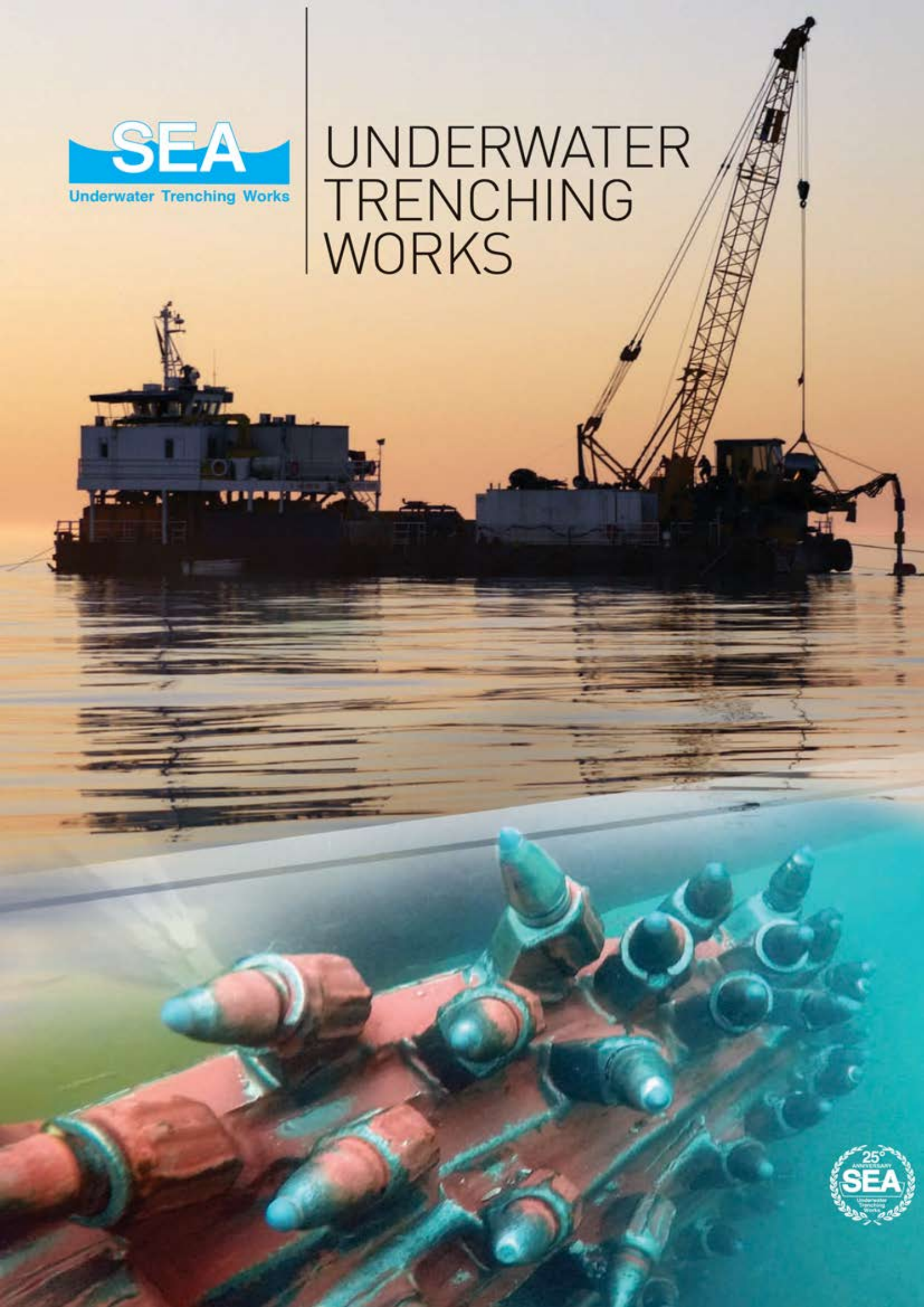




UNDERWATER TRENCHING WORKS





SEA

Underwater Trenching Works

SEA S.r.l. (SEA) is an Italian Company that has been working for major Oil & Gas Companies all over the world, for more than 25 YEARS. SEA highly specializes in sea trenching works of pipelines (from 3" to 60") and cables.

From the design and building of its machinery (supervising the engineering part), to the execution of trenching works, SEA is able to provide a full pipeline/cable burial service to the Client.

The concept behind SEA's machine derives from particular necessities connected to the project and therefore to the evolution from a previous model: this guarantees extreme versatility of the machines, which are suitable to perform trenches in most types of seabeds and on products which vary in diameter.

The Company's headquarters is in Ravenna. However, SEA also has collaboration agreements in place with other companies in Europe and America, that render their offices/bases available to SEA's operations in various countries all over the world.

Some of the main Clients:





SHORE APPROACH

SEA specializes in carrying out post-trenching operations in shore-approach areas, even in hard seabeds, without having to build cofferdams or finger piers to support the works.

POST-TRENCHING OF PIPELINES



SEA pioneered the "post-trenching system" for the burial of pipelines and cables.

Its machines have been so innovative and functional, that they are often used as example by other Companies in the same sector.

SEA continues to design and use newer evolved versions.

The machines differ according to the product to be post-trenched (e.g. pipeline diameter) as well as project specifications.

Post-trenching intends burying a pipeline or cable already laid on the seabed, by creating a trench which is only a little wider than the actual diameter of the product itself.

Some of SEA's post-trenching capabilities are:

- Carrying out post-trenching operations on many Shore Approaches, without having to build cofferdams/finger piers to support the works;
- Trenching through very loose and very soft soil to hard material, including ROCK (up to 71 MPa in UCS) and high PLASTIC CLAY;
- Using in contemporary, various PTM spreads during the same project;
- Using just one PTM machine to trench different OD pipelines in the same project;
- Minimizing the dimensions of the trench in order to promote natural back-filling.



POST-TRENCHING OF CABLES



SEA specializes in trenching various types of cables (i.e. FOCs, umbilicals and power cables) during and/or after the the laying operations,

reaching burial quotas of up to 3 metres TOC per pass, even in shore approach areas.



TRENCHING SUPPORT VESSEL/BARGE

SEA's post-trenching machines are powered through an umbilical connected to its power-pack onboard of a support vessel

DP2 ISKATEL-2

Iskatel-2 is a DP2 catamaran vessel that was completely refurbished in 2009. Its main dimensions are 49,30m (length) x 18,20m (width) with a draft of 2.4m (including Azimuth thrusters). In addition to the crew, it can host up to 25 people.

Thanks to its Dynamic Positioning 2 system, the vessel can work without having to rely on anchors, both in deep and very shallow waters: this is possible due to the dimensions of the thrusters, which were purposely designed by SEA's engineering department.



TRIMARAN ROSSANA

SEA can rely on Trimaran Rossana, property of Interface Shipping for the supply of this modular pontoon. The elements which it is composed of are shaped as standard size containers: it is therefore easily transportable both by land and by sea. The construction of the ROSSANA, which was modified from Catamaran to Trimaran, thus adding safety and versatility, makes SEA very competitive when it comes to performing trenching operations in shallow waters and in shore approaches. Together, ROSSANA and the PTM, form a very special team, for safety, simplicity and speed in operations.



SPECIAL EQUIPMENT & SERVICES

RACK

The development of new technologies used to assist in Shore Approach activities has led to SEA creating the RACK.

This structure is capable of supporting various equipment, in particular, trenching machines in the area closest to the beach, where traditional naval means struggle to reach.

The RACK can operate in various types of seabed, including sand, rock and coral, moving from the beach up to a water depth of -3m (in good marine conditions).



PULLING MACHINE – 200 TONNES

The pulling machine construction (designed and built entirely by the Company's technicians) has given SEA a particular autonomy in the execution of offshore projects, as the Company can address projects that also include cable and small pipeline installations, other than subsequent burial.

The Linear Winch has a pulling capacity of 200 Tonnes and is equipped with a power pack, a cable reel and a control panel, for the monitoring of the operations.



BACK-FILLING MACHINE

In order to be able to answer to market requirements, SEA has developed the Back-filling machine. This machine is designed to take advantage of seabed material deposited on the trench sides during trenching operations, and recover it back into the trench, which speeds-up the closing-up process of the trench.



SEA works in compliance with ISO 9001 and ISO 14001 specifications



Underwater Trenching Works

**SEA S.r.l. Servizi Ecologici Affossamenti
Company Headquarters**

Via Mariani, 44/46 - 48121 Ravenna - Italy
phone +39 0544 30283 - fax +39 0544 35591
www.seatrenching.it - info@sea-group.it



SEA S.r.l.

In collaboration with:



**Servizi Ecologici
Affossamenti SEA
(Malta) Ltd**

HF 8 Hal Far - Industrial Estate
Hal Far BBG 3000 - Malta
phone +356 21 658977
fax +356 21 658978
seamalta@sea-group.net



**SEA Brasil Serviços
Submarinos Ltda**

Praia do Flamengo, 66 bloco B s/ls
1715 a 1718 Flamengo - Rio de Janeiro
CEP22210 - 903 - Brasil
phone +55 21 2285-3996
fax +55 21 2205-8820
info@sea-group.it



HF 8 Hal Far - Industrial Estate
Hal Far BBG 3000 - Malta
phone +356 21 658977
fax +356 21 658978
seamalta@sea-group.net



HF 8 Hal Far - Industrial Estate
Hal Far BBG 3000 - Malta
phone +356 21 658977
fax +356 21 658978
seamalta@sea-group.net

