



RETROSLED™ ANODE SLED FOR PIPELINE CATHODIC-PROTECTION RETROFITS

The Retrosled allows operators to easily replace cathodic protection anodes on aging pipelines.

The Retrosled is an aluminum-anode sled designed for offshore pipeline life-extension projects. The Retrosled is lowered onto the sea floor via crane and connected electrically to the pipeline with one or two Retroclamps. Anode sled retrofit sites along the pipeline are determined by our cathodic protection designers using recent survey data and our cathodic-protection modeling system. Taking into consideration seabed conditions and pipeline burial, our engineers pick spots that maximize cathodic-protection potentials while minimizing the number of installation sites required.

Versatile in design

A cathodic-protection retrofit project using the Retrosled system can add 15 to 30 years to the life of an existing pipeline, depending on existing CP potentials and the needs of the operator. The Retrosled is available in two versions: the standard, rigid sled and an expandable version that opens once on the seabed. The expanding sled is used to quickly re-polarize a pipeline with dangerously low cathodic-protection readings; the standard sled is employed for pipelines with depleted anodes, but which are still adequately protected. Both sled models can be installed by diver or ROV.

A reliable connection

The Retroclamp is patented technology, developed at Deepwater and unavailable elsewhere. The Retrosled connects to the pipeline it protects by using two armored cables attached to the Retroclamp. The contact tip of the clamp that creates electrical contact with the pipeline can be fitted with a soft drill bit, allowing it to penetrate concrete weight coats. The Retroclamp is diver and ROV-friendly; the floating plate on the top of the clamp ensures a strong and constant connection that will not damage pipes. The ease with which it is installed makes the Retroclamp incredibly cost-effective compared to underwater welding or other attachment methods. For a buried pipeline, only part of the pipeline must be visible for the diver to install a Retroclamp..

Rigid and expandable versions

Use the standard Retrosled when extending life on a pipeline with good coating and readings that indicate the pipeline is still protected (above (-) 0.900 V vs. Ag/AgCl sw). Use the expanding sled when an extra current boost is required for a depolarized pipeline or one with degraded coating. Both models of Retrosled ship via normal trucks and containers. The expanding sled is deployed closed and is opened via crane or ROV once on the seabed.

More info at www.stoprust.com



GULF OF MEXICO
RetroSled with two clamps being overboarded



EQUATORIAL GUINEA
Expanding sled ships and deploys 12' x 8' and measures 40' on bottom



NORTH SEA
RetroSled aboard a vessel bound to retrofit the Forties infield flowlines



Technical datasheet

RetroSled™

General

RetroSled is a retrofit sacrificial anode system designed for pipelines where anode burial below the natural seabed is required or anticipated. The sled can be rapidly and safely deployed offshore with little-to-no diver intervention.

RetroSled is suited for applications where there is little-or-no seabed movement. For situations where seabed movement is anticipated, Deepwater recommends the RetroMat (See RetroMat technical datasheet).

Frame (Item 2)

Steel grade ASTM A53 [ASTM A106]
ASTM A36 [EN 10025 S355]

Welding All welding conducted in accordance with Steel Structural Welding Code – AWS D1./D1.1M:2006 [EEMUA 158]

Lifting (Item 3) 1/2" [12.7 mm] Padeye
4 points

Connection details (Item 4)

RetroSled 2 x Ø 1/2" [M12] Stud welded to frame

Structure RetroClamp (See RetroClamp technical datasheet)
Quantity as per requirements, typically 2 per RetroSled

Cable 4/0 AWG [~107 mm²], EPDM insulated, heavy duty flexible cable
2 per RetroClamp

Overall weights & dimensions*

15 Year

Dimensions 78" x 270" x 10"
(W x H x L) [1980 x 6780 x 270 mm]

Weight (Air) 1980 lb [890 kg]

Weight (Water) 1455 lb [660 kg]

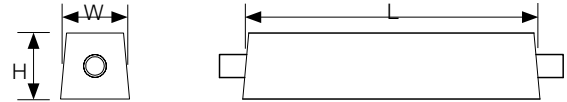
20 Year

Dimensions 78" x 270" x 11"
(W x H x L) [1980 x 6780 x 280 mm]

Weight (Air) 2140 lb [970 kg]

Weight (Water) 1575 lb [715 kg]

Anodes (Item 1)



Description

Deepwater offers two standard dimensions of anode for the RetroSled. The anode size is selected based on design life.

Design life

15 Year **20 Year**

Net weight

285 lb [129 kg] 325 lb [148 kg]

Gross weight

370 lb [167 kg] 410 lb [186 kg]

Dimensions (L x W x H)

120" x 5.3" x 5.5" 120" x 5.5" x 5.9"
[3050 x 135 x 140 mm] [3050 x 140 x 150 mm]

Core

2" Sch 80 Pipe 2" Sch 80 Pipe

Anode composition / electrical properties

Description

RetroSled is available with two anode compositions. Deep10 alloy was designed as an effective, general-purpose offshore alloy for use in tropical water environments. Deep7 alloy, with low iron content, is more effective in cold, deep water.

Composition (%)

	Deep7	Deep10
Iron (Fe)	0.07 max.	0.10 max.
Silicon (Si)	0.10 max.	0.10 max.
Copper (Cu)	0.003 max.	0.006 max.
Zinc (Zn)	4.75 - 5.25	4.75 - 5.75
Indium (In)	0.015 - 0.025	0.010 - 0.020
Titanium (Ti)	0.025 max.	0.025 max.
Others (each)	0.02 max.	0.02 max.
Aluminium (Al)	Remainder	Remainder
Open circuit potential (sw)	(-) 1.08 V vs Ag/AgCl	(-) 1.08 V vs Ag/AgCl
Closed circuit potential (sw)	(-) 1.05 V vs Ag/AgCl	(-) 1.05 V vs Ag/AgCl
Seawater capacity @ 25°C	1100 AHr/lb [2420 AHr/kg]	1100 AHr/lb [2420 AHr/kg]
Seawater capacity @ 5°C	1100 AHr/lb [2420 AHr/kg]	Variable

