

CONOSHIP NEWS

Periodical Newsletter - 2013 | 1

“READY TO REALISE
YOUR VISION”



Lady Anna: EEDI-champion



Comfortable seakeeping



Oceanic: M² Runner



The Conoship Design Team is looking forward to 2013 and is ready to realise your visions. In this edition of the Conoship Newsletter you will find a selection of recently delivered innovative ships, each originated from a vision of one of our creative clients, resulting in a challenging set of design requirements. We are happy and proud to support them- and you - to find new opportunities for today's and future markets.

READY TO REALISE YOUR VISION



Innovative designs that realise the visions of shipowners on new opportunities in their (niche) markets, are the main theme of this Conoship News.

The earlier research program for aft ship development led to the new ConoDuctTail, reducing fuel consumption and emissions based on maximum propulsive efficiency, as described in the first article. Application of the ConoDuctTail in the new River-Sea-Vessels for Wijnne Barends results in an EEDI-Champion thanks to surprisingly limited fuel consumption.

Another innovative concept is the 'Hartman *M² Runner*', developed in close cooperation with the Hartman Marine Group, supporting their creative vision on transport logistics of project cargo for the wind farm industry. The first vessel of the series, *MV Oceanic* is very successful in her niche market.

The first Pilot Station Vessel, the *Polaris* was successfully delivered by Barkmeijer Shipyards, turning the visions of a large number of well-experienced Pilots into reality. The motional behavior of the Conoship hull design proved to be very good. This experience provides a good basis for all kinds of new designs for offshore support operations.

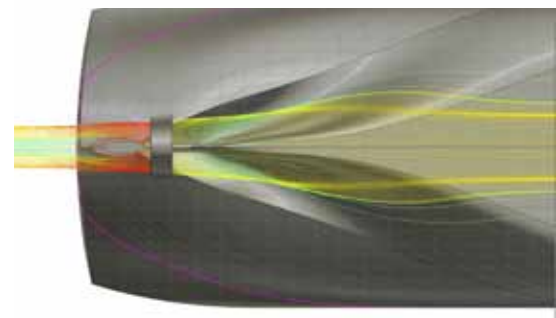
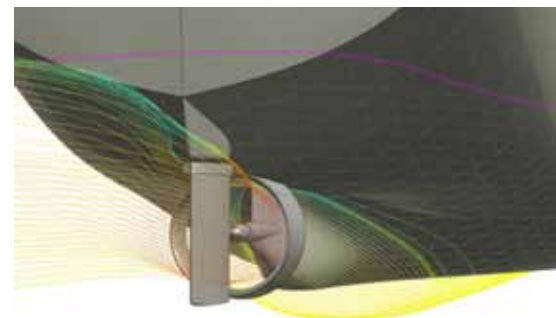
In the field of dredging, the various dredging specialists have their own vision on the optimal design of a Trailing Suction Hopper Dredger (TSHD). Conoship supported amongst others the following parties to realise their vision:

- The 2125 m³ *TSHD Contender* was delivered to ABEKO last year, a very versatile dredger, being a conversion of a former Conoship general cargo vessel;
- After the good performance of the 4500 m³ *TSHD Shoalway*, Boskalis ordered three more sister vessels further optimized in close cooperation with D.W. den Herder Maritiem BV;
- For Bijlsma Shipyard we developed the SmartDredge3500 in close cooperation with DredgeVision: a modular dredging equipment package, with hull lines for which existing steel hulls can be applied, reducing building time to less than a year.

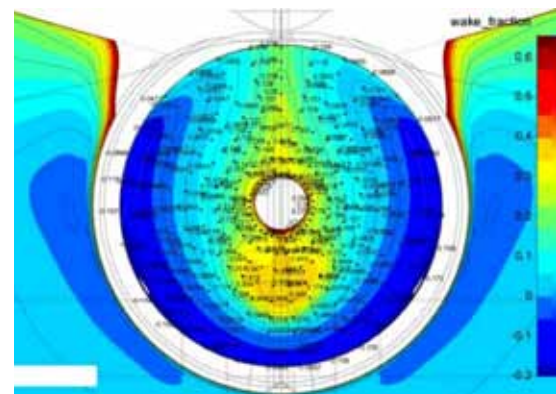
We hope that the presented visions and designs may inspire you to find new opportunities in your existing or new markets, both for new designs or the conversion of existing vessels.

We are looking forward to meet you and wish you good luck in the new year.

Guus van der Bles



ConoDuctTail for maximum propulsive efficiency



Optimal wake-field of ConoDuctTail



MV Lady Amalia with ConoDuctTail : EEDI-champion in her DWT-class with an "Attained Energy Efficiency Design Index" of 11.3, only 62% of the maximum allowable value ! In practice a daily fuel consumption of less than 3 ton/24h is reported, carrying 3000 – 3500 ton cargo at a service speed of abt. 10 kn.

main dimensions of these vessels (Lpp=84.98 m, B=13.35 m, D=7.05 m) are comparable to those of other Sea/River liners, the 748 kW installed power is often 20 to 50% lower! On the design draft of 4.30 m, these vessels carry 3000 tdw and reach a trial speed of 10.8 kn at 748 kW MCR. In practice they sail at an average service speed of abt. 10 kn in regular weather, with less than 3,0 ton fuel per day, carrying 3000 to 3500 ton cargo. Consumption figures of around 2.7 ton per day (!) have been reported by Wijnne Barends, by careful consideration of the actual required speed/power at each part of the trip. Also in adverse weather conditions the ConoDuctTail fulfils the expectations of Wijnne Barends: the combination of nozzle and tunnel enables good sustaining propeller thrust in heavy seaway.

Four vessels of this successful series were built at Groningen Shipyard and the design was elaborated in collaboration with Groot Ship Design who optimized steelweight and general arrangement while Conoship focussed on optimization of hull lines and speed/power.

Conoship's mission: improving eCONology

The ConoDuctTail enables optimization of both 'economy' and 'ecology', considered by us as the best way to improve the 'eCONology' of our designs. Application in the *Lady Anna* series leads to the EEDI-Champion in this DWT-class!

New 'eCONologic' designs are under development, combining ConoDuctTail design with new ConoSeaBow-developments, incorporating an LNG installation for propulsion fuel, enabling Conoships' drive for continuous improvement of the 'energy efficiency' of the Short Sea Shipping sector.

Conoship developed the ConoDuctTail to improve the energy efficiency of Short Sea Ships. The propulsive efficiency of the ConoDuctTail is maximized for actual (rather low) speeds of abt. 10 to 12 kn, by optimizing an aft ship shape with a duct, a nozzle and a propeller with a large diameter. Application in the MV Lady Anna of 3700 tdw shows a fuel consumption at 10 kn of abt. 3 ton per day: a reduction of up to 50% on emissions and fuel consumption compared to older existing vessels of same size!

Last few years, numerous innovative bow forms emerged which claim to substantially improve the efficiency and reduce the fuel consumption. They show characteristic hull shapes above the waterline that at least function as marketing tools for the designs and have positive effects in heavy seaway. At Conoship however, we were convinced that the largest energy efficiency gains could be found in a vessel's aft ship, so we started an extensive research program in cooperation with MARIN, SasTech and Delft University of Technology.

The analysis also included numerous discussions with ship-owners and captain-owners regarding the merits and disadvantages of various aft ship hull shapes.

Development of the ConoDuctTail-concept

With the use of extensive CFD calculations, performed in close cooperation with specialists SasTech and Van Oossanen, an aft ship hullform was developed which incorporates an

integrated nozzle and a ducted-tunnel shape in order to maximize the propeller diameter. Numerous CFD iterations supported an integral optimization of tunnel lines, nozzle design, resulting wakefield and propeller design, leading to the optimal combination of low resistance and best propulsive efficiency: the ConoDuctTail.

The optimized ducted-tunnel design reached 17% less resistance compared to a conventional tunnel aft ship hull shape. The tunnel design provides an optimal wakefield and the possibility to incorporate a nozzle and a larger propeller diameter (up to 25% larger). This results in quite an increase in propulsive efficiency and a considerable reduction of fuel consumption and emissions.

Practical Application of ConoDuctTail: MV Lady Anna + sister vessels

The performance of the first practical application of the ConoDuctTail in a series of 3700 dwt Sea/River vessels is very successful according to the owner Wijnne Barends. While the

PSV 'Polaris', first of three Pilot Station Vessels, christened by Queen Beatrix

Design description: Pilot Station Vessel
 Vessel name: PSV 'POLARIS'
 Owner: Dutch Pilot Association, Hoek van Holland, The Netherlands
 Builder: Barkmeijer Shipyards, Stroobos, The Netherlands



On the 10th of October 2012, the Dutch Queen Beatrix christened the Polaris, the first of a series of three Pilot Station Vessels at the Cruise Terminal in Rotterdam. The vessel was officially handed over by Barkmeijer Shipyards to the Dutch Pilot Association.

The delivery of the *Polaris* is one of the highlights of this long running project. Already at the beginning of 2008, Conoship International B.V., together with Barkmeijer Shipyards, started with the design of the Pilot Station Vessel. The Pilot Association started even earlier with "in-house" working groups to define an elaborate list of design requirements. During a very extensive preliminary design phase, which included thorough tank testing at MARIN prior to the actual building contract, a unique design was developed. Numerous design iterations resulted in a vessel that is capable for extended operations at sea in challenging weather conditions and wave heights up to 3.5 m.

After an extensive sea trial and training program, the *Polaris* chose position at the Rotterdam Pilot Station on the 6th of December. The reactions of the crew and the pilots are very enthusiastic. Especially the sea keeping behavior, which was the main focus point during the design, is judged to be very good. It seems that all effort spent during the design process to optimise the sea keeping characteristics of this vessel turned out to be successful. A true example of the capabilities of Conoship International B.V. and Barkmeijer Shipyards to turn the visions of a shipowner into reality.

On the 19th of October the Pollux, the second of the Pilot Station Vessel series

was launched at Barkmeijer Shipyards location in Stroobos. Currently this vessel is being outfitted in Harlingen.



Photo: H. van der Heijden - Maassluis.

PRINCIPAL PARTICULARS

Length over all	81.20 m
Length between p.p.	74.80 m
Breadth moulded	13.30 m
Draught (design)	4.80 m
Draught (max.)	5.10 m
Speed	16.0 kn

COMPLEMENT

Pilots	18
Crew	17
Others	10

PROPULSION SYSTEM

Electr. prop. engines	2 x 1700 kW
Diesel generators	4 x Caterpillar C32 2 x Caterpillar C18

M² Runner Oceanic

Project Cargo vision turned into reality

Design description: 3500 TDW Hartman M² Runner
Vessel name: MV 'Oceanic'
Owner: Global Seatrade BV, Urk, The Netherlands
Builder: Hartman Marine BV, Urk, The Netherlands



Flexibility, (fuel) efficiency and a maximization of the deck area were the leading aspects to be taken into account in the design of the Hartman M² runners. Recently the MV 'Oceanic' - the first of this series - has been delivered to her owner Global Seatrade.

In close cooperation with Hartman Marine BV, Conoship International BV developed the Hartman M² Runner, a flexible and spacious project cargo vessel for the short sea project market. With a total hold volume of 219,000 cuft and a free deck area of more than 1300 m², the vessel is 'oversized' compared to conventional 3500 tdw vessels. In fact, the hold capacity and deck area of the M² Runners are almost comparable to the capacities of a 6000 dwt general cargoes vessel.

With the M² Runner, Hartman Marine and Global Seatrade meet the changing needs of the project cargo market. More and more offshore plants and offshore windmill parks are constructed in

deeper waters, remote areas and harsh environments, requiring larger transport volumes and a need for more flexible vessels, capable of transporting larger parts or components in one-piece. Even more than in the past, shipping of project cargos will be dominated by available deck area and hold volume.

Open top

After extensive tank testing at MARIN, the M² Runner received permission from the Authorities to sail "open top". This enables worldwide operations without hatchcovers closing the hold and provides the possibility to transport very large and high parts. "Open-top" operations are usually not feasible with vessels of this size, but only permitted

with vessels much larger than the Hartman M² Runner.

The Hartman M² Runner is also an environmentally friendly vessel. Featuring an integrated nozzle and a relatively large propeller, the Hartman M² Runner is a very fuel efficient vessel. With an installed power of 1200 kW, a service speed of about 12 knots is reached.

PRINCIPAL PARTICULARS

Length over all	92.90 m
Length between p.p.	84.99 m
Breadth moulded	14.00 m
Breadth max.	15.00 m
Depth	10.00 m
Draught (summer)	5.00 m
Deadweight	3500 ton
Gross tonnage	2979 GT
Main engine	1200 kW
Speed (service)	12.0 kn

CARGO CAPACITIES

Hold dimensions:

Lower	53.90 x 12.00 x 3.20/3.90 m
Upper	69.30 x 12.50 x 4.60/3.90 m

Tank top area	635 m ²
Tweendeck area	830 m ²
Deck length x breadth	90 x 15 m
Deck area	1300 m ²
Cargo hold capacity	219200 cb.ft.
Container cap.	105 hold - 199 deck TEU



TSHD 'Contender': MV Sirocco converted to 2125 m² multi-purpose Trailing Suction Hopper Dredger

Design description: 2100 m³ Trailing Suction Hopper Dredger
 Vessel name: TSHD 'Contender'
 Owner: ABEKO Marine BV, Beverwijk, The Netherlands
 Builder: Neptune Marine Services BV, Hardinxveld-Giesendam, The Netherlands



cargo can be discharged through the bottom doors or through the rainbowing nozzle or bow-coupling to a floating pipeline.

This modular design approach, elaborated together with DredgeVision, leads to a very flexible 'dredging-tool' that can be adapted to any specific job. The design of the hopper and hull modifications enables the installation of this extra dredging equipment. Pumprooms were fitted in the aft- and forward part of the original cargo hold, the forecastle was raised and two sponsoons were fitted to enlarge the breadth from 12.50 m to 16 m to increase deadweight and stability.

At the foreship the sponsoons were faired into the existing hull lines, resulting in a good speed/power performance. The project management of this conversion was done by DredgeVision. This successful "make over" shows one of the opportunities to create a "new life" for good second hand General Cargo vessels that are widely available these days.

The successful 'extreme make-over' of the Conoship designed 3200 tdw General Cargo vessel Sirocco to a multi-purpose Trailing Suction Hopper Dredger resulted in the versatile 2125 m³ TSHD Contender for ABEKO Marine. The dredger was handed over in April when she directly started her first job in Wilhelmshaven and proved to be very efficient.

The design challenge for Conoship was to integrate the wide variety of required dredging equipment. One of the key issues for ABEKO is the possibility to fit an excavator on top of the hopper, conveyor belts alongside the hopper

and a rotatable shore-conveyor on the forecastle. This system is fully integrated in the design and can be installed for specific jobs in which dry delivery of sand or gravel to quay is required. For maintenance or construction jobs, the

IMSV 'Sanaborg': Multipurpose support vessel for extreme ice

Design description: 3900 kW Ice Breaking Support Vessel
 Vessel name: IMSV 'Sanaborg'
 Owner: Wagenborg Offshore, Delfzijl, The Netherlands
 Builder: Royal Niestern Sander, Delfzijl, The Netherlands

Recently Royal Niestern Sander in Delfzijl delivered the "Sanaborg" and the "Serkeborg" to Wagenborg Offshore. These Ice Breaking Multipurpose Support Vessels (IMSV) have been jointly developed, by the shipyard, Wagenborg and Conoship, for offshore services in shallow water and under arctic conditions.

Sanaborg and Serkeborg are more efficient than the existing vessels because of the new hull form, which was developed by Conoship International. Design target was to reach a minimum speed of 4.0 knots in unbroken first year ice of 0.60 m

thickness. Model tests were conducted to verify the icebreaking performance in deep and shallow waters, as well as "washing and breaking the ice" to penetrate grounded ridges travelling stern first. Equipped with two Wärtsilä Icepod® thrusters the vessels reach



a bollard pull of 36.3 mT and have excellent ice management capabilities.



PRINCIPAL PARTICULARS

Length between p.p.	63.45	m
Breadth moulded	14.00	m
Depth	5.10	m
Draught (design)	2.50	m
Deadweight (design)	444	ton
Draught (summer freeboard)	3.15	m
Deadweight (summer)	1005	ton
Gross tonnage	1520	GT
Main propulsion	2 x 1950	kW

TANK CAPACITIES:

Potable water	329	m ³
Gasoil	790	m ³
Treated water	260	m ³
Ballastwater	605	m ³

New Design

TSHD 'SmartDredge 3500'

Design description: 3500 m³ Trailing Suction Hopper Dredger
 Builder: Veka Bijlsma, Lemmer, The Netherlands

Profitable dredger shaped out of existing hull modules



PRINCIPAL PARTICULARS

Length over all	90.50	m
Length between p.p.	84.41	m
Breadth moulded	15.80	m
Depth	6.90	m
Draught (summer)	5.23	m
Deadweight (summer)	4200	ton
Draught (dredging)	6.35	m
Deadweight (dredging)	5700	ton
Gross tonnage	2999	GT
Speed (service)	13	kn
Main generators	3 x 1400	kW

DREDGING PARTICULARS

Diameter of drag arm	800	mm
Max. dredge depth	25-38	m
Sand pump output	1400	kW
Jet pump output	2 x 360	kW
Hopper capacity	3500	m ³
Density of hopper load	1.0-2.2	t/m ³

Under Construction

TSHD 'Causeway'

Design description: 4500 m³ Trailing Hopper Suction Dredger
 Vessel name: TSHD 'Causeway'
 Owner: Royal Boskalis, Papendrecht, The Netherlands
 Builder: D.W. den Herder Maritiem BV, Sliedrecht, The Netherlands

Boskalis' triple repeat order after successful 4500 m³ TSHD 'Shoalway'



PRINCIPAL PARTICULARS

Length over all	92.10	m
Length between p.p.	84.88	m
Breadth moulded	19.00	m
Depth	7.25	m
Draught (summer)	6.16	m
Deadweight (summer)	5950	ton
Draught (dredging)	6.82	m
Deadweight (dredging)	6980	ton
Gross tonnage	abt. 4300	GT
Speed (service)	11	kn
Main engines	2x1500	kW

DREDGING PARTICULARS

Diameter of drag arm	900	mm
Max. dredge depth	30	m
Sand pump output	2x1825	kW
Jet pump output	2x750	kW
Hopper capacity	4520	m ³
Density of hopper load	1.0-2.2	t/m ³

Recent Delivery

MV 'FIORANO'

Design description: Bijlsma Confeeder 350
 Vessel name: MV 'FIORANO'
 Owner: Fiorano CV, Werkendam, The Netherlands
 Builder: Veka Bijlsma, Lemmer, The Netherlands

Efficient trader for niche market



PRINCIPAL PARTICULARS

Length over all	99.97	m
Length between p.p.	84.99	m
Breadth moulded	15.85	m
Depth	8.85	m
Draught	5.65	m
Deadweight	4533	ton
Gross tonnage	3871	GT
Speed (service)	15	kn
Main engine	3280	kW

CAPACITIES

Hold dimensions		
Hold 1	24.20 x 13.20 x 8.85	m
Hold 2	27.27 x 13.20 x 8.85	m
Cargo hold capacity	212360	cb.ft.
Container capacity	354/124	hold
	- 230	deck
HFO	319	m ³
Ballast water	2615	m ³

Conoship International: the innovative designer of Short Sea vessels

Design and Engineering

Conoship International provides design, engineering and consultancy services for the maritime industry. Since 1952 Conoship designs are renowned throughout the world. More than 2.000 Conoship designs are sailing the seven seas. Each design is customized based on the client's demand in order to achieve an optimum technical and economical solution, enabled by the most innovative ship design tools.

Our wide range of services for shipowners, brokers and shipyards, includes:

- Conceptual ship design
- Basic ship design
- Class approval design
- Conversion design
- Market and marketing studies
- Ship design and shipbuilding project management
- Feasibility studies
- Research and development

Please contact us to find out more about our services, to discuss your ideas and to see whether we can be of any assistance to you.

Member shipyards:

Barkmeijer Shipyards, The Netherlands
Royal Bodewes Shipyards, The Netherlands
Royal Niestern Sander, The Netherlands

Recent selection of yards building our designs:

Bijlsma Shipyard, The Netherlands
Hartman Marine, The Netherlands
Groningen Shipyard, The Netherlands
Chowgule Shipyards, India
Gelibolu Shipyard, Turkey
Shipkits Shipbuilders, Poland
Daesun Shipbuilding, Korea
Wuxue Kaiyangxing, China

Upcoming topics in next issues:

- EEDI news
- New concepts
- LNG for propulsion
- ConoSeaBow



- Wind propulsion
- New Dredgers

Check www.conoship.com

Energy Efficiency Design Index

On the 1st of January 2013 the new IMO-regulations on 'energy efficiency for ships' enters into force, including the mandatory Energy Efficiency Design Index. The regulations aim to reduce the CO2-emissions of shipping, prescribing a maximum allowable EEDI-value for new designs. Conoship performed a study together with MARIN for the Dutch Shipbuilding Association on correction factors in the EEDI calculation for small General Cargo ships. Conoship presented the results in the IMO-meeting in London in October last year and the proposed correction factors are adopted in the Guidelines. For more info see www.conoship.com

Business Partners:

Dredge Vision Engineering, The Netherlands
SasTech, The Netherlands
India Futuristic Marine, India
SEDS Engineering, India
GTRC Algoship, Bahama's

Recent selection of shipowners sailing our designs:

Dutch Pilot Association, The Netherlands
Royal Boskalis, The Netherlands
DTM Dredging, France
ABEKO Marine, The Netherlands
UK Dredging, United Kingdom
Wagenborg, The Netherlands
Arklow Shipping, Ireland
Global Seatrade, The Netherlands
Wijnne Barends, The Netherlands
Union Transport, United Kingdom
Amasus Shipping, The Netherlands
Albros Shipping, Russia
Navigia Group, The Netherlands
Danser van Gent Shipping, The Netherlands
Fehn Shipping, Germany



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