

RESINEX news

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Resinex Trading S.r.l

Via Cappuccio, 14 - 20123 Milan (Italy)
www.resinextrad.com

Milan: ph: +39.02.72013463/89013176
fax: +39.02.72016182
marketing@resinextrad.com

Torbiato: ph: +39.030.7457245/7453063
fax: +39.030.7450162
production@resinextrad.com



In these 5 big autoclaves we test the deep water floats until 400 Bars.

Seawork is safer with innovation

Resinex pressure test until 4000-meter depth

Oil exploration is ever extending into the high seas to drill the ocean floor in order to find new oil and gas fields. Great depths which once seemed out of reach are now closer to hand thanks to the development of advanced technology in which the oil companies are making new and important investments.

Resinex, with its products, has always anticipated market needs and invested hefty sums in research thereby always keeping one step ahead of the competition: an example of this is the new autoclave installed last September in the Adro Marine Research Centre. No other similar autoclave exists in continental Europe in size for those able to carry out testing to 4000 metres depth. It is 1.1 metres in diame-

A new autoclave with the capacity to carry out tests to the maximum pressure has recently been installed in the Adro Marine Research Centre. Another research investment to maintain the height of quality.

ter by 2.2 metres in height and joins the four other autoclaves available to Resinex laboratory technicians among which is a giant of 2.1 metres in diameter by 3.5 metres in height which can simulate pressure conditions of upto depths of 500 metres.

In this way our company is once again the vanguard in quality and safety in its floats, offering an always more advanced service to the customer.

Quality Management of materials and pro-

duction process is certified by Lloyd's Register Quality Assurance norm ISO 9001:2000. Exhaustive laboratory tests are carried out on samples taken during the work process. But before being consigned, the floats that come off the production line in Torbiato (Brescia) are first passed through to the nearby Adro Resinex Marine Research Centre which is equipped with the most up-to-date and sophisticated analysis systems. Besides weight and dimension, traction resistance is tested, both of pressure and floatability (net buoyancy) and the data are fed into a computerized system which gives a report of all the characteristics of the piece in question. This is a type of Identity Card which represents an extra guarantee of Resinex quality.



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Singapore
5 - 8 December 2006
Booth 4J4-12



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www.resinextrad.com

A sonar in the Alaskan fiord

Resinex buoys for measuring acoustic health of U.S. Submarines

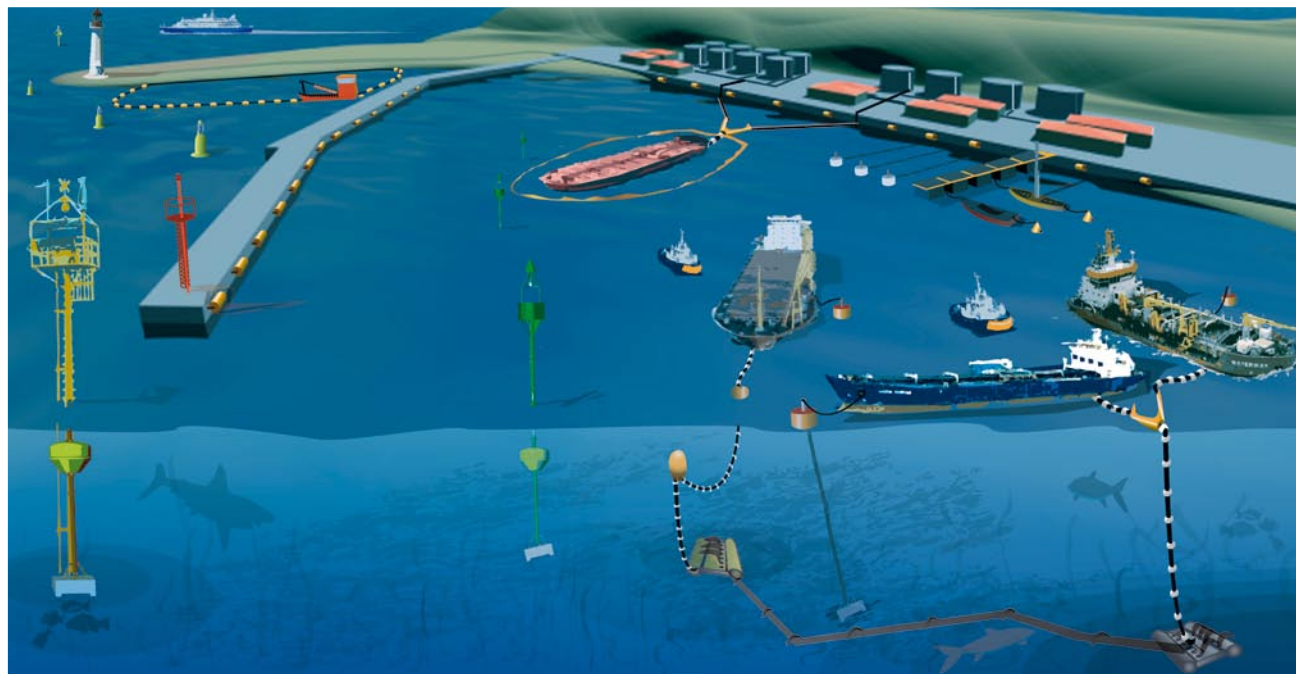
Its name is SEAFAC, which stands for Southeast Alaska Acoustic Measurement Facility, and it is an important and continuing U.S. Navy project developed by Naval Surface Warfare Center (NSWC) for the purpose of measuring the acoustic signatures of naval vessels. Science Applications International Corporation recently upgraded the measurement capabilities at the facility on behalf of NSWC. As part of these facility upgrades, SAIC opted to use Resinex support buoys. The SEAFAC site, in operation since 1991, is located in the Behm Canal, a fiord in an isolated area of Alaska, near Ketchikan. The location and depth of this fiord provide low environmental noise levels, without acoustic interference. In this remote, quiet environment, advanced measurements are carried out

to assess the noise levels generated by American submarines while navigating at full speed in deep water. The aim was to reduce noise levels to a minimum for the latest Seawolf and Virginia classes of submarines. SAIC will mount these highly sensitive hydrophone arrays on two cables supported by two large Resinex support buoys suspended 45 metres below the sea surface. When the submarine passes between the two arrays, the system will acquire all of the necessary acoustic measurements. This process involves the use of costly, sophisticated, and advanced electronic equipment, and Resinex is pleased that SAIC has chosen to use its Resinex type PEM 21 floats (2.1 metres width by 3.1 metres height, tested to operate at a depth of 60 metres and produce 6 tons of net buoyancy).



Reliability: Resinex buoys keep the sensor lines under tension at a 45-meter depth.

A complete range for every buoyancy need



In the ultra deep Indian Ocean

The two pilot systems (created by Envirtech on the behalf of the Indian SIOT) to monitor tides and anomalous waves (tsunami) avail themselves of a floating line composed of 5 Resinex buoys in syntactic material for high depths. They were installed at a water depth of more than 3000 metres by the Russian vessel Boris-Petrov, in the Bengala Gulf.



University deepens its study in the abyss



The buoys on the deck before deployment.

Tested to operate in total safety to a level of 500 metres below sea level, two deep water buoys were delivered this Autumn to the University of Azores.

The two buoys were ordered by the Oceanographic and Fish department of the said University and are positioned off Ponta Delgada in the island of San Miguel as a support for its study of ocean currents and fish movements in the area.

They are two floats formed by an external shell in polyethylene rotationally moulded filled with syntactic foam capable of resisting at great depths.

Both buoys are vertically crossed by a steel bar.

The bigger one measures 1.2 metres in diameter by 1.24 metres in height and has a swivel type hook for every extremity that can become 1.75 high (produces 745 kilos if net buoyancy).

The other, 1.15 metres in diameter by 1.15 metres in height, which in its upper part can accommodate a sensor, generates a net buoyancy of 710 kilos.



Telecom test at 2090-meter depth

The first anti-tsunami system in the Mediterranean sea

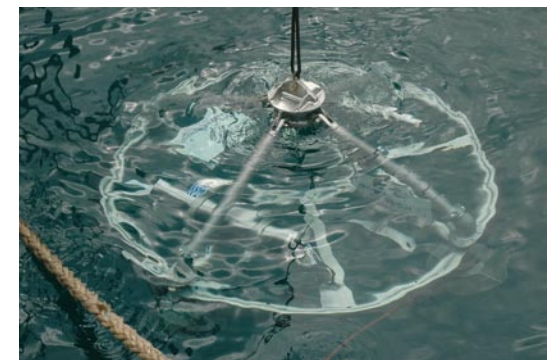
The first step, towards the end of 2006, consisted of the positioning of the system in the South Tyrrhenian, a few kilometres off Palermo. This was the test system for the Me Tas Mediterranean Tsunami Alarm System, a project for the monitoring of the water and sea bed instituted by Telecom Italia and Envirtech (www.envirtech.org) using Resinex buoys.

The prototype consists of two principle components, always linked together by a bi-directional acoustic modem: a platform is situated in deep water and float for satellite transmission.

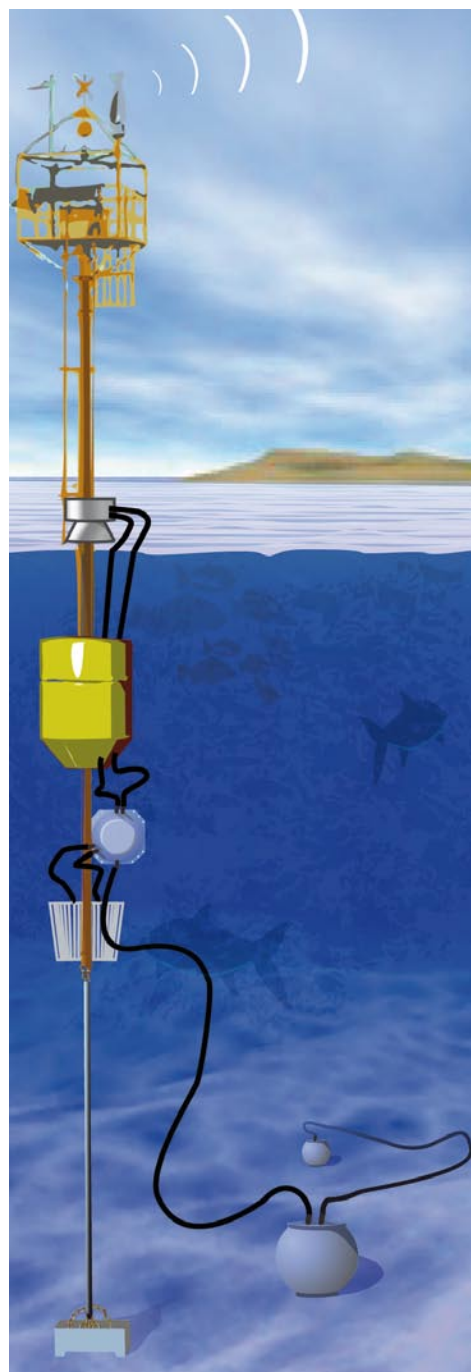
The platform collects the data provided by the sismometres and also records pressure variations, directly correlated to the indications of an expected tsunami or to the passage of one. The buoy, through the modem which remains connected to the platform on the bottom, transmits the data via satellite to Les Immarsat of Fucino which in turn passes it onto the Envirtech laboratories for preliminary tests.

Finally everything is elaborated by the Environmental Agency and Technical Services (Apat) which gives scientific support and approval of the results.

This experiment, which makes use of giant Resinex floats (a buoy of 1.3 metres in diameter and 13 meters long assigned to the receiving and transmission of data plus another 11 deep water buoys for the buoyancy of the mooring system), has the scope to calibrate the measuring procedure and alarm. The data and any danger warnings flow directly to a control centre which in turn passes such information to the competent authority. The system can be transferred to every port of the world and positioned at any sea depth and has therefore a vast range of potential applications.



Above, the long Resinex buoy on the deck. Right, positioning of the deep water platform.



Alenia controls the bradysism

The bradysism of the Gulf of Pozzuoli is that old phenomenon which produces the upward slide of the coast and the slow but inexorable deterioration of the inhabited area. This zone is scrutinied by every type of monitoring and it is exactly here that Resinex, in Autumn 2006, gave its own contribution with a big beacon which made up the floating competent of the project developed

by Alenia (www.alenia-aeronautica.it) through Meg Sud.

It is a system of control and analysis positioned at a depth of about 100 metres and linked to a central exchange situated on a square metal tower which transmits all collected data to a land

base. The equipment is powered by solar panels able to generate a power of 200 watts with a tension of 12 volts.

The choice of Meg Sud to use an elastic beacon anchored in 100 meter-deep water is the most recent testimony of the reliability and versatility of Resinex elastic beacons "invented" by our company in the 70's and used in hundreds of installations throughout the world.

All our catalogues in
www.resinextrad.com

Our software «sees» the buoys

When one speaks of innovation, the practical results of research carried out by Resinex in the area of software to make the signalling systems more efficient and safer even in the most extreme meteorological conditions, cannot be overlooked. The latest innovation brought into operation by our R&D staff is a computerized system (baptised RBC: Resinex Buoy Control) which collects and transmits to shore an abundant series of data on the buoy. Situated in any part of the open sea. Through the software, not only are battery levels, the efficient and correct working of the solar panels and lanterns monitored, but the RBC System also keeps the entire installation under control. Besides having a card for satellite positioning with a receiving antenna and programmed card to measure and transmit analogical and digital signals, it is also equipped with a GSM/GPRS modem which can receive and transmit the data and an electronic device which manages all the collected information. It is therefore very useful to have all the updated information. By SMS or email the user is informed both of the signalling efficiency and any fault such as the break or rent of the anchor caused by extremely bad conditions or other damage due to violent collision by vessels, if the buoy should, by any chance, come drift, the GSM equipment is able to locate and make salvage possible.



FPSO and FSO: the new frontier for deep water oil drilling

Resinex buoys in the offshore fields of the world

Resinex is one of the very few producers in the world of floating systems for SPM (Single Point Mooring) and is transferring its know-how and experience towards the new FSO, FPSO and now also the FDPSO systems.

The systems FDPSO (Floating Drilling Production, Storage and Offloading), FPSO (Floating Production, Storage and Offloading), or simply FSO (Floating Storage and Offloading) represent the latest frontier in offshore drilling. They are, simply speaking, two big ships firmly moored over a well-head in open sea in order to collect and store the oil which in turn is then transferred to a smaller vessel which then acts as a shuttle between the well and the storage port or nearest refinery.

The difference between the systems is that the FPSO is also directly connected with the oil drilling while the FSO is only concerned with storage.

The most advanced technology for deep sea oil extraction opens the way for oil companies to venture further into ever more extreme conditions in the search for oil. However, to guarantee a maximum level of safety of the plants it is also necessary that the support systems are equal to the situation. For this, Resinex specialist in floating and signalling systems since 1961, is the preferred choice by the world's oil companies. The reliability of our products is well-known and is supported by the thousands of installations we have been part of. From deep water floats to support buoys, from the giants for the mooring of oil tankers in open sea to plant signalling: the Resinex range is vast and is requested from all latitudes. Evidence? Also in 2006 various oil companies have found an answer to their needs in the



Above left, clockwise, some pictures of Resinex offshore oil installations.

- 1. Pick-up buoys in Korea.*
- 2. FSO shuttle tanker mooring in Malaysia.*
- 3. 4. e 5. Hose floats for the SBM and FSO in all continents.*
- 6. Floating Y pieces in Equador and Africa.*

spread of the Resinex range and our products can be found in all points of the compass. Needs for every type of installation FPSO, FSO and SPM were satisfied. Aramco, Azawiya, Petroequador, Agip, Viet-

SovPetro, Total, KNOC, Pertamina, Sumed, NAOC, Shell, Thai oil, NIOC, Conoco, Esso, Cepsa, are some of the major oil companies that used successfully our floating systems in 2006.

Our tie-in floats for the Sealine Gupco

In the Sealine Gupco Project, Saipem has ordered 40 tie-in module Resinex floats to be used in Egypt. These floats were made with a shell in polyethylene rotationally moulded and filled with expanded polyurethane at a variable density according to the required floatability. The tie-in are extremely useful in open sea to support the pipes in a sea-line prior to deep water positioning. The particular concave form of the structure was expressly studied in order to limit the mobility of the pipes and so to facilitate manoeuvring which in turn reduced time and costs in the operation. Gupco, a Gulf of Suex Petroleum Company, is a 50% joint venture between BP and Egpc, the government oil company. It deals with the production of gas and oil in the Suez Gulf, in the western desert and the Nile delta. The forty floats grantee a total floatability of 88 tons at 150 meter-depht.



Kuryk: a turnkey port

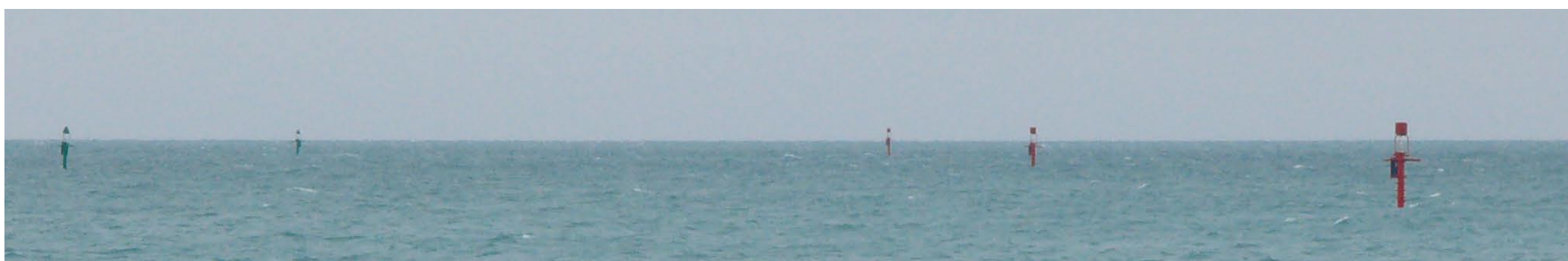
Kazakhstan, from here flows the Kashagan oil

At Kuryk, in Kazakhstan, one of Saipem's world operating bases (www.saipem.it) on the North-East Caspian Sea Coast, Resinex obtained from Ersai (50% controlled by the giant Italian installator) the order for the complete signalling installation in the new port under construction. Our company designed, produced and consigned all the signalling systems also giving assistance in assembling and setting up. Resinex

supplied eight elastic beacons and two land beacons for the signalling as well as a complete system for optic alignment of the ships to ensure their safe passage into the port canal. All the lanterns were Pharos Marine led type with the exception of the F4 240 installed for the alignment that used bulbs.

The construction of the port at Kuryk, 4800 inhabitants, 76 kilometres from Aktau, is the most important in the country and was approved in 2005 by the Kazakhstan government on the proposal of Kazmunai Gas, the national oil company. The Kashagan oil field crude will be transported from Aktau to Kuryk, then across the Caspian until Baku where with the aid of the BTC pipe-line (Baku-Tblisi-Ceyhan), onto Turkey.

Precision: the optic alignment leads the ships safely into the port canal, the elastic beacons sign the passage while the land beacons signal the approach.



Shallow water deep difficulty

They are extremely reliable and light surface floats, invented by Resinex for shallow waters and are known in jargon as "a coppella". They are rotationally moulded in polyethylene and have a double pipe passage. People in the trade consider them perfect for positioning the lines, using small special floats for particularly shallow water. This is particularly true for the Caspian Sea where Saipem (www.saipem.it) is working, on behalf of Agip KCO, in a mega-contract in one of the most important oil and gas fields in phase of development in the world, namely Kashagan.

Situated about 75 kilometres south-east of Atyrau, Kashagan was discovered in 2000 and its reserves, estimated at over 50 million barrels, is comparable to those of the huge Saudi Fields. In 2001 the ENI Group was nominated by the Kazakhstan government as "sole operator" in the new field.

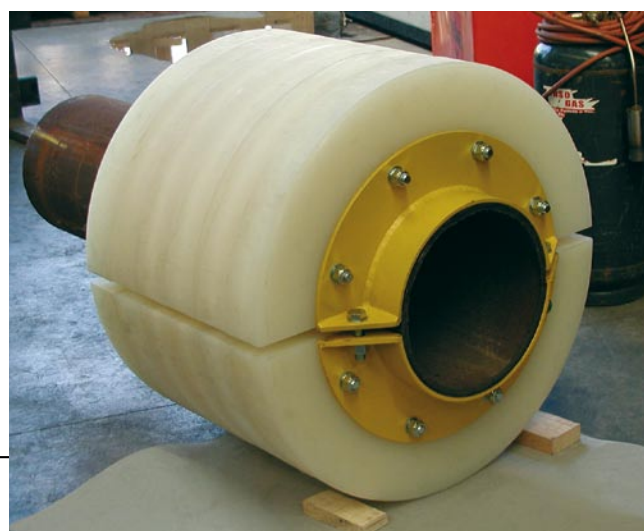
Resinex delivered the floats to Fratelli Righini of Ravenna (www.righiniravenna.it) which had just completed the supply of an installation for the transport, positioning and fixing of an approximate 8 kilometre pipe line. This conduct will be done by Saipem in the North-East region of the Caspian Sea and will link the dry land to the field. The water, very shallow, complicates the operation even more and a result the Consortium had a commission innovative flat hulled vessels in order to reach the wells and to build special offshore islands.



The complex shallow water trenching machine.

Pipe-in-pipe against the Sakhalin gelidity

On the island of Sakhalin, a long slice of land situated in the frozen Far East Siberian North Pacific, temperatures often drop to 50° below zero. This is a land rich in oil where all equipment is utilised in extreme conditions and which tax the resistance of machine and man to the full. In this inhospitable area, gelidity is the principle enemy to those who extract, store and transport the crude oil. As a result, Saibos, of the Saipem



group commissioned 6 particular pipe-in-pipe systems from Resinex in order to protect the pipeline hoses in the Sakhalin 2 field.

Basically, it is a pipe within another, insulated from the hostile exterior environment by a type of air space created by six high resistant polyethylene collars thus guaranteeing protection of the contents.

Solidity: one of the six pipe-in-pipe collars.



Wondering in the marine parks

Intelligent floats for the safe mooring of tourists



Resinex is the name for the new frontier of intelligent tourism, that chosen by those who visit the Italian maritime parks in absolute safety and complete respect for the environment, our company has supplied and installed the signalling and mooring systems, from the summer of 2006. The MarPark project (www.markpark.it), created by Em-Sailing, starting with an international patent of the Italgest Mare Company, got underway in the marine area of “Cinque Terre” (www.areamarinaprotetta5terre.it) and in “Capo Carbonara” reserve of Villasimius, Sardinia (www.ampcapocarbonara.it). It is a telematic system for the planned and controlled mooring of pleasure craft in most distinguished marine areas based on mooring buoys able to recognize the (booked) user and also to transmit any abuses to a central operation centre and so protecting the environment from damage caused by anchoring and excessive tourism. Resinex supplied the small offshore tourist floating materials where only authorised craft can dock. Every mooring is formed by floating buoy with a little fender to protect the docking craft and is anchored to the bottom by a system with a low impact on the environment (above all in the area of “Cinque Terre” where was necessary to protect the posidonia and the pioneer coral species, particularly vulnerable to anchors) and maintained in tension by a jumper. The metal parts are all in stainless steel.

MarkPark: booking by telephone or via internet

But how does the MarPark system work in practice (www.markpark.it)? One can reserve a buoy either through internet or by telephone, indicating the moorage period and size of craft, which for the moment can not be more than 24 metres. After having received the access code, a ring shaped seapass will be sent to one's residence (or collected on arrival) and must be placed at the top where the boat is tied up the buoy interfaces telematically with ring, communicating the access code via a modem to the control centre and so the permission to dock.



The jumper protects the posidonia.

Defending the Ustica's sea

Also the protected marine area of Ustica, the oldest in Italy, being founded in 1986, for the preservation of the fauna and environmental heritage on sea bed surrounding the island, is now signalled by Resinex buoys. It was at the end of July 2006 that the delivery and placing of two light buoys took place. These were part of a system ear-marked to mark the perimeter of the so-called Zone A, the most protected area of the park where navigation, mooring of any type of craft is forbidden. Fishing is also prohibited as well as any other activity that could disturb or alter natural characteristics of the environment. All the buoys are moored with a virbrur mooring type jumper.

Resinex signals the Sinis

The environment has been once again at the centre of an important project in which Resinex has participated with the municipality of Cabras in the planning, production and positioning of the bounds and signalling of the protected Sinis peninsular Marine Area in the Sardinian municipality (www.area-marinasinis.it).

Seven light buoys were used, whose mooring was kept under tension by as many jumpers. On

this occasion the brand new Pharos Marine self-contained led marine lanterns were used, with whom Resinex has the exclusivity for Italy.

The Sinis peninsula has the Oristano Gulf on its West and is bounded by great pools of Cabras, Pauli Murtas, Sale Porcus and Is Beneas. With an Environment Ministry Decree in 1997, the Marine Park was founded also encompassing the island of Mal di Ventre.





The light tower at the extreme east of Malamocco dam. Below right, the tall stainless steel land beacon positioned on the opposite side.

On the Malamocco dam

Venice: 2 towers for the breakwater

Last September, two large Resinex beacons were installed for the signalling of the Malamocco outer dam, built by Mantovani constructions (www.fip-group.it/mantovani/azienda.html) for the New Venice Consortium (www.salve.it) as part of the Mose project for the protection of the Lagoon.

Given the continuous back and forth flux of large cargo and passenger vessels, a system of signalling was the uppermost importance (both luminous and radioelectric) to guarantee navigational safety and to protect the delicate lagoon ecosystem from dangerous accidents. To satisfy this need, Resinex with its fine decades of experience combined with the quality of Pharos Marine products, with whom it has exclusivity in Italy, was chosen.

At the extreme East of the “moon” (the outer dam is also known by this name because of its

shape) there is a 18 metre high light tower on whose summit Resinex has placed a 1.1 metre diameter by 1.5 metre high stainless steel octagonal lantern with a Pharos Marine LBEA 250 red light. On the light house side Resinex has positioned a solar powered system able to supply 560 watt power.

On the opposite side, at the extreme west of the dam, Resinex has produced its own light tower structure of 11.5 metres in height, built entirely in stainless steel and hosting another Pharos Marine light of minor power than the other.

Both installations are, fed by batteries powered by solar panels. Though the luminous and radioelectric signalling have a guaranteed autonomy of 20 days even in the absence of a photovoltaic charge.

The power installed on the yellow signal is also of 560 Watt.

11 giants to protect the Lido

Not far from Malamocco, in the congested zone of Venice Lido, it was necessary to signal the navigable canal, while work on the consolidation and safety connected to the Mose project was under way at the mouth of the port. For this, The Grandi Lavori Fincosit company, which contracted the work from the New Venice Consortium, ordered eleven signalling megabuoy. There were FP 400 type light buoys with a diameter of 2.5 metres and fitted with lanterns fed by rechargeable batteries with solar panels and top mark with radar reflectors. Every buoy is made up of three troncoconical modules in rotomoulded polyethylene and filled with polyurethane foam. They are painted either in red or green depending on their positioning point and the lantern is placed in such a way as to have a 4 metre focal plane.



Stability: under traction tests the buoy tilts only a few degrees.

From Adro for the Thai Navy

If the Italian Navy relies on Resinex floats for coastal signalling, there must be a reason. This, more or less, must have been the reasoning of the heads of the Thai Navy supply department, who decided to use our buoys for their needs.

Thailand, as Italy, has thousands of kilometres of coastline and to have such a reliable supplier as Resinex, one of the world leaders in the sector, is very important. As a result, Bangkok decided to

acquire from Adro the floats for the first 20 signalling buoys.

They are 1.5 metres and 2.1 metres in diameter and were expressly designed and produced for low water anchorage. The buoy's metallic structure was instead made on sight, but always based on Resinex's project and specifications.

marketing@resinextrad.com

20 huge soft fenders against the jetty

Safe docking in Piombino harbour



The Piombino Port Authority commissioned Resinex for the complete production for the docking safety in the ports of Piombino and Portoferraio on the island of Elba. This involved 20 giant floating fenders and two corner fenders to protect ships and ferries entering and leaving port from accidental collisions against the jetty.

Four of these are jumbo-fenders with impressive dimensions: 3.3 metres in diameter by 6 metres in length. All the others have a more “normal” size: 2 metres in diameter by 3 in length.

Resinex fenders are normally produced with a “heart” of rigid expanded polyethylene and an exterior coating in thick layer of polyurethane

elastomer. In the case of Piombino the Port Authority requested an extra protection with a net of chains and tyres. Resinex’s experience in the fender sector is a guarantee of the highest standards of safety and reliability in the world, as can be witnessed by the hundreds of fenders produced and consigned throughout the years.



Stability, manoeuvrability and low costs with the Resinex floating lines.

Dredging: a real boom!



Starting almost unobtrusively, to meet the needs of an ever demanding class of customer, the production of floats for dredging is becoming always more and more important for Resinex to the point that by now Resinex has dozens of diverse models in its catalogue suitable for every type of work and to support pipes of all sizes. The latest arrival to the range is the DF 20; a float with an external diameter of 1,66 metres and which can support pipes very near to a metre in diameter (960 millimetres) with a buoyancy that touches 1000 kilogrammes.

But the question is why is there such a success of the Resinex line of dredging floats that has resulted in the production of thousand pieces a year? Besides the extensive range, one of the strong points is without doubt the particular attention paid to costs. Every float is composed of two half shells made in linear polyethylene connected to metal bolts. They can be supplied empty or filled with polyurethane foam which assures unsinkability in the event of violent collision.

The new super-barrier

Those who work in the sea on digging or dredging operations must give a full guarantee against pollution caused by the dispersion of mud, seaweed or other materials moved and suspended in the water during the work.

When, the need arises, to isolate the area concerned, there is nothing better than a Resinex boom with total protection from the surface to the sea bed.

The Resinex OSB boom has high floatability

which enables it to support an underwater “skirt” made of polyester fibre reinforced with PVC.

The boom can effortlessly resist seas of up to force 3 and even being quite a few metres high).

After having successfully used 300 metres of Resinex booms to circumscribe a dredging area in the port of Brindisi, last summer the Grandi Lavori Fincosit company (www.glf.it) ordered another 120 metres for the port of Bari (Southern Italy).

This is a boom with a floating part of 35 centimetres which supports 9 metres of underwater “skirt”, weighed down on the sea bed by a counterweight of a 10 millimetre steel chain.



Iseo lake chooses Resinex

Technical and administrative rationalization, cost control, singling out of the abusive occupancies, better visibility at night, more safety.

These are the reasons that have induced the Consortium of the Management of the Lake of Iseo (Northern Italy) to apply to the Resinex experience and know how for the “updating” of the mooring systems.

