

About COOEC.

China Offshore Oil Engineering Corporation (COOEC) is the largest engineering and construction company for designing, onshore fabrication and offshore installation and maintenance for oil and gas exploration and production offshore China. COOEC provides services for oil companies operating in offshore China, and has expanded its business to the Middle East, Southeast Asia and South Korea, etc. Its clients include CNOOC Limited, Shell, BP, Total, Mitsubishi and Hyundai.

About Samson.

For well over 100 years, Samson has been recognized as a worldwide leader in the development and manufacture of high performance ropes. Among its many innovations, Samson invented the double braid and pioneered the first high modulus polyethylene fiber ropes. Samson designed and manufactured the very first synthetic-rope mooring hawser for a single point mooring buoy in the North Sea. Samson is part of Wind River Holdings™ portfolio of operating companies.

For more information about Wind River Holdings™ visit www.windriverholdings.com

DPX™ is a registered trademark of Samson Rope Technologies, Inc.

Disclaimer

All information, data, recommendations, etc. relating DSM Dyneema products (the Information) is supported by research. DSM Dyneema assumes no liability arising from (i) the application, processing or use made of the Information or products; (ii) infringement of the intellectual or industrial property rights of third parties by reason of the application, processing or use of the Information or products by the Buyer. Buyer shall (i) assume such liability; and (ii) verify the information and the products.

Dyneema® and Dyneema®, the world's strongest fiber™ are trademarks of DSM. Use of these trademarks is prohibited unless strictly authorized.

DSM Dyneema B.V., Mauritslaan 49, 6129 EL Urmond,
The Netherlands. Tel. +31 (46)4 76 79 99

DSM Dyneema LLC, 1101 Highway 27 South,
Stanley, NC 28164, USA. Tel. +1 800 883 7404

DSM Dyneema, 476 Li Bing Road,
Zhang Jiang, Shanghai 201203, China.
Tel. +86 (21)61 41 80 58

www.dyneema.com

Offshore lifting slings made with Dyneema[®]

CNOOC's massive 16000 tons jacket installation marks heavy lift using synthetic rope slings

It was an installation for the record books. Certainly China Offshore Oil Engineering Corporation (COOEC) had installed heavier jackets – some up to 20,000 tons - in their offshore oil and natural gas fields in the South China Sea. All of those installations relied on the use of lifting slings made with steel wire. They may be strong, but wire slings are also very heavy, making them difficult (and dangerous) to handle, especially offshore, and even worse in rough seas. It's not unusual for an installation attempt to be abandoned due to bad weather closing a window of opportunity.

In September 2008, when faced with the challenge of installing a jacket measuring 75m x 75m and over 213m high, which weighed 16,213 metric tons, COOEC needed a better solution than traditional lifting slings made with wire rope. The task of installing the jacket in the Pu Yan natural gas field called for a solution that enabled a faster, safer and more efficient operation.

Four lifting slings made with Dyneema[®], the world's strongest fiber[™], and manufactured by Samson, proved to be the right solution. In fact, they were part of one of the heaviest lifts using synthetic rope slings to date.



Strong and lightweight for easier, more efficient rigging

The four lifting slings used for the job were made with Samson's DPX™ fiber, a patented blend of polyester and lightweight, high-strength Dyneema®. Weight-for-weight, Dyneema® high performance polyethylene fiber is 15 times stronger than steel. Lifting slings made with Dyneema®, therefore, can be of the similar diameter and of equal strength as slings made from steel wire... yet typically they will have one-seventh of the weight. The result is a sling that is ultra strong and lightweight.

For COOEC, this translated into a much more efficient operation. Installation of the jacket was smooth and efficient, due to the slings' light weight, ease of handling and speed of rigging. There were no reported incidents of injuries to the crew.

Mr. Hi Huai Liang, Technical Manager of Offshore Installation for COOEC says, "The ropes made with Dyneema® were excellent because of the light weight. Compared with steel wire and synthetic webbing slings, the ropes have better operational advantages because during operation, especially when hooking up our sling to the lifting point, they can be handled manually."

Easy handling was further enhanced by other properties of the slings. For example, the Samson DPX™ technology using Dyneema® gave the slings a higher coefficient of friction or more grip, which yielded in a shorter splice termination. In addition, the slings made with Dyneema® also are neutrally buoyant in seawater, boosting productivity as well as worker safety.

Save money. Now and in the future

In offshore installations, time is money, especially in short weather windows when the seas are calm. It's critical to be able to operate faster and more efficiently, especially in difficult conditions. For COOEC, the many benefits of working with lifting slings made with Dyneema® were immediately clear.

Mr. Hi Huai Liang: "In the past, when we were using wire rope slings in rough seas, many of our attempts were delayed and sometimes even abandoned as it would take too much time."

The financial consequences of abandoning an operation can be enormous. Working with slings made with Dyneema® can help eliminate this costly occurrence, because their light weight enables faster, easier handling.





Slings made with Dyneema® also help the bottom line in other ways. They are highly resistant to abrasion as well as to exposure to UV radiation, chemicals and salt water. Lifting slings made with Dyneema® are much less likely to be compromised by the elements and can be used time after time. In short, they are made to last longer, which can greatly reduce replacement costs.

And, of course, because slings made with Dyneema® are light and soft, they are safer to work with. They pose less risk of injury to the crew. Fewer injuries mean less associated costs.

Profile: Slings made from ropes made with Dyneema®

The four lifting slings used for the job were fabricated by Gaylin International Pte Ltd (Singapore), using 120mm

diameter Samson Quantum-8 synthetic ropes. The ropes are a patented blend of polyester and lightweight, high-strength Dyneema® fiber.

Gaylin delivered according to the precise design specifications, which called for spliced grommets with protected eyes on both ends, as well as extra protection for the mid-body of the sling. Each sling was witness-tested by ABS.

How slings made with Dyneema® helped COOEC

- All the strength of wire rope slings of equal diameter, at a fraction of the weight.
- Easier to handle, for faster installation to accommodate short weather windows.
- Enhance productivity and worker safety.
- Extremely durable... able to perform in harshest conditions.
- Remains resistant to UV exposure, chemicals and salt... further boosting their cost efficiency.

Clearly lifting slings made with Dyneema® worked well for COOEC. Now find out how they lift your operation. Visit www.dyneema.com

