

SPEL ESR Puraceptor

Full Flow Stormwater Treatment System

Overview

The SPEL ESR Puraceptor is designed to treat the full flow from the catchment area and includes the important Automatic Closure Device (ACD). This device will close off the outlet when captured oil exceeds the maximum oil spill capacity.

Fully certified to meet the CIRIA SuDS Mitigation Index, this system has been tested by WRc to the British Water Code of Practice for Manufactured Treatment Devices and by HR Wallingford to the British and European Standard BS EN 858.

SPEL's ESR range is a total treatment system removing Hydrocarbons, Total Suspended Solids (TSS) and Metals from stormwater. It's a highly efficient, single unit, SuDS water quality device.

Product Range

200 Series

(1.2m internal diameter):
Flow Rate: 4-10 l/s
Catchment Area: 222m² - 556m²

300 Series

(1.8m internal diameter):
Flow Rate: 15-50 l/s
Catchment Area: 833m² - 2,778m²

400 Series

(2.6m internal diameter):
Flow Rate: 65-280 l/s
Catchment Area: 3,611m² - 15,555m²

500 Series

(3.5m internal diameter):
Flow Rate: 300-500 l/s
Catchment Area: 16,665m² - 27,775m²

600 Series

(4m internal diameter):
Flow Rate: 500-900 l/s
Catchment Area: 27,775m² - 49,846m²

Applications

The ESR Puraceptor includes the added benefit of the Automatic Closure Device (ACD) and will treat the full flow. It is designed to treat surface water run-off to a Pollution Hazard Index of 'Medium' which covers surfaces such as:

Roofs

Private and public car parks

Residential roads and drives

Low and medium use roads

Commercial yards and delivery areas

The ESR Puraceptor can be used as part of a treatment train to achieve a Pollution Hazard Index of 'High'. (See other SPEL SuDS treatment systems).

Shell Design

Designed with reference to BS EN 13121. All tank shells carry the SPEL 25 Year Warranty and life expectancy in excess of 50 years.

Shell Specifications

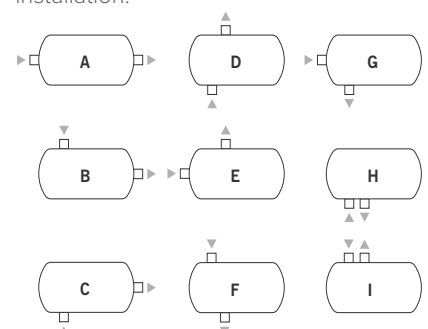
Different tank shell specifications are available dependent upon tank invert levels, ground conditions and ground water levels.

Inlet/Outlet Connections

160/225/300mm diameter PVCU socket/spigot.

450, 600, 750, 900 and 1200mm diameter GRP spigot available, for connecting to site pipework via Flex-Seal/Band-Seal or similar flexible couplings.

The nine inlet/outlet options below are available to assist with design and installation.



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The coalescer inserts are easy to clean and simple to replace but rarely require replacing. The unique 'insert' format ensures that this unit can be extracted complete every time, compared to other systems where 'wrap around' style units allow the foam to slip off, requiring confined space entry to retrieve.

SPEL ESR Puraceptor Certified Mitigation Index

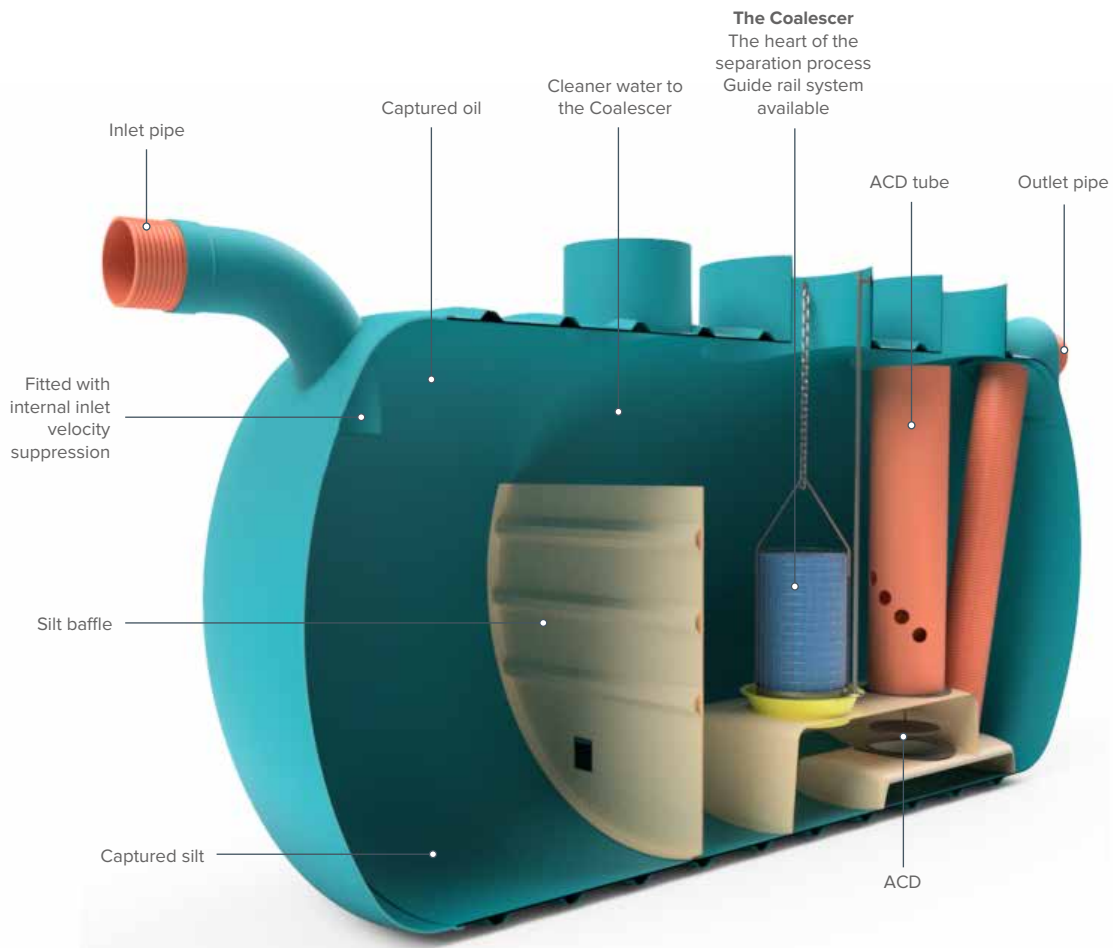
TSS 0.8

Metals 0.6

Hydrocarbons 0.9*

*H R Wallingford test results to BS EN 858: tested to it's maximum designed flow rate

The total treatment solution for SuDS



SPEL ESR Puraceptor

Testing and Certification

Research and development is at the heart of what we do at SPEL, our passion as Zero Pollution Ambassadors is to be at the cutting edge of clean surface water technology.

Months of rigorous testing has resulted in the new SPEL ESR Treatment System, available in both bypass or full flow.



Surface Water Treatment Device Performance Declaration

Testing carried out according to British Water Code of Practice*

Product Details	Description
Manufacturer	SPEL Products
Treatment Device Name/Model	Puraceptor Type ESR P010/1C
General description	Full Retention Class 1 Separator with Silt Capacity
Envisaged application	Treatment of Surface Water Run-off
Pollutant(s) captured	Total Suspended Solids

Parameter	Value	Unit
Treatment device capacity	3200	litres
Sediment Storage capacity	1000	litres
Treatment Flow rate	10	l/s
Connected Area	1,333	m²
Pollution retention flow rate	10	l/s

Parameter	Value	Unit
Maximum capacity flow rate	10*	l/s
Device head loss (at treatment flowrate)	0.286	m
Device head loss (at maximum capacity treatment flowrate)	0.286*	m
TSS capture and retention efficiency (Milsä V4 test sediment)	80	%
Zinc capture efficiency (if tested)	Not tested for dissolved metals	%
Zinc retention efficiency (if tested)	Not tested for dissolved metals	%
Copper capture efficiency (if tested)	Not tested for dissolved metals	%
Copper retention efficiency (if tested)	Not tested for dissolved metals	%
Dissolved Metals reduction	0.0	%
Particulate metals reduction*	60.3*	%
Total Metals reduction*	60.3*	%

* Maximum test flow for a Full Retention device equates to the device maximum design flow.

* Extrapolated value in accordance with British Water How to Guide: Applying the CIRIA The SuDS Manual (C753) Simple Index Approach to Proprietary / Manufactured Stormwater Treatment Devices. Version 7, Section 4.3, (2021 - under pre-publication review).

CERTIFICATE

LIGHT LIQUID SEPARATOR TEST PERFORMANCE CERTIFICATE

Compliance with Clause 8.3.3 of BS EN 858

Separator make and model number: SPEL PURACEPTOR P010/1CSC N338
As detailed in SPEL Drawing SSP 9080

The separator tested complied with the drawing provided by the manufacturer and no additional features were noticed

Test date: 3 August 2006

Designated/nominal flow rate, Q_n (litres/second): 30 litres/s
Net capacity of separator (excluding any allowance for silt storage), V_n (litres): 7368 litres

Total duration of test (minutes): 21.4 min
Running-in period (≥ 15 minutes): 15.4 min
Sampling period (minutes): 7 minutes common to all tests

Oil flow rate (based on 0.3% of water flowrate, litres/second): 0.13 litres/s

Temperature of oil (°C): 15.0
Temperature of water (°C): 15.8
Temperature of air (°C): 14.0

Analysis of samples by IR spectroscopy carried out by: Intertek Catchment Testing Services*

Date of results: 11/08/06

Sample	Oil concentration (mg/l)**
1	0.2
2	0.1
3	0.1
4	0.3
5	1.7
Resulting average:	0.5

Name: *James F. Smith* Date: *11/08/06*
For and behalf of IIR, Watlington Limited

* NAMAS accredited laboratory
** Value of baseline concentration deducted



SPEL's Head of Technical Development alongside the WRC testing officer.

SPEL ESR Puraceptor

Specification Chart

As directed by the SuDS Manual, treatment trains should be sized according to the **connectible area**, see column 4 below.



IMPORTANT: It is essential to cross-check the catchment-based flow rate from the chart below with the modelled flow rate to ensure the separator is correctly sized to treat the peak flow without causing restriction or overstressing the system.

Model	Series	Max. Flow (l/s)	Catchment Area Based on 65mm/hr	Oil Storage (L)	Silt Capacity (L)	Tank Length (mm)	Internal Diameter (mm)	Inlet Invert (mm)	Base to Inlet (mm)	Base to Outlet (mm)	Optimum in/out Pipe Diameter* (mm)	Number of Access Shafts (dia. mm)				
												450	600	750	900	1200
P004/1C/ESR	200	4	222	40	400	1,710	1,220	630	1,110	1,050	160	-	-	1	-	-
P006/1C/ESR	200	6	333	60	600	2,310	1,220	630	1,110	1,050	160	-	-	1	-	-
P010/1C/ESR	200	10	556	100	1,000	3,400	1,220	630	1,110	1,050	160	-	1	1	-	-
P015/1C/ESR	300	15	833	150	1,500	3,200	1,800	350	1,800	1,740	225	1	-	1	-	-
P020/1C/ESR	300	20	1,111	200	2,000	3,540	1,800	350	1,800	1,740	225	-	1	1	-	-
P030/1C/ESR	300	30	1,667	300	3,000	4,420	1,800	390	1,760	1,700	300	-	1	-	1	-
P040/1C/ESR	300	40	2,222	400	4,000	5,760	1,800	390	1,760	1,700	300	-	1	-	1	-
P050/1C/ESR	300	50	2,778	500	5,000	7,060	1,800	390	1,760	1,700	300	-	1	-	1	-
P065/1C/ESR	400	65	3,611	650	6,500	4,810	2,600	425	2,625	2,525	300	-	1	-	2	-
P080/1C/ESR	400	80	4,444	800	8,000	5,700	2,600	425	2,625	2,525	300	-	1	-	2	-
P100/1C/ESR	400	100	5,555	1,000	10,000	7,400	2,600	475	2,575	2,475	450	-	1	-	2	-
P125/1C/ESR	400	125	6,944	1,250	12,500	8,580	2,600	475	2,575	2,475	450	-	-	1	2	-
P150/1C/ESR	400	150	8,333	1,500	15,000	10,180	2,600	475	2,575	2,475	450	-	-	1	2	-
P165/1C/ESR	400	165	9,166	1,650	16,500	11,200	2,600	500	2,550	2,450	450	-	-	1	2	-
P200/1C/ESR	400	200	11,110	2,000	20,000	13,710	2,600	660	2,390	2,290	600	-	1	2	1	-
P250/1C/ESR	400	250	13,888	2,500	25,000	16,750	2,600	660	2,390	2,290	600	-	1	2	2	-
P280/1C/ESR	400	280	15,555	2,800	28,000	18,800	2,600	660	2,390	2,290	600	-	1	2	2	-
P300/1C/ESR	500	300	16,665	3,000	30,000	12,410	3,500	805	3,070	2,970	750	-	1	2	2	-
P400/1C/ESR	500	400	22,220	4,000	40,000	15,760	3,500	805	3,070	2,970	750	-	2	2	2	-
P500/1C/ESR	500	500	27,775	5,000	50,000	20,530	3,500	955	2,920	2,820	900	-	2	2	1	1
P500/1C/ESR	600	500	27,775	5,000	50,000	16,040	4,000	925	3,250	3,150	900	-	2	2	1	1
P600/1C/ESR	600	600	33,330	6,000	60,000	19,080	4,000	925	3,250	3,150	900	-	2	2	-	2
P700/1C/ESR	600	700	38,888	7,000	70,000	21,470	4,000	925	3,250	3,150	900	-	3	2	3	-
P800/1C/ESR	600	800	44,440	8,000	80,000	23,020	4,000	925	3,250	3,150	900	-	3	2	2	1
P900/1C/ESR	600	900	49,846	9,000	90,000	24,658	4,000	925	3,250	3,150	900	-	3	2	-	3
Full flow devices must be sized on modeled flow rate																

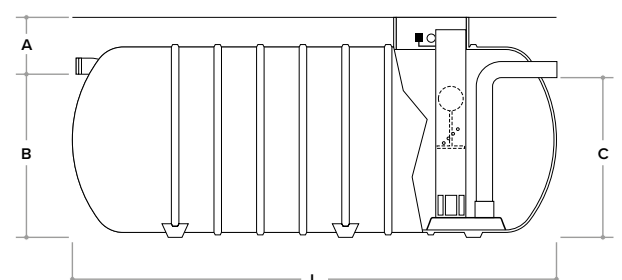
*SPEL ESR Puraceptors are designed for a maximum flow (NS/NSB) but can be fitted with larger than the recommended maximum connection size IN/OUT or with the addition of adapters providing the maximum flow (NS/NSB) cannot be exceeded or any increase in the operating level in the SPEL Separator to cause the captured pollutants to escape into the vent connections or through access shaft connections. Any overriding of the above criteria could jeopardise performance to the European Standard BS EN 858-1.

Shell Specification

The 'standard' specification is normally adequate for most installations but Heavy, Extra Heavy, Special, Extra Special, Ultra and Ultra Plus specifications are available depending upon the burial depth and water table level, in winter. The concern is when the system is emptied completely and remains empty for a period of time.

For more information and to see burial depth charts, see Section 7.

200 Series ESR – Internal diameter 1200mm, outside diameter 1225mm.
300 Series ESR – Internal diameter 1800mm, outside diameter 1875mm.
400 Series ESR – Internal diameter 2600mm, outside diameter 2700mm.
500 Series ESR – Internal diameter 3500mm, outside diameter 3650mm.
600 Series ESR – Internal diameter 4000mm, outside diameter 4150mm.



SPEL ESR Puraceptor

Components and Accessories

SPEL Coalescer Guide Rail Systems

To facilitate easy insertion of coalescer units, the optional SPEL guide rail system manufactured in stainless steel can be incorporated into SPEL ESR Puraceptors.

Brackets fixed to the top and bottom of the coalescer unit simply engage with the stainless steel guide rail which is fixed to the top of the stub access shaft. The coalescer unit is then lowered in the normal way, being guided at the correct angle into the conical base.

Lifting chains are available for the larger coalescer units and where extension shafts are fitted.

Extension guide rails can be incorporated into SPEL extension shafts to suit.

SPEL Coalescer Lifting, Locating and Locking system (3L)

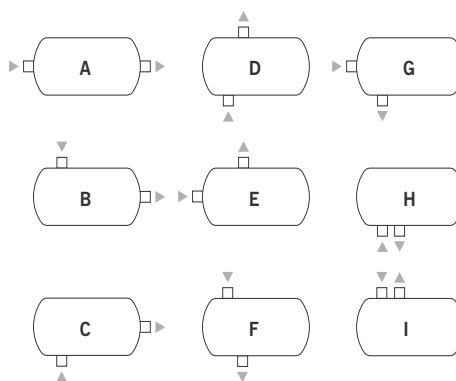
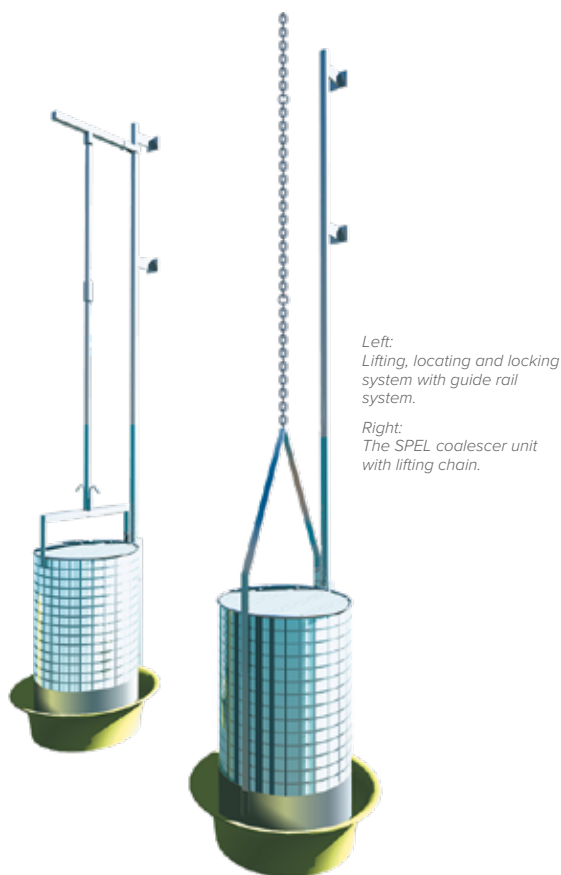
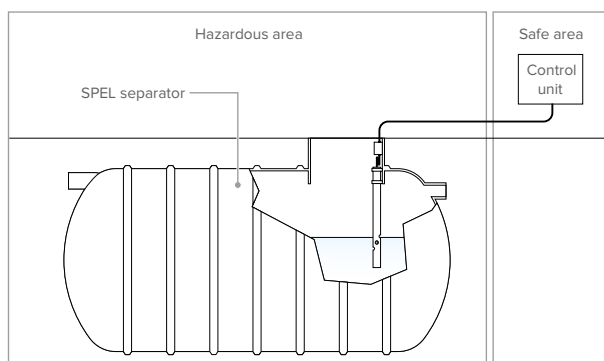
Where SPEL ESR Systems can be subjected to surcharging and/or tidal outfall, then the SPEL 3L system should be included.

The SPEL Lifting, Locating and Locking system is manufactured in stainless steel and replaces the standard coalescer unit handle.

The locating/locking handle ensures the coalescer unit is seated and locked in its correct position.

SPEL Automatic Monitoring Alarms

SPEL offer a range of alarms, for full details refer to the SPEL Data Manual Section 8.



SPEL ESR Range Inlet/Outlet Orientation

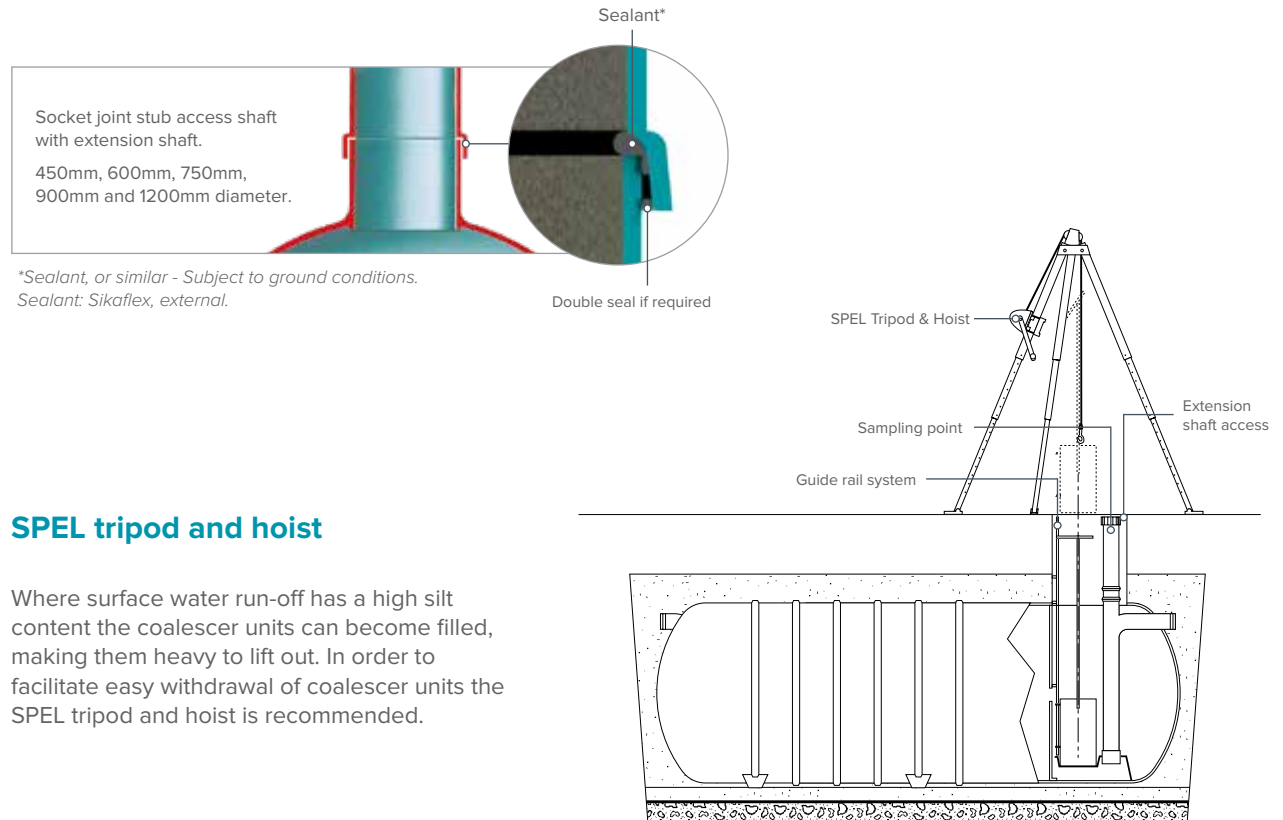
Dependent upon model and diameter of connections, these nine different orientations are available. However on the larger models it is important to check with our technical department.

SPEL ESR Purceptor

Components and Accessories

SPEL extension access shafts

Extension access shafts are available for deep invert application and are available in 500mm height increments.



SPEL tripod and hoist

Where surface water run-off has a high silt content the coalescer units can become filled, making them heavy to lift out. In order to facilitate easy withdrawal of coalescer units the SPEL tripod and hoist is recommended.

