



**E4 POWER**

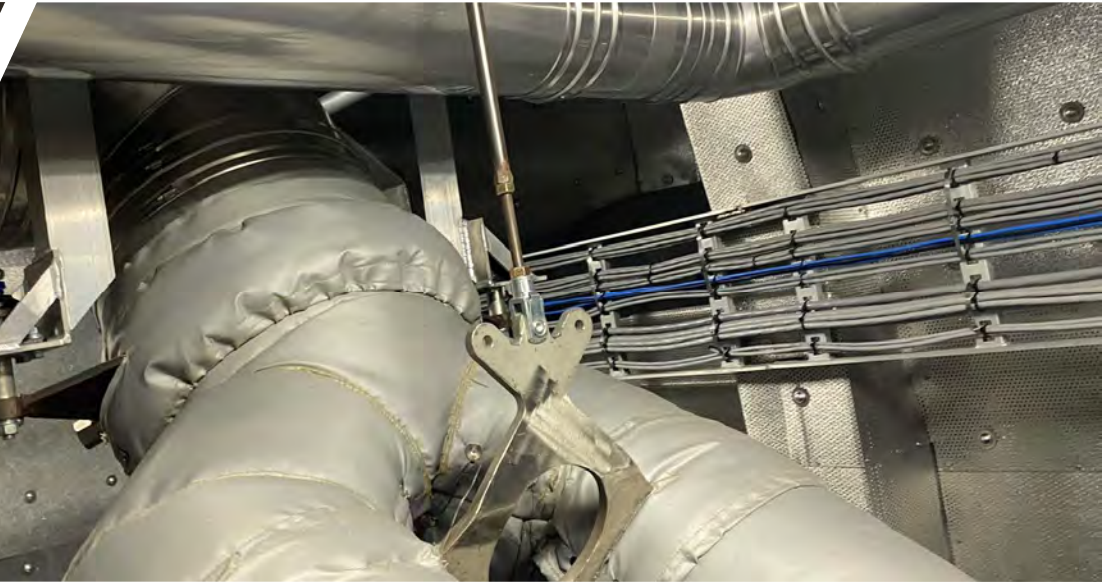
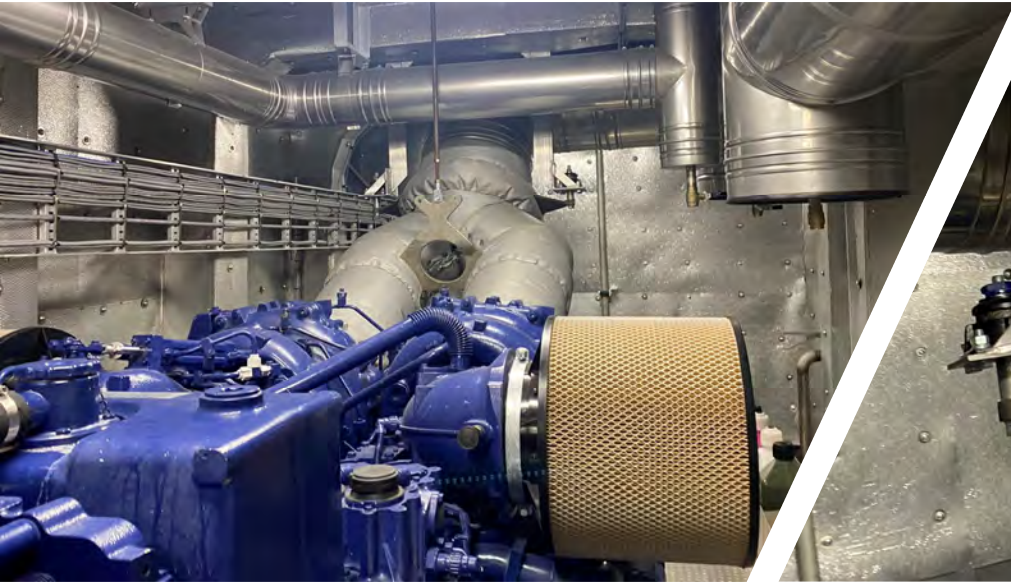
Powerful, marine engineering solutions

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Enovation and Custom Solution





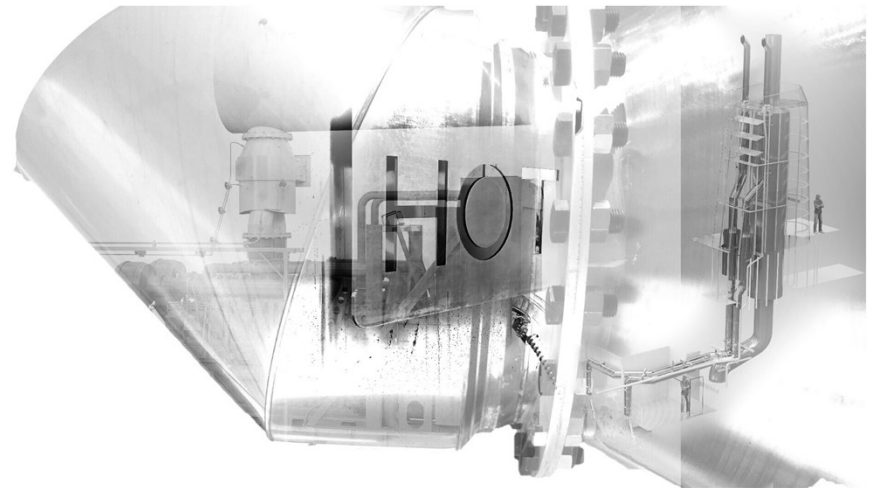




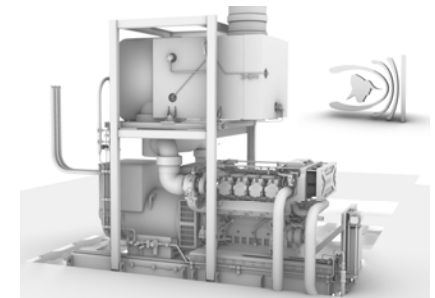
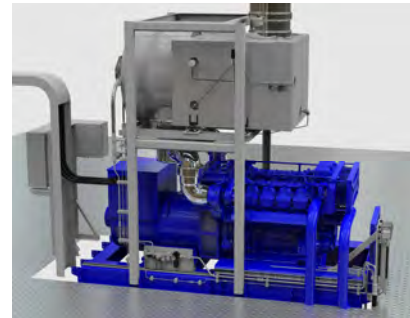


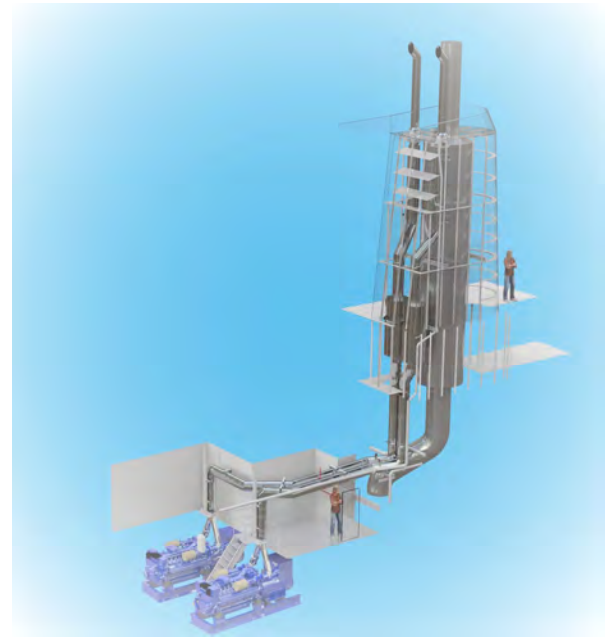
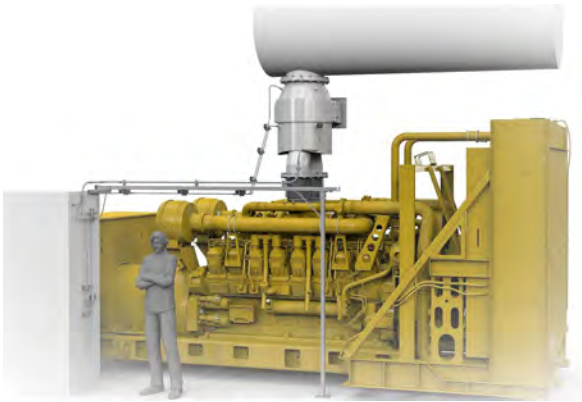
# Exhaust Pipe Systems and Exhaust Filtration

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From  
development  
to final  
design





Turn-Key solution providing all required components and materials.  
Onsite project management.

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Industrial and Marine.....



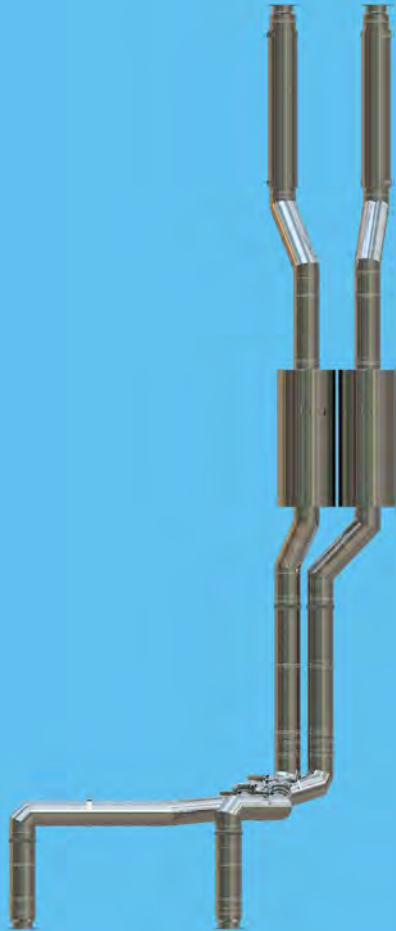


## R/V FALKOR Refit 2017



[Download the full general arrangement for the R/V \*Falkor\* \(.pdf\)](#)

<b>Length Overall</b>	82.90 meters	<b>Fuel Capacity</b>	105,150 US gals / 398 m3 / 330 MT
<b>Length between perpendiculars</b>	76.20 meters	<b>Fuel Consumption per day</b>	at 10 kts 2,900 US gals / 11 m3 / 9.1 MT
<b>Beam, overall</b>	13.00 meters	<b>Galley Messing Seats</b>	30
<b>Freeboard</b>	2.28 meters	<b>Maximum Speed</b>	17 knots
<b>Draft (design)</b>	4.80 meters	<b>Cruising Speed</b>	10 to 12 knots
<b>Draft (gondola)</b>	5.80 meters	<b>Survey Speed</b>	8.0 knots
<b>Depth (moulded)</b>	6.67 meters	<b>Range at 10 kts</b>	8,000 nautical miles (estimated)
<b>Displacement (weight)</b>	2,260 m3	<b>Endurance with 41 personnel aboard</b>	36 days
<b>International Gross Tonnage</b>	2,024 GRT	<b>Year Built / Year Converted</b>	1981 / 2010-2012
<b>Net Tonnage</b>	608 NRT		

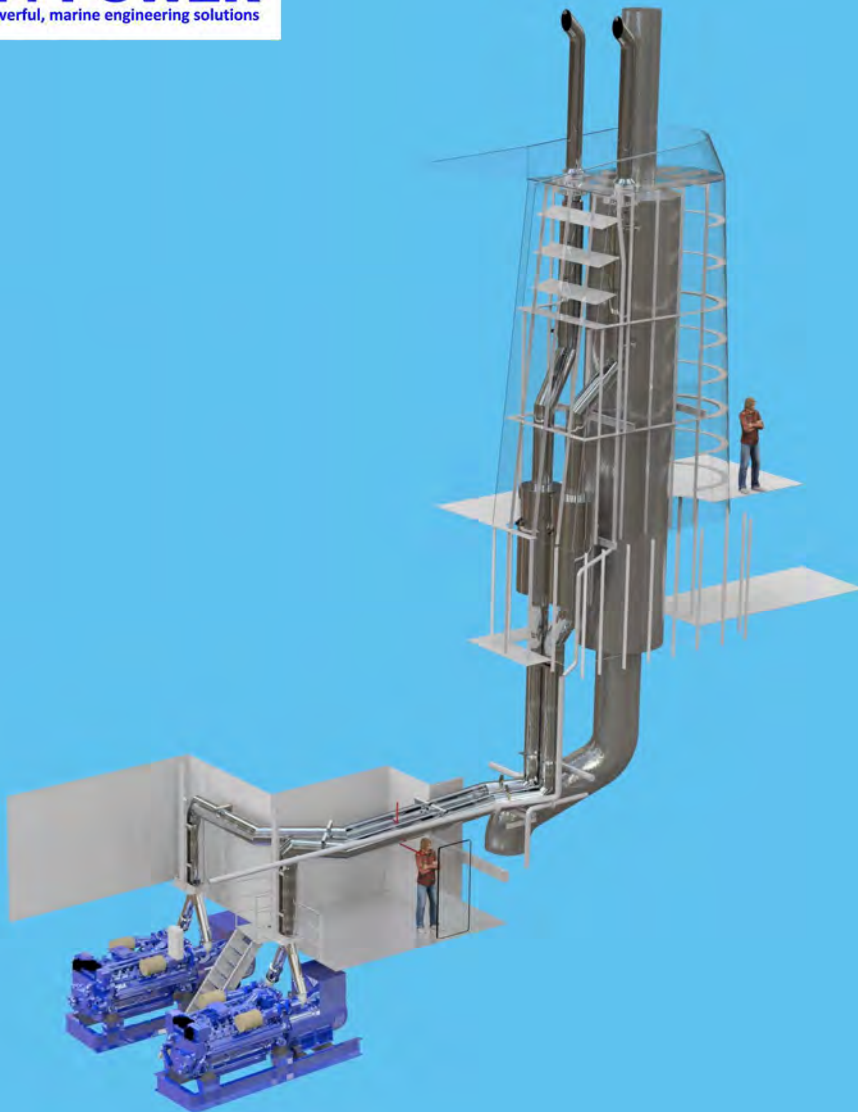


Provision of two complete exhaust systems for MTU 700 kWe on board power generation

Solution:

- Light weight and low cost modular exhaust pipe system with silencers
- Fully insulated
- Stainless Steel
- Solid mounted to the ships structure
- No vibration isolation system required





### 3D Modeling

- Avoiding points of conflicts
- Easy to illustrate and share with all parties
- Planning of installation

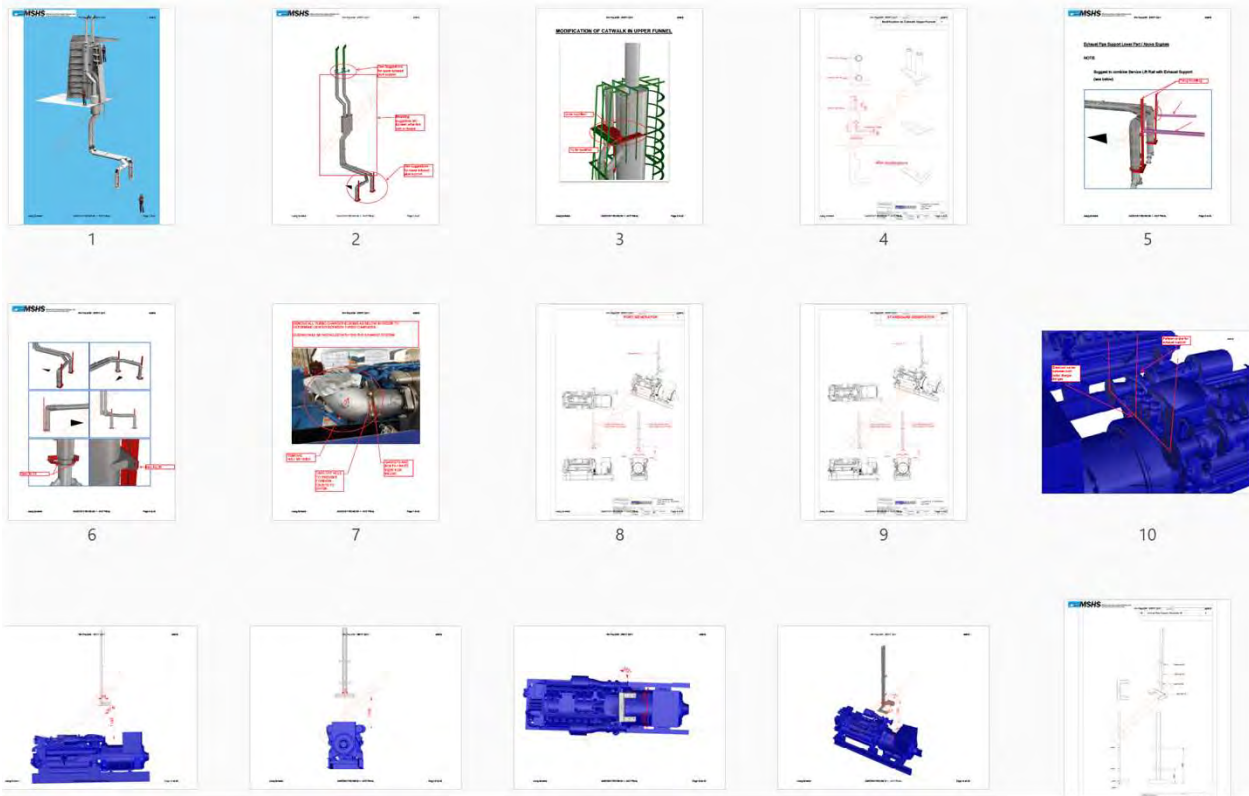
### Shipping

All components were shipped in one  
20 foot sea container

Total shipping weight: 1,800 kg / 3,970 lbs

### Onsite Assembly:

- 200 men hours
- 2 men



Detailed project planning and sharing with customer as well shipyard ahead of installation.





Onsite installation



Female end of pipe segment  
with notches



Male end of pipe segment





# Applications

- Diesel Generatorsets / Backup power
- Gas Generatorsets / CHP
- Marine Propulsion Engines & Gensets
- (Steam) Boilers
- Ovens (Bakeries, Dry processes etc.)
- (Micro) Turbines
- Etc.





# Specification

- Max (over)pressure: 5.000 F
- Operational temperature: 200-600
- Max temperature: 1.000 °C (mo)
- Material inner tube: AISI 316L
- Material outer tube: AISI 304/904
- Insulation: Mineral wool
- Seal: ring + silicon seal
- Approvals: CE/DNV/LR/Gost/A

**ALP**

**marine**



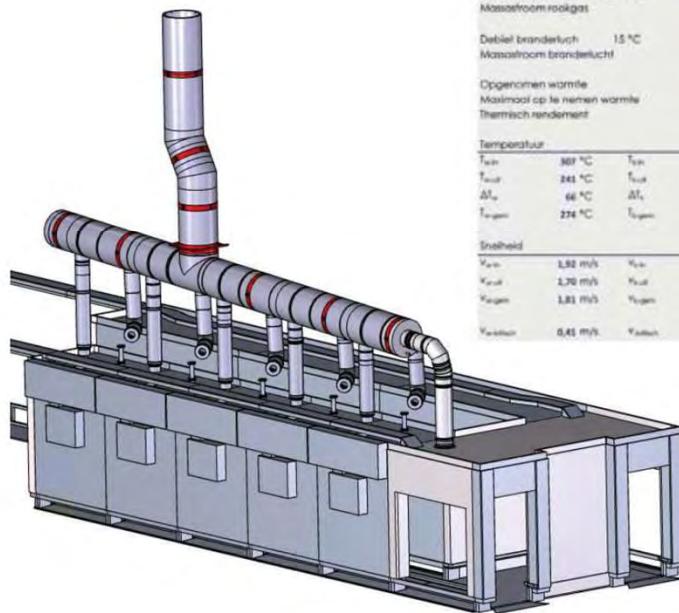


# Benefits

- Light Weight (60% lighter than conventional)
- One calculated system, one calculated performance
- Flexible applicability
- Pre insulated
- Stainless Steel, different qualities for diverse applications
- Click & Fix – Easy and clean to install. No welding.
- Up to 1000 mm diameter for pipes, 2500 mm for silencers



# Tri-wall system for heat recovery

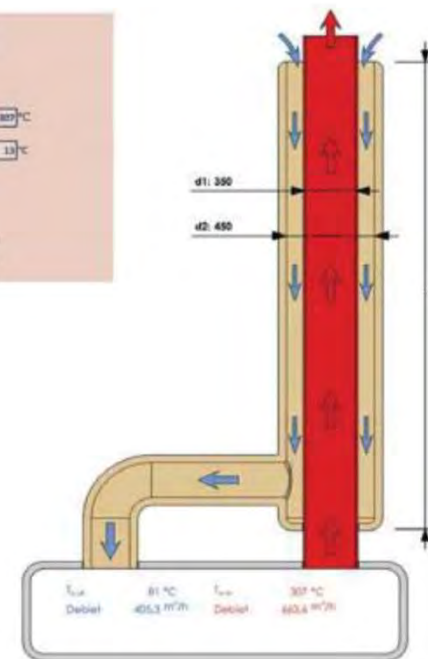


Diameter rookgas kanaal	$d_1$	300 mm
Diameter concentrisch kanaal	$d_2$	450 mm
Hoogte warmtewisselaar	$h$	0 m
Temperatuur ingang Rookgas	$T_{in, r}$	307 °C
Temperatuur ingang branderlucht (omgevingstemperatuur)	$T_{in, b}$	13 °C
Overdruk Rookgas	$p$	200 pa
Verhouding branderlucht/Rookgas		100%
<input type="radio"/>	Debiet rookgas bij 15 °C	330 m <sup>3</sup> /h
<input type="radio"/>	Debiet rookgas bij 307 °C	330 m <sup>3</sup> /h
<input checked="" type="radio"/>	Massaflow rookgas	400 kg/h

Algemeen			
Debiet rookgas bij 15 °C	330 m <sup>3</sup> /h		
Debiet rookgas bij 307 °C	666 m <sup>3</sup> /h		
Massaflow rookgas	400 kg/h		
Debiet branderlucht 15 °C	330 m <sup>3</sup> /h		
Massaflow branderlucht	399 kg/h		
Opgenomen warmte	1634 J/s		
Maatmaat op te nemen warmte	3349 J/s		
Thermisch rendement	23%		

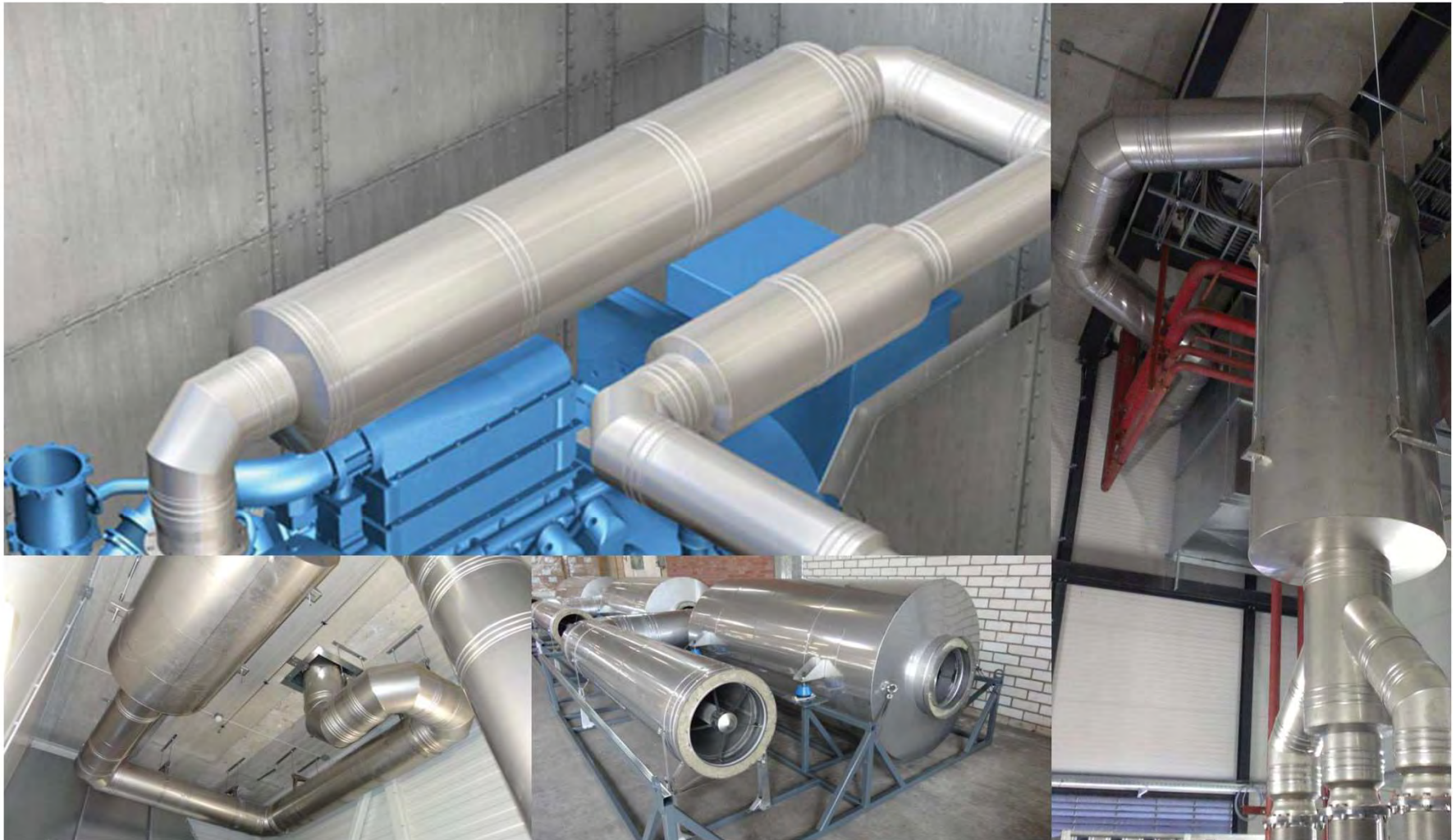
Temperatuur			
$T_{in, r}$	307 °C	$T_{in, b}$	13 °C
$T_{out, r}$	241 °C	$T_{out, b}$	61 °C
$\Delta T_{in}$	66 °C	$\Delta T_{out}$	68 °C
$T_{gem, r}$	274 °C	$T_{gem, b}$	47 °C

Snelheid			
$v_{in, r}$	1,82 m/s	$v_{in, b}$	1,48 m/s
$v_{out, r}$	1,70 m/s	$v_{out, b}$	1,79 m/s
$v_{gem, r}$	1,81 m/s	$v_{gem, b}$	1,62 m/s
$v_{rotatie}$	0,41 m/s	$v_{rotatie}$	0,82 m/s





# Application references: Gensets



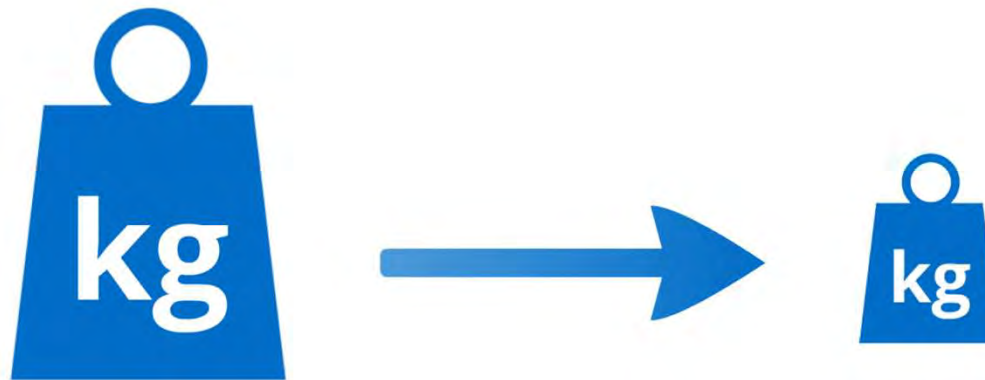






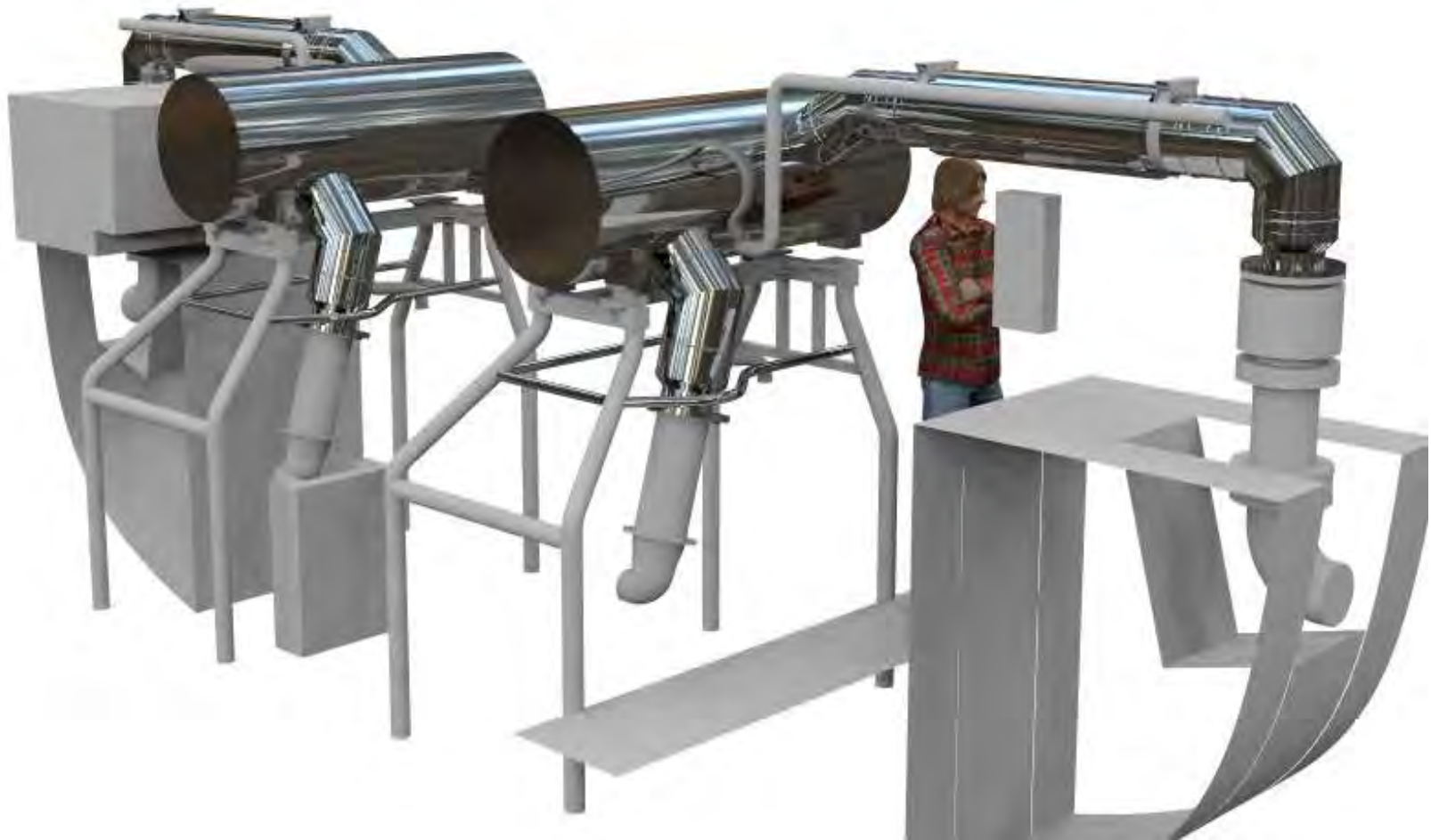
*Reduction of manhours  
of at least 50%*

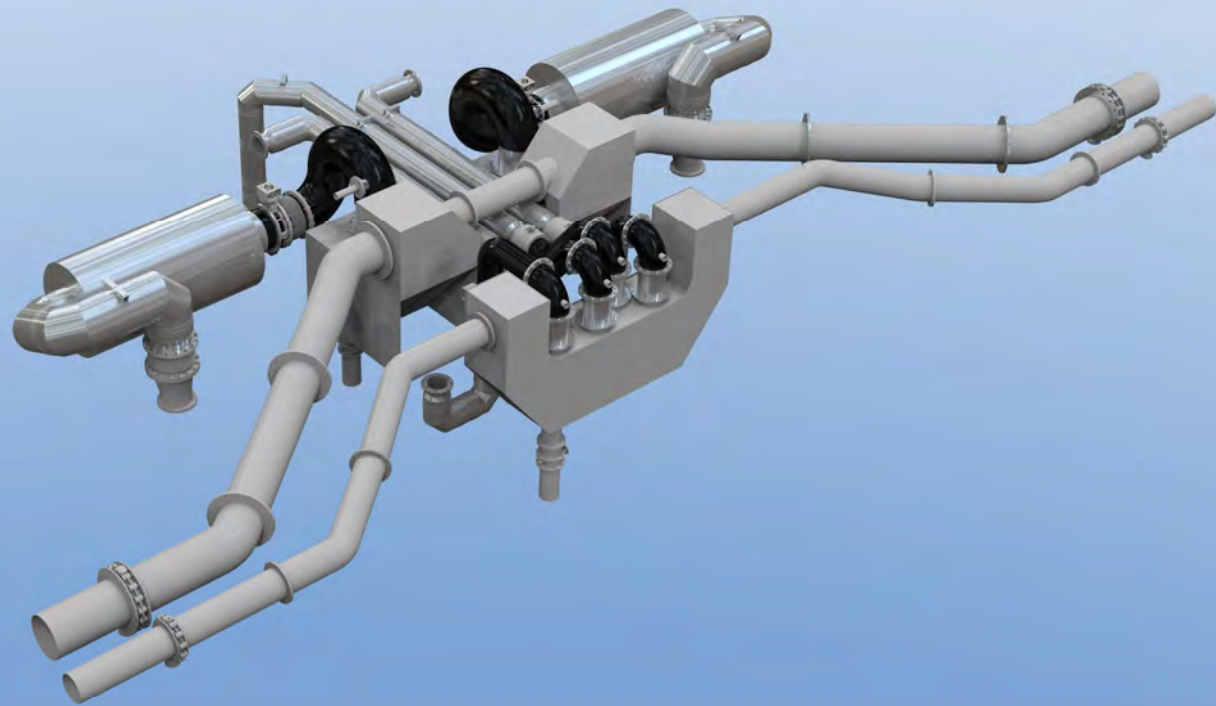
*Up to 75% weight reduction*



**Example:**  
**Conventional system 15,7 tons**  
**modular 4,8 tons**







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## Partnership with **POLYFLAKE**

- Endless marine application possibilities
- 5year warranty / 20 years + product lifetime
- Wear resistant
- Full corrosion protection
- Machinable
- Approved by all major “Classification Societies”
- Approved for portable water tanks and pipes
- Major cost savings verses replacement

*Sea water pipes and chest  
Water pump housings and impellers  
Pool tank and surrounding areas*

### *Tanks:*

- *Portable water*
- *Grey and black water tanks*
- *Chemical tanks etc...*

*Exhaust scrubbers and discharge pipes*

*Under water hull coating*

*Thruster tunnel*

*Rudder*

Contact:

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**Thank you for your time**