



Run-off water treatment



Treatment units for dry-docks units

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1 - Regulations

Other than the Water Act (dated 3 January 1992) applicable to dry-docks units, section 6 of the Environment Code and its article L 216-6 applies, according to which:

"The act of discarding, discharging or releasing into surface water, underground water or seawater within territorial waters, directly or indirectly, one of the substances whose action or reactions cause, even temporarily, harmful effects to health or damage to flora and fauna or significant modifications to the normal water supply or restricted use of bathing areas is punishable by two years in prison and a €75,000 fine".

In addition, the Maritime Ports Code, via articles R 322-1 and R 353-4 of book III of the Maritime Ports Code (Decree no. 93-726 of 29 March 1993), indicate:

"No one may cause harm to ports or harbours, whether in terms of depth, cleanliness or facilities". "Failure to respect the places provided for waste disposal is a punishable offence".

Finally, it is important to note that sediment from port dragging cannot be discharged into the sea if contaminated by heavy metals. It must be retreated on land.

Techneau has developed a treatment unit for dry-docks units (UTC) which traps macro pollutants and micro pollutants in run-off water. Many options are available, and optimal results have been obtained, as proven by the analyses below:

Example of UTC with a hydraulic head of 2 m/h and installed in the Granville careening area (50):

	Pollutant load concentration		Overall performance
	Input (mg/l)	Output (mg/l)	
SS	620	9	98.53
BOD5	100	8.8	91.20
COD	480	53.2	88.92

	Heavy metals		Overall performance
	Input (mg/l)	Output (mg/l)	
SS	16.63	0.59	96.43
BOD5	0.85	< 0.25	> 70
COD	5.11	0.54	89.50

Analyses conducted by the Manche Departmental Analysis Laboratory.

2 - Uses

The UTC was developed to treat effluent from dry-docks units and boat storage platforms.

This effluent (run-off water + process water) is characterised by the presence of dust and toxic pollutants from boat maintenance operations (cleaning, sanding, painting, draining, etc.).



3 - Operating principle

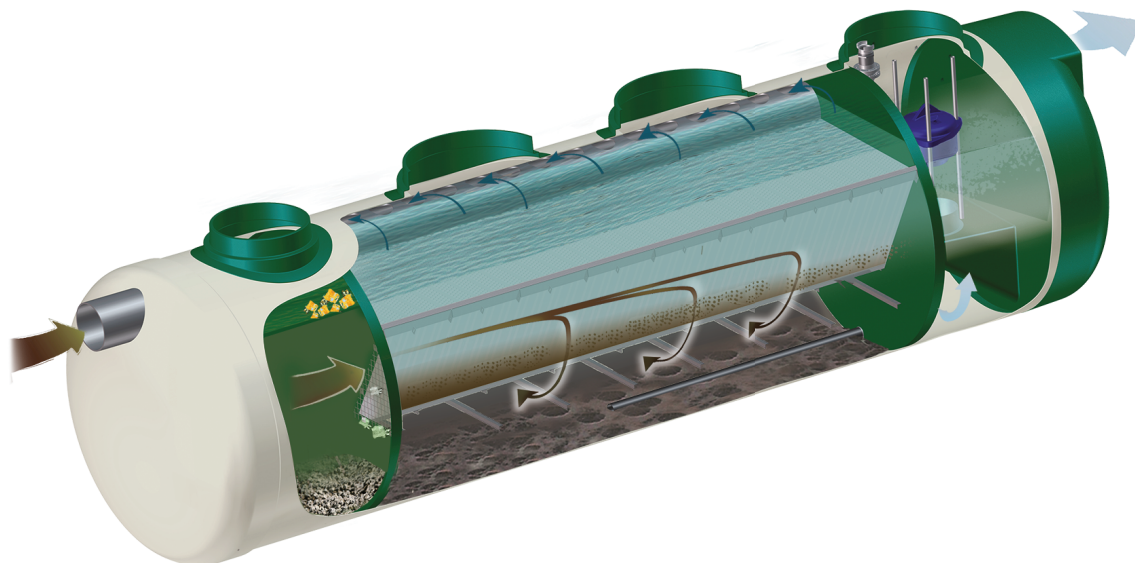
These pollutants, found in large quantities, are mainly linked to Suspended Solids (SS).

By trapping accidentally released SS and light liquids, the UTC contributes to port water quality.

Specific size calculation from a rainfall data study with French data:

- 95% of ten-year run-off volume is treated with a Hydraulic Head (CH) ≤ 2 m/h
- Exceptional overflows (5% of run-off is accepted by the unit). Treatment is completed with Hydraulic Head ≤ 4.5 m/h.
- **Over 80% reduction in pollutant load linked to SS.**
- Simplified installation without storm overflow hatch or bypass.
- **Zero release of raw (untreated) water in the receiving environment.**

Optimised hydraulic operation thanks to the overflow channel providing uniform distribution of the flow across the entire filter.



4 - Manufacturing

Treatment Units for dry-docks units (UTC) include:

- fibreglass-reinforced polyester lining made by filament winding and contact moulding allowing high mechanical strength,
- an automatic shutter in the event of a significant discharge of light liquids (oils) avoiding any release to the receiving environment,
- anti-corrosion materials suited to a salt water environment,
- significant sand and sludge storage capacity ($> 10 \text{ m}^3/\text{ha}$) allowing less frequent draining,
- an AlvéEau tube bundle in recycled PVC, angled at 60° and removable, specially designed by Techneau,
- 3 to 4 manholes (depending on product) for easy access,
- a sludge drain column for simplified maintenance.



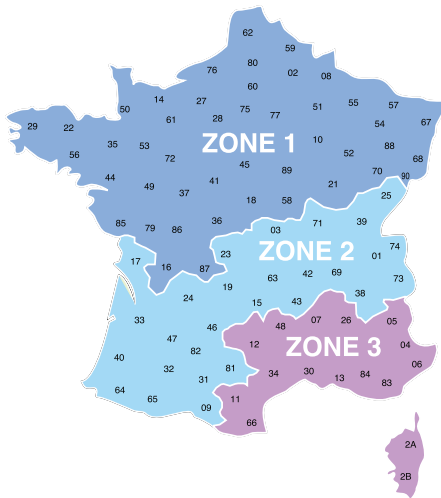
Treatment of dry-docks units

Size of our units and installation

Waste water

Polyester

CH progressive
2m/h for Q=1 year
Size 6 to 75 l/s



5-benefits

Gravity-fed system and suited even to exceptional rainfall events:
maximum autonomy.

No "consumable" to replace regularly: **reduced operating costs.**

6 - installation

The UTC can be buried deep underground or in a submersible zone.

7 - determining size

The size of the unit is determined based on local rainfall and geographic zone.

$$Q_{10} = \psi \times I \times A$$

Q₁₀: Ten-year peak flow rate
(litres/second)

Q_T: Treatment flow rate (litres/second)

ψ: Run-off coefficient
(depending on type of surface: 0.9 for concrete or asphalt)

I: Rainfall intensity
(litres/second/hectare) based on 3 geographic zones (as ten-year flow rate):

Example in France :

ZONE 1 (oceanic climate): 300 l/s/ha

ZONE 2 (continental climate): 400 l/s/ha

ZONE 3 (Mediterranean climate): 500 l/s/ha

A: Uncovered area (hectares)

We will choose the unit type in the table below depending on the surface area of the careening area and the geographic zone (3 pre-defined zones, see map opposite).

Unit selection table

ZONE 1	ZONE 2	ZONE 3	UTC range ref.
Q10 = 300 l/s/ha	Q10 = 400 l/s/ha	Q10 = 500 l/s/ha	
< 539 m ²	< 404 m ²	< 323 m ²	UTC2AAG2P
< 842 m ²	< 631 m ²	< 505 m ²	UTC2ABA2P
< 1263 m ²	< 947 m ²	< 758 m ²	UTC2ABF3P
< 1684 m ²	< 1263 m ²	< 1010 m ²	UTC2ACA3P
< 2104 m ²	< 1578 m ²	< 1263 m ²	UTC2ACF3P
< 2525 m ²	< 1894 m ²	< 1515 m ²	UTC2ADA3P
< 2946 m ²	< 2210 m ²	< 1768 m ²	UTC2ADF3P
< 3367 m ²	< 2525 m ²	< 2020 m ²	UTC2AEA3P
< 3788 m ²	< 2841 m ²	< 2273 m ²	UTC2AEF4P
< 4630 m ²	< 3472 m ²	< 2778 m ²	UTC2AFF4P
< 5471 m ²	< 4104 m ²	< 3283 m ²	UTC2AGF4P
< 6313 m ²	< 4735 m ²	< 3788 m ²	UTC2AHF4P



Treatment unit

for boat dry-docks units

Waste water

Polyester

CH progressive
2m/h for Q=1year
Size 6 to 75 l/s

- Fibreglass-reinforced polyester tanks. Filament winding design.
- Coating **perfectly suited to treat very aggressive water.**
- Internal or external installation. **Can withstand being submerged in sea water.**
- PVC and stainless steel internal components.

- **Surface to be treated** up to 6,300 m² (depending on geographic zone).
- **Drain column.**
- **Tube bundle.**
- **Automatic shutter** calibrated to 0.85

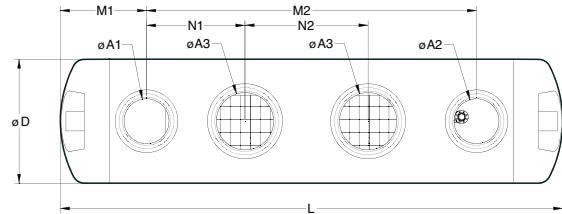
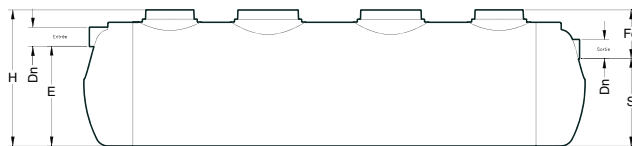
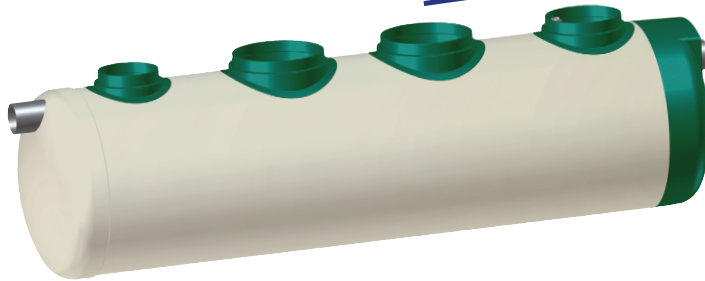
15-YEAR WARRANTY
RUST-PROOF
HIGH MECHANICAL
STRENGTH

OPTIONS

- Polyethylene extensions [see p. 90](#)
- Visual & audible alarm [see p. 90-91](#)
- Anchor straps [see p. 92](#)
- Speed chassis [see p. 92](#)

Techneau
Innovation

Alvéole[®] tube bundle
in PVC angled at 60°
to settle suspended solids
35 mm hydraulic diameter.



Size characteristics

UTC range ref.	ø D	H	L	E	S	Dn	øA1	øA2	øA3	M1	M2	N1	N2	Weight	Number of manholes
UTC2AAG2P	1600	1816	4700	1217	1117	200	730	730	730	1200	2300	1150	-	548	3
UTC2ABA2P	1600	1816	4870	1217	1117	200	730	730	730	1200	2470	1235	-	609	3
UTC2ABF3P	1600	1816	5830	1217	1117	315	730	730	730	1200	3430	1150	1150	745	4
UTC2ACA3P	1600	1816	6474	1217	1117	315	730	730	730	1200	4074	1358	1358	830	4
UTC2ACF3P	2000	2216	6430	1627	1427	315	730	930	930	1400	3530	1765	-	996	3
UTC2ADA3P	2000	2216	7074	1627	1427	315	730	930	930	1400	4174	1390	1390	1113	4
UTC2ADF3P	2000	2216	7714	1627	1427	315	730	930	930	1400	4814	1605	1605	1228	4
UTC2AEA3P	2000	2216	8038	1627	1427	315	730	930	930	1400	5138	1713	1713	1287	4
UTC2AEF4P	2400	2640	7170	1980	1730	400	730	930	1130	1335	4315	2215	-	1950	3
UTC2AFF4P	2400	2640	7814	1980	1730	400	730	930	1130	1335	4959	2509	-	2175	3
UTC2AGF4P	2400	2640	8458	1980	1730	400	730	930	1130	1335	5603	1798	2015	2347	4
UTC2AHF4P	2400	2640	9102	1980	1730	400	730	930	1130	1335	6147	2002	2050	2780	4

Hydraulic characteristics

UTC range ref.	Nominal treatment flow rate	Accepted peak flow rate	Sand storage vol.	Hydraulic Head m/h		Sludge storage vol.	light liquids storage	Useful vol.	Total vol.
	Q 1year (l/s)	Q 10 (l/s)	litres	Q 1year	Q 10	litres	litres	litres	litres
UTC2AAG2P	6	14	1608	1.9	4.4	347	500	6595	8847
UTC2ABA2P	10	23	1608	1.9	4.4	578	500	6865	9209
UTC2ABF3P	15	34	1608	1.8	4.1	1059	500	8313	11151
UTC2ACA3P	20	45	1608	1.9	4.4	1290	500	9278	12446
UTC2ACF3P	25	57	2991	2.0	4.4	1517	800	14235	18648
UTC2ADA3P	30	68	2991	1.9	4.3	1836	800	15779	20672
UTC2ADF3P	35	80	2991	1.8	4.1	2155	800	17324	22695
UTC2AEA3P	40	91	2991	1.9	4.4	2315	800	18096	23706
UTC2AEF4P	45	102	4252	1.9	4.4	2501	1200	23357	30265
UTC2AFF4P	55	125	4252	2.0	4.4	2922	1200	25605	33178
UTC2AGF4P	65	148	4252	2.0	4.5	3343	1200	27854	36092
UTC2AHF4P	75	170	4252	2.0	4.5	3764	1200	30695	39774

For larger sizes, please contact our design office.

Dimensions are in millimetres, weights in kilograms, volumes in litres.

Fairing
treatment