

RESINEX

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*Signalling
for offshore*

Discover Atlas Cove with Resinex lights

Nigerian Atlas Cove SPM System totally signalled by Resinex

Resinex has been awarded by Bilfinger + Berger, Germany, the contract to design, manufacture and deliver the onshore and offshore light buoys for the Atlas Cove Single Point Mooring system located in Nigeria. The scope included 14 light buoys RPL 20 to be installed at both sides along the 3,7 kilometer offshore pipeline, three pieces 3,2 meter high light pipes FP 320 to be installed on the mooring buoy and 2 light pipes FP 600 to be installed onshore at



Onshore signals protected from intrusion

the starting point of the onshore pipeline section. The supply included further spare parts for 2 years operation and 3 complete spare units. Particular procedures for galvanization and painting had to be implemented by Resinex to meet Client and National Nigerian Petroleum Corporation specifications and quality requirements.

Atlas Cove Channel



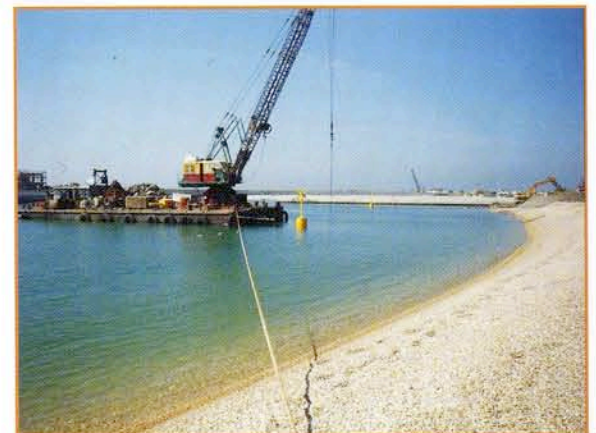
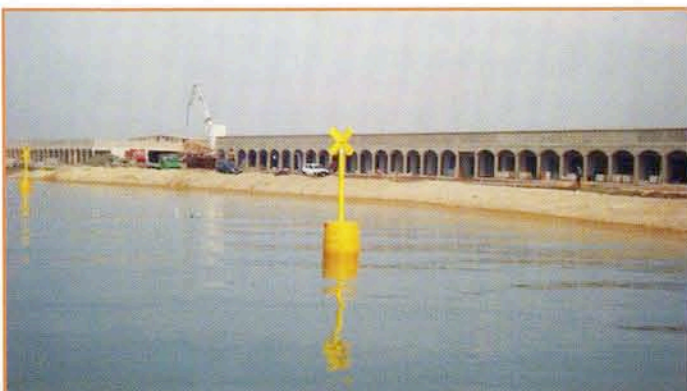
Resinex signalling pipes installed on SBM monobuoy

New small buoy-beacons for Rome (Ostia) new marina

Small buoy-beacons have been installed inside the new Rome's (Ostia) touristic port which was built by Grandi Lavori Fincosit (www.village.it/glfspa) in the Autumn 2000. The customer's requirement was to minimize signalling equipment oscillations in the presence of shallow water. Resinex developed this small day signalling buoy however endowed with mooring similar to that of much bigger elastic beacons. The result is a high-performance signalling product (signalling stability and precision) at moderate costs. It is

suitable for day-signalling for small as well as touristic ports. A reflecting stripe has also been installed on the buoys' upper part in order to better identify them during night navigation.

The small beach of Ostia new marina with Resinex signals of shallow waters



Installation



The seven buoy-beacons after testing

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Signalling
Resinex's great capacity to quickly meet customer's requirements from a quality standpoint was tested once again in the Autumn 2000. The Italian Navy was entrusted with the important task to urgently supply a signalling system to the port of Durres in Albania. In just 4 weeks Resinex has been able to supply 13 beacons intended for 8-10 mt. depths plus 2 green signalling buoys. All the signalling equipment was supplied with spare parts, mooring and 10 ton sinkers. A true success for the Italian Navy of which we also feel proud.

Italian Navy safety nav-aids for Albania

Durres port gains a brand new safe signalling system with Resinex elastic beacons



Assembling on the deck



Positioning of south cardinal elastic beacon



Last details

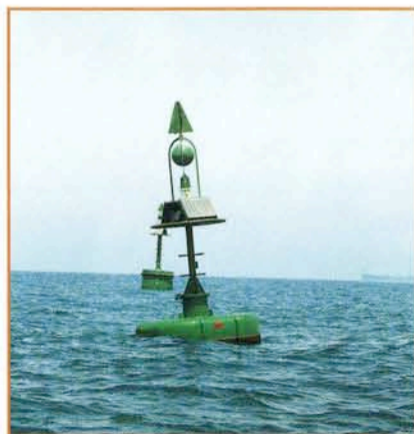
Mediterranean ports follow Resinex advice

In 2001 various Resinex buoys have been installed in different mediterranean ports

In the course of the current spring three important ports in the Mediterranean Sea have opted for Resinex. Seven RPL 20 buoys plus 5 FP 3500 were installed together with a single RPI 20 buoy with rubber fender. Resinex has been chosen thanks to the extraordinary quality mix composed of plastic and steel structures along with the usage of first class power supply and signalling system: Pharos Marine lanterns, Solarex solar panels and Delco batteries. As a result, the above ports are safer with Resinex signalling system.



Light test of the buoys before installation



Day and night high visibility



The high stability of RPL 20

High depth elastic beacon for the straits of Messina

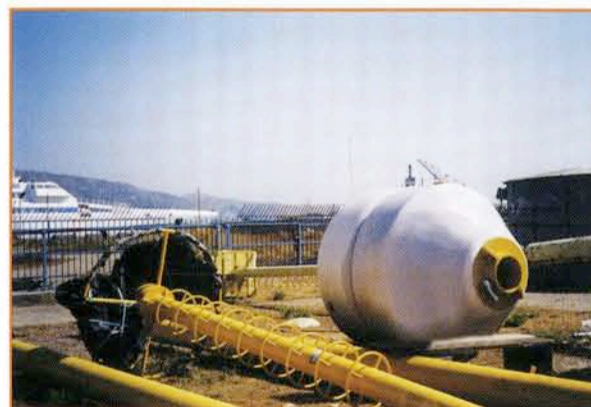
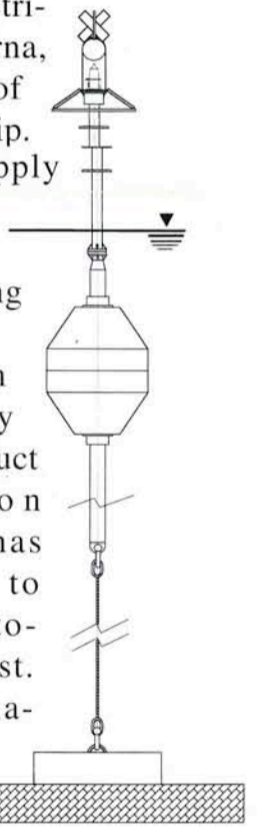
Resinex reliable elastic beacon for ENEL

After 11 years "ENEL" (the Italian National Electricity Board) through its operative company Terna, has replaced one of its beacons in the Straits of Messina after it was damaged by the impact with a ship. The beacon has been installed to signal power supply cables which link Sicily to the National Power Network. The various depths of the Straits induced Enel to require signalling equipment capable of being positioned on different sea depths.

Resinex studied a light buoy capable of being laid down to 108 mt. depth. A recent emergency has led Enel to lay the beacon down to 50 mt. depth. The resulting product

adaptation capacity has been able to satisfy customer's request. By just replacing the

antitor-sion cable, Enel has managed to fulfil this requirement in the course of 2001



Assembling at Terna Messina Yard

Resinex is the new Pharos Italian dealer

Pharos Marine  **Automatic Power**

In 2000 Resinex was entrusted by Pharos Marine (www.pharosmarine.com) to distribute and sell Pharos products in Italy. Resinex is very proud of Pharos' choice also because the UK company can be considered as the ideal partner of our firm. In fact, Pharos offers a very wide range of navigation aids (lanterns, fog horns, racons) which bear extraordinary technical features as well as Solarex solar panels and charge regulators (www.solarex.it) and Delco 2000 or Sonneschein batteries. Pharos lights complete the range of very high level signalling components which are installed on Resinex buoys and beacons and which guarantee very high quality and security performances



Led Lantern

to Resinex customers.



Falcon 2000 Pharos Racon

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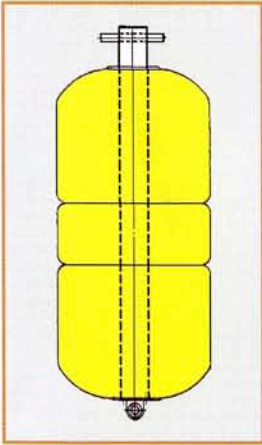
Offshore

The days of the pendants

Offshore Oil Companies discover a safe and reliable alternative with the wide range of Resinex pendant buoys

111.000 Kg net buoyancy in 40 days

Good job done by Resinex production staff in delivering 39 floating modules for 300 meter depth in 6 weeks



Test procedures

39 floating modules destined to the North Sea have been sold by Resinex to EMM Corporation in Spring 2001. The modules have been bought to be used in different occasions and to achieve variable floating levels. The customer has produced the buoy's metallic parts in order to optimize assembling modularization. The required total buoyancy was 111 tons. Two types of floats have



Dispatching of the modules

been chosen (2,6 and 3,25 tons net buoyancy). They are capable, if differently combined, of reaching several total net buoyancy combinations by single buoy. Useless to say that, also in this case, delivery speed acted as a fundamental factor to obtain the order (6-week delivery!), along with

Resinex's capacity to fulfil delivery requirements by carrying out a very accurate testing performance. The used compound was Resinex Nautex 50.

Girassol project wants Resinex buoys

Twelve pennant buoys for Girassol installation

The TotalFinaElf Girassol project in the Angolan offshore was supplied by Resinex with twelve Anchor Pendant Buoys, 2,700 Kg buoyancy. The buoys have been delivered in January 2001 after having been tested for 20 mt. depth.



Dispatching Girassol buoys under the snow

Elf Congo utilizes Resinex pem buoys different times

Two orders from Elf Congo at the end of 2000. Elf Congo opted for Resinex Pendant Buoys of both 4000 Kg and 7000 Kg net buoyancy.



Pendant 7000 kg N.B.



Pendant 4000 kg N.B.

Four 7,000 Kg buoyancy buoys and eight 4,000 Kg buoys were delivered in different periods at the end of 2000. The buoys were supplied for surface use.

In Brief

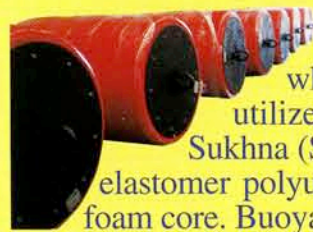
Gall Thomson has chosen again Resinex floats to make its own **breakaway coupling floating**. The floats have been studied to be perfectly combined with coupling flanges.



Very urgent request in January 2001 of floats from Louisiana Offshore Oil Port (LOOP) (www.loopllc.com) which asked Resinex to deliver **64 floats** type NB 312Kg in 5 weeks. Loop floats are supplied with reducer to reach 40 mt depths with inside diameter of 780mm.



Dominican Shell has continued to use **Resinex buoys type 1502**, with 750 Kg buoyancy, high performance and high usage elasticity protected by special strips.



Support buoys for the eight Monobuoys which Sumed (Arab Petroleum Pipelines-Egypt) utilizes in Sidi Kerir (Mediterranean Sea) and Ain Sukhna (Suez). The buoys are in polyethylene foam and elastomer polyurethane with a steel cage and a polyurethane foam core. Buoyancy is 3000 Kg.

RANA Italian diving company chooses Resinex swivel floating modules for AGIP job

Rana (www.ranadiving.it), one of the major Italian companies specializing in the offshore business, used in Spring 2001 four Resinex Swivel Pen-



dant Buoys to replace control pod of the wellhead Agip Luna 40 in the Crotona's offshore (Calabria - Italy). Rana carried out the job by using DSV Sentinel in 5 days thus achieving an excellent result in terms of technical outcome and action timing.

For new development in the Persian Gulf, The Yokohama Rubber Company asked Resinex **33 deep water floats for 80 meters** operational depth: 234Kg NB for grooved type and 275Kg NB for bolted type. All the floats were delivered assembled with internal reducers to assure the best bending performances on the lazy-s configuration of the hoses of the Single Point Mooring System.



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Deep waters

New test facilities in Resinex Adro Centre

High depths require high quality of the materials used and a steady control. In Resinex Test Centre deep water floats are always tested for dimensions, weight, net buoyancy and



Traction (here in SIRTEF facility)



Pressure

pressure resistance. Net buoyancy is also controlled during the pressure tests. Random traction strength tests are also available. The Resinex Marine Research Centre hosts four pressure tanks up to 200 bars, two load cells for

net buoyancy control and one electronic weight control device. A PC terminal gathers all the data (weight, pressure, net buoyancy) at one point to give our customers a complete Quality Control Test Certificate.



Buoyancy



Weight

Naval University of Naples uses buoys of proven reliability



Compound used: Nautex 50.

In 2000, the University of Naples (www.uninav.it) purchased several small Resinex depth buoys (operational depth 300mt) supplied with a stainless steel structure. The buoys have been used to lighten current-meter chains installed off Puglia's coasts within an Italo-Greek physical oceanography project.



Sisgen ROV wheels to run on the sea bed

Resinex has been entrusted by Sisgen (sisgen@sis-gen.com), Italian leading company dealing with submarine optical-



fibre and energy cable laying to set up a float for their Triton ROV (operation depth 1000mt) plus the supply of two submarine wheels, manufactured with Nautex 100, able to operate on the machine (operational depth 500mt).

Triton ROV

Saclant research center always with Resinex security

Saclant, the Nato's research center for sea operations (www.saclantc.nato.int) used 4 Resinex buoys, 850Kg buoyancy for an emergency operation off the Island of Elba in October 2000. Saclant regularly uses Resinex



buoys and also small spherical buoys that can be used in different operations.



850 NB

Radar reflector buoy developed by Saclant

In Brief

50 new extra - strong modules for dredging have been placed in the Port of Ravenna. Dredging machine's peculiar performances have led us to study a stronger float with increased polyethylene thickness and high elasticity.



New polyurethane clamps for small floats cables and umbilical to achieve the success key factor in the floating field for cables and umbelical: tightening capability.

Resinex has studied a new elastomer polyurethane clamp which has been built in such a way as to maximize the grip on the cable surface. Four internal clamps guarantee a higher tightening force between floating system and cable.



70 L buoy

lights along with small light buoys 70L. The kit proposed by

Resinex offers tested reliability as well as marked economicity features. As to *acquaculture signalling system* Resinex offers the range of lighting components (Pharos, Solarex, Delco) that makes Resinex successful in all the ports in the world.



Perimeter buoy

Self - sufficient light buoys for protected water. Resinex has studied light buoys 150L with self-fed light type Carmanah. The buoys bear high visibility features (up to 3,2 Km) and autonomy.



Various lengths of Resinex OSA 650 Boom has been supplied to Enichem in 2001 to protect their out-take flow in the Mantua Plant. The boom has been studied to reduce stock dimentions and to give the best emergency effects through its *quick assembling and release* stainless steel metallic parts

Enel asks for a heavy duty barrier Resinex studies a new floating barrier to protect power station intake

After out-take protection, Resinex has been appointed by Enel to study and manufacture a special barrier able to protect Genoa's power station intake from deposits. The barrier is formed by a series of floats in stiff polyethylene which support an anti-intrusion net layed down on the sea bottom. The net blocks deposit inlet also under the sea level whilst allowing at the same time the intake water flow for the power station.

