# SUBMAT BITUMEN MATTRESSES

1 

2 

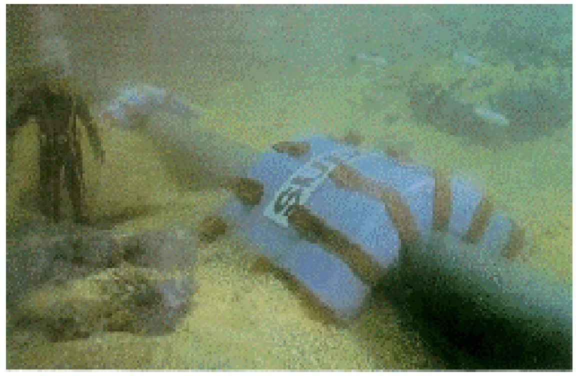
3 

***Counteraction to scouring the SUBMAT BITUMEN MATTRESSES progressively encourage sand build-up.***

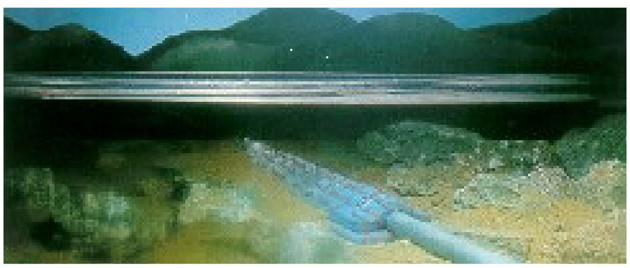
*__1. Installation__*

*__2. Partially embedded__*

*__3. Permanent anchorage__*



***Submat Bitumen Mattress the ocean's pipeline stabilisation and protection system.***



***Protection and stabilisation against erosion at land to sea transition.***

***Stabilisation and separation padding for pipeline crossovers.***

***Prevention of pipelift and snaking.***

Developed and patented by Submat in 1971, the Submat Bitumen Mattress is the original subsea pipeline stabilisation / protection mattress and is synonymous with the business of subsea pipeline stabilisation / protection.

The Submat Bitumen Mattress has been deployed on numerous projects throughout the world up to the present time, and remains today a proven cost effective solution to many applications associated with subsea pipeline technology.

The Submat Bitumen Mattress consists of a durable outer canvas envelope c/w integral lifting slings which is filled with a dense suitably re-inforced bitu-mastic filler material, all of which combine to produce a flexible mattress that is suited for dealing with all pipeline support, stabilisation and protection requirements. Submat Bitumen Mattress in its solid form retains a flexible nature even in the coldest operational conditions which enables the mattress to respond to ever changing seabed conditions which are particularly attributed to the problems of scour.

The Submat Bitumen Mattress with its relatively void-less mass and size versatility is particularly successful in applications such as pipeline crossovers whereby support piers may be constructed with a minimal number of offshore lifts.

The Submat Bitumen Mattresses is installed with a simple quick release frame which can be supplied as an integral part of each order.

***See reverse for Technical Data***

# SUBMAT BITUMEN MATTRESS

# TECHNICAL DATA

**SIZE**

The Submat Bitumen Mattress, can be manufactured to suit client specification generally up to 10m x 4m in plan area.

**STANDARD DENSITY**

Approx.. 2.2 Tonnes per cubic metre, may be varied from approx. 1.5 to 3.2 Tonnes per cubic metre.

**MIX SPECIFICATION (Standard Density)**

| | |
|---|---|
| 48% | 14mm down graded stone / crushed rock |
| 30.5% | Sharp sand |
| 11.5% | Limestone Filler |
| 10% | 200 penetration bitumen |

**ENVELOPE COVERS**

The envelopes are manufactured from Duradon Extra or Regentex which are man made fibres.

Tensile strength in warp 2409N/50mm
Tensile strength in weft 2628N/50mm

Tear strength in warp 400N
Tear strength in weft 512N

**LIFTING SLINGS**

Each mattress is fitted with loomstate polyester lifting slings with a combined SWL of at least double the mattress weight in air.

Each sling has a break factor of 7 times the sling SWL, i.e. the combined sling break factor of a 10 Tonne mattress shall not be less than 140 Tonnes.

**REINFORCEMENT MESH**

Tensar Ar1 - Polyproplyene
Weight 0.24kg/m$^3$
Tensile strength Transverse 18kN/m
Tensile strength Longitudinal 14kN/m

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