ACO BoxDrain

Hygienic Stainless Steel Drainage
for Food & Beverage Applications

BoxDrain Bodies

BoxDrain Grates

Outlet Connections

ACO.

we care for water

The ACO Group

Founded in 1946, the ACO Group is a world leader in drainage technology. Industry changes set us a challenge to react effectively with innovative solutions to new environmental conditions. With its integrated approach, ACO provides systems for professional grade, efficient, and hygienic surface water and building drainage.

Major innovative strengths of the ACO Group are its continuous research and development and technical expertise in the processing of polymer concrete, plastics, cast iron, stainless steel and cement concretes.

ACO in Canada

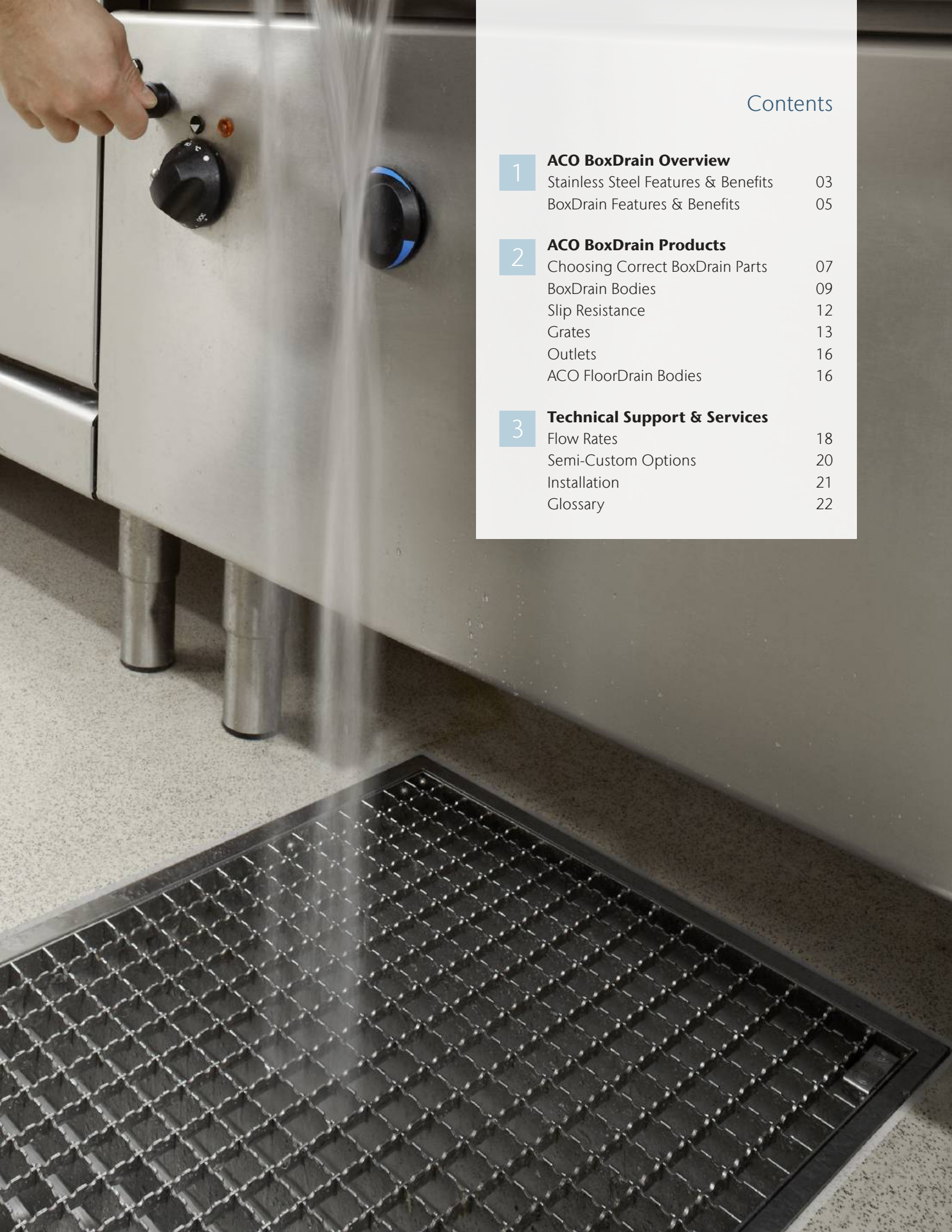
The ACO group was founded in 1946. ACO Systems, Ltd. was founded in 2006 in Ontario. Since the start, continuous growth in Canada has seen the company expand across all provinces and open an office and warehouse in Vancouver, British Columbia. Today ACO Canada has comprehensive sales and technical personnel and an extensive distribution network serving all provinces and territories.

ACO Building Drainage

ACO offers drainage systems designed to protect your business and the environment. The stainless steel drainage products are corrosion-resistant and built with hygiene in mind, ensuring the health and safety of workers, customers and products while still allowing clean-in-place functionality.

Products include:

- Modular Trench Drains
- Floor Drains
- Slot Drain Systems
- Hygienic push-fit pipes



Contents

Stainless Steel

Material For Handling Water

MATERIAL TECHNOLOGY

Long Term Value

The properties of stainless steel make it a powerful candidate in material selection. When total life cycle cost is considered, stainless steel is often the least expensive option.

In the building and construction industry, stainless steel is selected due to:

- Resistant to corrosion in pure water environments and to cleaning agents used in process plants
- Resistant to oxidation and scaling while retaining strength at high temperatures
- Easy cleaning makes it the correct choice for strict hygiene conditions
- Bright and easily maintained surface provides a modern and attractive appearance

These features make stainless steel an obvious choice for demanding drainage applications.

There is a variety of different stainless steels available. Austenitic stainless steels are the most widely used and encompass the generic 304 and 316L grades. These material grades are ideal for many applications found in food processing, dairy, commercial kitchens, pharmaceutical, chemical, winery and brewery industries.

304 grade stainless steel is the most common material available but grade 316L provides superior corrosion resistance and is ideal for conditions where extreme heat or chemicals are used.

Stainless steel is one of the most sustainable material choices available and is 100% recyclable. One benefit is that it reduces the consumption, expenses, energy and time to mine other valuable resources. On average the recycled content of stainless steel is 60%. Recycled stainless steel is beneficial to the environment as it consumes less energy and resources to produce.

PERFORMANCE

Corrosion and Temperature Resistance

Some industrial applications present a challenging environment for drainage systems. All systems featured are manufactured from stainless steel grade 304 or 316L. Products are finished with a pickle passivation process ensuring corrosion-free welded joints.

Environments where highly aggressive liquids such as acids, alkaline solutions or chlorine bearing agents are used, drainage products must be durable and corrosion resistant. For these applications, ACO recommends stainless steel systems be manufactured using grade 316L stainless steel.

PICKLING & PASSIVATION

Superior Finish and Protection

Bending, cutting, and welding during the manufacturing process results in damage to the stainless surface that can lead to corrosion. Pickling and passivation processes restore physical properties of stainless steel.

- Increases corrosion resitance
- Smooth uniform and attractive appearance
- Extends the life of the product

HYGIENE

Food and Employee Safety

Hygiene requirements can be intense and demanding; from consumption products such as beverage and food preparation, to medical facilities and processing plants.

- Stainless steel is an excellent material suitable for internal and external use for humans and animals, protecting against harmful bacteria and other contaminants
- ACO designs hygienic drains that promote efficient cleaning, protection against microorganisms and bacteria and ultimately minimizing financial risk to you
- ACO applies relevant hygienic design principles reserved for food contact surfaces or recommended by NSF/ANSI and EHEDG

Products shown with the HF symbol in the catalog indicate ACO's hygienic design that enhance the hygienic properties of stainless steel.

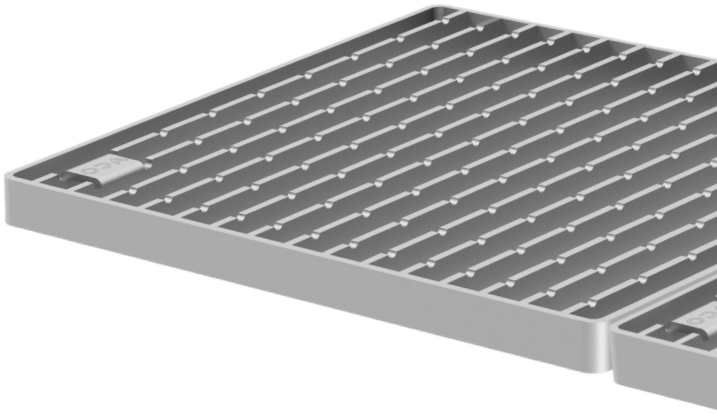
HygieneFirst HF

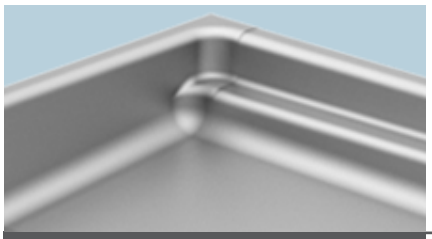
Drainage systems are a particularly important niche for the persistence of listeria and can be a source of food contamination. Poorly specified drainage leads to costly ongoing cleaning and maintenance and at worst it can result in food contamination.

HygieneFirst stands for ACO's commitment to ultimate hygienic performance. ACO addresses the hygienic requirements of floor drains and applies the design principles reserved for food contact equipment on them to deliver fully hygienic solutions.

- ACO is committed to raising industry standards by designing and promoting hygienic products for multiple commercial applications.
- Hygienic drainage systems reduce the risk of food contamination and optimize total cleaning costs of your organization.
- ACO drainage systems prioritize health and safety in the food sector for employees and end users.
- ACO efficient and hygienic designs reduce the usage of volatile cleaning agents that affect indoor air quality while promoting employee safety.

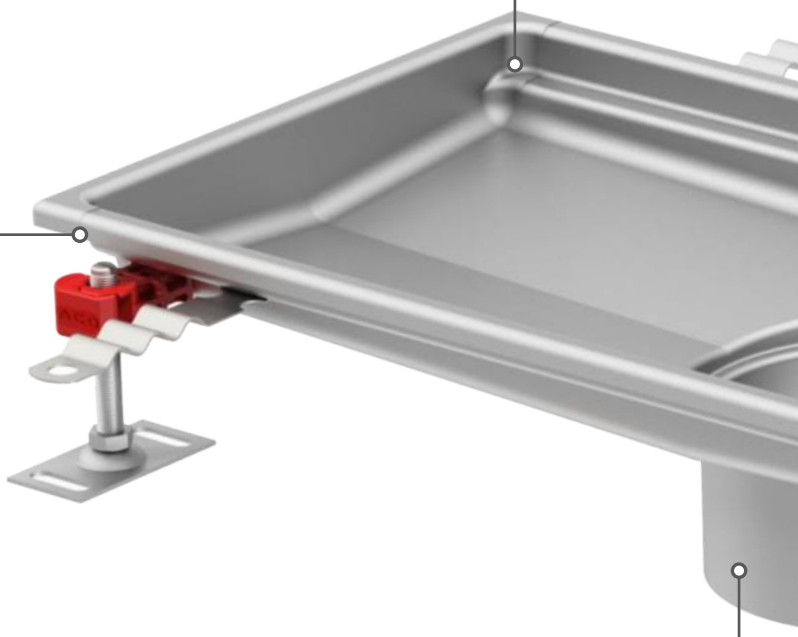
BoxDrain Hygienic Features & Benefits

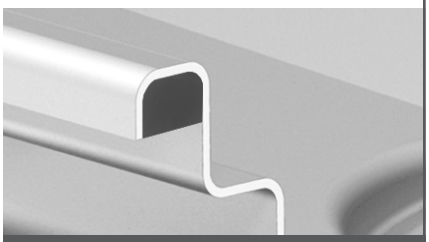




Internal Radii

All internal radii equal or larger than 1/8" (3 mm) which greatly increases cleaning effectiveness.





Edge In-fill

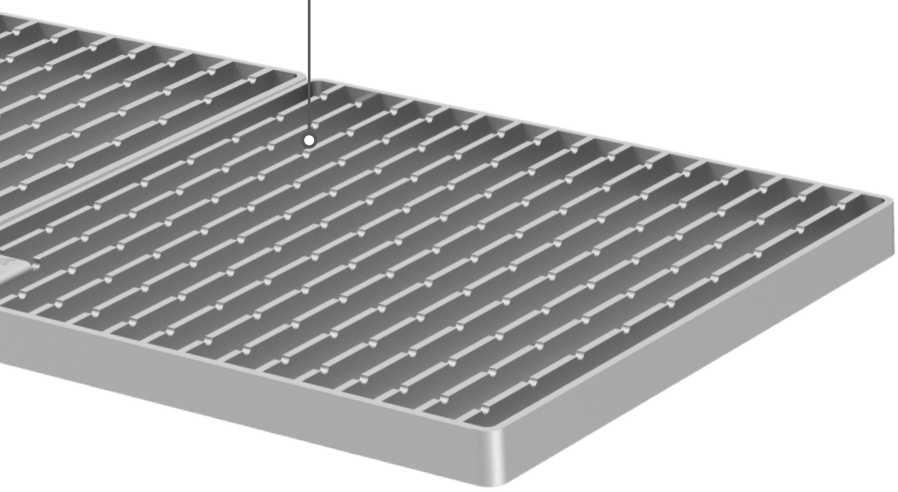
Ensures stable and durable connection between the floor drain and surrounding floor and helps to minimize risk of floor cracks which could harbor microorganisms.

Full Drainability

Dry sump design, completely drainable - eliminating standing water, smells, microbial growth and potential chemical hazards.

Grates

A variety of stainless steel grates are available and certified up to 5 tons. Unlocked grates make it easy to get access to the drain channels for maintenance.

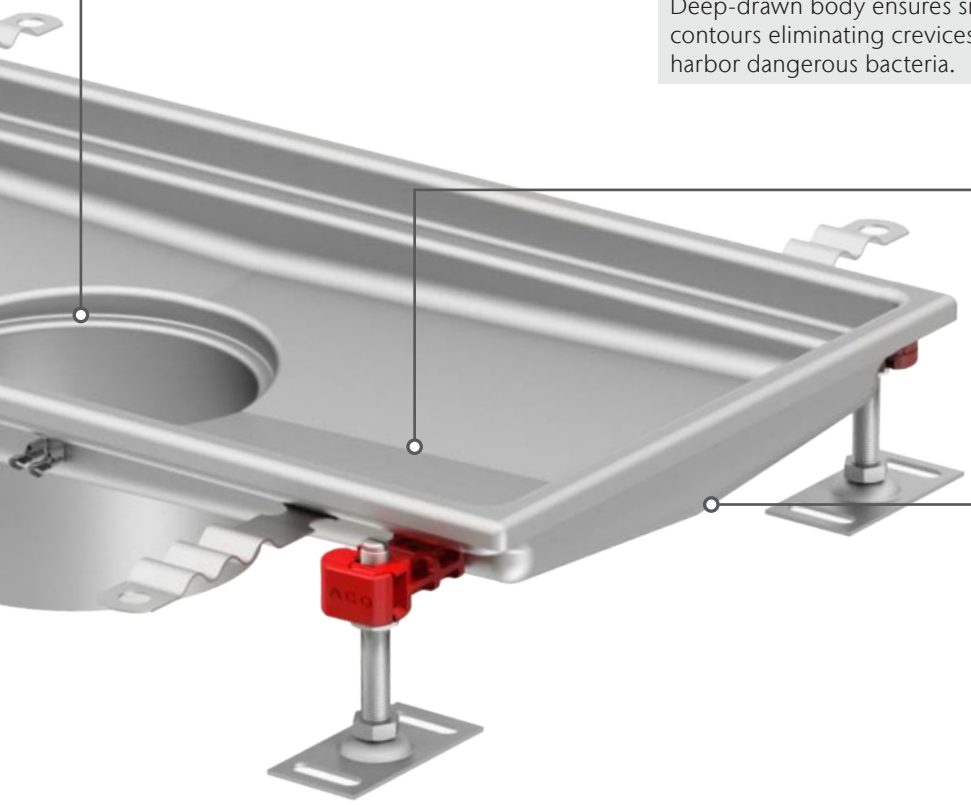


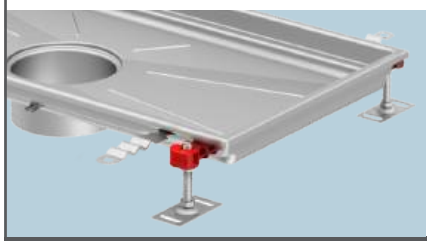
Hygienic Joints

Deep-drawn body ensures smooth contours eliminating crevices that can harbor dangerous bacteria.

Drain Body

V-shape bottom for width less than 12" (300 mm).





Drain Body

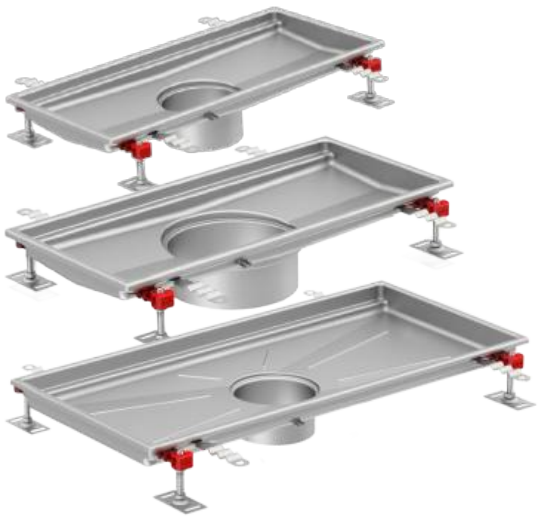
Reinforced bottom for width 16" (400 mm) and greater.

Choosing Correct BoxDrain Parts

ACO BoxDrain is available in a number of versions featuring variations in the following:

- Sizes
- Flow rates
- Grate designs
- Outlet positions
- Outlet diameters

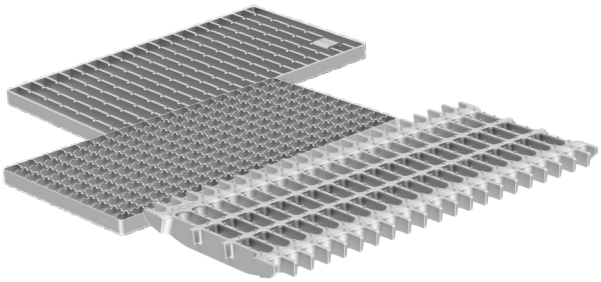
A box drain is necessary in commercial kitchens/restaurants and should be used in areas where steamers, dishwashers and other sources of wastewater are present.



1 Choose a BoxDrain Body

Consider the location of the box drain with respect to wastewater discharge equipment.

1. Volume of liquid discharge (Width and Length)
2. Choose outlet size



2 Choose a Grate

Consider type of traffic - pedestrian, carts, forklifts, etc. *See page 12* for more information on grate selection.

Factors to consider in grate selection:
1. Users - type of traffic and application
2. Safety features such as slip resistance
3. Appearance
4. Maintenance and hygienic features

3 Choose Accessories

Consider all debris types that will enter the drain system.

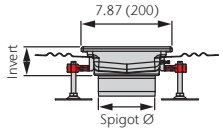
1. A range of debris strainer baskets for the collection of solid particles
2. A portable funnel is installed to prevent cross-contamination and spills from wastewater

Optional Stainless Steel P-Trap
(Refer to ACO Pipe Brochure)

Note:
BoxDrain can be connected to pipework if no membrane present.

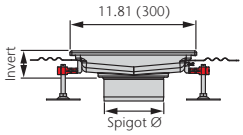
BoxDrain Bodies

8" BoxDrain200



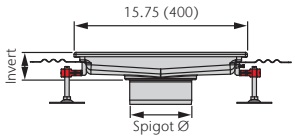
Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416608	**416590**	7.87 (200)	20.87 (530)	2.36 (60)	4.80 (122)	5.59 (142)[2]	10" FloorDrain Body with 4" Outlet *See page 17*
416609	**416591**		32.68 (830)				
416610	**416592**		40.55 (1030)				
416611	**416593**		48.43 (1230)				
416612	**416594**		60.24 (1530)				
416613	**416595**		79.92 (2030)				

12" BoxDrain300



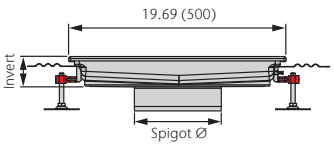
Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416635	**416621**	11.81 (300)	12.99 (330)	2.17 (55)	4.52 (55)	7.87 (200)[3]	200 mm Pipe *ACO Pipe Catalog* or ACO P-Trap *ACO Pipe Catalog* or 12" FloorDrain Body with 4"/6" Outlet *See page 17*
416636	**416622**		24.80 (630)	2.36 (60)	4.72 (120)		
416637	**416623**		40.55 (1030)				
416638	**416624**		60.24 (1530)				
416639	**416625**		79.92 (2030)				
416640	**416626**		119.29 (3030)	2.76 (70)	5.11 (130)		

16" BoxDrain400



Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416651	**416645**	15.75 (400)	16.93 (430)	2.36 (60)	4.72 (120)	7.87 (200)[3]	200 mm Pipe *ACO Pipe Catalog* or ACO P-Trap *ACO Pipe Catalog* or 12" FloorDrain Body with 4"/6" Outlet *See page 17*
416652	**416646**		24.80 (630)				
416653	**416647**		32.68 (830)				

20" BoxDrain500



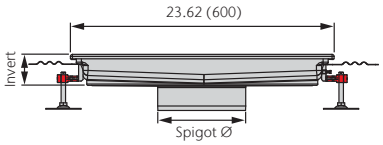
Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416663	**416657**	19.69 (500)	20.87 (530)	2.56 (65)	4.88 (124)	7.87 (200)[3]	200 mm Pipe *ACO Pipe Catalog* or ACO P-Trap *ACO Pipe Catalog* or 12" FloorDrain Body with 4"/6" Outlet *See page 17*
416664	**416658**		32.68 (830)				
416665	**416659**		40.55 (1030)				

Note:
Refer to page 17 for FloorDrain bodies.

1. Use 414339/414340 or 445232/445233 debris strainer basket - See page 10
2. Use 408202/408212 or 445234/445235 debris strainer basket - See page 10
3. Use 408222/408232 or 445236/445237 debris strainer basket - See page 10

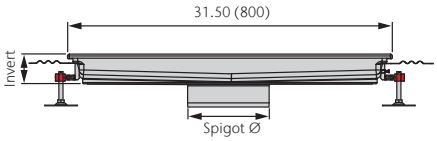
BoxDrain Bodies & Accessories

24" BoxDrain600



Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416669	**416666**	23.62 (600)	24.80 (630)	2.76 (70)	5.11 (130)	7.87 (200)[3]	200 mm Pipe *ACO Pipe Catalog* or ACO P-Trap *ACO Pipe Catalog* or 12" FloorDrain Body with 4"/6" Outlet *See page 17*
416670	**416667**		36.61 (930)		4.88 (124)		
416671	**416668**		48.43 (1230)		4.92 (125)		

32" BoxDrain800



Part No. AISI 316L	Part No. AISI 304	Overall Width in (mm)	Overall Length in (mm)	Invert Depth in (mm)	Overall Depth in (mm)	Spigot Ø in (mm)	Outlet Options
416673	**416672**	31.50 (800)	32.68 (830)	3.15 (80)	5.23 (133)	7.87 (200)[3]	200 mm Pipe *ACO Pipe Catalog* or ACO P-Trap *ACO Pipe Catalog* or 12" FloorDrain Body with 4"/6" Outlet *See page 17*

Debris Strainer Baskets

Part No. AISI 316L	Part No. AISI 304	Depth in (mm)	For Spigot Ø in (mm)
408212	**408202**	2.0 (50)	5.59 (142)
445235	**445234**	3.9 (100)	
408232	**408222**	2.0 (50)	7.87 (200)
445237	**445236**	5.3 (135)	

Portable Funnel

Part No. AISI 316L	Part No. AISI 304	Depth in (mm)	For Spigot Ø in (mm)
N/A	**415821**	9.84 (250)	9.84 (250)

Note:
Refer to page 17 for FloorDrain bodies.

1. Use 414339/414340 or 445232/445233 debris strainer basket
2. Use 408202/408212 or 445234/445235 debris strainer basket
3. Use 408222/408232 or 445236/445237 debris strainer basket

BoxDrain Grate Selection

RELEVANT LOAD STANDARDS

In Canada, the CSA B79-08 (R2013) is the most relevant standard. However, it is designed primarily for floor drains, and does not effectively address linear trench drains. ACO has independent certification for floor drains to ASME 112.3.3 and EN 1253, but all trench drains are tested to EN 1433 : 2002 Drainage channels for vehicular and pedestrian areas.

To assist with evaluating and comparing these standards to ACO products, a guide is provided below equating stresses (psi) from CSA B79-08 (R2013) Load categories to the Load Class A - F categories from EN 1433. It is also broken down by internal channel widths. A comparison to EN 1243 : 2015 Gullies for Buildings is also provided. Load class certification for each product is available upon request.

CSA B79-08 (R2013) Commercial and residential drains and cleanouts Safe Live Load	**EN 1433** **Load class of similar rating:**			**EN 1253** **Load class of similar rating:**
	4<8" channel	**8<12" channel**	**>12" channel**	**All channel widths**
Light Duty up to 1.96kN (440.6lbf), foot traffic	**A - B**	**A - B**	**A - C**	**L 15**
Medium Duty up to 8.83kN (1985.1lbf), light vehicular	**B - C**	**B - D**	**C - D**	**R 50**
Heavy Duty up to 16.18kN (3637.4lbf), medium truck	**C - D**	**D**	**D - E**	**M 125**
Extra Heavy Duty up to 33.84kN (7607.5lbf),	**D - E**	**E**	**E - F**	**N250**
Special Duty all above Extra Heavy Duty	**E - F**	**E - F**	**F**	**P400**

BOXDRAIN GRATE QUANTITIES

BoxDrains and grates are available in various lengths. The table below assists with selecting the appropriate size and calculating the quantity of grates to use for your project. Note: Available grate styles vary by length.

Overall Box Drain Length in (mm)	Internal Box Drain Length in (mm)	Example	
		Grate Length in (mm)	Grate Qty
12.99 (330)	11.81 (300)	11.73 (298)	1
16.93 (430)	15.75 (400)	15.67 (398)	1
20.87 (530)	19.69 (500)	19.65 (499)	1
24.80 (630)[1]	23.62 (600)	23.54 (598)	1
32.68 (830)	31.50 (800)	15.67 (398)	2
36.61 (930)	35.43 (900)	11.73 (298)	3
40.55 (1030)	39.37 (1000)	19.65 (499)	2
48.43 (1230)[2]	47.24 (1200)	23.54 (598)	2
60.24 (1530)	59.06 (1500)	19.65 (499)	3
79.92 (2030)	78.74 (2000)	19.65 (499)	4
119.29 (3030)	118.11 (3000)	19.65 (499)	6

Note:
1. Could also use 2 qty 11.73" (298 mm) grates
2. Could also use 3 qty 15.67" (398 mm) grates, or 4 qty 11.73" (298 mm) grates

BoxDrain Grate Selection (Cont.)

SLIP RESISTANCE

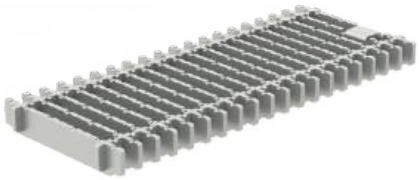
Slip resistance is critical for user safety in pure water environments or wet floor areas.

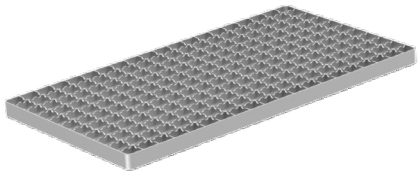
ACO recommends alignment between the slip resistance of the floor and of the grate to provide a smooth transition and not create a trip hazard.

A number of test options are available;

- **Pendulum Test -** Most accepted pedestrian slip resistance test method in the world. A pendulum is swung over a wet surface and friction properties are measured. Results are assigned a BPN value - values in excess of 36 would be used.
- **Variable Angle Ramp Test -** Grates are installed on a mechanical ramp that inclines while a user walks up and down until it becomes unstable. This test is repeated 3 times to create an average "R" value. The higher the "R value" the higher the slip resistance.

Slope, presence of surface contaminants (grease/oil), etc. can also negatively affect slip and skid resistance and may require a higher slip resistance grate.





Grate Style	Slip Resistance	Pendulum Test Data BPN Value	Wet Ramp Test Data R-Value
Ladder	✓	45	R11
Frameless Ladder	✓	51	R12
Mesh	✓	62	R11
Slot	✓	-	R11

BPN Value	Likelihood of a Slip*	BPN Value	R-Value
36	1 in a Million	11-18	R9
34	1 in 100,000	18-34	R10
29	1 in 10,000	34-51	R11
27	1 in 200	51-70	R12
24	1 in 20	70+	R13

** Construction Industry Research and Information Association (UK CIRIA) Safer Surfaces to walk on 2006.*

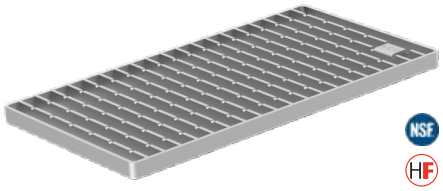
Slopes - ramps, etc. create an increased risk of slips, even a 5 degree slope requires a higher slip resistance value to be used - minimum Pendulum Test Value (BPN) of 45, or minimum of R12, ideally R13 rating for any slopes.

Flooring contaminants - water, grease, oils, etc. will affect slip resistance and higher slip resistance values should be considered. Application specific test can be carried out as necessary.

To minimize the slip/trip hazard impact of a drainage grate, where possible, design the drainage system to be located out of the main area of traffic - close to equipment, walls etc. This may also allow a lower load rating to be used.

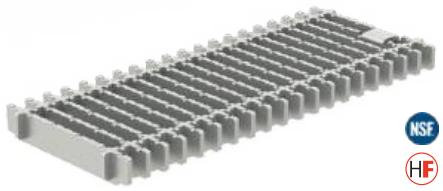
BoxDrain Grates

Ladder Grate



Part No. AISI 316L	Part No. AISI 304	Load Class To suit Box Drain Width in (mm)	Grate Length in (mm)	EN 1433	ASME	EN 1253	Slip Resistance	Open Area sq in
416809	**416808**	7.87 (200)	15.75 (400)	A15	LD	R50	✓	80.2
416803	**416802**		19.69 (500)					101.0
416811	**416810**		15.75 (400)	B125	MD	M125		76.7
416805	**416804**		19.69 (500)					96.5
416847	**416846**		15.75 (400)	C250	HD	N250		87.9
416845	**416844**		19.69 (500)					92.3
416813	**416812**	11.81 (300)	11.81 (300)	A15	LD	R50	✓	98.0
416815	**416814**		19.69 (500)					164.8
416817	**416816**		11.81 (300)	B125	MD	M125		92.1
416819	**416818**		19.69 (500)					156.7
416851	**416850**		11.81 (300)	C250	HD	N250		87.7
416849	**416848**		19.69 (500)					161.1
416821	**416820**	15.75 (400)	15.75 (400)	A15	LD	R50	✓	180.9
416823	**416822**		23.62 (600)					274.6
416825	**416824**		15.75 (400)	B125	MD	M125		172.6
416827	**416826**		23.62 (600)					261.4
416831	**416830**	19.69 (500)	15.75 (400)	A15	LD	R50	✓	221.1
416829	**416828**		19.69 (500)					279.0
416835	**416834**		15.75 (400)	B125	MD	M125		214.6
416833	**416832**		19.69 (500)					269.8
416839	**416838**	23.62 (600)	11.81 (300)	A15	LD	R50	✓	191.4
416843	**416842**	31.50 (800)	15.75 (400)	A15	LD	R50	✓	356.1

Frameless Ladder Grate



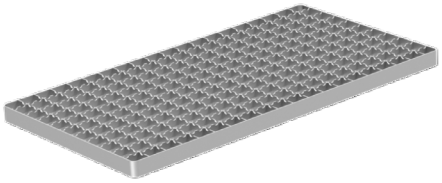
Part No. AISI 316L	Part No. AISI 304	Load Class To suit Box Drain Width in (mm)	Grate Length in (mm)	EN 1433	ASME	EN 1253	Slip Resistance	Open Area sq in
446251	**446250**	7.87 (200)	15.75 (400)	A15	LD	R50	✓	76.2
446247	**446246**		19.69 (500)					95.5
446253	**446252**		15.75 (400)	B125	MD	M125		72.6
446249	**446248**		19.69 (500)					90.7
446259	**446258**	11.81 (300)	11.81 (300)	A15	LD	R50	✓	94.7
446255	**446254**		19.69 (500)					158.7
446261	**446260**		11.81 (300)	B125	MD	M125		89.9
446257	**446256**		19.69 (500)					150.7

Tested and Certified by NSF International.

Grates feature a hygienic design.

BoxDrain Grates

Mesh Grate



Part No. AISI 316L	Part No. AISI 304	Load Class: To suit Box Drain Width in (mm)	Load Class: Grate Length in (mm)	EN 1433	ASME	EN 1253	Slip Resistance	Open Area sq in
416863	**416862**	7.87 (200)	15.75 (400)	A15	LD	L15	✓	85.1
416861	**416860**		19.69 (500)					106.7
416865	**416864**	11.81 (300)	11.81 (300)					101.8
416867	**416866**		19.69 (500)					172.0
416869	**416868**	15.75 (400)	15.75 (400)					188.5
416871	**416870**		23.62 (600)					284.3
416875	**416874**	19.69 (500)	15.75 (400)					240.4
416873	**416872**		19.69 (500)					302.5
416877	**416876**	23.62 (600)	11.81 (300)					219.4
416879	**416878**	31.50 (800)	15.75 (400)					360.4

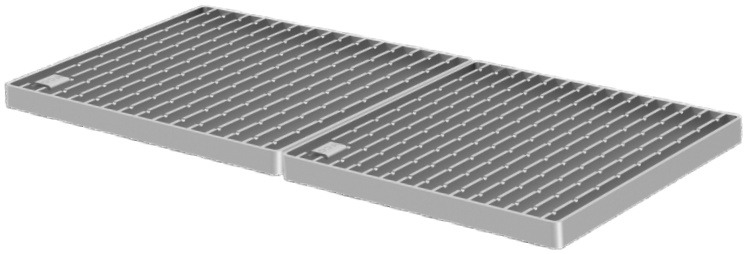
Slot Cover Grate

Part No. AISI 316L	Part No. AISI 304	Load Class: To suit Box Drain Width in (mm)	Load Class: Grate Length in (mm)	EN 1433	ASME	EN 1253	Slip Resistance	Open Area sq in
445763	**445762**	7.87 (200)	15.75 (400)	A15	LD	L15	✓	9.2
445757	**445756**		19.69 (500)					11.3
445765	**445764**		15.75 (400)	B125	MD	M125		9.2
445759	**445758**		19.69 (500)					11.3
445761	**445760**		15.75 (400)	C250	HD	N250		9.2
445767	**445766**		19.69 (500)					11.3
445775	**445774**	11.81 (300)	11.81 (300)	A15	LD	L15	✓	7.0
445769	**445768**		19.69 (500)					11.3
445777	**445776**		11.81 (300)	B125	MD	M125		7.0
445771	**445770**		19.69 (500)					11.3
445779	**445778**		11.81 (300)	C250	HD	N250		7.0
445773	**445772**		19.69 (500)					11.3

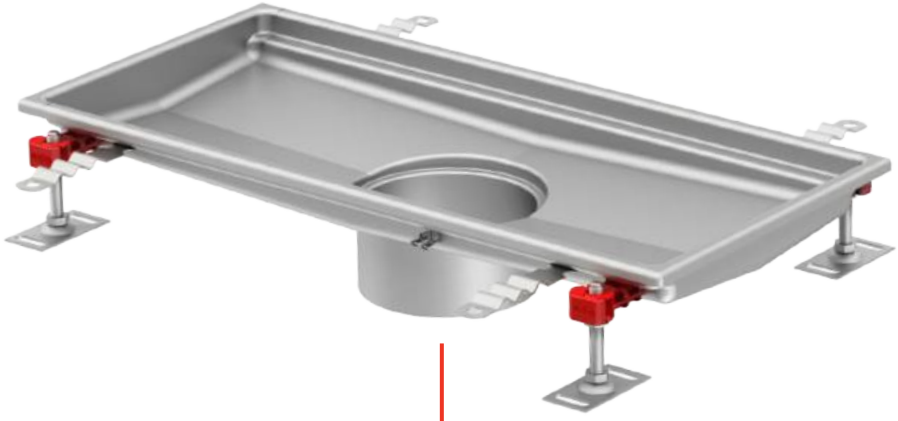
Tested and Certified by NSF International.

Grates feature a hygienic design.

BoxDrain Outlet Connections



GRATES



BOXDRAIN BODY

Prevents debris from entering the drainage system and eliminates clogs, spills and other plumbing related issues.

DEBRIS STRAINER BASKET

DIRECT PUSH PIPE CONNECTION
See ACO Pipe Catalog

P-TRAP CONNECTION
See ACO Pipe Catalog

OR

LONG SWEEP P-TRAP
See ACO Pipe Catalog

FLOORDRAIN BODY
See Page 17

BoxDrain Outlet Options

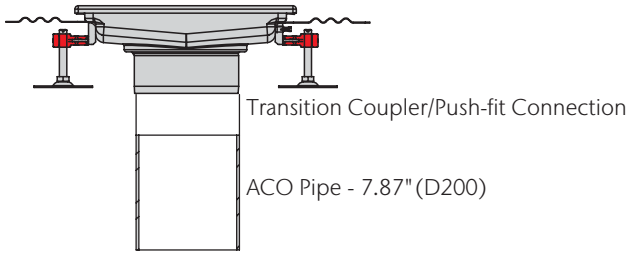
ACO stainless steel drain systems are compatible with existing underground waste water pipework.

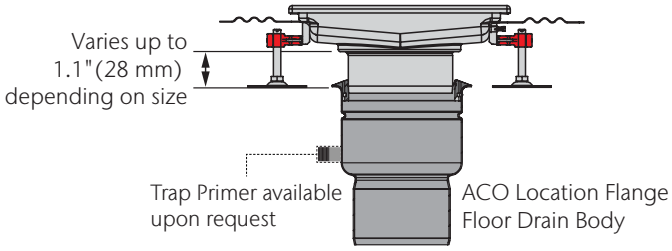
Common Connection Types:

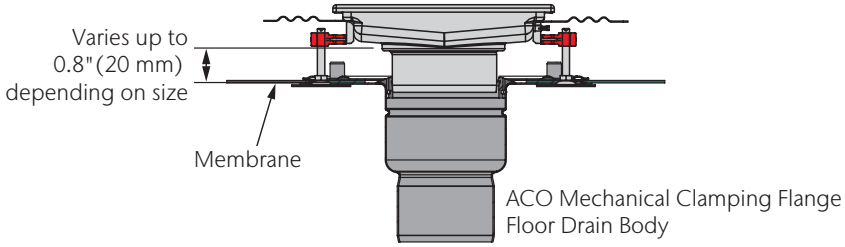
1. Vertical pipe spigot out of channel bottom. Simplest method to connect pipework. The connection can be made with a no-hub connector, or ACO stainless steel push-fit pipe system. ACO provides pipe and drain solutions set up prior to installation of flooring.

2. Use of a floor drain body with location flange. The floor drain body can be cast into the slab at the first concrete pour. The trench system is then set to finished height. The vertical spigot on the underside of the stainless steel trench will push-fit into the floor drain body. This gives variable height adjustment of approximately 1.1" (28 mm) vertically.

3. Use of a floor drain body with mechanical clamping flange. If the floor slab has a waterproof membrane, the membrane can be dressed into the floor drain body and the trench system installed afterwards. As with the location flange body, the vertical spigot on the underside of the stainless steel trench will push-fit into the floor drain body. This gives variable height adjustment of approximately 0.8" (20 mm) vertically.

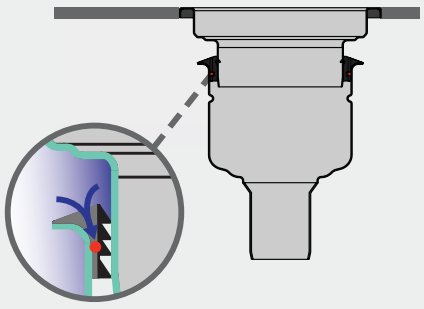




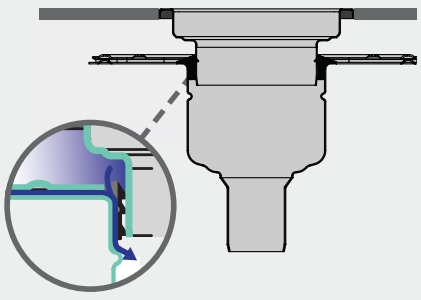


FRICTION RING

When using adjustable height floor drain with **location flange,** red sealing o-ring must be used to prevent water from entering body.



When using adjustable height floor drain with **mechanical membrane clamping flange,** red sealing o-ring must be removed to allow water to enter floor drain body through weep holes on friction ring.



Parts Table: FloorDrain Bodies

Location Flange Vertical Outlet

Part No. AISI 316L	Part No. AISI 304	Body Size	Fits Spigot Ø in (mm)	Flange Type	Outlet Ø in (mm)
445195	**445129**	10"	5.59 (142)	Location	4 (114)
445201	**445135**	12"	7.87 (200)		4 (114)
445207	**445141**				6 (168)

Location Flange Horizontal Outlet

Part No. AISI 316L	Part No. AISI 304	Body Size	Fits Spigot Ø in (mm)	Flange Type	Outlet Ø in (mm)
445219	**445153**	10"	5.59 (142)	Location	4 (114)
445225	**445159**	12"	7.87 (200)		4 (114)

Mechanical Membrane Clamp Vertical Outlet

Part No. AISI 316L	Part No. AISI 304	Body Size	Fits Spigot Ø in (mm)	Flange Type	Outlet Ø in (mm)
445199	**445133**	10"	5.59 (142)	Mechanical Membrane Clamp	4 (114)
445205	**445139**	12"	7.87 (200)		4 (114)
445211	**445145**				6 (168)

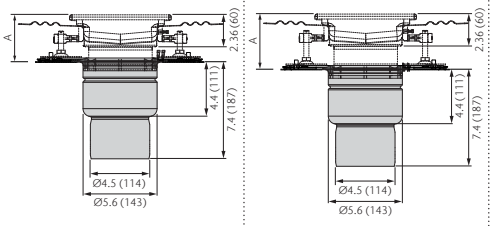
Mechanical Membrane Clamp Horizontal Outlet

Part No. AISI 316L	Part No. AISI 304	Body Size	Fits Spigot Ø in (mm)	Flange Type	Outlet Ø in (mm)
445223	**445157**	10"	5.59 (142)	Mechanical Membrane Clamp	4 (114)
445229	**445163**	12"	7.87 (200)		4 (114)

Note:
An automatic trap primer can be installed to the floor drain body to prevent the 'P' trap from drying out. Contact ACO for details.

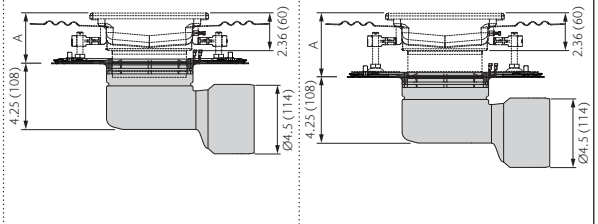
Flow Rates

8" BOXDRAIN200 WITH 10" FLOOR DRAIN BODY VERTICAL OUTLET



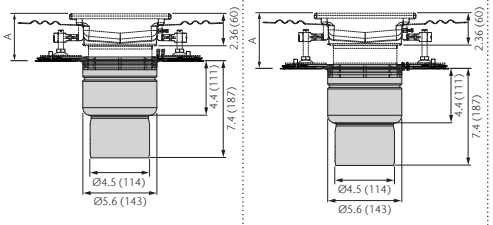
Outlet Diameter (Ø) in (mm)	A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)

8" BOXDRAIN200 WITH 10" FLOOR DRAIN BODY HORIZONTAL OUTLET



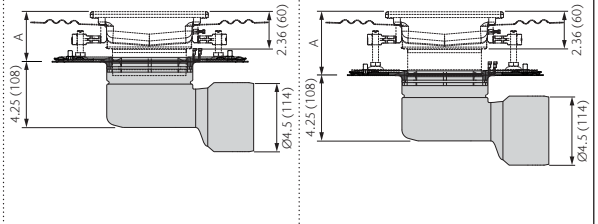
A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

12" BOXDRAIN300 WITH 12" FLOOR DRAIN BODY VERTICAL OUTLET



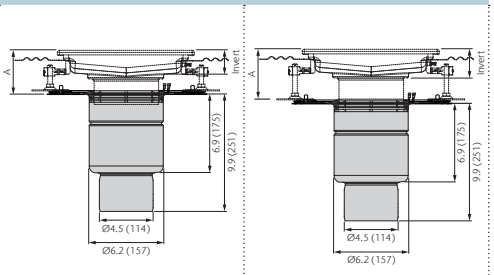
Outlet Diameter (Ø) in (mm)	A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)
6" SCH10 (Ø 168 mm)	348 (22.0)	362 (22.8)

12" BOXDRAIN300 WITH 12" FLOOR DRAIN BODY HORIZONTAL OUTLET



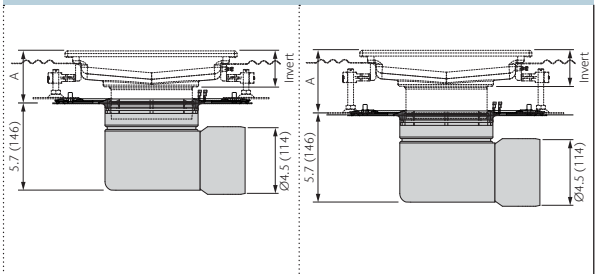
A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

16" BOXDRAIN400 WITH 12" FLOOR DRAIN BODY VERTICAL OUTLET



Outlet Diameter (Ø) in (mm)	A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)
6" SCH10 (Ø 168 mm)	348 (22.0)	362 (22.8)

16" BOXDRAIN400 WITH 12" FLOOR DRAIN BODY HORIZONTAL OUTLET

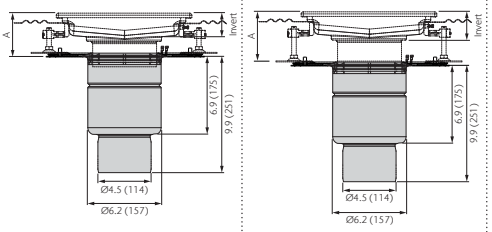


A = 2.60" (66 mm) Flow Rate gpm	A = 3.70" (94 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

Note:
1. Silt basket and debris/solids, or foul air trap will reduce flow rates.
2. Flow rates are based on drowned orifice calculations.
3. Box drain inverts will impact the A min/max - min is based on shallowest invert and max is based on deepest invert.
4. Risers are also available to increase installation heights from 1" to 3.5" or where multi waterproofing is needed. Contact ACO for details.

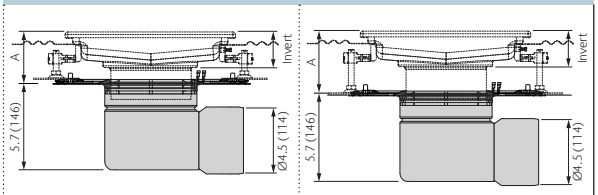
Flow Rates

20" BOXDRAIN500 WITH 12" FLOOR DRAIN BODY VERTICAL OUTLET



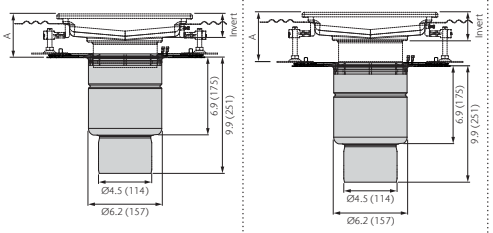
Outlet Diameter (Ø) in (mm)	A = 2.80" (71 mm) Flow Rate gpm	A = 3.80" (96 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)
6" SCH10 (Ø 168 mm)	348 (22.0)	362 (22.8)

20" BOXDRAIN500 WITH 12" FLOOR DRAIN BODY HORIZONTAL OUTLET



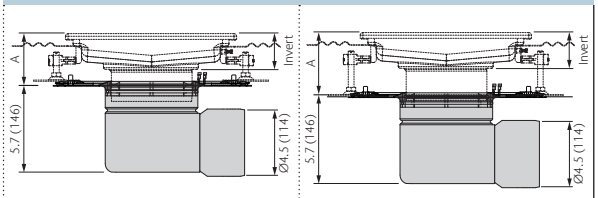
A = 2.80" (71 mm) Flow Rate gpm	A = 3.80" (96 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

24" BOXDRAIN600 WITH 12" FLOOR DRAIN BODY VERTICAL OUTLET



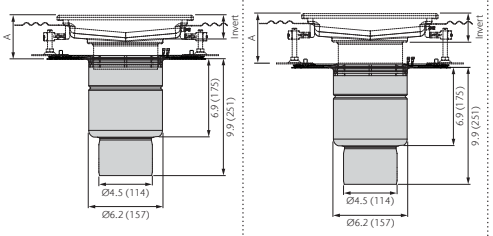
Outlet Diameter (Ø) in (mm)	A = 3.00" (76 mm) Flow Rate gpm	A = 4.00" (101 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)
6" SCH10 (Ø 168 mm)	348 (22.0)	362 (22.8)

24" BOXDRAIN600 WITH 12" FLOOR DRAIN BODY HORIZONTAL OUTLET



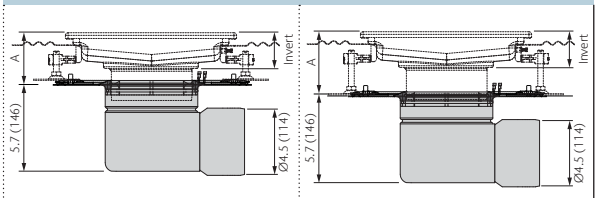
A = 3.00" (76 mm) Flow Rate gpm	A = 4.00" (101 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

32" BOXDRAIN800 WITH 12" FLOOR DRAIN BODY VERTICAL OUTLET



Outlet Diameter (Ø) in (mm)	A = 3.40" (86 mm) Flow Rate gpm	A = 4.40" (111 mm) Flow Rate gpm
4" SCH10 (Ø 114 mm)	154 (9.7)	162 (10.2)
6" SCH10 (Ø 168 mm)	358 (22.6)	372 (23.5)

32" BOXDRAIN800 WITH 12" FLOOR DRAIN BODY HORIZONTAL OUTLET



A = 3.40" (86 mm) Flow Rate gpm	A = 4.40" (111 mm) Flow Rate gpm
111 (7.0)	121 (7.6)

Note:

1. Silt basket and debris/solids, or foul air trap will reduce flow rates.

2. Flow rates are based on drowned orifice calculations.

3. Box drain inverts will impact the A min/max - min is based on shallowest invert and max is based on deepest invert.

4. Risers are also available to increase installation heights from 1" to 3.5" or where multi waterproofing is needed. Contact ACO for details.

Semi-Custom Options

ACO's box drains can be customized to fit specific configurations. Typical non-standard stainless steel drainage can include custom widths, special grates, and unique depth configurations. ACO has years of experience with these types of applications, and in instances where a standard or modified standard product cannot fulfil the project, please contact us.

Customers' individual project designs can be managed by our expert team with tailored services for specific projects, including complete technical support, CAD layout drawings and assembly instructions.

Contact our Sales/Technical department team to help find the best solution.

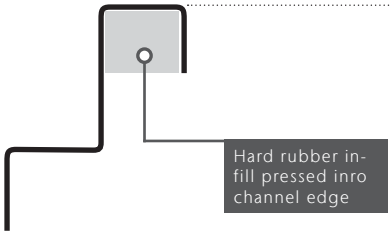
Customizations:

- Custom widths
- Custom depths
- Custom edge profile
- Built-in back splash upstand
- Custom invert depths
- Different gauge of material for box drain body
- Outlet position along box drain
- Custom silt baskets

CHANNEL EDGE OPTIONS

All ACO BoxDrain's are available with different edge details to suit varying load requirements and the surrounding floor material.

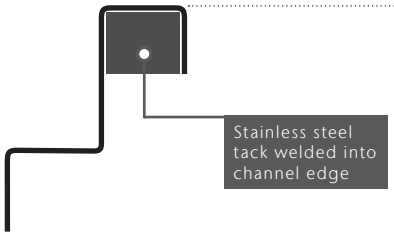
STANDARD EDGE



Suitable for tiled, concrete and epoxy resin floors in pedestrian and light industrial applications. Drains without infill are susceptible to failure as the surrounding concrete rarely fills that void. As edges compress, cavities create breeding grounds for pathogens and are impossible to clean. Edge in-fill in other materials - contact ACO for details.

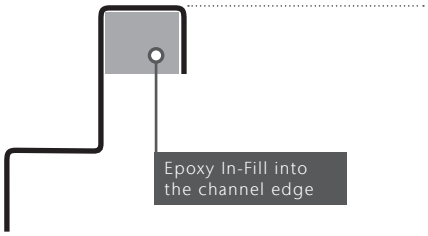
SEMI-CUSTOMIZATION - ALTERNATIVE EDGE OPTIONS

SOLID STEEL EDGE IN-FILL - heavy duty



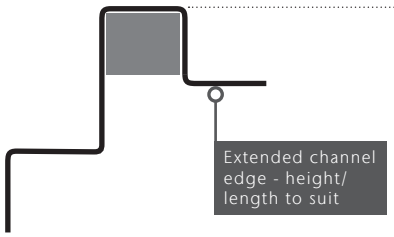
ACO recommends the use of a solid steel edge in-fill when using class E grates or where fork lift traffic is expected.

EPOXY EDGE IN-FILL - tile floors



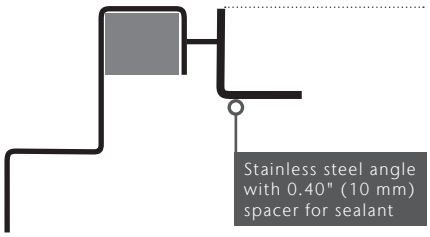
Suitable for medium traffic load, providing a high quality connection between the drainage and floor tiles. Pur In-Infill is ideal for use in multiple applications including the beverage industry, pharmaceutical and chemical industries.

EXTENDED EDGE - tile floors



Suitable for tiled floors in pedestrian and light industrial applications.

FLOOR ANGLE EDGE - heavy duty resin floor



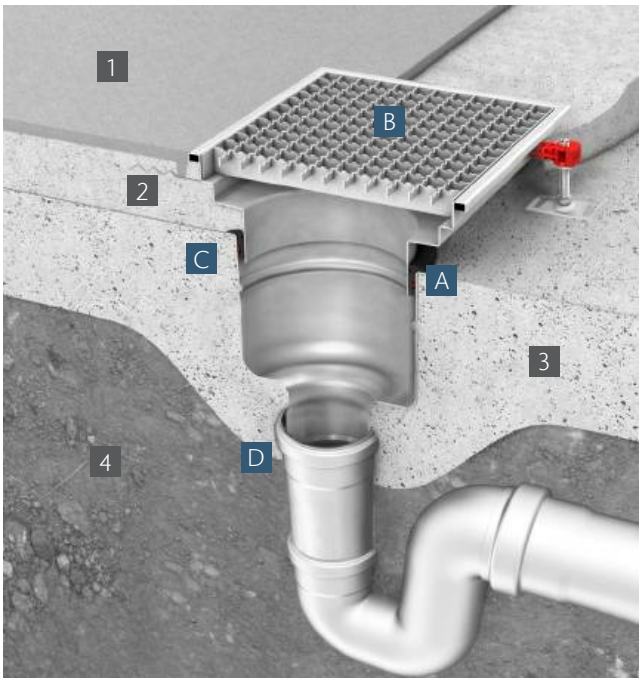
Suitable for heavy duty tiled, paver and resin floor applications, isolates channel from floor and provides gap for sealant. If deeper steel angle required contact ACO.

Stainless Steel BoxDrain Installation Guide

Box drain connected to ACO Floor Drain Body with location flange (concrete floor)

1 Epoxy/resin floor
2 Screed
3 Solid concrete floor slab
4 Compacted soil

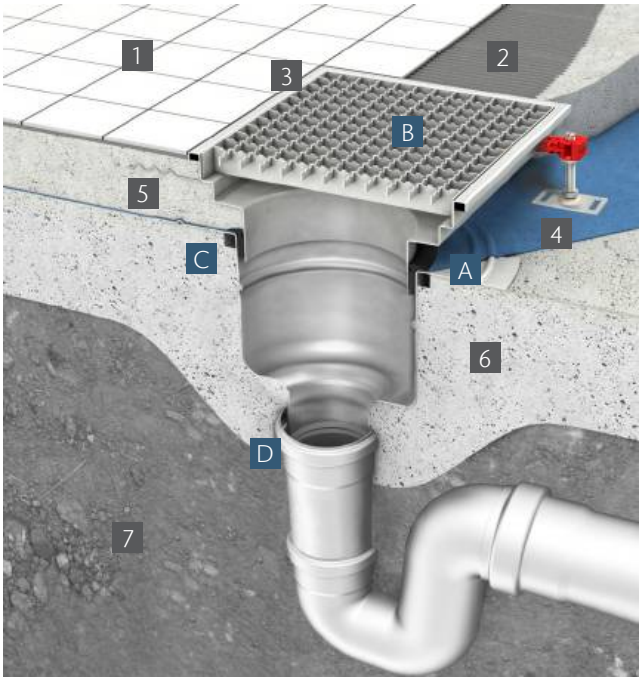
A Location flange floor drain body
B Grate
C Friction ring with red O-ring
D Outlet pipe connection



Box drain connected to ACO Floor Drain Body with membrane clamping flange (tiled floor)

1 Tile
2 Cement/tile adhesive
3 Flexible sealant
4 Waterproof membrane
5 Screed
6 Solid concrete floor slab
7 Compacted soil

A Mechanical flange floor drain body
B Grate
C Friction ring without red O-ring
D Outlet pipe connection



Post-Install Cleaning:

Remove all protective tape from the channel edge and clean the surface with a solvent if necessary to remove any adhesive residue. Wash and clean the channel (and floor drain if applicable), empty silt basket and refit grates.

Glossary

Anti-slip grate - grates certified to offer improved grip.

Axle load - load carried by each axle of vehicle.

Channel - one section of a modular trench drain system.

Clamping flange - metal plate with mechanical fixing (bolts) that allows a floor membrane to be dressed into floor drain.

Debris strainer basket - perforated basket to collect larger volumes of sediment/debris passing into pipework.

Electropolished - electrolytic process producing a highly reflective luster which offers chemical and bacterial resistance.

Flow rate - quantity of liquid evacuated through outlet in a given time frame - gallons per minute (GPM).

Foul air trap - drain section designed to prevent odors traveling up from underground waste water system.

Heelsafe - per ASME A112.6 - maximum grate hole size in least dimension of 0.31", deemed safe for high-heeled shoes.

Invert depth - depth from top of grate to inside base of channel.

Leveling feet - fixed to base of channels to allow height and level adjustment.

Linished - brushed effect usually on channel edge surface.

Load class - ability of grate to resist load specified in a load standard.

Pickled & passivated - chemical descaling and coating of stainless steel part to restore corrosion and chemical resistance qualities.

Point load - load exerted through an area for specification and testing purposes.

Rubber infill - strip inserted to underside of channel edge, prevents concrete voids during installation and improves loading performance. Stainless steel infill available for heavy duty applications.

Sieve - perforated plate to prevent sediment/debris passing into pipework.

Spigot - section of pipe used for outlet connection, may require a coupler.

Trench drain - an assembly of channels that make up a linear drain.

Wheel load - load exerted through one wheel of vehicle/trolley.

askACO

Every project brings its own requirements and challenges. In addition to our products, ACO offers you our knowledge and services to jointly develop tailor-made solutions from planning to after-sales support. With our extensive network of sales and support representation, ACO strives to ensure that the needs of your project are professionally and efficiently met.

train

Information and further education

At ACO, we share the expertise of the global ACO Group with architects, engineers, installers, and distributors who value quality. We invite you to benefit from it.

design

Planning and optimization

There are many drainage solutions to consider when planning a project. But which option leads to the most economically and technically safest solution? We help you to find the right answer.

Construction advice and presence

To prevent unpleasant surprises between planning and implementation stages, we advise and support you on a project-specific basis.

Inspection and maintenance

ACO products are designed and produced to last. With our after-sales support, we ensure that ACO will exceed your standards for years to come.

ACO ON THE WEB

You will find further information for our products on the ACO Building Drainage website. This allows you to access technical data, images, specifications, and installation instructions during planning.
www.acocan.ca
www.acobd.com

www.askACO.ca

ACO products support the ACO System Chain

Building Drainage

- ACO Stainless - Stainless Trench Drains
- ACO BoxDrain - Stainless Hygienic Drains
- ACO FloorDrain - Stainless Point Drains
- ACO Pipe - Stainless Push-fit Piping
- ACO ShowerDrain - Bathroom Drainage

Surface Water Management

- ACO Drain - Commercial Trench Drains
- ACO Infrastructure - Heavy Duty Drainage
- ACO Sport - Athletic Venue Drainage
- ACO StormBrixx - Geocellular Tanks
- ACO Aquaduct - Custom Drainage
- ACO Environment - Solid & Oil Separators
- ACO Wildlife - Guidance & Passage
- ACO Self - Garden & Landscape Drainage
- ACO UtilityDuct - Ducting System

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