

First Defense® High Capacity

Advanced Hydrodynamic Separator

Product Summary

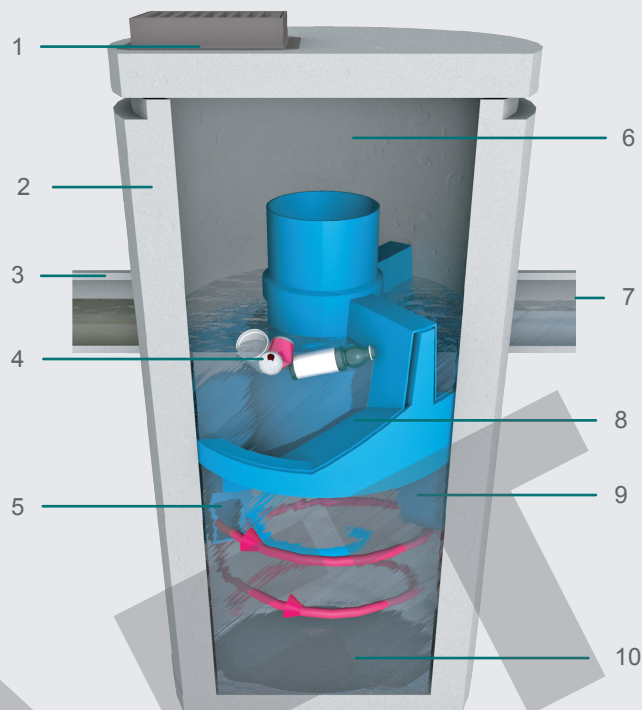
The First Defense® High Capacity is an enhanced vortex separator that combines an effective stormwater treatment chamber with an integral peak flow bypass. It efficiently removes sediment total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® High Capacity is available in several model configurations to accommodate a wide range of pipe sizes, peak flows and depth constraints (Table 1, next page).

Applications

- » Stormwater treatment at the point of entry into the drainage line
- » Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- » Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- » Pretreatment for filters, infiltration and storage

Benefits

- » Accommodates surface grates and multiple inlet pipe configurations, providing greater design flexibility
- » Integral high-capacity bypass conveys large peak flows without requiring separate offline treatment structures or junction manholes
- » Proven to prevent pollutant washout at flows up to **450% of the treatment flow rate**, maintaining treatment performance during storm events
- » Extended flow path maximises residence time within the treatment chamber, enhancing pollutant settlement and capture
- » Delivered pre-assembled for faster installation and reduced site construction time



Components

- | | |
|--|-------------------------------|
| 1. Inlet grate (optional) | 6. Internal bypass |
| 2. Precast chamber | 7. Outlet pipe |
| 3. Inlet pipe (optional) | 8. Oil and floatables storage |
| 4. Floatables draw off slot (not pictured) | 9. Outlet chute |
| 5. Inlet chute | 10. Sediment storage sump |

Verified by NJCAT and NJDEP



Find out more about how the First Defense® High Capacity can help protect water quality while managing high stormwater flows:

→ hydro-int.com/firstdefensehc

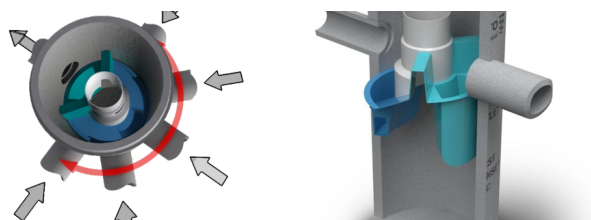
How it works

The First Defense® High Capacity has internal components designed to remove and retain gross debris, total suspended solids (TSS) and hydrocarbons (Fig.1).

Contaminated stormwater runoff enters the inlet chute from a surface grate and/or inlet pipe. The inlet chute introduces flow into the chamber tangentially to create a low energy vortex flow regime (magenta arrow) that directs sediment into the sump while oils, floating trash and debris rise to the surface.

Treated stormwater exits through a submerged outlet chute located opposite to the direction of the rotating flow (blue arrow). Enhanced vortex separation is provided by forcing the rotating flow within the vessel to follow the longest path possible rather than directly from inlet to outlet.

Higher flows bypass the treatment chamber to prevent turbulence and washout of captured pollutants. An internal bypass conveys infrequent peak flows directly to the outlet eliminating the need for, and expense of, external bypass control structures. A floatables draw off slot functions to convey floatables into the treatment chamber prior to bypass.



Sizing & Design

This adaptable online treatment system works easily with large pipes, multiple inlet pipes and inlet grates.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates		Peak Online Flow Rate	Maximum Pipe Diameter ¹	Oil Storage Capacity	Typical Sediment Storage Capacity ²	Minimum Distance from Outlet to Invert to Top of Rim ³	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified ⁴	110µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd ³ / m ³)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	1.06 / 30.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	1.88 / 53.2	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC	5 / 1.5	2.34 / 66.2	2.94 / 83.2	20 / 566	24 / 600	300 / 1,135	1.1 / 0.84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	4.23 / 119.8	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6 / 169.9	7.52 / 212.9	50 / 1,415	48 / 1,219	1,120 / 4,239	2.8 / 2.1	3.0 - 6.0 / 0.9 - 1.8	7.40 / 2.2

¹ Contact Hydro International when larger pipe sizes are required

² Contact Hydro International when custom sediment storage capacity is required

³ Minimum distance for models depends on pipe diameter

⁴ NJDEP Certified / NJCAT Verified, based on one inlet pipe and no inlet grate

Inspection & Maintenance

Protect long-term performance with service and maintenance from the experts who designed the system. Hydro International provides specialist support to help maximise the performance

and lifespan of First Defense® High Capacity.



Maintenance is done with a vactor truck

First Defense® High Capacity is a registered trademark of CRH Group Services Limited.



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Find out more about how our First Defense® High Capacity can help meet your stormwater requirements:

→ hydro-int.com/firstdefensehc