

RESINEX *news*

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High tech elastic beacons for the new Suez Canal



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Resinex comes across the New Suez Canal again

It is with the doubling of the Suez Canal, inaugurated last 6th August 2015, that Resinex is reconfirmed as official partner of the Suez Canal Authority for the construction of the navigation signalling.

The complex navigational system guarantees the safety of navigation on the new canal, 72 km long and makes more comfortable and efficient the old passage from the Red Sea to the Mediterranean Sea, turning it into a real two-lane water highway.

In 1980, Resinex supplied 600 elastic beacons for the old Suez Canal and in February 2015, after an international tender, was awarded the contract for the project and the manufacture of 110 elastic beacons used to indicate the route to the ships.

For the above project, Resinex has relied on the most innovative technology, using its patented elastic beacons, considered the most sophisticated and reliable than traditional solutions, since they assure the stability of the signal point. They maintain the proper alignment also in case of impact, of strong currents or tides, thanks to the usage of big subsurface floats.

Moreover, these beacons are equipped with adjustable focal plane which allows a homogeneous alignment definitely indispensable for the pilots of vessels which run across the channel.

In 80 working days, Resinex delivered 110 elastic beacons (red and green colours), which were assembled in Egypt under the direction of Italian engineers and installed in record time by the vessels of the Suez Canal Authority.

The new canal, with a total cost of 8.4 billion dollars, aims to double the cargo passages (from 50 to 100 per day) to reach in 2023 an amount of 13 billion USD a year in revenue, becoming a great and fundamental job for the commercial development of Egypt and of Europe.





Great results achieved offshore the Korean oriental coast

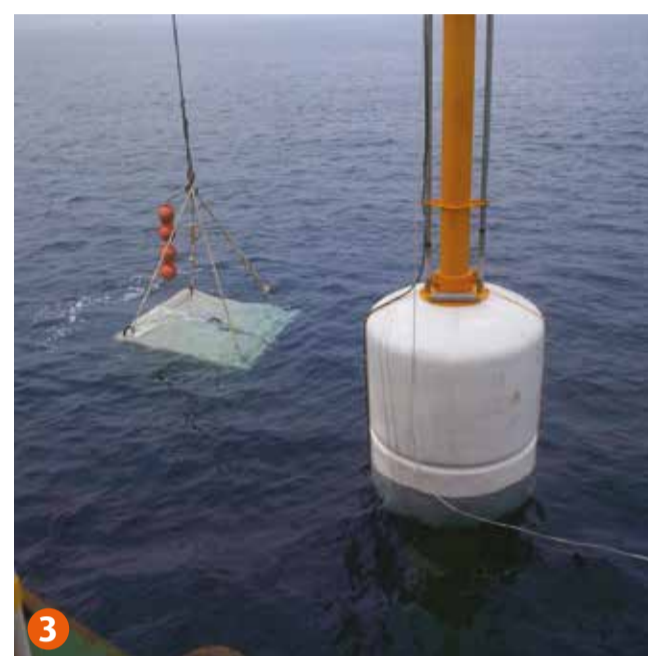


Photo 1, 2 and 3: assembly of the lower part at sea. The beacon structure is more than 40 metres long.

Resinex has specifically manufactured for Kigam (the Korean Institute for Geoscience and Mineral Resources), three big elastic beacons for instruments. They have been projected taking into consideration simulations using TetherBuoy 2 (a software for the numerical simulation of the dynamics of floating-moored structures), studied by Resinex with the cooperation of MOX (the Laboratory for Modelling and Scientific Computing).

The elastic beacons were manufactured at the beginning of 2015 and delivered in Korea last May, then installed in July 2015 under the supervision of Resinex personnel, offshore the Korean oriental coast in the Sea of Japan, at a depth of 80 metres.



The beacons are equipped with a huge turret (2x2 metres), able to host the power system (solar panels and batteries) and the electronic equipment which controls the devices placed on the sea bed by Guralp Systems Ltd, for surveying the geophysical activity and the transmission of data to-land.

Moreover, the beacon structure is more than 40 metres long and it is linked to the seabed through an anti-torsion wire rope \varnothing 52 mm fixed to a concrete sinker of 25 tons.

The three beacons are placed at the vertices of a triangle and spaced out 300 metres each other.

Resinex quality and technology have fully satisfied the requirement of the well-known Korean Research Centre.



Photo 4, 5 and 6: assembly of the upper part, able to host the power system and the electronic equipment.

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Resinex quality for Montenegro again

In 2015 Resinex returns in Montenegro, after having supplied in 2009, 17 buoys destined to Jetty 1 for the new port. The prestigious British Harbor Association has awarded the "5 gold anchors" to the Port of Montenegro. The most recent extension of the leisure port goes back to the autumn 2014 concerning the creation of further 150 berths purposely studied for maxi yachts up to 180 m. The modification of Jetty 1 has been made with 13 Resinex buoys type PEM 30 X 1000 for 100, 120 and 140 m yachts and with 6 buoys type PEM 25 X 1000 for 80 m boats; while new Jetty 3 has been equipped with 10 buoys type Resinex PEM 21 X 1000 for 60 m yachts and with 5 buoys type PEM 18 X 1000 for boats of 45 m. The new refuelling plant, is protected on both sides by more than 300 m of Resinex



floating barriers type 3000 X 1000 PE, semi rigid, which protect the sea from any oil loss. These barriers are kept on position thanks to three special elastic beacons.

Maxi Malaysian buoys

At the end of 2014 Resinex delivered to Misc Berhad Malaysia and assembled at Kemaman Base in Terengganu (Malaysia), the fourth buoy destined to be used as spare buoy of the mooring system of FSO South Angsi operated by Talisman Malaysia Limited (TML). The maxi buoy type PEM 58, has a diameter of 6 metres and a height of about 3 metres. Net buoyancy is 40 tons and it is provided with a quick release hook of 75 tons. The operator of the system is FPSO Ventures and FSO is located 139 km from east coast of Peninsular Malaysia at block PM-305 (South Angsi field) and it is spread moored at a water depth of 72 metres.



Mooring for Java electricity

Two big Resinex mooring modular buoys type PEM 43 have been supplied to PT PJB (PT Java-Bali Power Plant) in 2014. The buoys have a single net buoyancy of 25.8 tons and will moor the 35000 tons oil tankers going every day to furnish the necessary fuel to produce electricity at the Muara Tuwar power station near Jakarta, Indonesia. The Quick Release Hooks (QRH) of the buoys have a 125 tons capacity. Resinex technicians have also followed the final assembly at site.



Perro Negro safety for supply vessel mooring

In 2014 Resinex has supplied two mooring buoys type PEM 30 with a net buoyancy of 8.2 tons for the safety of the supply vessels destined to Perro Negro 8.

Off the Italian coasts, in the Adriatic Offshore Area, numerous jack-up are operating for the oil extraction. One of these is Perro Negro 8, a large semi-submersible drilling platform owned by Eni. Perro Negro was built in 2010, it has a gross tonnage of 9.627 tons and an operative size of 65 x 62 metres. It is able to work up to a water depth of 350 feet and to extract thousands of barrels of hydrocarbons a day.



Angola, big mooring

At the beginning of 2015, Resinex manufactured, shipped, assembled and followed the installation of eight maxi-buoys type PEM 58 x 2000 at Luanda Fishing Port in Angola. Timing from the project of the CBM till the delivery of the 8 buoys was only 3 months. The final installation has been carried out as expected, that is in March 2015.

The Conventional Buoy Mooring (CBM) has been studied by Resinex on demand of the South African Engineering Company PMI, which has supplied a complete package (design, site investigation, procurement and installation) to Pumangol, the major distributor of Hydrocarbons in Angola.

Vessels up to 225.000 Dwt will moor at this CBM; these vessels will supply the refined oil to the onshore tank farm Pumangol in Luanda and then they ship it to the distribution net which is widespread in the African country. Pem 58 buoys are the top model buoys of Resinex CBM range and are installed in open sea all over the world.

In this case the diameter is 6 metres and the height is 2 metres. Net buoyancy is 38 tons.

They are equipped with quick release hook of 120 tons and a complex system of stabilising levers which allows mooring and unmooring operations even with adverse marine conditions.

The whole project has been ABS certified; ABS provided also the complete design approval of the buoy type 58 x 2000 tons. Buoys were shipped using 22 containers of 40' box and assembled in only 8 working days. As per other cases, the modularity of the Resinex Buoys granted a considerable saving of transport charges and a remarkable reduction of assembly costs.

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US Navy acoustic array

In early 2012 Resinex supplied to Sound and Sea Technology (SST) of Lynnwood – WA - four big buoys for underwater usage (between 150 and 360 m depth). Maximum net buoyancy 2950 kg. The buoys were installed in summer 2012 in the South Atlantic Ocean. The end user is the Naval Facilities Engineering Services Center (NFESC) of US Navy that designed a Surface Ship Radiated Noise Measurement (SSRNM) array to be installed at the Atlantic Undersea Test and Evaluation Center (AUTC). After that, Resinex received from SST a twin order of four buoys also to be deployed from 150 and 360 m depth. Maximum buoyancy 3600 kg. This time the four



buoys were installed in 2014. NFESC is the utilizer of this mid-Pacific Surface Ship Radiated Noise Measurement (SSRNM MIDPAC) array off Oahu, Hawaii. The SSRNM MIDPAC system will be similar to the SSRNM AUTC system with the hydrophone arrays and electronics being identical. The structures supporting the AUTC and MIDPAC arrays will be single-point moorings with umbilical cable assemblies connecting the systems to their trunk cables.



gs for a big country

40 support buoys for the Concordia cables

More than three years have passed from the terrible wreck, which took place on January 13, 2012. In these days, the cruise ship Costa Concordia has returned to fill the front pages of national and European newspapers. In the following months, after the sad maritime disaster, hundreds of technicians have worked hard to dismantle the ship piece by piece and recover the wreck placed just a few hundreds metres from the Island of Giglio.

In April 2014, to make the recover of the huge sponson (disassembled from the ship structure), the support of Resinex was also asked. Alioto Group, a leader of lifting systems at sea, in agreement with Titan, asked Resinex the supply of 40 buoys to be placed on the grommets, the large cables used to lift the sponson, to allow them to float during the sea operations. Thus Resinex has developed and applied to the grommet, 40 buoys type DF06 in linear polyethylene.



Advanced monitoring in the Black Sea

At the end of February 2015, the first of the 5 buoys commissioned to Resinex by Envirtech (on demand of the Turkish Meteorological General Direction), was installed. Thanks to the cooperation of Resinex, Envirtech has achieved and positioned in the waters of the Black Sea, more precisely at 10 nautical miles northward Samsun, one hi-tech buoy for meteorological surveys. The buoy (type FP 2500 Monitor) is composed of a three module float (1800 mm wide, 1600 mm high) which supports a stainless steel structure able to host the survey system and data transmission system. The supplied buoys are part of the ambitious project which aims to make a wide net of automatic stations for the environmental monitoring through buoys. A project which started in 2014 with the installation of a similar system in the Marmara Sea (served by the Turkish Petroleum Corporation) and which now will be extended to all the Turkish waters. After Samsun, the same system will be adopted in the Bosphorus, in Antalya Port and in Tasucu Port.

The above mentioned buoys, besides giving a constant meteo monitoring, they are able to make a considerable variety of surveys: from the water salinity, to the marine current measurements, passing through the wave measurement and the tsunami prevention.





Titanic floats for West Chirag

585 tons net buoyancy to transport giant piles to BP site



In the Caspian Sea, in the territory of Azerbaijan, about 120 kilometres east of Baku, about 120 metres depth, are located three oil fields (Azeri, Chirag and Gunashli). BP (on behalf of Azerbaijan International Operating Company- AIOC) has awarded KBR the FEED and procurement contract for construction of the Chirag drilling platform.

The lack of so big marine vessels in the Caspian Sea has led KBR to evaluate the choice to carry the huge piles supporting the platform with a floating system.

Resinex and KBR have together developed the floatation project



that led to the creation of 13 Modular floats (each with 16 modules) with a total net buoyancy of 585 tons. The operation was successfully completed in the summer of 2013.

Syntactic floats for Liwan and Panyu projects



The Far East, despite the global economic crisis continues to be in great turmoil for the exploration of natural gas in ultra deep waters.

The Liwan offshore field, where the operator is Husky Oil China and its twin project Panyu field (main partner CNOOC) are considered the main Chinese energy investments in recent years. Regarding Liwan, Resinex has been involved in both the supply of floats used in the positioning of offshore lines (user Saipem) and in the realization of the floats that remain permanently in depth for the duration of the gas production of the field (user CNOOC). Resinex provided buoyancy floats of various sizes and with changes of use from 200 metres up to 1500 metres depth. In this case the pressure tests carried out by Resinex in its test facility of Adro have arrived up to 2200 metres. Due to the success of its products in the twin field of Liwan, Resinex received the request of the same types of floating also for the project Panyu Gas Field where the operator is Devon Energy and CNOOC remains the main partner.

American pipe laying in ultra-deep waters

Saipem America has chosen Resinex ultra deep floats for the pipe laying programme of his CastorOne vessel in the Gulf of Mexico.

CastorOne works in Jack-St.Malo, Big Foot and Keathley Canyon oil fields. Resinex supplied special floats for the verticalization of the grommets and slings used



during the installation of the pipelines. Each module has 400 kg net buoyancy and has been composed in 400, 1200 and 2400 kg net buoyancy floats. Always at 2000 m underwater. The floats were produced at Resinex Ultra Deep Production Unit in Torbiato Adro (BS) and tested up to 220 bar at the Resinex Marine Centre in Adro.

Uote: high tech terminal in Brazil

In autumn 2013 Resinex was chosen by Bluewater as supplier of 125 Deep Water Floats to be used by Petrobras on its UOTE terminal

offshore Brazil. The floats were tested at 11.4 bars to withstand the pressure of 80 metres underwater. Net buoyancy of floats goes from 265 to 340 kg. The FSO hosts the Unidade Offshore de Transferencia e Exportacao (UOTE) and it is positioned 55 km off Rio de Janeiro at a water depth of 75 metres. UOTE is a high sea advanced terminal, designed to

transfer oil from a dynamic positioning (DP) vessel to an FSO which, in turn, distributes the load to two buoys which transfer oil to shuttle tankers responsible to transport the oil to its final destination. The submarine hoses (supplied by Flexomarine-BR) on which Resinex Deep Water Floats are positioned, have the purpose to transfer oil to the FSO (70 metres below sea level) where they are connected to the PLEM and PLETs and distribute to the buoys which offload to the exporting vessels.





Landfall buoys for Technip

152 floats for Moho Nord field in the Congolese offshore



In January 2015, Resinex supplied to Technip France 152 floats, specifically designed and produced in order to accelerate and optimize the beach pool operations of the 16" export flowline in the Moho North Field in the Congolese offshore.

The floats, 65 pcs with a net buoyancy of 2.5 tons and 87 pcs with a net buoyancy of 2 tons, shall contribute to reduce the pulling force during flowline installation. Maximum operational depth is 20 metres. Besides the floats, Resinex also provided 304 fastening sets and 152 release systems of the floats from the pipeline.

The test package required by Technip was intensive. Hydrostatic tests, fit up tests (on the pipe), release tests (from the pipe) and impact tests, all successfully performed at Resinex Marine Research Centre in Adro (BS). The \$10bn Moho Nord Subsea project is located around 75 km off the coast of Pointe Noire in the Republic of Congo.

It is the first deepwater offshore project in Congo at water depths ranging between 650 and 1100 m. Moho Nord is the latest project being developed in the Moho-Bilondo License which is owned 53.5% by its operator Total E&P Congo, a subsidiary of Total. Chevron and the Congolese state-owned oil company SNPC hold 31.5% and 15% interest respectively in the licence area. In the field, a new Floating Production Unit (FPU) will be installed. This FPU will have a capacity to process 100.000 barrels of oil or equivalent per day. FPU output will be sent to the onshore base of Djeno through a pipeline.

The final configuration will have 50 subsea structures, 230 km of rigid pipeline and 23 km of flexible pipeline. For the installation, Technip will use its own vessel G1200. Installation operations are scheduled for November 2015.

Deep Panuke emergency



A prompt action was the key to success, which allowed SBM Offshore to commission Resinex 14 big elastic buoys able to guarantee extra buoyancy of 336 tons during transport and installation of the Deep Panuke platform (owned by Encana) in the Canadian waters.

SBM asked Resinex for a supply of 14 buoys in just 4 working weeks. Resinex received the order on mid December and delivered the buoys at the end of January. Transport was made using the semi submersible vessel named Talisman. Deep Panuke is a drilling jack-up which produces and transforms natural gas from the namesake oilfield placed 250 km (155 miles) south east Halifax.

Filanovsky field ready

Resinex has supplied to Saipem, 8 big support buoys (type PEM 30 X 4600 CHAIN THROUGH – NB 22.5 TONS), specifically designed for the transport and installation of the jackets of the ice-resistant platforms in the oil fields of Korchagin and Filanovsky (Filanovskogo) of Lukoil in the Northern Caspian Sea (Russian territory, 50 km off Astrakhan). These support modular buoys have been provided with a particular steel structure able to perfectly match the base structure of the jackets and to distribute the 180 tons of net buoyancy in a homogeneous and safe way. The usage of these

buoys has ensured that, during the positioning, there has been no need to utilize huge naval means, particularly hard to find in the Caspian Sea. The same goal was, as a matter of fact, reached by BP in 2013 for the positioning of big support pipes of the platform West Chirag in the Azerbaijani Caspian Sea. Also in this case, the 585 tons of net buoyancy given by Resinex floats, have contributed to a safe transport till the positioning place without using huge vessels.



Scarabeo 9: 180 Riser Shims down to 3700 metres depth

The drilling in depth for oil production is very dangerous and complicated. There is no margin of error and inaccuracy can cost, at best, valuable resources or incalculable environmental damages. The ENI Group for its new drilling rig ship Scarabeo 9 has chosen Resinex for the supply of 180 modules Riser Shim. The first use of Resinex Shims for Scarabeo 9 occurred during prospecting exploration off the coast of Cuba in 2012. All products have been tested at Resinex Reserch Centre in Adro for the resistance at high pressure (3700 metres operating depth) and the resistance at impact and the grip on the line of the riser.



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Dubai, the ultimate buoys

Traditional sea commerce with new marine technology



At the beginning of 2014, 19 new model Resinex marker buoys type FP 200 D. 1500 3-5 NM PLASTIC were installed at the Dhow Wharfage in Deira Dubai Corniche. Resinex has been chosen by the Dubai Municipality (through GBA) to supply a complete system of marine signalization for one of the most important projects of the last years in Dubai.

The project consists in the construction of a global wharfage of 3 km of length between Deira Corniche and Palm Deira. The investment has a value of 54.4 million USD and will facilitate an increase in traditional Dhow trade throughout the region with the purpose to make Dubai the economic centre of import and export activities in the Gulf area.

More than 1.7 million tons of goods will be loaded/unloaded every year using this type of traditional, but efficient Arabic vessel. For this job, Resinex has developed a brand new model of marker buoy (our type FP 200 D. 1500 3-5 NM), totally built in plastic. The new buoy (diameter 1500 mm, total height 2630 mm) has high visibility and durability together with minimum maintenance. This is another model of the Resinex range of Full Plastic Marker Buoys together with our PEM 22 Light Buoy and 1800 mm diameter (new project 2015).

Saudi Aramco refinery with top class markers

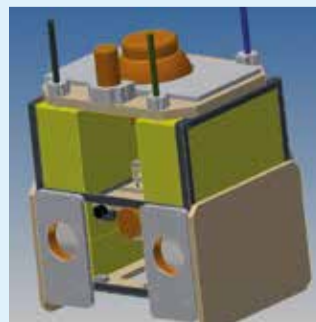


From 2010 to 2014, Resinex has installed on behalf of Saudi Aramco, 12 signalling buoys of the access channels to the refinery of Jeddah (KSA). They are buoys type PEM 25 (diameter 2500 mm), type PEM 21 (diameter 2100 mm) and type PEM 18 (diameter 1800 mm). We are referring to buoys with plastic floating modules, they are shockproof resistant and they have a low maintenance costs throughout their life time. Focal plane is 4.1 m for the PEM 25 buoys and of 3 m for the other models. Resinex and Saudi Aramco started a long collaboration since the 70's and this cooperation still goes on also today. Resinex has projected and made for Aramco, special underwater floats and chain passing through buoys destined to the oil fields of the eastern coast of Saudi Arabia. Products, which are constantly used by the great Saudi operator.

6000 metres depth for geophysical and volcanic researches. A new phase of EMSO MedIT Projects



The cooperation between Resinex and the Italian volcano experts is not a new thing. Indeed, our company has supplied various floats from 2010 to 2015. In 2010, as a matter of fact, INGV (National Institute of Geophysics and Volcanology) used Resinex technological support to create floats able to reach high depths and to withstand pressures up to 600 bars. The high performance of Resinex floats has brought INGV to choose Resinex again. This time, the Resinex contribution has concerned the supply of 24 special floats for the Emso-MedIT project, the ambitious INGV project started in 2013 for the reinforcement of the infrastructures of marine research in Sicily, Campania and Apulia. Specifically, Emso-MedIT is an aspiring project, coordinated by INGV and involves other research partners such as CNR (National Research Centre), ISPRA and INFN, whose main aim is to strengthen the marine infrastructures for monitoring sea beds of sites of particular strategic interest. It is about special ring floats, having a body in syntactic foam and a cover made of elastomer polyurethane, able to arrive at 6000 metres of water depth. Floats were installed during the summer 2014 off Cefalù coast during the TOMO ETNA campaign.



In July 2015 Resinex has been called again to supply high depth floats for EMSO MedIT Project after the successful results achieved last years. This time INGV through Meccanotecnica Riesi has requested 88 syntactic foam floats with different sizes to realise two EMSO MedIT Projects. Deep water syntactic foam floats have been manufactured with a special syntactic material that does not absorb water. Moreover, the floats are able to reach 6000 metres depth and to withstand pressures up to 600 bars. Our quality always guarantees a proper support for important projects.