Oval towing for assistance at higher speeds

Mampaey Offshore Industries B.V., Dordrecht, the Netherlands

The Dutch have always been on the forefront of innovation when it comes to towage. This is once again underscored by Mampaey Offshore Industries with a new towage system called 'dynamic oval towing' (DOT®). With over 100 years of experience Mampaey Offshore Industries have grown to be the world leader in Safe Mooring and Towing Systems. Their latest improvement is in response to the recent demand to enhance the performance, safety and controllability of tug assistance at higher speeds. This is achieved by optimising the tugs' towline attachment by means of a 360° all around towing system.

Changes in ship assistance

Precious time in ports can be saved if the speed at which vessels are assisted is increased. Tug operators are constantly facing a dilemma between ever increasing assisting speed and the safety of the tug and crew. If the speed is too high, the tug will lose control and encounters a serious risk of capsizing. Time pressure causes a serious threat not only for the safety of the tug, but for the assisted ship with cargo as well. By making use of the DOT system, not only can the towing performance be increased, but it can also be accomplished with safe and controlled handling, at higher speeds.

The DOT system

The system consists of a 360° oval rail integrated into the ships' structure, with free running carriages on which the towing installation is fitted. The rail is oval shaped in order to integrate all towing points into one towing system. The oval offers a range of flexible parameters to adapt to most tug designs allowing the width, length and specific curvature to be chosen to meet the owner's requirements. This flexibility provides advantages not only for new buildings but also for retrofitting on existing tugs. In addition, the system has a large area inside the oval shape offering sufficient space for accommodation, exhaust uptakes, vents, cranes and workboats.

The optimal balance

The main advantage of a tug fitted with a DOT system lies in the fact that a tug has a different towing point when towing over the stern and when towing over the bow. Only an oval shape is able to integrate all towing points into one towing system. The carriages are always aligning the tow line forces with the hull forces for all directions with a continuous towline connection. This can not be achieved by any other existing tugboat. The alignment assures controllability with a minimal use of propulsion power. Combining this with the fact that the radial support of the towline attachment prevents the tug from capsizing, due to towline forces, this makes it possible to perform assistance at higher speeds safely. The increased safety margin is especially beneficial for assisting ships at exposed terminals and harbours with influences from tide and waves.

The prevention of capsizing also extends the dynamic towing performance. The tug is flexible to rotate freely and controlled from one direction to the other. This makes it possible to make use of the tugs' dynamic forces in all directions instead of propulsion power to escort the ship. The dynamic forces can easily outperform the bollard pull of the tug. Taking advantage of the dynamic forces reduces fuel expenses.

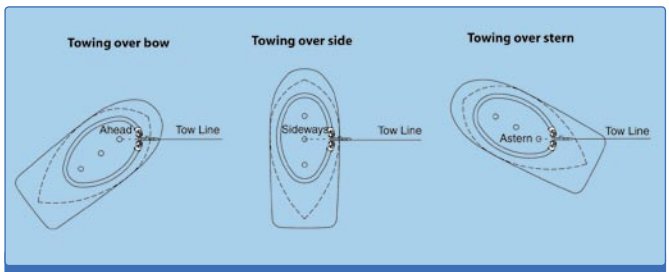
A DOT-tug assisting safely and controlled at 10 kts.

Full scale testing of the DOT system.

DOT ready-to-go

The system was tested thoroughly and after detailed engineering, it was subjected to a number of real-life tests. First a scaled steel prototype was produced and the system was mounted on a scaled model tug which successfully passed a series of tests in realistic operational conditions. This was followed by mounting the DOT system on the deck of a pontoon and tested with a double workload of 60 tonnes applied by a large harbour tug. The results from this test demonstrated that the design requirements were easily met.

This initiated the official start of the delivery of the 30 tonne SWL DOT system equipped with a tow hook. Larger sized systems and a towing winch are currently under development.

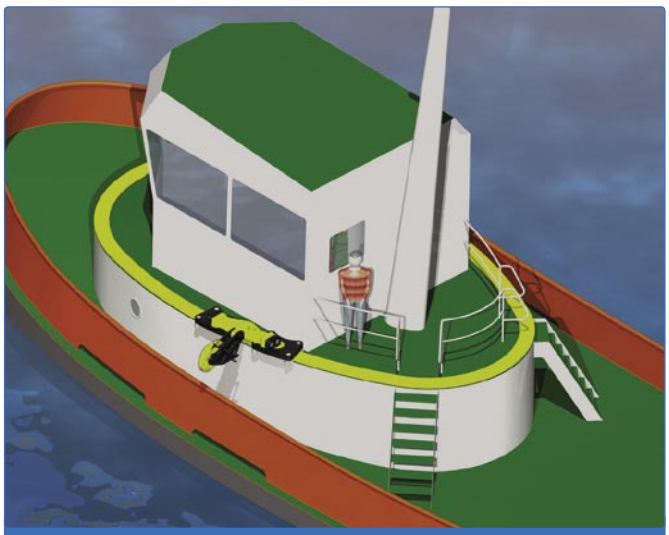


The integration of all towing points into one towing system.

Mampaey has requested the Dutch engineering company IMC, which was involved in the invention of the completely circular 'Carrousel' system, to assist in detail work and strength validations.

Dilemma solved

With a DOT system, tug operators can solve the dilemma between ever increasing assisting speeds and the safety of the tug and crew. Dynamic Oval Towing is a towing system that extends the towing performance by matching the towline forces with the hull forces. The optimal match for all towing directions can only be achieved by an oval shape. By installing the DOT system, not only can the dynamic towline forces be significantly increased, but also, with safe and controlled handling, at higher speeds. The Dynamic Oval Towing system makes assisting ships safe and reliable.


A DOT system installed on harbour tug.

ABOUT THE COMPANY

Mampaey Offshore Industries designs and manufactures a complete line of equipment for towing and mooring applications which are in use world-wide. The product range consists of hooks for the towing, mooring and offshore industry, mooring buoys and berthing approach systems. Mampaey is constantly improving their extensive range of safe and reliable products to maintain its position as world leader.

ENQUIRIES

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