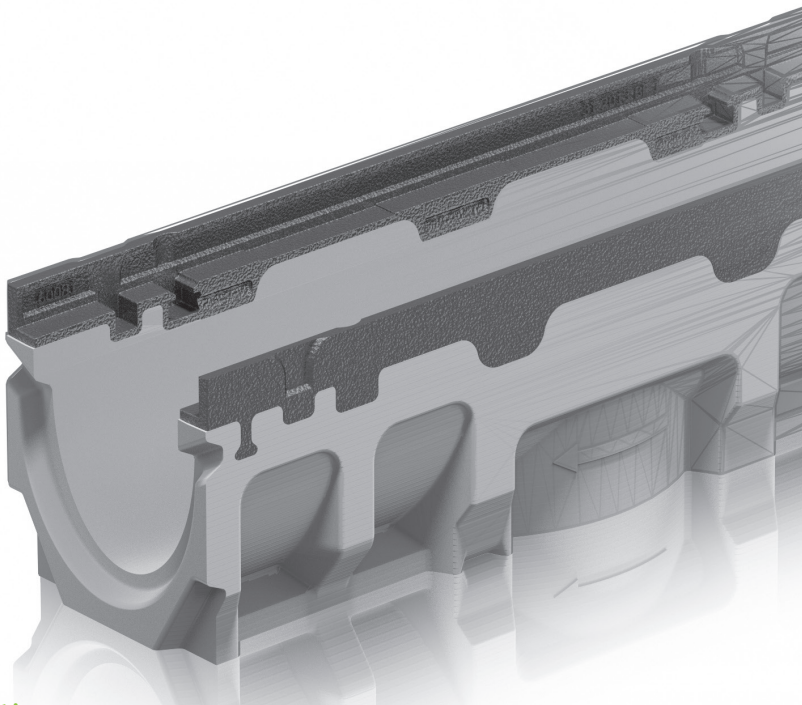
The material combines the positive features of stable concrete bodies with the construction of resin-bonded cements (light construction), and years after its introduction into the market it is still unrivalled. FILCOTEN® complies with the EN 1433 standard and the ASTM A112.6.3.2001 floor and trench drain standard.

Temperature, frost and UV-resistant

Since FILCOTEN® bodies are made of cement-bonded fiber composites, they react to changes in temperature in the same way as the surrounding concrete bedding. This achieves a continuous unit and a long service life for the trench drain system. Resistance to frost and de-icing salt down to -40° C has been demonstrated (taking into account EN1433).

Improved impact stability

The high impact stability of FILCOTEN® ensures greater safety when handling and installing the bodies.



100 % recyclable

The manufacturing and processing focus is on the conservation of resources. There is none of the high energy consumption which is required, for example, to heat the tools in the production of plastic products.
Better still, FILCOTEN® is 100 % recyclable.
Tested by the soil and building materials testing facility in Linz, Austria.

Lower transport costs, swifter installation

Depending on the type of body, FILCOTEN® bodies are up to 70 % lighter than conventional concrete bodies. This huge saving in terms of weight decreases the consumption of fuel, conserves resources and decreases the proportional CO_2 emissions. The lower weight also facilitates installation on site.

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Adapted surface properties

The particularly flat inner surface of FILCOTEN® bodies achieves the best flow characteristics and a high self-cleaning effect. The textured outer surface ensures erfect cohesion with the concrete bed.

Surface properties:

36µm	Polymer concrete
Glass fiber modified concrete	100µm
Concrete	170µm
*	FILCOTEN®

* *This value is based on initial results. Final details will be published after completion of testing.*

High compressive strength

The cement-bonded material with a high proportion of fibers enables thin-walled bodies with particularly high compressive strength. FILCOTEN® bodies are therefore lighter yet highly resilient.

Compressive strength

Polymer concrete	90 N/mm²
Glass fiber modified concrete	70 N/mm²
Concrete	65 N/mm²
FILCOTEN®	90 N/mm²

ÉMISSIONS DANS L'AIR INTÉRIEUR
A+
A+ A B C

Geprüft und empfohlen
IBR
Institut für Baubiologie Rosenheim GmbH
Produkt überprüft auf VOC · Biozide · Schwermetalle und Radioaktivität

Non-flammable

While plastics are flammable, the purely mineral mix of materials means that FILCOTEN® does not have a fire load.

Fire protection classes:

- Polymer concrete: B1 difficult to ignite
- Plastic: B2 normal combustibility
- Glass fiber reinforced plastic: B2 normal combustibility
- FILCOTEN®: A1 non-combustible

0 % harmful substances

FILCOTEN® is free from artificial resins and solvents. This means that it is harmless to the environment and our employees even during production. FILCOTEN® bodies have been bioconstructively tested and are recommended on this basis by the IBR (Institut für Baubiologie Rosenheim GmbH).

Made in AUSTRIA

Only a heavyweight when it comes to features:

MIFAB® FILCOTEN®

The FILCOTEN® trench drain systems do not make any compromises. In addition to the lightness and stability it offers, the system can also be variably adapted to your needs, thereby remaining resilient up to Class E 600 (in accordance with EN 1433) and ANSI "Extra Heavy Duty" load rating (between 7,500 and 10,000 lbs.). (with MIFAB's cast, ductile iron grates).

Areas of use

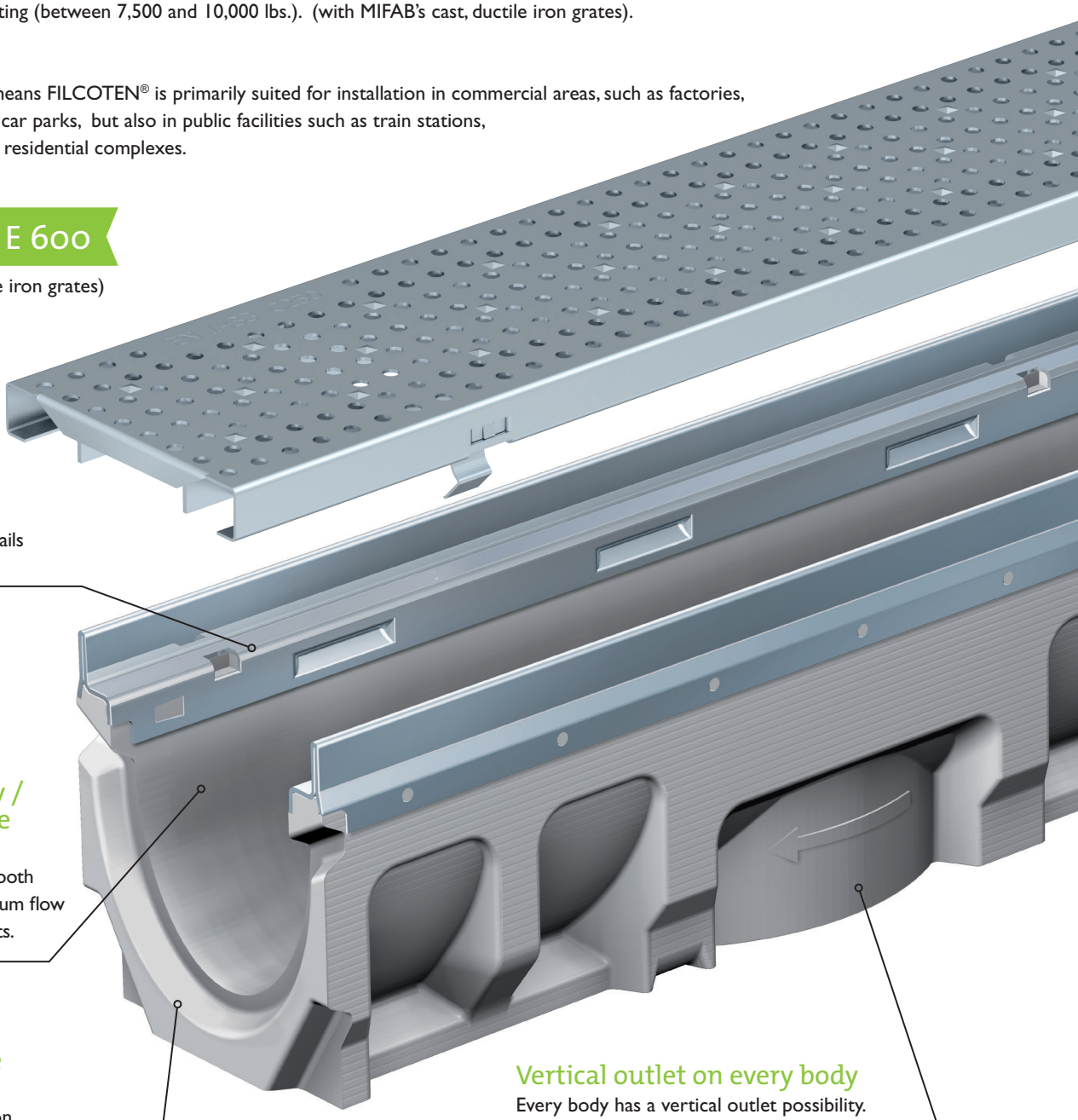
The high resilience means FILCOTEN® is primarily suited for installation in commercial areas, such as factories, storage facilities and car parks, but also in public facilities such as train stations, pedestrian areas and residential complexes.

Load Class E 600

(with MIFAB's ductile iron grates)

Rail variants

The FILCOTEN® body system is also available with various integral rails made of galvanized steel or stainless steel. Standard 4mm thick rails are extra heavy duty.



Body geometry / smooth surface

The optimized body geometry and the smooth surface ensure maximum flow and self-cleaning effects.

Sealant groove

Sealant groove for waterproof installation.

Vertical outlet on every body

Every body has a vertical outlet possibility.

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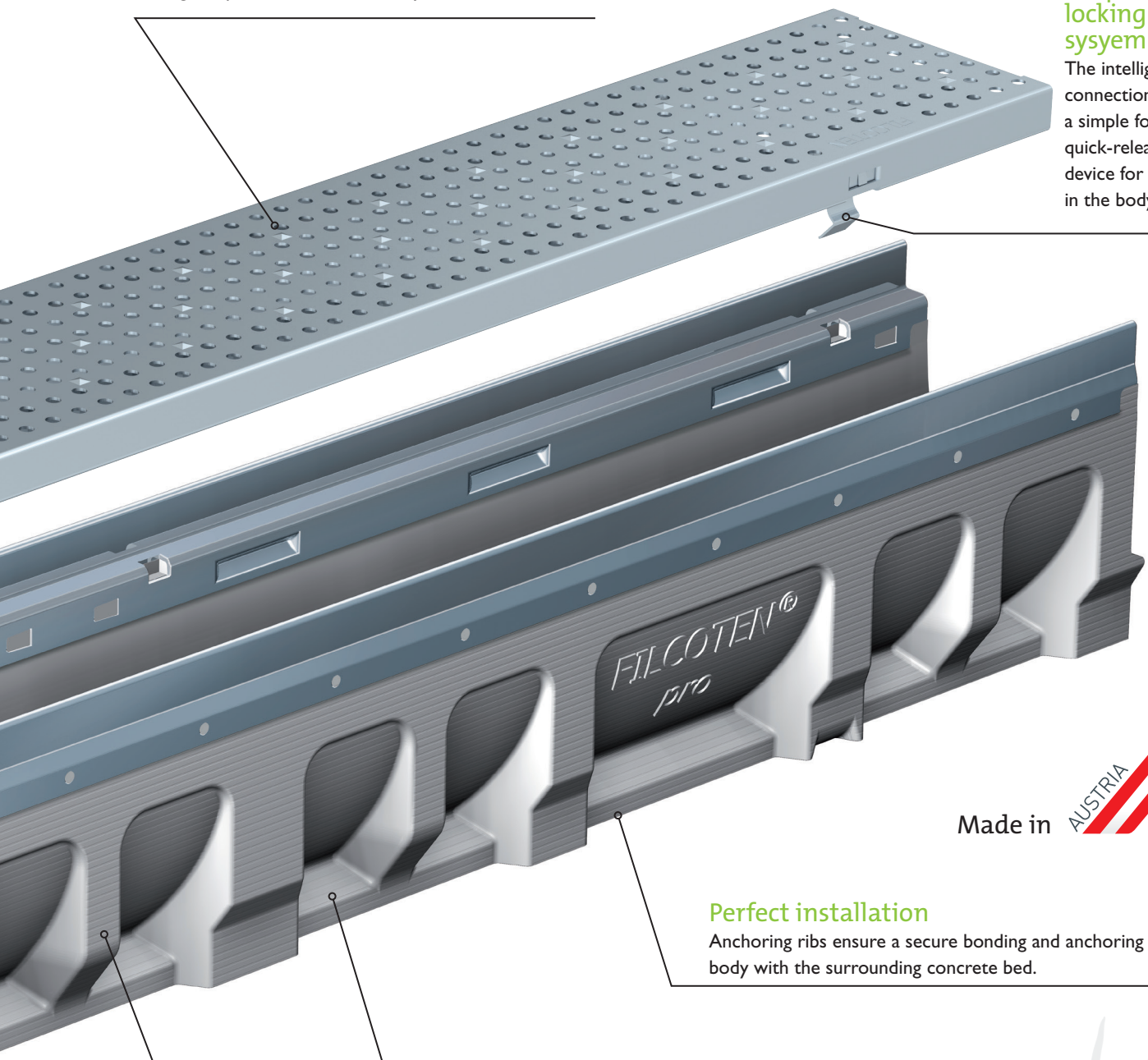
No longitudal shift of grates

Two anti-sliding lugs secure the grating against any longitudal shifting and provides additional safety.

Fast and secure fiX snap-on locking sysyem

The intelligent fiX connection enables a simple four-point quick-release safety device for the grate in the body.



Made in AUSTRIA

Perfect installation

Anchoring ribs ensure a secure bonding and anchoring of the body with the surrounding concrete bed.

Innovative production technology

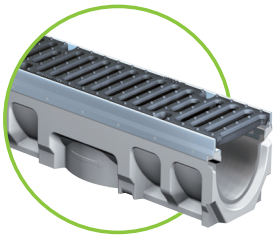
The innovative FILCOTEN® production and moulding technology has created anchoring ribs, therefore ensuring a secure bonding with the surrounding concrete bed.

Stable thanks to the FEM analysis

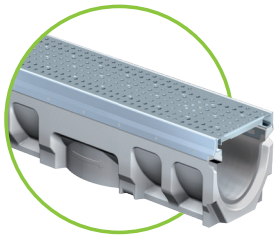
The FEM analysis is a computer-assisted process which simulates exactly which constructions withstand which loads. The more accurately the effect of the forces is known, the easier it is to choose the optimal solution.

Load Class E

(with Ductile Iron grates)

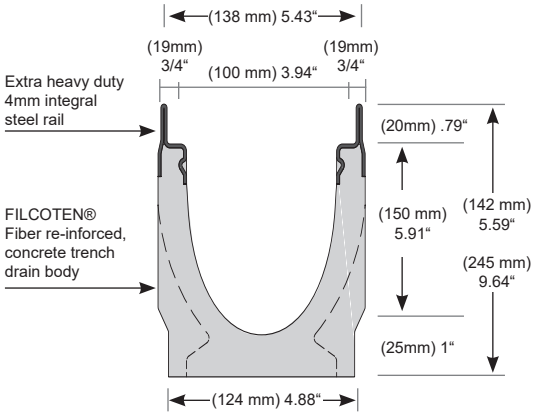


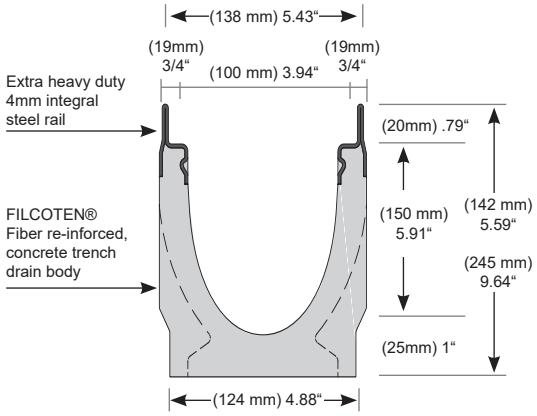
FILCOTEN® T1500
incl. galvanized steel rails



FILCOTEN® T1500-3
incl. stainless steel rails

FILCOTEN® T1500-DSB
dual slope body





T1502 T1501 T1500-DSB T1501 T1502

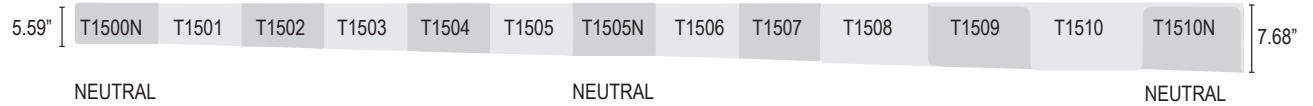
Illustrated: Sample run using the T1500-DSB dual slope body to connect trench runs going in opposite directions.

*GPM = Gallons per Minute
*LPS = Litres per Second
*CFS=Cubic Feet per Second

Note: The T1500-3 Series (with integral stainless steel rails) are available in neutral trench drain bodies only. The T1500-ST (step connector) is required to connect the T1500N-3 body to the T1510N-3 and also to connect the T1510N-3 body to the T1520N-3. Pages 18 and 19 explain why neutral bodies are better to use than sloped bodies.

FILCOTEN® T1500.

Body Part Number						Overall Body Depth		Maximum Flow Rate			Weight (Less Grate)	
Galvanized Steel Integral Rails	List Price, Each, Add	Stainless Steel Integral Rails	List Price, Each, Add	Body type	Slope	E1 (Min.)	E2 (Max.)	GPM*	LPS*	CFS*	Lbs.	kg.
T1500N	$288.00	T1500N-3	$422.00	Neutral	0 %	5.59" (142 mm)	5.59" (142 mm)	51	3.22	0.111	33.80	17.60
T1500-DSB	$288.00	T1500-3-DSB	$422.00	connect 2 sloped bodies	0 %	5.71" (145 mm)	5.71" (145 mm)	51	3.22	0.111	40.30	18.30
T1505N	$298.00	-	-	Neutral	0 %	6.69" (170 mm)	6.69" (170 mm)	84	5.32	0.183	43.87	19.90
T1510N	$298.00	T1510N-3	$422.00	Neutral	0 %	7.68" (195 mm)	7.68" (195 mm)	119	7.52	0.259	51.81	23.50
T1520N	$298.00	T1520N-3	$422.00	Neutral	0 %	9.64" (245 mm)	9.64" (245 mm)	127	9.60	0.339	65.91	29.90
T1501	$298.00	-	-	Sloped	0.5 %	5.71" (145 mm)	5.91" (150 mm)	58	3.69	0.127	39.90	18.10
T1502	$298.00	-	-	Sloped	0.5 %	5.91" (150 mm)	6.10" (155 mm)	63	3.95	0.136	40.79	18.50
T1503	$298.00	-	-	Sloped	0.5 %	6.10" (155 mm)	6.30" (160 mm)	67	4.21	0.145	41.67	18.90
T1504	$298.00	-	-	Sloped	0.5 %	6.30" (160 mm)	6.50" (165 mm)	71	4.48	0.154	42.55	19.30
T1505	$298.00	-	-	Sloped	0.5 %	6.50" (165 mm)	6.69" (170 mm)	75	4.75	0.164	43.43	19.70
T1506	$298.00	-	-	Sloped	0.5 %	6.69" (170 mm)	6.89" (175 mm)	80	5.02	0.173	44.31	20.10
T1507	$298.00	-	-	Sloped	0.5 %	6.89" (175 mm)	7.09" (180 mm)	84	5.29	0.182	45.19	20.50
T1508	$298.00	-	-	Sloped	0.5 %	7.09" (180 mm)	7.28" (185 mm)	92	5.83	0.201	46.08	20.90
T1509	$298.00	-	-	Sloped	0.5 %	7.28" (185 mm)	7.48" (190 mm)	97	6.11	0.210	46.96	21.30
T1510	$298.00	-	-	Sloped	0.5 %	7.48" (190 mm)	7.68" (195 mm)	119	7.52	0.259	47.84	21.70



Design and dimensions are subject to modification. Prices do not include applicable taxes.

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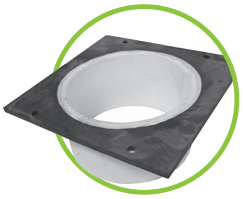
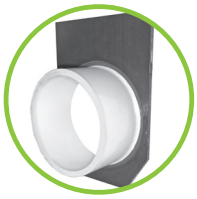
Load Class E

(with Ductile Iron grates)

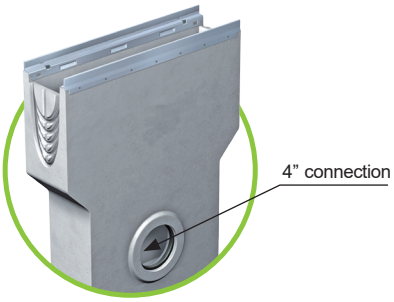


T1500-PBO2, 3, or 4
No Hub Bottom Outlet (2", 3" or 4")

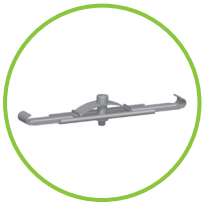


T1500-PEO2, 3 or 4
No Hub End Outlet (2", 3" or 4")

T1500-PEC
Front / End Cap

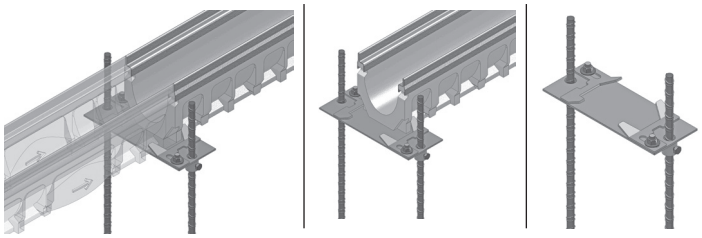


FILCOTEN® T1500 catch basin
(part #: T1500-CB620)

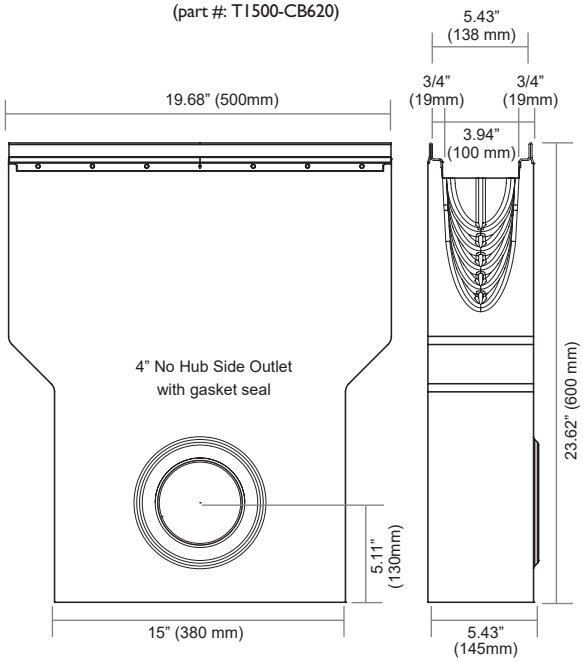


Anti-vandalism locking device for all grates (except perforated), ADA compliant. 2 pieces required per grate.

T1500-REB (Rebar Support)



Optional Rebar support (T1500-REB)



Accessories FILCOTEN® T1500.

Model Number	Description	Material	Weight LBS	Weight kg.	List Price, Each, Add
T1500-CB620	Catch basin 6" with galvanized steel rails and 4" outlet with seal	FILCOTEN	71.42	32.4	$572.00
T1500-3-CB620	Catch basin 6" with stainless steel rails and 4" outlet with seal	FILCOTEN	71.42	32.4	$890.00
T1500-CB620-SB	Sediment bucket for catch basin	plastic	0.44	0.2	$105.00
T1500-PEC	Front/end cap	plastic	0.22	0.1	$75.00
T1500-PBO2	2" No Hub Bottom Outlet	plastic	0.44	0.2	$100.00
T1500-PBO3	3" No Hub Bottom Outlet	plastic	0.44	0.2	$100.00
T1500-PBO4	4" No Hub Bottom Outlet	plastic	0.44	0.2	$100.00
T1500-PEO2	2" No Hub End Outlet	plastic	0.44	0.2	$100.00
T1500-PEO3	3" No Hub End Outlet	plastic	0.44	0.2	$100.00
T1500-PEO4	4" No Hub End Outlet	plastic	0.44	0.2	$100.00
T1500-PGLVP	Vandal proof grate lockdown* (stainless steel) (Not for perforated grates)	stainless steel	0.22	0.1	$100.00
T1500-REB	Rebar support	fabricated steel	0.22	0.1	$100.00
T1500-ST	Step connector for T1500N / T1510N / T1520N	FILCOTEN	2.2	1.0	$67.50
T1500-PBDS	Bottom Dome Strainer	plastic	0.20	0.1	$64.50
T1500-CUT	Cutting / per cut - Net Price only	-	-	0.1	$100.00 Net Price Only
Tees	Fabricated tee (available in T1500N-TEE, T1505N-TEE, T1510N-TEE models)	-	-	-	$400.00 ($550.00 for the -3 bodies)
45°	45° body section	-	-	-	$400.00 ($550.00 for the -3 bodies)
90°	90° body section	-	-	-	$400.00 ($550.00 for the -3 bodies)

Accessory details including additional images = page 20

*Does not work with ADA compliant gratings

Load Class E

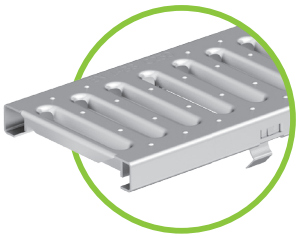
(with Ductile Iron grates)

Gratings FILCOTEN® T1500 with fiX self-locking system.

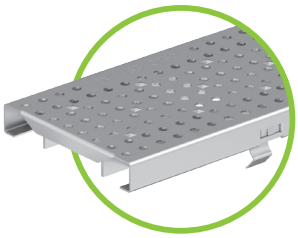
Grate Model Number	Grates	Material	Dimensions in inches	Load class as per ANSI Standard	Slot-/mesh-width	Weight/pc. LBS	Weight/pc. kg.	Inlet cross-section (Free Area)	List Price, Each, Add	List Price, Per Foot, Add
T1500-PG-FSC	Slotted	galvanized steel	4.80" x 39.40"	C- Heavy Duty	0.31" wide x 3.15" slots (8x80 mm)	9.92	4.5	30.7 sq. inches	$155.00	$47.21
T1500-PG-FSC-500	Slotted	galvanized steel	4.80x 19.68"	C- Heavy Duty	0.31" wide x 3.15" slots (8x80 mm)	4.85	2.2	15.4 sq. inches	$141.75	$86.43
T1500-PG-FSSC	Slotted	stainless steel	4.80" x 39.40"	C- Heavy Duty	0.31" wide x 3.15" slots (8x80 mm)	9.92	4.5	30.7 sq. inches	$208.00	$63.35
T1500-PG-FSSC-500	Slotted	stainless steel	4.80x 19.68"	C- Heavy Duty	0.31" wide x 3.15" slots (8x80 mm)	4.85	2.2	15.4 sq. inches	$190.00	$115.85
T1500-PG-FPC	Perforated	galvanized steel	4.80" x 39.40"	C- Heavy Duty	Ø 1/4" hole (6.0 mm)	7.27	3.3	29.78 sq. inches	$175.25	$53.38
T1500-PG-FPC-500	Perforated	galvanized steel	4.80x 19.68"	C- Heavy Duty	Ø 1/4" hole (6.0 mm)	3.74	1.7	14.11 sq. inches	$156.00	$95.12
T1500-PG-FSPC	Perforated	stainless steel	4.80" x 39.40"	C- Heavy Duty	Ø 1/4" hole (6.0 mm)	7.27	3.3	29.78 sq. inches	$279.00	$84.97
T1500-PG-FSPC-500	Perforated	stainless steel	4.80x 19.68"	C- Heavy Duty	Ø 1/4" hole (6.0 mm)	3.74	1.7	14.11 sq. inches	$190.00	$115.85
T1500-PG-PGC	Perforated	Polyamide	4.80x 19.68"	C- Heavy Duty	Ø 1/4" hole (8.0 mm)	2.42	1.1	22.47 sq. inches	$84.75	$51.68
T1500-PG-4-ADA	HEELSAFE bar	ductile iron	4.80x 19.68"	C- Heavy Duty	0.23" by 0.9" (29x6 mm)	7.93	3.6	26.35 sq. inches	$216.50	$132.01
T1500-PG-4-13-ADA	HEELSAFE bar	Galvanized ductile iron	4.80x 19.68"	C - Heavy Duty	0.23" by 0.9" (29x6 mm)	7.93	3.6	26.35 sq. inches	$385.00	$234.76
T1500-PG-4	Ductile iron slotted	ductile iron	4.80x 19.68"	E- Extra Heavy Duty	0.55" wide x 3.94" slots (14x100 mm)	8.37	3.8	36.00 sq. inches	$95.00	$57.93
T1500-PG-4-13	Ductile iron slotted	Galvanized ductile iron	4.80x 19.68"	E- Extra Heavy Duty	0.55" wide x 3.94" slots (14x100 mm)	8.37	3.8	36.00 sq. inches	$180.00	$109.75
T1500-PG-FMC	Mesh	galvanized steel	4.80x 39.40"	C- Heavy Duty	.39" wide x 1.18" slots			26.35 sq. inches	$222.25	$67.69
T1500-PG-FMC-500	Mesh	galvanized steel	4.80x 19.68"	C- Heavy Duty	.39" wide x 1.18" slots			13.15 sq. inches	$111.00	$67.68

PER FOOT PRICE CALCULATION:
Full size bodies: The **T1500N** neutral body (with integral, heavy duty, 4mm thick galvanized steel rail) has a List Price of $288.00. Divide $288.00 by 39.40" (length of body) = $7.31 List per inch.
$7.31 x 12" = $87.72 List per foot. (Body with Integral, heavy duty, 4mm thick galvanized Steel Rail Only)
Full size standard ductile iron grates:
Divide the above List Price ($95.00 for the T1500-PG-4 for example) by length of the grate (19.68") = $4.8272 List per inch.
List per inch. $4.8272 x 12" = $57.93 List per foot. (Grate Only)
Therefore, a typical T1500 trench drain system is $145.65 List Price / foot ($87.72 + $57.93). This List Price includes the body with integral, heavy duty, 4mm thick galvanized steel rail, ductile iron grate (Load Class E), and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.
Note that the T1501 & other sloped bodies have a higher List Price than the T1500 neutral bodies. See page 10.

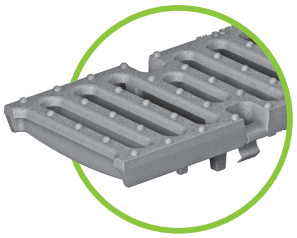
PER FOOT PRICE CALCULATION:
Full size bodies:
All **T1500N-3** bodies (with integral, heavy duty, 4mm thick stainless steel rail) have a List Price of $422.00
Divide $422.00 by 39.40" (length of the body) = $10.71 List per inch.
$10.71 x 12" = $128.52 List per foot. (Body with Integral, heavy duty, 4mm thick, Stainless Steel Rail Only)
One meter long fabricated stainless steel slotted grates:
Divide the above List Price ($208.00 for the T1500-PG-FSSC for example) by length of the grate (39.40") = $5.279 List per inch. $5.279 x 12" = $63.35 List per foot. (Grate Only)
Therefore, a typical T1500-3 trench drain system is $191.87 List Price / foot ($128.52 + $63.35). This List Price includes the body with integral, heavy duty, 4mm thick, stainless steel rail, fabricated slotted grate, and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.



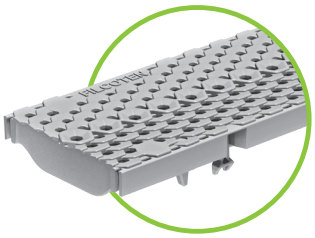
Slotted grates
galvanized or stainless steel
(FSC or FSSC Grates)



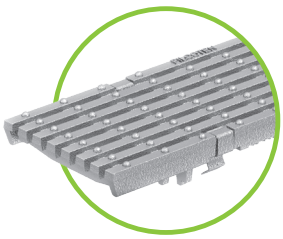
ADA Perforated grates
galvanized or stainless steel
(FPC or FSPC Grates)



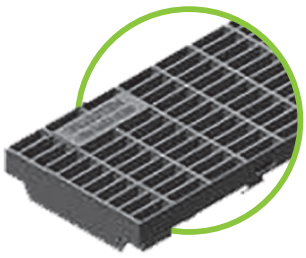
Ductile iron slotted grates
(T1500-PG-4)



ADA HEELPROOF COMBee composite grates with anti-slip surface structure
(T1500-PG-PGC)



ADA HEELPROOF ductile iron longitudal slotted grates
(T1500-PG-4-ADA)



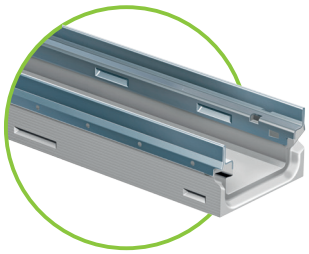
ADA galvanized steel mesh grates
(T1500-PG-FMC)

MIFAB® FILCOTEN®

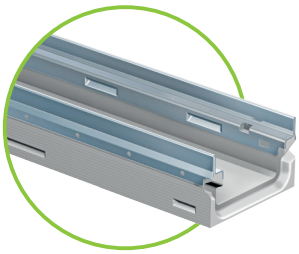
T1560 - 6" Wide Shallow Body (Only 2.36" Deep)

Load Class E

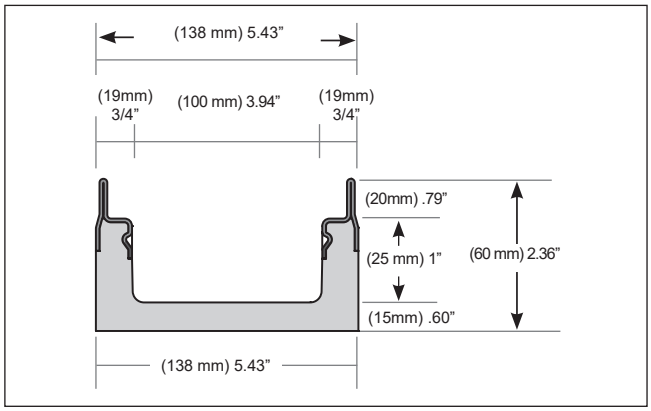
(with Ductile Iron grates)

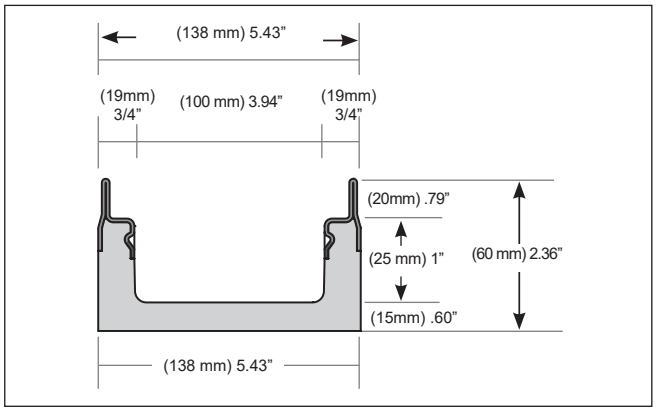


FILCOTEN® T1560
incl. galvanized steel rails



FILCOTEN® T1560-3
incl. stainless steel rails





PER FOOT PRICE CALCULATION:

Full size bodies: All **T1560** bodies (with integral, heavy duty, 4mm thick galvanized steel rail) have a List Price of $299.00. Divide $299.00 by 39.40" (length of body) = $7.59 List per inch.

$7.59 x 12" = $91.08 List per foot. (Body with Integral, heavy duty, 4mm thick galvanized Steel Rail Only)

Full size standard ductile iron grates:

Divide the above List Price ($95.00 for the T1500-PG-4 for example) by length of the grate (20") = $4.8272 List per inch.

List per inch. $4.8272 x 12" = $57.93 List per foot. (Grate Only)

Therefore, a typical T1560 trench drain system is $149.01 List Price / foot ($91.08 + $57.93). This List Price includes the body with integral, heavy duty, 4mm thick galvanized steel rail, ductile iron grate (Load Class E), and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.

PER FOOT PRICE CALCULATION:

Full size bodies:

All **T1560-3** bodies (with integral, heavy duty, 4mm thick stainless steel rail) have a List Price of $427.00

Divide $427.00 by 39.40" (length of the body) = $10.8375 List per inch.

$10.8375 x 12" = $130.05 List per foot. (Body with Integral, heavy duty, 4mm thick, Stainless Steel Rail Only)

One meter long fabricated stainless steel slotted grates:

Divide the above List Price ($208.00 for the T1500-PG-FSSC for example) by length of the grate (39.40") = $5.279

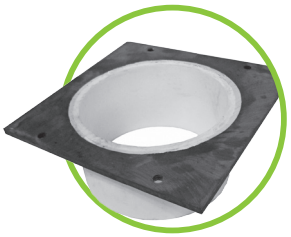
List per inch. $5.279 x 12" = $63.35 List per foot. (Grate Only)

Therefore, a typical T1560-3 trench drain system is $193.40 List Price / foot ($130.05 + $63.35). This List Price includes the body with integral, heavy duty, 4mm thick, stainless steel rail, fabricated slotted grate, and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.

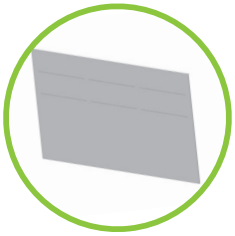
Body Part Number						Overall Body Depth		Maximum Flow Rate			Weight (Less Grate)	
Galvanized Steel Integral Rails	List Price, Each, Add	Stainless Steel Integral Rails	List Price, Each, Add	Body type	Slope	E1 (Min.)	E2 (Max.)	GPM*	LPS*	CFS*	Lbs.	kg.
T1560	$299.00	T1560-3	$427.00	Neutral	0 %	2.36" (60 mm)	2.36" (60 mm)	4.75	.30	0.011	18.73	8.5

for grate options, please refer to page 12

Accessories FILCOTEN® T1560.

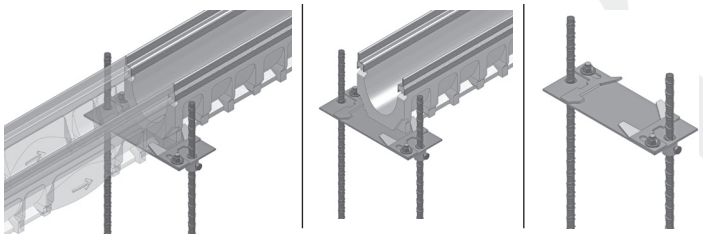


T1560-PBO2
No Hub Bottom Outlet (2")



T1560-PEC
Front / End Cap

T1500-REB (Rebar Support)

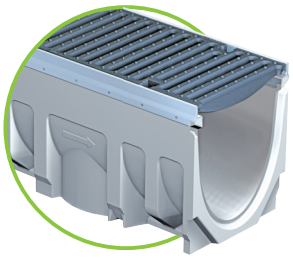


Optional Rebar support (T1500-REB)

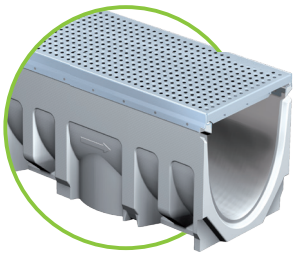
T1700 - 8" Wide

Load Class E

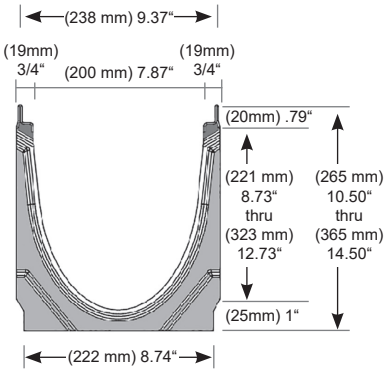
(with Ductile Iron grates)

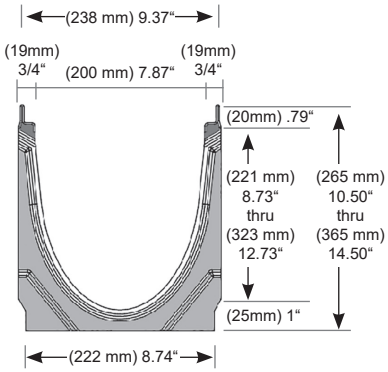


FILCOTEN® T1700
incl. galvanized steel rails



FILCOTEN® T1700-3
incl. stainless steel rails





T1700 - Per Foot Price Calculation:
Full size bodies: All T1700 bodies (with integral, heavy duty, 4mm thick galvanized steel rail) have a List Price of $542.50. Divide $542.50 by 39.40" (length of the body) = $13.769 List per inch.

$13.769 x 12" = $165.23 List per foot. (Body with integral, heavy duty, 4mm thick galvanized steel rail only)

Full size standard ductile iron grates:
Divide the List Price ($197.00 for the T1700-PG-4 for example) by length of the grate (19.68") = $10.01 List per inch. $10.01 x 12" = $120.12 List per foot. (Grate Only) Therefore, a typical T1700 trench drain system is $285.35 List Price / foot ($165.23 + $120.12).

This List Price includes the body with integral galvanized steel rail, ductile iron grate, and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.

T1700-3 - Per Foot Price Calculation:

Full size bodies:

All T1700-3 bodies (with integral, heavy duty, 4mm thick stainless steel rail) have a List Price of $878.00. Divide $878.00 by 39.40" (length of the body) = $22.2842 List per inch.

$22.2842 x 12" = $267.41 List per foot. (Body with integral, heavy duty, 4mm thick stainless steel rail only)

One metre long fabricated stainless steel slotted grates:

Divide the List Price ($885.00 for the T1700-PG-FSPC for example) by length of the grate (39.40") = $22.462

List per inch. $22.462 x 12" = $269.54 List per foot. (Grate Only) Therefore, a typical T1700-3 trench drain system is $536.95 List Price / foot (269.54 + $267.41).

This List Price includes the body with integral stainless steel rail, fabricated perforated grate, and four point self locking grate locking system. End caps, outlet connections and all other accessories are extra.

Note: The T1700 and T1700-3 (8" wide) are available in neutral trench drain bodies only. The T1700-ST (step connector) is required to connect the T1700N and T1700N-3 bodies to the T1710N and T1710N-3 and also to connect the T1710N and T1710N-3 bodies to the T1720N and T1720N-3. Pages 18 and 19 explain why neutral bodies are better to use than sloped bodies.

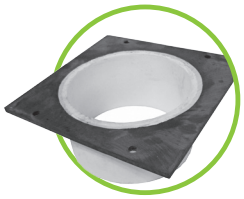
*GPM = Gallons per Minute
*LPS = Litres per Second
*CFS=Cubic Feet per Second

FILCOTEN® T1700.

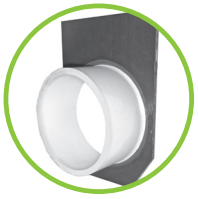
Body Part Number						Overall Body Depth		Maximum Flow Rate			Weight (Less Grate)	
Galvanized Steel Integral Rails	List Price, Each, Add	Stainless Steel Integral Rails	List Price, Each, Add	Body type	Slope	E1 (Min.)	E2 (Max.)	GPM*	LPS*	CFS*	Lbs.	kg.
T1700N	$542.50	T1700N-3	$878.00	Neutral	0 %	10.50" (265 mm)	10.50" (265 mm)	367.70	23.20	0.82	95.24	43.20
T1710N	$542.50	T1710N-3	$878.00	Neutral	0 %	12.50" (315 mm)	12.50" (315 mm)	518.30	32.70	1.15	114.64	52.00
T1720N	$542.50	T1720N-3	$878.00	Neutral	0 %	14.50" (365 mm)	14.50" (365 mm)	564.80	42.80	1.51	138.22	62.70

Accessories FILCOTEN® T1700.

Model Number	List Price, Each, Add	Description	Material	Weight	
				LBS	kg.
T1700-CB820	$1,430.00	Catch basin 8" wide with galvanized steel rails and 8" outlet with seal	FILCOTEN	105.82	48.0
T1700-3-CB820	$1,788.00	Catch basin 8" wide with stainless steel rails and 8" outlet with seal	FILCOTEN	105.82	48.0
T1700-CB820-SB	$100.00	Sediment bucket for catch basin	plastic	1.54	0.7
T1700-PEC	$75.00	Front/end cap	plastic	1.54	0.7
T1700-PBO4	$100.00	4" No Hub Bottom Outlet	plastic	2.42	1.1
T1700-PBO6	$100.00	6" No Hub Bottom Outlet	plastic	2.42	1.1
T1700-PBO8	$125.00	8" No Hub Bottom Outlet	plastic	2.42	1.1
T1700-PEO4	$100.00	4" No Hub End Outlet	plastic	2.42	1.1
T1700-PEO6	$100.00	6" No Hub End Outlet	plastic	2.42	1.1
T1700-PEO8	$125.00	8" No Hub End Outlet	plastic	2.42	1.1
T1700-PGLVP	$100.00	Vandal proof grate lockdown*	steel	0.22	0.1
T1700-REB	$100.00	Rebar support	steel	6.61	3.0
T1700-ST	$50.00	Step connector for T1700N / T1710N / T1720N	FILCOTEN		
T1700-PBDS	$93.50	Bottom Dome Strainer	plastic	0.20	0.1
T1700-CUT	$100	Cutting / per cut - Net Price only	-	-	-
Tees	$440.00 ($600.00 for the -3 bodies)	Fabricated tee	-	-	-
45°	$440.00 ($600.00 for the -3 bodies)	45°	45° body section	-	-
90°	$440.00 ($600.00 for the -3 bodies)	90°	90° body section	-	-



T1700-PBO4, 6 or 8
No Hub Bottom Outlet (4", 6" or 8")

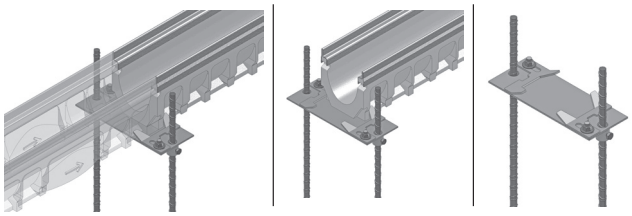


T1700-PEO4, 6 or 8
No Hub End Outlet (4", 6" or 8")

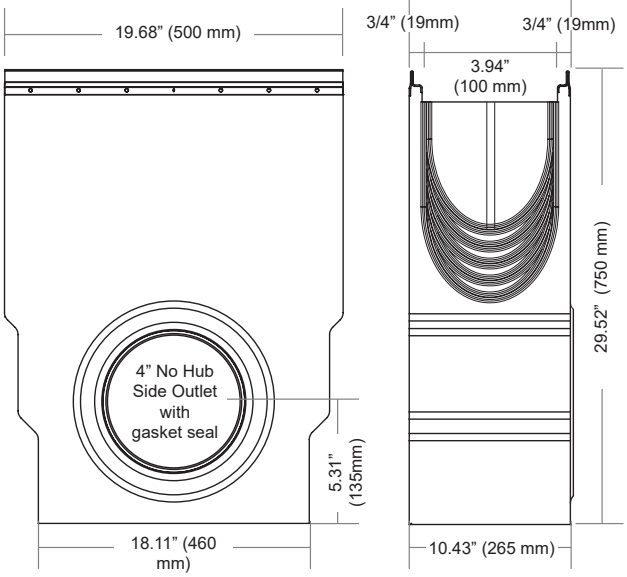
T1700-PEC
Front / End Cap

FILCOTEN® T1700 catch basin
(part #: T1700-CB820)

T1700-REB (Rebar Support)



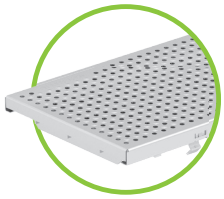
Optional Rebar support (T1700-REB)



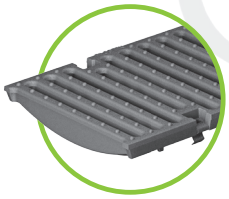
Gratings FILCOTEN® T1700 with fiX self-locking system.

Grate Part Number	Grates	Material	Dimensions in inches	Load class as per EN-standard	Slot / Hole Width	Weight/pc.		Inlet cross-section (Free Area)	List Price, Each, Add	List Price, Per Foot, Add
						LBS	kg.			
T1700-PG-FPC	Perforated	galvanized steel	8.74" x 39.40"	C - Heavy Duty	Ø 1/4" hole (6.0 mm)	28.66	13.00	104.33 sq. inches	$470.00	$143.15
T1700-PG-FPC-500	Perforated	galvanized steel	8.74"x 19.68"	C - Heavy Duty	Ø 1/4" hole (6.0 mm)	14.33	6.50	52.16 sq. inches	$374.00	$228.05
T1700-PG-FSPC	Perforated	stainless steel	8.74" x 39.40"	C - Heavy Duty	Ø 1/4" hole (6.0 mm)	28.66	13.00	104.33 sq. inches	$885.00	$269.54
T1700-PG-FSPC-500	Perforated	stainless steel	8.74"x 19.68"	C - Heavy Duty	Ø 1/4" hole (6.0 mm)	14.33	6.50	52.16 sq. inches	$710.00	$432.92
T1700-PG-4	Slotted	ductile iron	8.74" 19.68"	E- Extra Heavy Duty	0.55" wide x 7.87" slots (14x200 mm)	18.95	8.6	74.78 sq. inches	$197.00	$120.12
T1700-PG-4-13	Slotted	Galvanized ductile iron	8.74" 19.68"	E- Extra Heavy Duty	0.55" wide x 7.87" slots (14x200 mm)	18.95	8.6	74.78 sq. inches	$330.00	$201.22

*Does not work with ADA compliant gratings

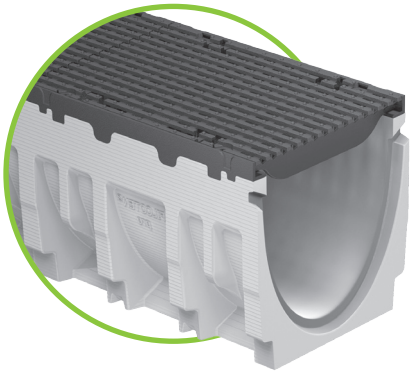


ADA Perforated grates
galvanized or stainless steel
(FPC or FSPC Grates)

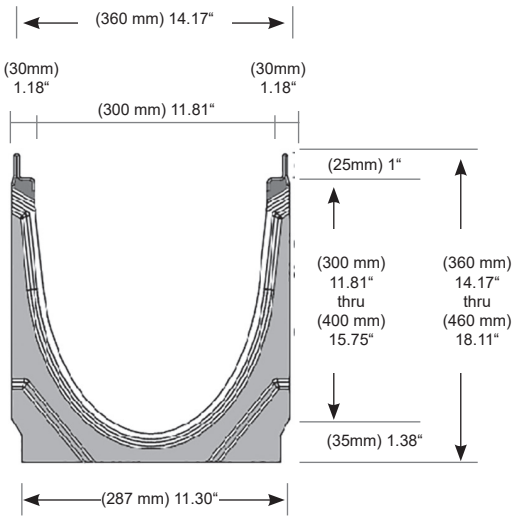


Ductile iron
slotted grates
(T1700-PG-4)

Accessory details including additional images = page 20



FILCOTEN® T1800
incl. cast iron rails



Note: The T1800 Series (with integral cast iron rails) are available in neutral trench drain bodies only. The T1800-ST (step connector) is required to connect the T1800N body to the T1810N and also to connect the T1810N body to the T1820N. Pages 18 and 19 explain why neutral bodies are better to use than sloped bodies.

T1800 - Per Foot Price Calculation:

Full size bodies:

All T1800 bodies (with integral, extra heavy duty, 5mm thick cast iron rail) have a List Price of $770.00. Divide $770.00 by 39.40" (length of the body) = $19.5431 List per inch.

$19.5431 x 12" = $234.52 List per foot. (Body with integral, extra heavy duty, 5mm thick cast iron rail only)

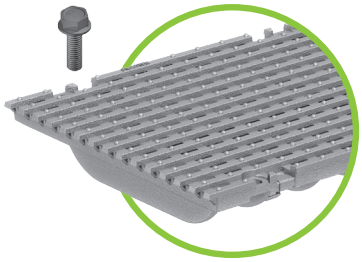
Full size standard ductile iron grates:

Divide the List Price ($580.00 for the T1800-PG-4 for example) by length of the grate (19.68") = $29.47

List per inch. $29.47 x 12" = $353.64 List per foot. (Grate Only)

Therefore, a typical T1800 trench drain system is $588.16 List Price / foot ($234.52 + $353.64).

This List Price includes the body with integral cast iron rail and ductile iron grate. The four point self locking grate locking system, end caps, outlet connections and all other accessories are extra.

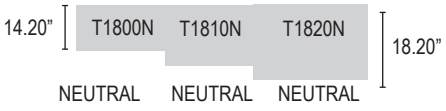


Ductile iron longitudinal slotted grating
4-point bolting
(T1800-PG-4)

FILCOTEN® T1800.

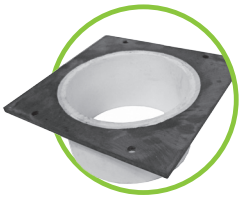
Body Part Number with cast iron rails	List Price, Each, Add	Body type	Slope	Overall Body Depth		Maximum Flow Rate			Weight (Less Grate)	
				E1 (Min.)	E2 (Max.)	GPM*	LPS*	CFS*	Lbs.	kg.
T1800N	$770.00	Neutral	0 %	14.20" (360 mm)	14.20" (360 mm)	870.20	54.90	1.94	170.42	77.30
T1810N	$770.00	Neutral	0 %	16.20" (410 mm)	16.20" (410 mm)	1103.20	69.60	2.46	199.08	90.30
T1820N	$770.00	Neutral	0 %	18.20" (460 mm)	18.20" (460 mm)	1348.90	85.10	3.01	244.05	110.70

*GPM = Gallons per Minute
*LPS = Litres per Second
*CFS=Cubic Feet per Second

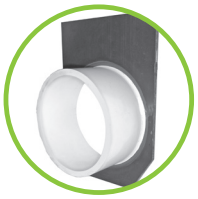


Gratings FILCOTEN® T1800 with 4-point bolting.

Model Number	Grates	Material	Dimensions in mm	Load class as per EN-standard	(Slot Width)	Weight/pc.		Inlet cross-section (Free Area)	List Price, Each, Add
						LBS	kg.		
T1800-PG-4	Longitudinal Slotted	ductile iron	13.62" x 19.68"	E -Extra Heavy Duty	1.14" by 0.51" (29x13 mm)	33.7	15.30	113.53 sq. inches	$580.00
T1800-PG-4-13	Longitudinal Slotted	galvanized ductile iron	13.62" x 19.68"	E -Extra Heavy Duty	1.14" by 0.51" (29x13 mm)	33.7	15.30	113.53 sq. inches	$910.00
T1800-BOLT	Bolts / nuts for Class E ductile iron longitudinal slotted grates (4 bolts per grate)								$29.00 (for 4 bolts - 1 grate)

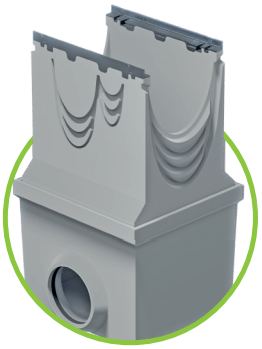


T1800-PBO8 or 10
No Hub Bottom Outlet (8" or 10")



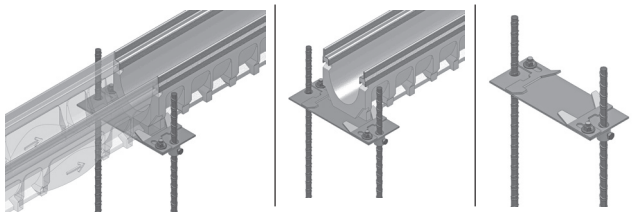
T1800-PEO8 or 10
No Hub End Outlet (8"or 10")

T1800-PEC
Front / End Cap

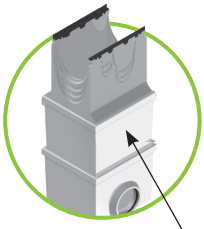


FILCOTEN® T1800
catch basin

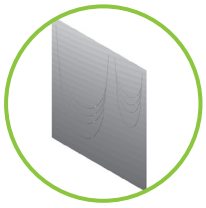
T1800-REB (Rebar Support)



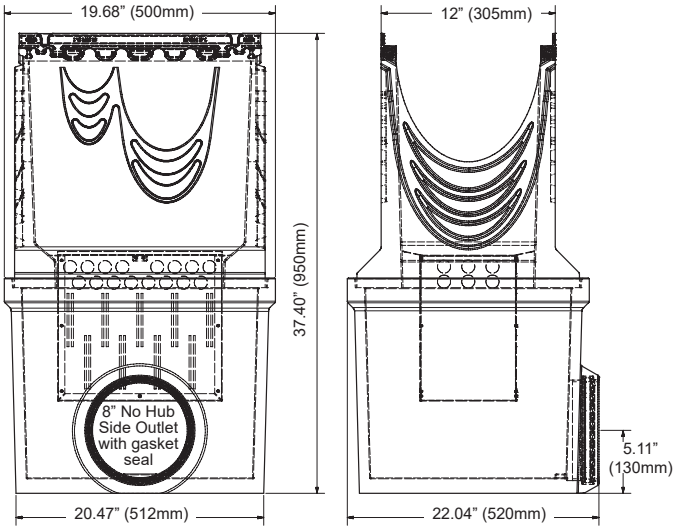
Optional Rebar support (T1800-REB)



T1800-CB-EXT
Optional catch basin extension



T1800-CB-PEC
Optional catch basin end cap



Accessories FILCOTEN® T1800.

Model Number	Description	Material	Weight LBS	Weight kg.	List Price, Each, Add
T1800-CB1220	Catch basin 12" wide with cast iron rails and 8" outlet with seal and connection for T1500/T1700/T1800	FILCOTEN	237.37	124.0	$1,650.00
T1800-CB-EXT	Catch basin extension unit	FILCOTEN	93.69	42.5	$1,000.00
T1800-CB-PEC	Catch basin adapter plates for connection with T1500 and T1700	galvanized steel	3.8	1.7	$75.00
T1800-CB1220-SB	Sediment bucket for catch basin	galvanized steel	7.1	3.2	$200.00
T1800-PEC	Front/end cap	galvanized steel	3.8	1.7	$75.00
T1800-PBO8	8" No Hub Bottom Outlet	galvanized steel	3.8	1.7	$100.00
T1800-PBO10	10" No Hub Bottom Outlet	galvanized steel	3.8	1.7	$125.00
T1800-PEO8	8" No Hub End Outlet	galvanized steel	3.8	1.7	$100.00
T1800-PEO10	10" No Hub End Outlet	galvanized steel	3.8	1.7	$125.00
T1800-REB	Rebar support	fabricated steel			$110.00
T1800-PBDS	Bottom Dome Strainer	plastic	0.20	0.1	$110.00
T1800-CUT	Cutting / per cut - Net Price only-	-	-	1.7	$495.00 Net Price Only
T1800-PGLVP	Vandal Proof Grate Lockdown	stainless steel	-	-	$110.00
Tees	Fabricated tee	-	-	-	$1,100.00
45°	45° body section	-	-	-	$1,100.00
90°	90° body section	-	-	-	$1,100.00
T1800-ST	Step Connector	fabricated steel	-	-	$100.00

*Does not work with ADA compliant gratings

Accessory details including additional images = page 20

Neutral Trench Drain Flow Rates vs. Sloped Trench Drain Flow Rates

It has been the custom in the United States and Canada to specify trench drain systems that have presloped bodies – under the assumption that presloped trench drains will provide a greater flow of water due to the sloped sections. Like many things in today's world, this custom has been accepted as the common practice. In contrast, for decades, specifiers in Europe specify neutral trench drain systems as their standard design. This is because neutral trench drain systems perform just as well (if not better) than sloped trench drain systems.

The advantages for the specifier, building owner, contractor and wholesaler to use neutral trench drain systems are:

1. Faster delivery to the jobsite as fewer sizes of trench drain bodies are needed.
2. No chance of installing the incorrect trench drain body in the proper numerical sloped order of the system.
3. Faster installation preparation because one size trench drain body does not require complicated site organization.
4. Faster installation due to same height of the trench drain body. Often, sloped trench drain bodies are mixed on a pallet - requiring time to sort and identify them. This is not the case with neutral bodies.
5. Increased flexibility, because the contractor can easily increase the number of neutral trench drain bodies in order to be have extensions or replacements. This is not possible with sloped trench drain bodies.
6. Lower overall cost to the building owner.

The flow rate of a trench drain is affected by three main factors: height of the bodies, width of the bodies and length of the run. Trench drain bodies with a greater height (assuming the width is the same) have more volume capacity and therefore a greater flow rate because the head pressure is greater when the water height is higher. Trench drain bodies that are wider than others have more volume capacity (assuming that the height of the water is the same) and as a result, a higher flow rate. The shorter the trench drain run, the greater the flow rate because of the build up of head pressure and greater velocity of water draining to the closer outlet.

A typical sloped trench drain system (see Figures 1-A and 1-B in the adjacent page) starts off with a shallow sloped body section and ends with a deeper sloped body section. This means that the body height is not consistent and the volume capacity of the sloped system is less than the volume capacity of a neutral system that has the same body height throughout the run. (see Figures 2-A and 2-B in the adjacent page).

Figures 1-A and 1-B illustrate a typical sloped trench drain system with flow rates of 98.27 GPM in the 10 metre run and 142.60 GPM in the 20 metre run. Figures 2-A and 2-B illustrate the MIFAB – FILCOTEN T1520N neutral trench drain system with flow rates of 99.20 GPM in the 10 meter run and 149.80 GPM in the 20 meter run. Note that the ending body height in a typical sloped 10 meter trench drain system (195 mm) is the same as all of the body heights in the MIFAB – FILCOTEN T1510N system (195 mm) and the ending body height in a typical sloped trench drain system (245 mm) is the same as all of the body heights in the MIFAB – FILCOTEN T1520N system (245 mm).

Therefore, take advantage of the greater flow rates and easier installation of the MIFAB-FILCOTEN neutral trench drain systems instead of the industry standard sloped trench drain systems.

Flow rate comparison calculation according to MANNING and STRICKLER

Note: You can see in the details below that the inner slope changes between a 10 meter run and a 20 meter run. This also explains why the flow rate will be substantially higher with a 10 meter run.

6" Wide Sloped vs. Neutral Flow Rate Comparison

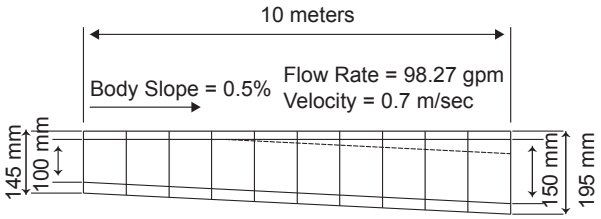


Figure 1-A Typical Sloped Trench Drain from Others

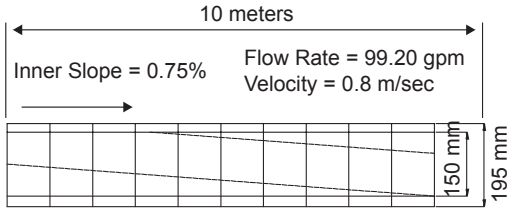


Figure 2-A Filcoten T1510N

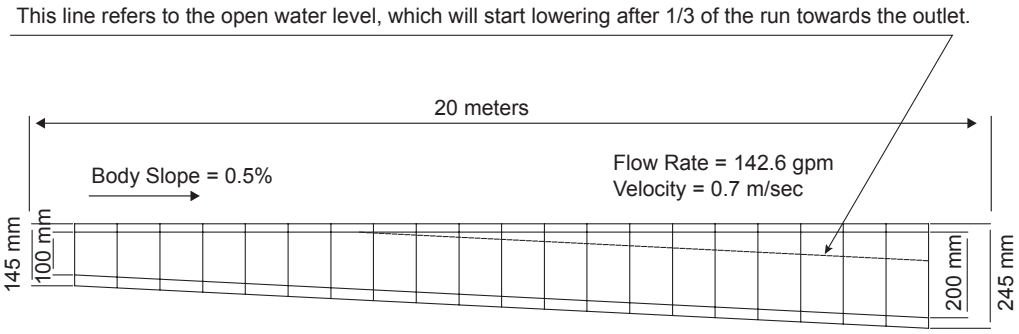


Figure 1-B Typical Sloped Trench Drain from Others

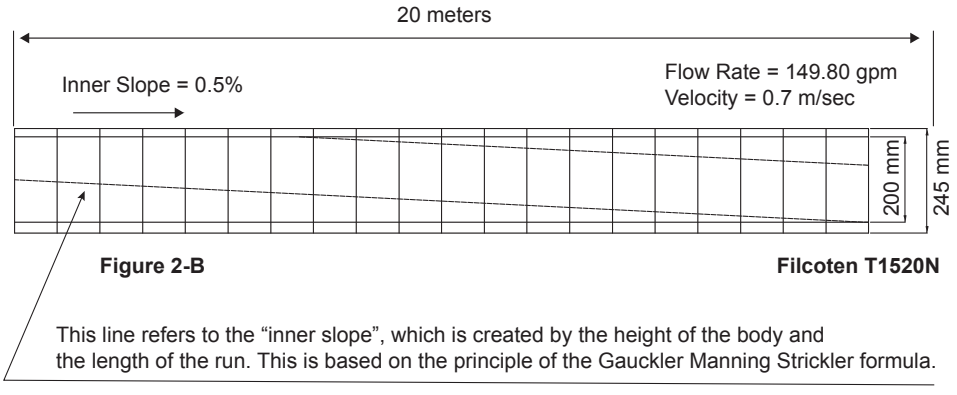
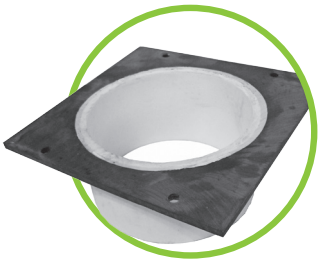


Figure 2-B Filcoten T1520N

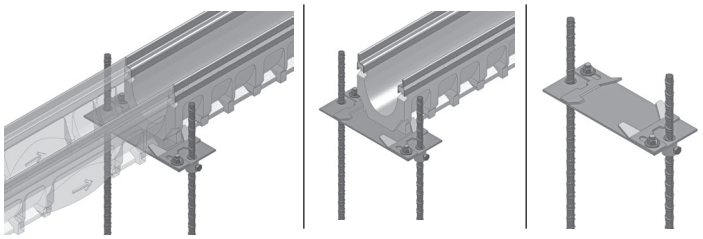
Note: A neutral run with a constant height of the bodies will always have a higher flow rate, because the total trench drain volume will be higher than a sloped system with 0.5 to 0.6% slope. An substantial increase in flow rate can only be achieved with a sloped system that has an slope of more than 1.6%. Note that sloped bodies available typically have a body slope of only 0.5% to 0.6%

Accessories

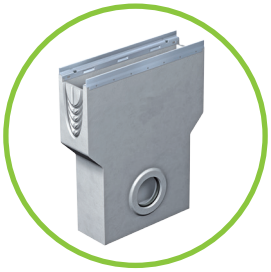


Prefabricated no hub bottom outlet

Rebar Support



Optional Rebar support



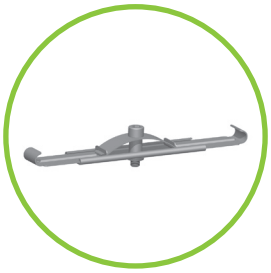
FILCOTEN catch basin

(the sediment bucket is optional. It is not standard.)

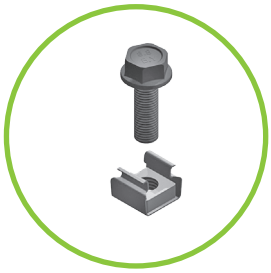
Plastic Sediment bucket for catch basins to fit all widths

Front / End Cap for all widths

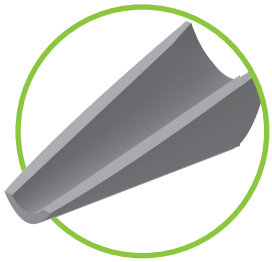
End cap with outlet for all widths



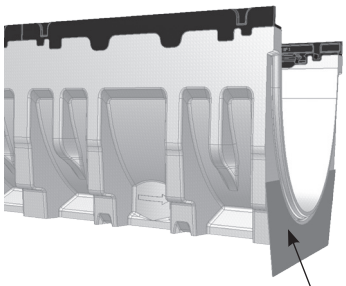
Anti-vandalism locking device for all grates (except perforated), ADA compliant. Two pieces required per grate



Galvanized Bolts / Nuts for the T1800 Load Class E Ductile Iron Grates



Step connector for connecting bodies with different heights (for T1500 and T1700)



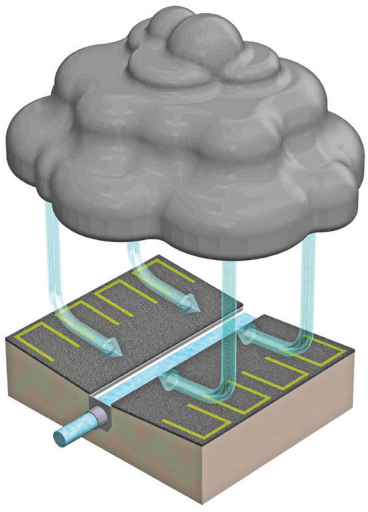
T1800-ST - Step Connector

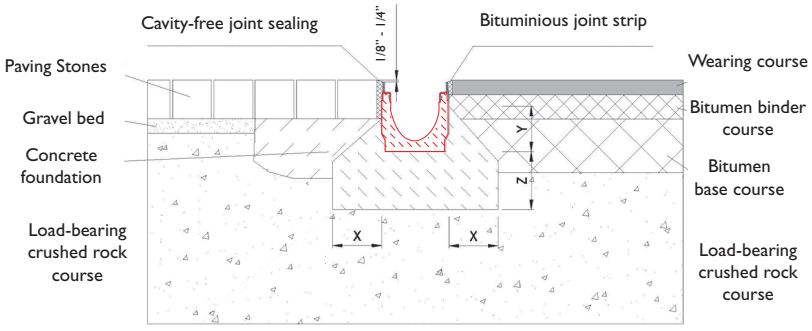
TYPICAL TRENCH DRAIN SIZING CONSIDERATIONS

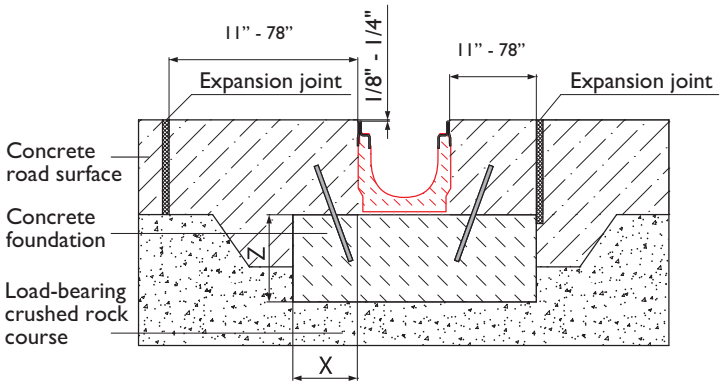
In order to size a trench drain system (length and width), the following information is required:

1. Length of trench drain run (feet or meters)
2. Length and width of the surface area draining into the trench drain (feet or meters)
3. Surface area type - concrete, pavement, asphalt, etc.
4. Rainfall intensity (in/hr or mm/hr) of the area where the trench drain will be installed.
5. Slope of the ground along the trench drain (%)
6. Perpendicular approach slopes to the trench drain (%)
7. Location of and number of outlets along the trench drain run
8. Any slab depth height restrictions

Please contact MIFAB's Engineering Department at sales@mifab.com for help to design your next trench drain project.







Load Class EN 1433	A15kN	B125kN	C250kN	D400kN	E600kN
PSI for T1500 & T1700	70	580	1160	1856	2784
PSI for T1800	58	483	971	1547	2320
Concrete	Minimum grade 4000PSI compressive strength concrete				
X	≥ 3.1" (8cm)	≥ 3.9" (10cm)	≥ 5.9" (15cm)	≥ 5.9" (15cm)	≥ 5.9" (15 cm)
Y	Body height minus 3.1" (8cm)			Body height minus 2" (5cm)	
Z	≥ 3.1" (8cm)	≥ 3.9" (10cm)	≥ 5.9" (15cm)	≥ 7.9" (20cm)	≥ 7.9" (20cm)
Reinforcement Bar	Not required			Consult Engineer	

**Required minimum quality strength concrete, which has to be adapted to the local requirements.

ATTENTION: Acceleration, braking and torque forces must be taken into consideration for product selection and installation. Installation must be performed according to the installation instructions.

Technical specifications are subject to change without further notice.

For further information visit us at www.mifab.com or contact our technical support team.

The following installation guidelines and installation examples are intended for conventional applications. The load class and installation site, as specified in DIN19580, must be adapted to local conditions by the respective architectural office. The codes and regulations generally familiar to the trade must be heeded during installation.

1. MIFAB® concrete bodies are to be laid on a concrete foundation, or in a drain concrete, paying attention to the desired fall during excavation. Depending on static requirements, a lateral support wedge may be necessary - for details see table and cross- sections. Body sections should, in principle, be placed into position using the appropriate tools.

2. For sloped bodies, observe the different heights. The body run should be placed into position starting at the discharge transition point. The direction of flow on each body is indicated by an arrow.

3. The connecting area between individual bodies may be sealed or bonded using suitable sealants - refer to the MIFAB Sealing System for material descriptions and quantity determination information.

4. Insert the grates into the bodies, and secure where applicable, or sufficiently brace the body against compression prior to laying the adjoining surface covering. Take care not to damage bodies during compaction of the surfacing and the surface covering (asphalt, paving stones, concrete, etc.).

5. A sufficiently large expansion joint, positioned 11" – 78" from the body, must be provided at the junction to the carriageway where horizontal forces are anticipated (e.g. for concrete surfaces, inclines, etc.). Expansion joints passing across the body run are to be positioned in the adjoining concrete surfaces so that they pass through a body joint.

6. Depending on the application, the frequency and speed with which bodies are crossed, in highly trafficked areas we recommend that covers are secured in position with the anti-vandalism locking device.

7. All adjacent surface coverings should be laid to be 1/8" - 1/4" permanently higher than the body surface in order to avoid mechanical damage (e.g. during snow clearance) and to ensure proper water runoff.

8. We recommend the installation of drainage bodies with stainless steel side edges and stainless steel covers in areas where the possibility of chemical influences (e.g. de-icing agents, acids, alkalis, etc.) is high.

The same installation principles apply to catch basins.

There are two main grate definitions in the trench drain industry to help specifiers select the appropriate grate: ANSI A112.21.1M and DIN 19580.

ANSI A112.21.1M

Grates and top rims shall be designed to meet the following loading classifications in a static condition.

 **Light Duty**	All grates having safe live load (as calculated in paragraph 6.1.6 of the ANSI Standard) under 2,000 lbs. (900 kg.) For pedestrian foot traffic only.
 **Medium Duty**	All grates having safe live load (as calculated in paragraph 6.1.6 of the ANSI Standard) between 2,000 lbs. (900 kg.) and 4,999 lbs. (2,250 kg.) For light pneumatic tire traffic only. Sidewalks and residential parking.
 **Heavy Duty**	All grates having safe live load (as calculated in paragraph 6.1.6 of the ANSI Standard) between 5,000 lbs. (2,250 kg.) and 7,499 lbs. (3,375 kg.) For Commercial Pneumatic tire traffic patterns and tractor trailors.
 **Extra Heavy Duty**	All grates having safe live load (as calculated in paragraph 6.1.6 of the ANSI Standard) between 7,500 lbs. (3,375 kg.) and 10,000 lbs. (4,500 kg.) For forklift traffic. Roads and Highways. H-20 Load Rated.
 **Special Duty**	All grates having safe live load (as calculated in paragraph 6.1.6 of the ANSI Standard) over 10,000 lbs. (4,500 kg.) For airport traffic.

DIN 19580/ EN1433

Grates and top rims shall be designed to meet the following loading classifications in a static condition.

 **Load Class A**	Light Duty Grate design load up to or exceeding 3,372 lbs per foot. (15 kn). For pedestrian foot traffic only.
 **Load Class B**	Medium Duty Grate design load of at least 28,100 lbs per foot. (125 kn). For light pneumatic tire traffic only. Sidewalks and residential parking.
 **Load Class C**	Heavy Duty Grate design load of at least 56,200 lbs per foot. (250 kn). Commercial Applications.
 **Load Class D**	Grate design load of at least 89,920 lbs per foot. (400 kn). For pneumatic forklift traffic. Extra Heavy Duty. Roads and Highways. H-20 Load Rated.
 **Load Class E**	Grate design load of at least 134,800 lbs per foot. (600 kn). For Commercial Solid tire traffic patterns, and impacts from steel struts or metal wheels (forklifts). Extreme Heavy Duty.
 **Load Class F**	Grate design load of at least 202,320 lbs per foot. (900 kn). For airport traffic.

Transportation Classifications

The American Association of State Highway and Transportation Officials' (AASHTO) "Standard Specification for Highway Bridges" defines H-20 loading as a two-axle truck with a maximum dual-wheel load of 16,000 lbs. HS-20 loading is defined as a tractor truck with a tandem axle semi-trailer with a dual- wheel load of 16,000 lbs.

The FAA (Federal Aviation Administration) Advisory Circular AC 150/5320-6D describes aircraft loading as 100,000 lbs. placed over a 9" x 9" area. The Americans with Disabilities Act (ADA) stipulates that the slot width be limited on gratings in walkways and elongated slots must be placed longitudinally so that they are perpendicular to the dominant direction of travel.

Heel Proof is defined as slots or perforations that are less than ¼" in width or diameter.

The maximum safe live load is calculated by dividing the load at failure by two.

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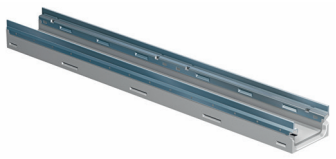
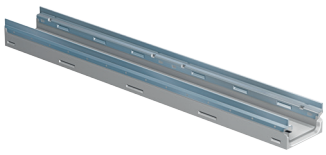
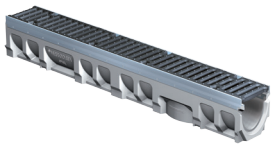
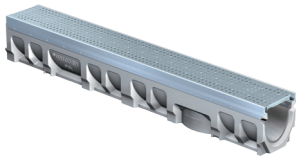
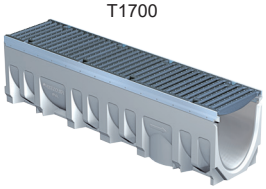
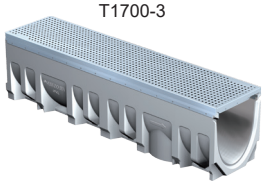
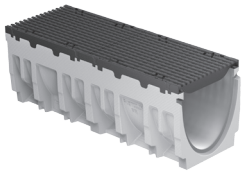
T1560 	T1560-3 
T1500 	T1500-3 
T1700 	T1700-3 
T1800 	T1500 catch basin 
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