

# Harsh environment wastewater pumps

The right material for your  
wastewater pump – whatever  
the environment

**GRUNDFOS** 

Possibility in every drop

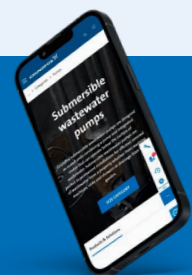
# Complete range of material solutions



Whether it's process water, seawater, unscreened sewage or something even harsher, our wastewater pumps keep your systems running reliably and trouble-free – whatever the environment.

Our range of hydraulics and pumps, in your choice of durable materials, are built to suit your wastewater application and withstand any harsh environment.

Discover on the following pages the different options we offer for fibre handling, grit and abrasion resistance, corrosion resistance, and engineered-to-order customisation options.



**Browse full specifications online**  
<https://product-selection.grundfos.com/categories/pumps/submersible-wastewater-pumps?tab=categories>

## Impellers

Our full range of impellers for the SE, SL and S pump ranges are available in cast iron or stainless steel.

Variant D pumps have EN1.4517 stainless steel impeller option for SuperVortex and S-tube®.

The Open S-tube® impeller is also available in White Iron in accordance with GJN-HB555\_XCR18 (minimum chromium content of 21%), and a hardness of 55HRC. The white iron Open S-tube® hydraulics also come with a guide vane on the suction cover to assist the funnelling of long fibres through the impeller without clogging it.



Pump range	S-tube®			Open S-tube®			SuperVortex			Channel		
SE & SL Range 48 (1.1-11kW/1.5-15Hp)	•						•					
SE & SL Range 52 (9-30kW/12-42Hp)	•			•*			•					
SE & SL Range 56 (18-41kW/24-55Hp)				•								
S Range 62-78 (50-520kW/67-697Hp)							•					•

Impeller Material	SE	SL	S	SE	SL	S	SE	SL	S	SE	SL	S
Cast Iron (EN-GJL-250)	•	•		•	•		•	•	•			•
Stainless steel (EN1.4408)	•	•		•	•		•	•	•			•
Stainless steel (EN1.4517)	•						•	•				
White Iron (GJN-HB555_XCR18)				•	•							

\* Open S-tube® for S & H head class.

**S-tube® closed impellers** with one or two channels provide large free passage and high efficiency.

SE/SL pumps fitted with the closed S-tube® impeller are ideal for low to medium contaminated wastewater.

**Open S-tube® semi-open impellers** provide high efficiency over a wide operating range.

They can be trimmed to meet a specific duty point, and SE/SL pumps fitted with Open S-tube® impellers are the ideal solution for medium to extreme contamination of wastewater.

**SuperVortex free-flow impellers** are ideal for challenging applications with high abrasives content or long fibrous materials.

SuperVortex free-flow impellers are trimmable and ideal for challenging applications with high abrasives content or long fibrous materials.

**Channel impellers** used in the S range are self-cleaning, with long vanes reducing the risk of jamming or clogging.

Channel impellers used in the S range are trimmable, self-cleaning, with long vanes reducing the risk of jamming or clogging.

# Hardened blades, reduced wear, reduced cost, Open S-tube® impeller

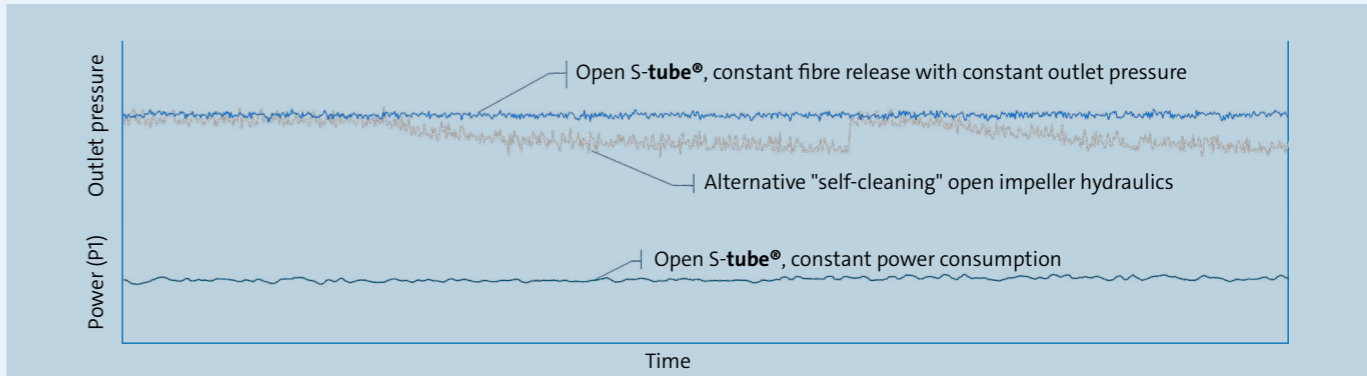
The patented Open S-tube® impeller and suction cover work together to reduce clogging and wear. For the majority of wastewater applications, there's no need to have the entire impeller hardened, as this would be excessive cost without benefit.

The cast iron(EN-GJL-250) Open S-tube® impeller's blade surfaces are hardened by induction heating to 46HRC. The anti-clogging casted groove in the suction cover keeps the hydraulics free of fibres, while the blades and suction cover groove have been shaped and angled in a way that will release fibre pressure produced when fibres grind between them.

This feature significantly reduces the wear on the cast iron impellers and suction covers, and for the applications that demand it, stainless steel and white iron variants are available.



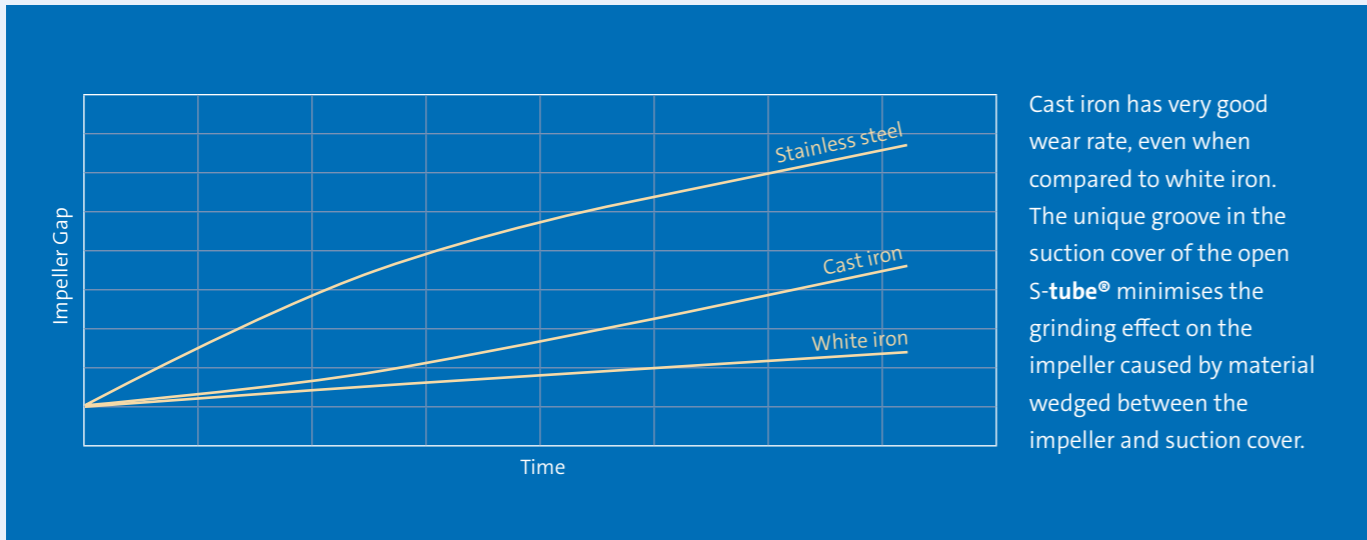
# Constant cleaning with constant outlet pressure and power consumption



The following comparison shows Open S-tube® and suction cover in action during an accelerated clogging test. The Open S-tube® is being compared to an alternative "self-cleaning" open impeller. Self-cleaning hydraulics typically accumulate fibers until they are released, resulting in a continual part blockage which negatively affects its performance.

The Open S-tube® hydraulics do not have this problem. The Open S-tube® hydraulics continually release fibers within the hydraulics to ensure a constant outlet head pressure, while maintaining a constant power consumption. This unique feature not only reduces the wear on the hydraulic components, but also the stress on the motor.

# Open S-tube® – impeller gaps over time



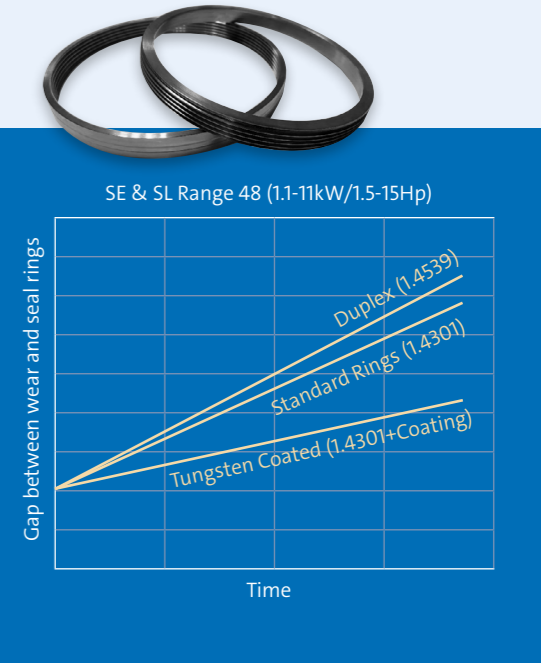
Cast iron has very good wear rate, even when compared to white iron. The unique groove in the suction cover of the open S-tube® minimises the grinding effect on the impeller caused by material wedged between the impeller and suction cover.

# Grit and abrasion resistance

**White iron**  
Our white iron impellers and suction covers have a hardness of 55HRC and undergo stress relief heat treatment after casting to ensure superior ductility of the components. As such, they have the hardness without the brittleness usually associated with such materials.

**Anti-jamming wear and seal rings**  
Our wear and seal rings on SE & SL Range 48 (1.1-11kW/1.5-15Hp) have large spin-out grooves that keep rags and fibres away from the gap between the impeller and volute. Like all moving parts, the threads on the wear and seal rings will wear down, particularly in wastewater thick with sand.

For sandy conditions, we offer heavy-duty tungsten carbide coated wear and seal rings that provide significantly lower wear rate, bringing you prolonged trouble-free operation even in very sandy conditions.



# SE, SL & S wastewater pumps

All our SE, SL and S range submersible and dry-installed wastewater pumps come in two basic material configurations:

## Standard

Cast iron impeller and volute. Motor housing either cast iron (SL, S) or with a stainless steel motor jacket (SE)

## Variant Q

Stainless steel impeller in EN 1.4408. Volute is cast iron and motor housing either cast iron (SL, S) or with a stainless steel motor jacket (SE)



SE 1.1-11kW / 1.5-15Hp pump range have higher grade stainless steel material variants:

## Variant R

All parts in contact with media are entirely of stainless steel EN 1.4408. Shaft upgraded to EN 1.4462.

## Variant D

All parts in contact with media are entirely of stainless steel with the critical parts upgraded to EN 1.4517 for casted parts and EN 1.4539 for plate material.



	Standard	Q	R	D
<b>Lifting Handle</b>	Stainless Steel EN1.4301			
<b>Cable Protection</b>	Not included		Polyolefin cable protection sleeve included	
<b>SE Motor Top</b>	Cast iron		Stainless Steel EN1.4408	Stainless Steel EN1.4517
<b>O-rings</b>	NBR		FKM	
<b>SE Cooling Jacket</b>	Stainless Steel EN1.4301		Stainless Steel EN1.4401	Stainless Steel EN1.4539
<b>Bolts/Washers</b>	A2-70		A4-70	Stainless Steel EN1.4539
<b>Shaft Seal*</b>	Standard shaft seal: Housing in EN1.4408, primary and secondary seals SIC/SIC, and o-rings in NBR		The FKM shaft seal: Housing in EN1.4408, primary and secondary seals SIC/SIC, and o-rings in FKM	
<b>Impeller</b>	Cast iron	Stainless Steel EN1.4408		Stainless Steel EN1.4517
<b>Wear and Seal Ring</b>	Stainless Steel EN1.4301		Stainless steel EN1.4401	Stainless Steel EN1.4539
<b>Volute</b>	Cast iron		Stainless Steel EN1.4408	Stainless Steel EN1.4517

Example shown: SE 1.1-11kW / 1.5-15Hp pump range

\* Shaft Seal Material Variants: We offer 5 variants for Range 48, 26 variants for Range 52 and 3 variants for S Range. Contact your local Grundfos representative about shaft seal options.

DIN/EN	AISI/ASTM
1.4408	AISI 316/A351 CF8M
1.4462	UNS S32205
1.4517	ASTM A890 1B
1.4539	AISI 904L

## Material declaration

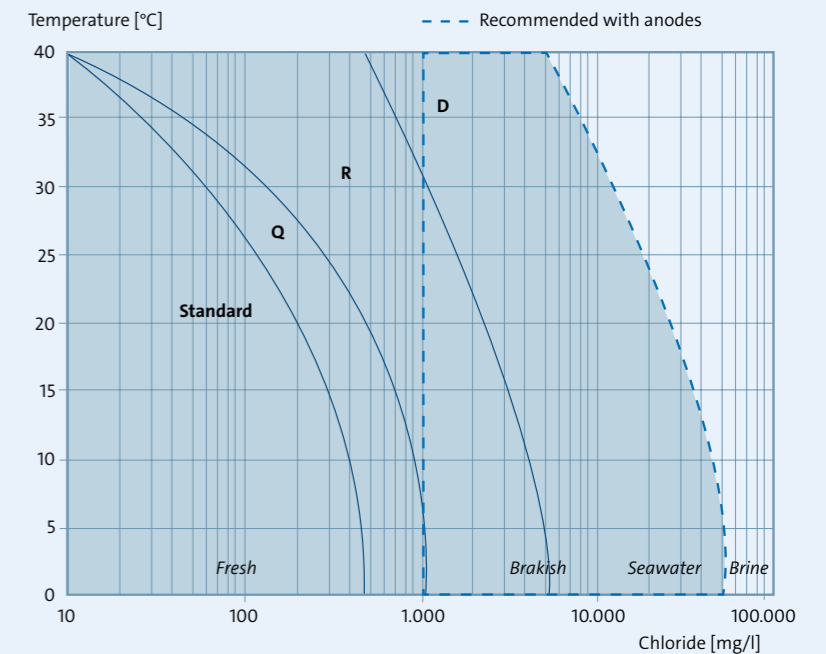
Grey cast iron are manufactured according to EN 1561:1997  
Cast stainless steel are manufactured according to EN 10283:2010.  
Conversion to other standards as AISI/ASTM are normative and products are not manufactured according to these.

# Which material do I need?

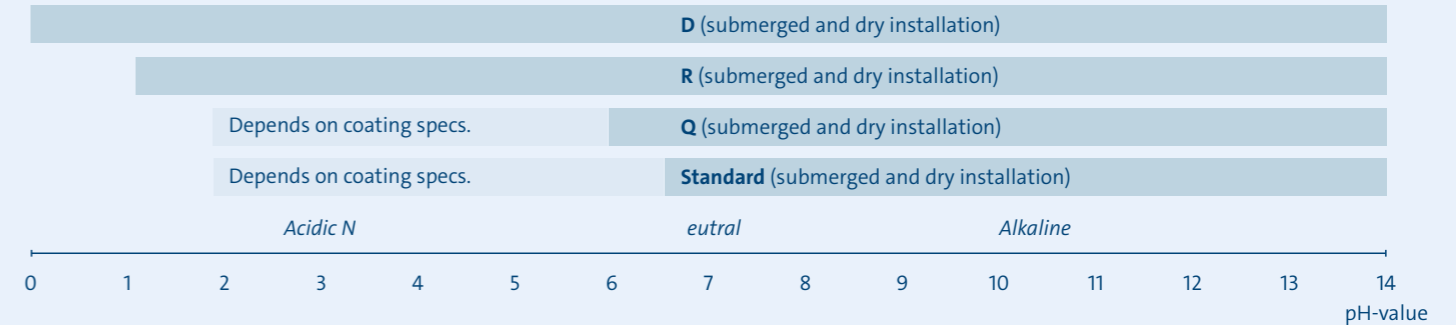
Use the following diagrams as a general guide to selecting the suitable pump variant and materials for your specific application, evaluated according to pH value and chloride concentration.

To minimise the risk of corrosion in brackish and seawater environments, the pump must be running continuously, meaning that standstills must not exceed six to eight hours. Resistance in these aggressive environments may be limited.

Factory-fitted sacrificial anodes are available for all SE, SL and S pumps. This additional corrosion protection will help to protect cast iron and stainless steel parts.



## pH



The pH value is a good indicator for corrosive behaviour, however pH is insufficient on its own to evaluate a media as its composition and variations must be considered before final

pump configuration. Contact Grundfos for an evaluation of your conditions, and for anode options.

# Don't see what you need? We'll build it.

With our engineer-to-order(ETO) service, we can create a fully-customised pump to precisely meet the needs of your application, and supply casted material to meet your special material needs. Choose from a range of coating options, including a variety of ceramic coating options and thicker epoxy coating options. For very corrosive applications, we can fit anodes to the pump in locations that maximise protection.

And for applications that large amounts of potentially damaging debris in the water, we can fit the cable with a protection sheath.

Contact your local Grundfos representative to find out more.



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