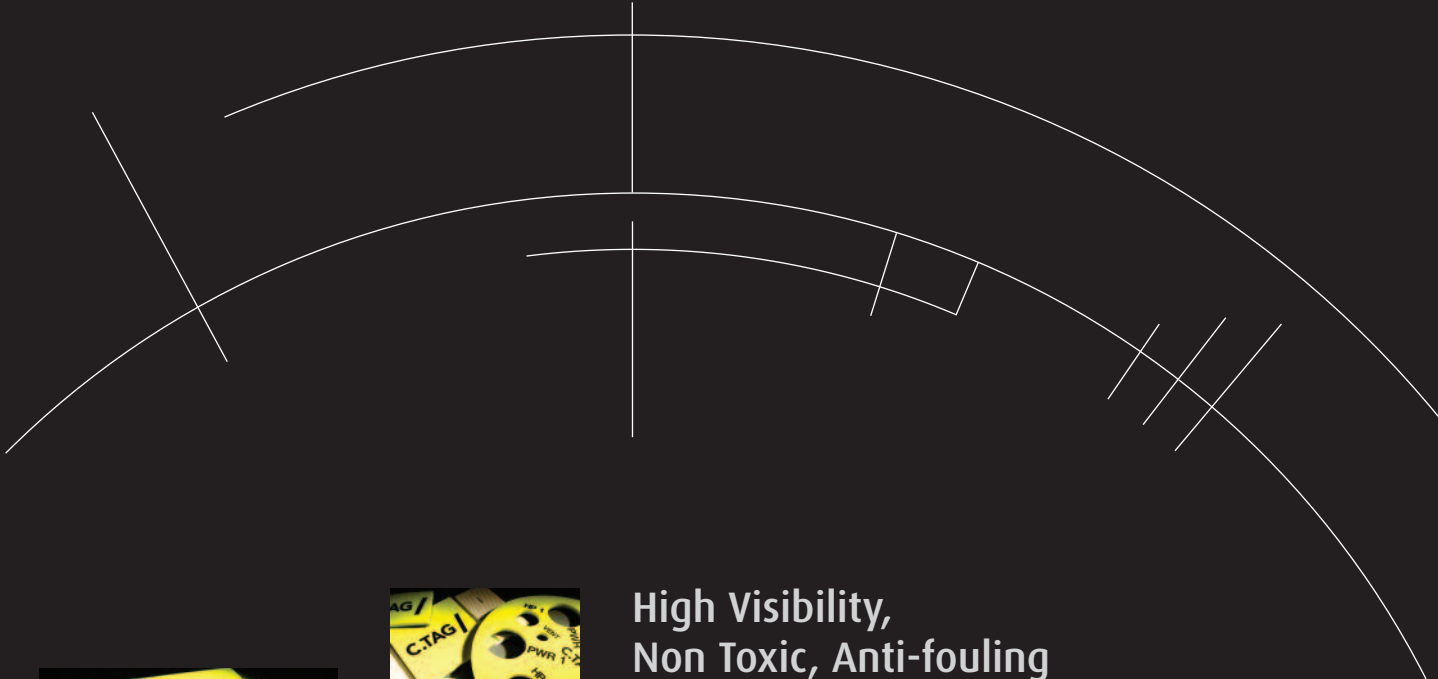




An Advanced Subsea Marker



**High Visibility,
Non Toxic, Anti-fouling
Underwater Markers**
for greater surveillance and
improved subsea monitoring



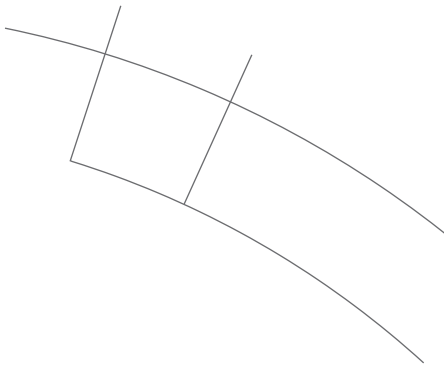
Advanced Insulation :
better products for challenging situations



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High Visibility, Non Toxic, Anti-fouling Subsea Markers

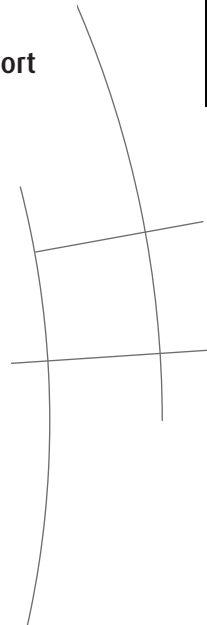
C.TAG[®] is the next generation underwater marker system which facilitates the need for greater surveillance and improved subsea monitoring. With the growth of deepwater oil production, remote and harsher environments, low light conditions and turbid water conditions, C.TAG[®] can offer greater visibility and easier identification methods for ROV operators.



C.TAG[®] offers a complete non toxic environmental solution which is extremely long lasting and maintains its anti-fouling properties for the lifecycle of the marker. Movevirgo Ltd has expertise dating back to 1982 in manufacturing Aquasign subsea markers which have surpassed 20 years of exposure in the North Sea. Movevirgo now brings this expertise to C.TAG[®].

C.TAG[®] applications :-

- + Identification
- + Positioning
- + Orientation
- + Lifecycle Support
- + ROV support
- + AUV Support



The Benefits

Non Toxic Anti-Fouling Properties = Zero Effect on Environment

C.TAG/® is 100% non toxic and therefore offers peace-of-mind environmental support, protecting the oceans ecology. The advanced anti-fouling performance has been achieved by extensive research and development by Movevirgo Ltd in both base materials, gained over 10 years testing in ultra harsh fouling conditions in an estuary. The development of the manufacturing process and moulding process has resulted in several patent grants.

High Visibility

C.TAG/® base material silicone coupled with fluorescent dyes meets all operational requirements and maintains greater visibility over longer periods.

Longevity

The base material used in the production of C.TAG/® has been on subsea test for over 10 years with excellent results.

Damage Tolerance and Extreme Pressure

C.TAG/® comes with protective covers for use during installation and offers UV protection for extreme sunlight conditions and protection from the yard environment (eg weld spatter). The base silicone used in C.TAG/® is extremely durable to both sharp and heavy pressure and can withstand a major impact from an ROV or other device.

C.TAG/® and its fixing applications have been pressure tested and the results showed zero deterioration, no visual difference, neither was there any hardening of the materials used in C.TAG/®.

Withstand High and Low Temperatures

C.TAG/® and C.TAG/® UW2 adhesive can withstand temperatures between -40°C and +120°C.

Efficient Ordering and Processing

Advanced Insulation Systems Ltd can quote from drawings and can make recommendations for the type of fixing method required for the marker. Quotes on markers can usually be submitted within four hours and orders dispatched within four working days for the UK and five working days for export, subject to order quantity.

Total Environmental Lifecycle Support on every marker

Advanced Insulation Systems Ltd will provide a comprehensive product lifecycle support to ensure that C.TAG/® and all the support information is aligned with the evolving product definition over the entire lifecycle, from design to disposal.

This will involve the following :-

- + Product definition: Advanced Insulation Systems Ltd will have the capability to define the C.TAG/® configuration, including the product structures as designed, manufactured and assembled
- + Operational feedback: Advanced Insulation Systems Ltd will provide feedback on the product properties, operating states, behaviour and usage
- + Support and environment: Advanced Insulation Systems Ltd will support and maintain all environmental standards and provide any special tools or equipment required during installation along with all personnel knowledge

Varied Choice of Specification

Colour – C.TAG/® markers come with black lettering on a fluorescent yellow background, red lettering on a white background or red lettering on a yellow background. Pictograms and logos in three colours can also be incorporated.

C.TAG/[®]

Methods of fixing

C.TAG/[®] comes with an innovative adhesive compatible backing material integrally moulded during the patented manufacturing process. This allows the marker to be bonded to various substrates (steel, PVC, glass flake epoxy, neoprene etc) using C.TAG/[®] UW2 adhesive.

Adhesive Fixing

C.TAG/[®] UW2 adhesive is supplied in cartridges and should be used in accordance with the Advanced Insulation Systems Ltd instructions and is applied to the prepared surface using a cartridge gun and spreader. Surface coverage of C.TAG/[®] UW2 adhesive is 3 cartridges per m², or 1 cartridge per 10 small markers. C.TAG/[®] UW2 adhesive is recommended not to be used in an air temperature of less than 5°C nor when humidity is above 70%. C.TAG/[®] UW2 adhesive is supplied in 380ml cartridges, for use in standard skeleton guns, and comes complete with abrasive paper, spreader and environmentally friendly de-greasing wipes. Once the cartridge has been used it is suitable for disposal as landfill. The cartridge format of the C.TAG/[®] UW2 adhesive lends itself well to clean operating conditions for the applicators.

The fixing team at Advanced Insulation Systems Ltd will check the correct orientation of the marker before applying it in position. The marker will then be progressively rolled onto the surface pushing any air away in front of the glue line. Once in place roller or hand pressure is used over the

surface of the marker to expel any remaining air and to ensure good contact with the substrate.

Once any excess adhesive is cleaned from the surrounding area a protective cover(s) is/are placed over the marker using cloth tape to secure the marker and cover in place. The curing process takes place in approx 24hrs dependant on temperature and humidity and the use of the cloth tape ensures the marker remains in position until sufficient cure has occurred to support the marker. The C.TAG/[®] UW2 adhesive has sufficient tack to normally hold the marker in place within 10 mins.

The cover(s) remains in position to help prevent ingress of dirt onto the marker surface as well as preventing UV light degradation of the yellow surface of the marker.

The black protective cover will provide protection from weld spatter and other mechanical damage. The yellow cover will provide UV protection for the marker.

N.B. It will be the contractor's responsibility to remove the protective covers before the equipment is deployed subsea.

C.TAG/[®] can be bonded to ABS sheet/GRP
Flexible strapping for fixing using the following methods :

Strap Fixing

For some applications it is more convenient to mechanically fix the C.TAG/[®] in place. In this instance C.TAG/[®] is supplied glued to a flexible Strap with slots for using either cable ties or Q Band (a proprietary strapping system) to fasten the marker in place.

In the case of Q Band, tensioning and cutting tools are required for fixing markers to large diameter pipes. Strapped markers can be fixed to small diameter pipes and tightened by hand using protective gloves.



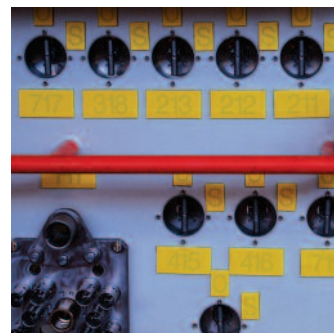


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Concrete Fixing :

C.TAG/[®] markers are commonly used in Concrete Gravity Based Structures (GBS) for marking external Base Caisson Walls, Top Slab and Shaft Walls. C.TAG/[®] can be supplied for through bolting to frames or pre cast elements in the concrete structures.

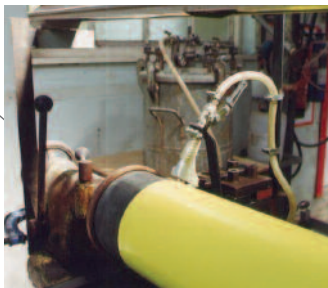
The subsea markers are supplied pre-drilled to customer's requirements and can be supplied with either stainless steel or nylon nuts with bolts of predetermined length.



C.TAG/[®] with see through protective cover bonded on to a UTA. (please note text visible with protective UV cover)

The alternative methods of fixing C.TAG/[®]:

- + Recessed plastic bolts or cable ties for grating and frameworks
- + Stand-off fixing system using Q Band is used when there is a requirement for water flow behind the marker
- + Small C.TAG/[®] markers can be fixed to valves as a valve tag with cable ties
- + C.TAG/[®] is manufactured with a spring clip fixing and is used when there is a requirement to retrofit a marker subsea with a ROV
- + Magnetic backing as an alternative to retrofit the marker Subsea
- + Slip Form Concrete Fixing. Adhered to an ABS plate with weld mesh strips



C.TAG/[®] – Pipe Coating

The concept of the C.TECH system can be used in pipe coating applications that require anti fouling.

The pipe to be coated is slowly rotated on rollers whilst a catalysed mix of liquid C.TAG/[®] material is applied to the primed and painted surface of the pipe via a dispensing machine. By traversing the dispensing machine along the length of pipe an even thickness is applied and the pipe is kept rotating while the material cures.

Typical coating thickness is 3-6mm.

C.TAG/[®]

Proven technology for Subsea applications

Advanced Insulation Systems Ltd has formed a working partnership with Movevirgo Ltd, who have been manufacturing and developing innovative silicone based high visibility underwater markers since 1982, originally for Shell, in their ISO 9001:2008 accredited facility in Redruth, Cornwall, UK. The marker material used in C.TAG/[®] has a long term anti-fouling performance which has been tested over the last 10 years on a test facility in Falmouth Harbour. This is coupled with the knowledge that Movevirgo Ltd have prior expertise in manufacturing Aquasign subsea markers which have been installed in the North Sea for over 20 years.

The technology behind the non toxic anti-fouling performance is achieved by the production of a low surface energy face on the marker. This is the result of extensive research and development in both the base materials and their moulding performance and the development of a patented manufacturing process owned by Movevirgo's parent company. The environmental performance of C.TAG/[®] material does not incorporate any biocides and therefore has zero effect on the marine environment.

Movevirgo Ltd has gained more than 25 years of engineering expertise and brings this expertise to C.TAG/[®], which is now available through Advanced Insulation Systems Ltd to meet the growing demand for underwater markers within the subsea oil and gas sector.

The Testing Facility in Falmouth Harbour and the Results:

1

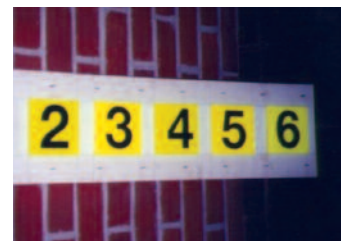
The raft holds the testing boards which are positioned between 6ft and 10ft under the surface; this means the markers are subjected to extreme fouling conditions coupled with maximum UV light. These conditions are rarely found in most subsea operations making the perfect testing facility.

2

The original board which contained five matching markers was positioned on the raft with the numbers 3 & 5 made from the same material which is now used in C.TAG/[®] subsea markers.

3

After 6 years on the raft and under extreme fouling conditions the only visible markers were 3 & 5 made from the same material which is now used in C.TAG/[®] subsea markers.





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Varied Choice of Specification

Colour – C.TAG/® markers come with black lettering on a fluorescent yellow background or red lettering on a white background. Pictograms and logos in three colours can also be incorporated.

Sizes and Text – Marker size can be up to 1000mm x 1400mm in one piece or longer by using several sections. Mimic diagrams, dials and irregular shapes can be accommodated. Character height from 6mm to 500mm. Default text is Helvetica Bold but other fonts are available with all characters 300 microns in depth. Standard marker thickness is 6mm, but 3mm and 8mm can also be produced for certain applications.



AIS has supplied C.TAG/® subsea markers to the following projects to date:

Operator	Project	Location	Water Depth (m)
Exxon Neftegas	Sakhalin 1 Arkutun Dagi GBS	Offshore Russia	35
Dong Energy	Oselvar	Offshore Norway	70
BP	Taurt I	Mediterranean Sea	108
BP	Taurt II	Mediterranean Sea	108
BP	Tmists	Offshore Angola	-
Statoil Hydro	Troll	North sea	330
Mariner Energy	Balboa	Gulf of Mexico	1052
Dong Energy	Trym	North Sea	65
Statoil Hydro	Gjoa	North Sea	380
Burullus Gas	West Delta Deep Marina	Mediterranean Sea	850

C.TAG

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We offer full technical support service for all our products regardless of location or application. For further information please contact us to discuss your requirements and/or request product trial reports.

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