Polyway
Global composite solutions

# Technical booklet

CRP Lifting station

2025

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# General description

The CRP lifting station is primarily designed for the collection and transport of wastewater or stormwater.

The CRP lifting station is made of fiberglass-reinforced polyester (GRP) and consists of a self-cleaning base, a shell, and an optional cover. It's equipped with customized piping and various components specified based on project requirements.

It is provided with a customized piping system and various components determined according to the project data.

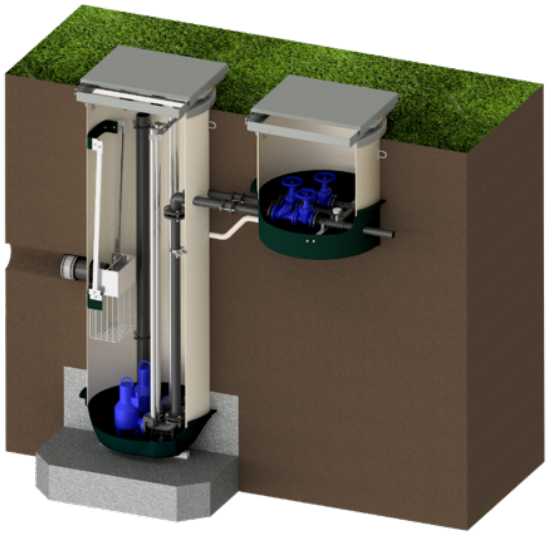
The CRP lifting station is durable, rot-proof, non-corrodible, and non-porous.

**The CRP lifting station is fully modular and can be configured using our dedicated application (contact us for details).**

## Applications

The primary application of the CRP lifting station is the collection and transport of the following effluents :

- Municipal and domestic wastewater
- Drainage water
- Stormwater
- Industrial wastewater (under certain conditions)



## Usage Limitations

The CRP lifting station is primarily designed to be installed underground. It can be installed in flood-prone areas, under green spaces, under roads, or along the roadside.

In its standard version, the CRP lifting station can handle effluents with pH values between 5.5 and 8 at temperatures up to 30°C.

Upon request, the CRP station can be adapted to contain effluents with pH values between 4 and 11, at temperatures up to 80°C.

For above-ground use: please contact us.



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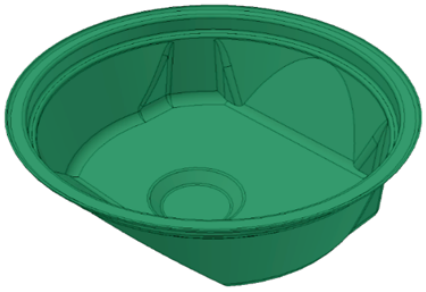
# CRP Station Range

The CRP lifting station is available with inner diameters ranging from 800 mm to 2400 mm and depths from 1.5 m to 9 m.

| Model | Inner Diameter | Height | Number of Pumps | Discharge connexion Diameter |
|---|---|---|---|---|
| CRP800 | Ø800 | 1,50 à 4,00 m | 1 | DN50 |
| CRP1000 | Ø1000 | 1,50 à 8,00 m | 1 à 2 | DN50 à DN65 |
| CRP1200 | Ø1200 | 1,50 à 8,00 m | 1 à 2 | DN50 à DN80 |
| CRP1400 | Ø1400 | 1,50 à 8,00 m | 1 à 2 | DN50 à DN100 |
| CRP1600 | Ø1600 | 1,50 à 8,00 m | 1 à 2 | DN50 à DN150 |
| CRP1800 | Ø1800 | 1,50 à 8,00 m | 1 à 3 | DN50 à DN150 |
| CRP2000 | Ø2000 | 1,50 à 9,00 m | 1 à 3 | DN50 à DN200 |
| CRP2400 | Ø2400 | 1,50 à 9,00 m | 1 à 3 | DN50 à DN250 |

# Design and Construction

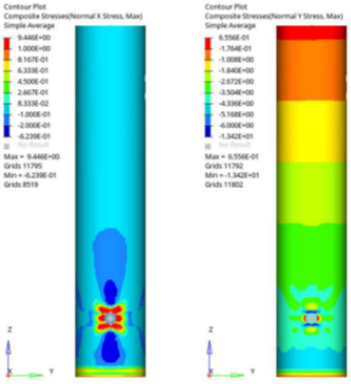
## 1. Base



The base of the CRP station is moulded using either vacuum injection (RTM) or infusion technique. These manufacturing methods ensure consistent, high-quality parts. Its smooth walls and sloped surfaces direct effluents toward the center of the station, minimizing sediment or grease build-up. A central gutter allows for total cleaning and drying of the station when necessary. A peripheral flange is included for anchoring the station to the ground.

## 2. Shell

The cylindrical shell of the CRP station is moulded using filament winding in accordance with EN13121 standards. Its inner surface is protected by an anti-corrosion liner to withstand chemical attacks from effluents.



The station's mechanical strength, particularly its resistance to buckling, is achieved through a combination of orthogonal and helical filament winding.



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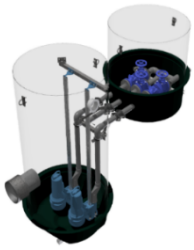
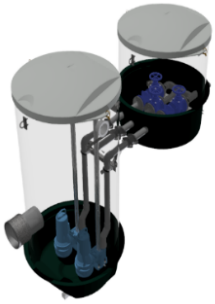
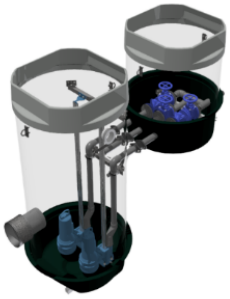
## 3. Cover

The CRP lifting station can be equipped with various types of covers (GRP or mixed GRP/Aluminium) depending on the installation location.

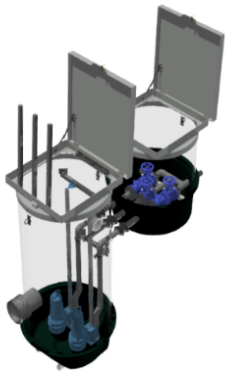


- **No cover version**: Suitable only for under-road installations.
    - **Simple cover**: Fits directly on top of the shell and allows for full opening. It is secured to the shell with two padlocks. This version is intended for installations under green spaces.





- **Lost formwork**: Simplifies formwork during the construction of a concrete slab at the top of the station. Used in installations along the roadside.



- **Articulated cover**: Composed of two parts, one fixed to the shell and the other hinged. It includes a support that keeps the movable part upright.

| Cover Type | Green Space | Roadside | Under Road |
|---|---|---|---|
| No Cover | No | No | Yes |
| Simple Cover | Yes | No | No |
| Lost Formwork | No | Yes | Yes |
| Articulated Cover (GRP or Alu) | Yes | Yes | No |

## 4. Safety grid device

For safe access during maintenance or servicing, the station can optionally be equipped with a safety grid device. This system consists of a set of automatically retracting rungs with an impact resistance of 1200 joules, preventing accidental falls.

The device is designed in accordance with Annex 5 of the INRS document ED6076 (December 2010) on the design and layout of wastewater lifting stations. This anti-fall device has been certified by APAVE under certification number PV No. 13194082, dated April 10, 2013.



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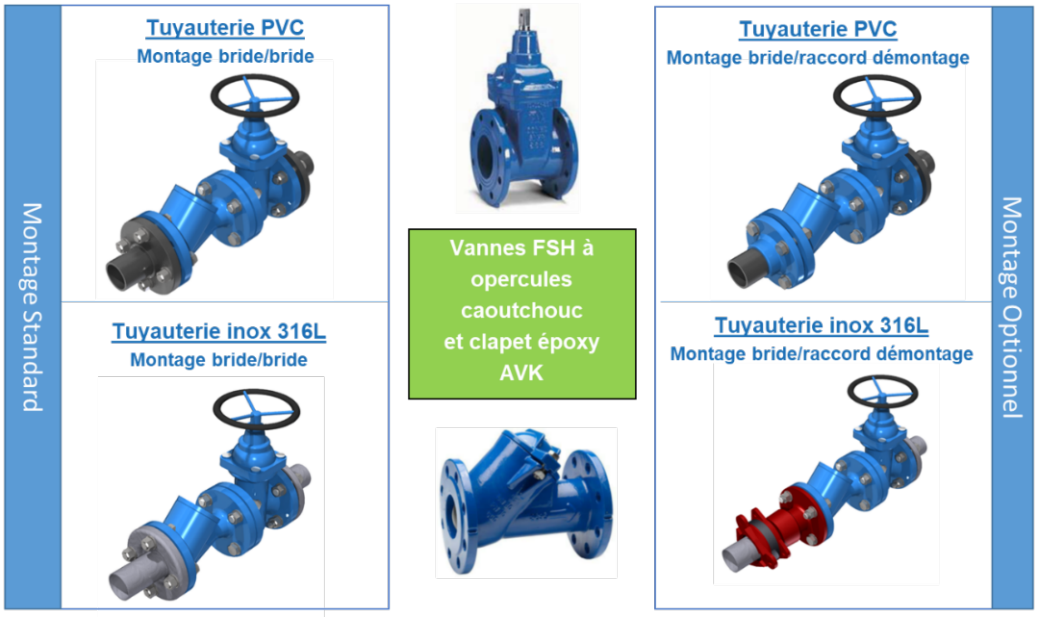
## 5. Discharge Pipe

Discharge pipes are available in either pressure PVC or stainless steel 316L.

| Nominal Diameter | PVC pipe (PVC-U) | | | Tube Inox 316L roulé soudé | | |
|---|---|---|---|---|---|---|
| | EN 1452 | | | EN 10217-7 | | |
| | Outer diameter (mm) | Thickness (mm) | Nominal pressure (PN) | Outer diameter (mm) | Thickness (mm) | Pressure max (Bar) |
| DN15 | 20 | 2,3 | PN25 | 21,3 | 2 | 110,1 |
| DN20 | 25 | 2,8 | PN25 | 26,9 | 2 | 87,3 |
| DN25 | 32 | 2,4 | PN16 | 33,7 | 2 | 69,5 |
| DN32 | 40 | 3 | PN16 | 42,4 | 2 | 55,1 |
| DN40 | 50 | 3,7 | PN16 | 48,3 | 2 | 48,5 |
| DN50 | 63 | 4,7 | PN16 | 60,3 | 2 | 38,7 |
| DN65 | 75 | 5,6 | PN16 | 76,1 | 2 | 30,8 |
| DN80 | 90 | 4,3 | PN10 | 88,9 | 2 | 26,1 |
| DN100 | 110 | 5,3 | PN10 | 114,3 | 2 | 20,5 |
| DN125 | 125 | 4,8 | PN10 | 139,7 | 2 | 16,8 |
| DN150 | 160 | 6,2 | PN10 | 168,3 | 2 | 14 |
| DN200 | 200 | 7,7 | PN10 | 219,1 | 2 | 10,7 |
| DN250 | 250 | 9,6 | PN10 | 273 | 2 | 8,4 |
| DN300 | 315 | 12,1 | PN10 | 323,9 | 2,9 | 10,7 |
| DN400 | 400 | 9,8 | PN6 | 406,4 | 2,9 | 8,9 |

## 6. Valves



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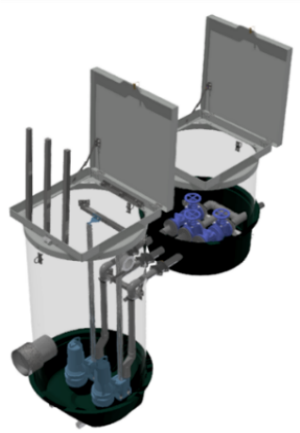
## 7. Installation Types

- **TM1**: Each discharge pipe in the station is equipped with an independent piping system without valves. Use for simple lifting applications.
- **TM2**: Each discharge pipe in the station is equipped with piping and internal valves, connected to a manifold with a single outlet.
- **TM3**: Each discharge pipe in the station is equipped with an independent piping system without valves. For additional security, the valves are placed in an external inspection chamber, complementing the installation.





## 8. Valves Chamber

The CRP external inspection chamber is available with inner diameters ranging from 1000 mm to 2400 mm and depths from 0.8 m to 3.5 m.

| Model | Inner Diameter | Height | Max Valve DN |
|---|---|---|---|
| CRP1000 | Ø1000 | 0.8 to 3.5 m | DN65 |
| CRP1200 | Ø1200 | 0.8 to 3.5 m | DN80 |
| CRP1400 | Ø1400 | 0.8 to 3.5 m | DN100 |
| CRP1600 | Ø1600 | 0.8 to 3.5 m | DN150 |
| CRP2000 | Ø2000 | 0.8 to 3.5 m | DN200 |
| CRP2400 | Ø2400 | 0.8 to 3.5 m | DN250 |

The CRP valve chamber is made of fiberglass-reinforced polyester (GRP). It features a flat base with a drainage channel, a shell, and an optional cover. It is primarily equipped with piping and valves. The valve chamber is durable, rot-proof, non-corrodible, and non-porous.



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## 9. Design

The base of the CRP inspection chamber is molded by vacuum injection (RTM) or by infusion, ensuring consistent quality through reproducible parts. Its smooth surface allows for easy maintenance, while a central channel collects drainage water, keeping internal equipment dry. A peripheral flange allows the inspection chamber to be anchored in the ground.

# Material Specifications

## 10.Resins

Resins are selected to ensure that, at maximum operating temperature, there is no reduction in mechanical properties. Manufacturing Process and Resin Specifications

| Process | Filament Winding | | Hand Lay Up | RTM/Infusion |
|---|---|---|---|---|
| Resin | Vinylester | Polyester | Polyester | Polyester |
| HDT Temperature (°C) | 115 | 64 | 55 | 80 |
| Density (kg/m$^3$) | 1110 | 1200 | 1200 | 1200 |
| Elastic Modulus (MPa) | 3500 | 3715 | 3300 | 4000 |
| Tensile Strength (MPa) | 83 | 57 | 55 | 52 |
| Compressive Strength (MPa) | 126 | 126 | 126 | 126 |
| Shear Strength (MPa) | 43 | 43 | 43 | 43 |
| Elongation at Break (%) | 4.2 | 2.3 | 2.4 | 2.0 |
| Poisson's Ratio | 0.30 | 0.37 | 0.37 | 0.37 |

## 11.E-Glass Fiber

The mechanical properties of E-glass Fibers are detailed below:

| Property | Value |
|---|---|
| Fiber Density (kg/m$^3$) | 2540 |
| Elastic Modulus (MPa) | 73000 |
| Shear Modulus (MPa) | 29900 |
| Poisson's Ratio | 0.22 |
| Tensile Strength (MPa) | 1990 |
| Compressive Strength (MPa) | 1200 |



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## 12.Polyester Shells

The properties of GRP laminates, including elasticity and limit deformation, are determined according to the EN 13121-3 standard.

| Diameter (mm) | Elastic Modulus Axial (MPa) | Elastic Modulus Circumferential (MPa) | Elastic Modulus Circumferential Bending (MPa) | Axial Tensile Strength (MPa) | Circumferential Tensile Strength (MPa) | Axial Strain Limit (%) | Circumferential Strain Limit (%) |
|---|---|---|---|---|---|---|---|
| Ø800 | 10,881 | 28,474 | 27,67 | 43.4 | 455 | 0.20% | 0.23% |
| Ø1000 | 11,11 | 30,921 | 29,483 | 41.7 | 531 | 0.20% | 0.23% |
| Ø1200 | 11,304 | 32,628 | 31,255 | 40.9 | 550 | 0.20% | 0.23% |
| Ø1400 | 11,42 | 33,653 | 32,229 | 40.8 | 569 | 0.20% | 0.23% |
| Ø1600 | 11,516 | 34,511 | 32,948 | 40.7 | 586 | 0.20% | 0.23% |
| Ø1800 | 11,554 | 34,856 | 33,18 | 40.6 | 575 | 0.20% | 0.23% |
| Ø2000 | 11,629 | 35,415 | 34,062 | 40.4 | 602 | 0.20% | 0.23% |
| Ø2400 | 11,678 | 35,813 | 34,563 | 40.5 | 609 | 0.20% | 0.23% |

## 13.Vinyl Ester Shells

Like polyester shells, the properties of GRP laminates made with vinyl ester are determined according to the EN 13121-3 standard.

| Diameter (mm) | Elastic Modulus Axial (MPa) | Elastic Modulus Circumferential (MPa) | Elastic Modulus Circumferential Bending (MPa) | Axial Tensile Strength (MPa) | Circumferential Tensile Strength (MPa) | Axial Strain Limit (%) | Circumferential Strain Limit (%) |
|---|---|---|---|---|---|---|---|
| Ø800 | 9,88 | 27,16 | 26,425 | 55.9 | 438 | 0.23% | 0.30% |
| Ø1000 | 10,09 | 29,582 | 28,217 | 58.1 | 511 | 0.23% | 0.30% |
| Ø1200 | 10,265 | 31,261 | 29,948 | 56.7 | 530 | 0.23% | 0.30% |
| Ø1400 | 10,371 | 32,27 | 30,903 | 57.0 | 550 | 0.23% | 0.30% |
| Ø1600 | 10,459 | 33,115 | 31,61 | 57.2 | 586 | 0.23% | 0.30% |
| Ø1800 | 10,494 | 33,456 | 31,84 | 59.5 | 557 | 0.23% | 0.30% |
| Ø2000 | 10,56 | 34,001 | 32,696 | 57.9 | 583 | 0.23% | 0.30% |
| Ø2400 | 10,605 | 34,391 | 33,185 | 58.2 | 591 | 0.23% | 0.30% |



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## 14.Components and Accessories

| Component | Material | EN/DIN ISO | AISI/ASTM |
|---|---|---|---|
| Composite Parts (Base, Cover, Inspection Chamber) | GRP (Glass-Fiber Reinforced Polyester) | - | - |
| Shell | GRP (Glass-Fiber Reinforced Polyester) | EN13121 | - |
| Handling Ears | Galvanized Steel | EN 10263-4 | - |
| Mounting Feet (Inserts, Washers, Nuts) | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Support Beams, Guide Bars, and Piping | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Support Beams, Guide Bars, and Piping | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Pipe Clamps | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Pipe Clamps | PVC-U | 8063 | - |
| Pump Guide Bars | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Pipe Fittings (Flanges, Elbows, Tees, Reducers) | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Pipe Fittings (Flanges, Elbows, Tees, Reducers) | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Pipe Fittings (Flanges, Elbows, Tees, Reducers) | PVC-U | 8063 | - |
| Discharge Piping | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Discharge Piping | PVC-U | 8063 | - |
| Hinges, Support Legs, Locking Brackets | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Safety grid Frame and Bars | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Safety grid Frame and Bars | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Safety grid Frame and Bars | GRP (Glass-Fiber Reinforced Polyester) | - | - |
| Fasteners (Nuts, Bolts, Washers, Studs) | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Fasteners (Nuts, Bolts, Washers, Studs) | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Screening Basket | Stainless Steel, Grade 1.4307 | EN 10088-1 | 304L |
| Screening Basket | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| FlexSeal Connections (Gaskets, Tension Bands) | Elastomer | EN681-1 | - |
| FlexSeal Connections | Stainless Steel, Grade 1.4301 | EN 10088-1 | 304 |
| WAGA Connection | Cast Iron | EN-GJS 450-10 | - |
| Gibault Connection | Cast Iron | EN-GJL 250 | - |
| Major Stop Connection (Flange, Gasket, Ring) | Cast Iron | EN-GJS 450-10 | - |
| Major Stop Connection | Elastomer | EN681-1 | - |
| Major Stop Connection | Aluminum Alloy AL6061 | EN12167 | - |
| Sight Glass Seal | Rubber | EN681-1 | - |
| Bulkhead (Inlet, Overflow) | Stainless Steel, Grade 1.4404 | EN 10088-1 | 316L |
| Bulkhead (Inlet, Overflow) | PVC-U | 8063 | - |
| Bulkhead (Inlet, Overflow) | GRP (Glass-Fiber Reinforced Polyester) | - | - |



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