



Engineered and produced in Rostock, Germany



# Water mist catcher EUBv6

The efficient water mist catcher  
for your 2-stroke large diesel engine



# Starting position

---

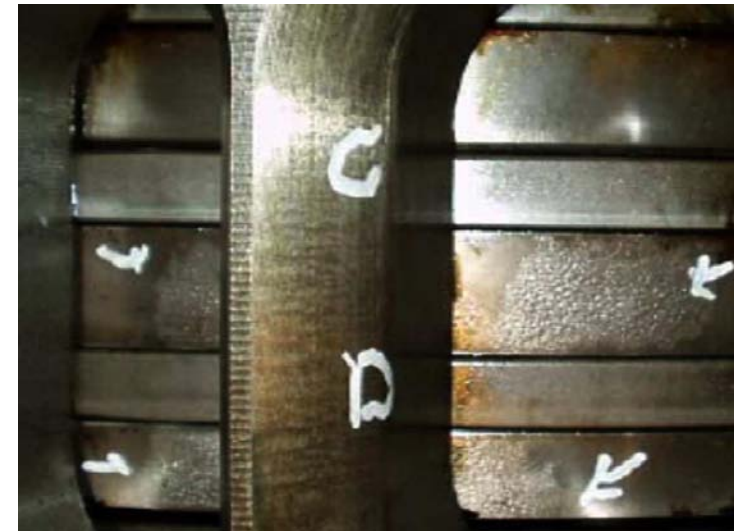
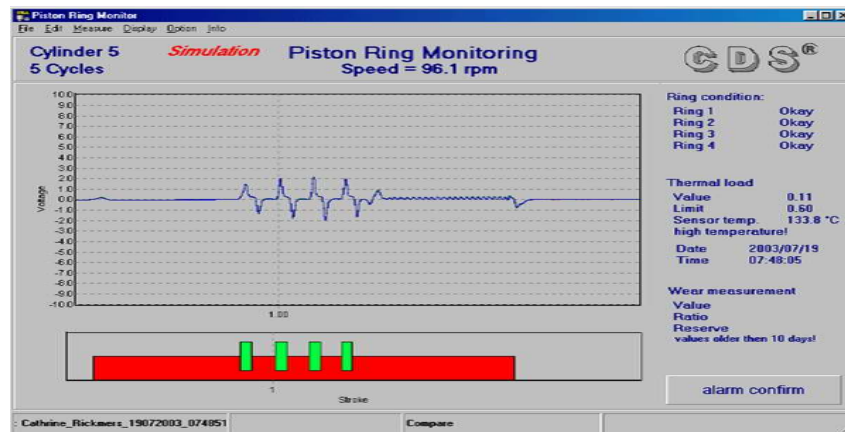
**Excessive wear of cylinder liners in engines of Sulzer type RTA84 and RTA96 (examination during a study by Wärtsilä and EUB supported by a monitoring system)**

## Determined parameters:

- **Lubrication** 1,1 g/kWh, no malfunction
- **Cooling** no malfunction
- **Material** if lubrication is working properly, no salience
- **Condensate in charge air**
  - unusual small amount of condensate in bilge-tank
  - white exhaust gas color
  - fog in charge air receiver

# Analysis I

- Monitoring of liner temperature and piston rings by CDS-system
- Observation of unusual temperature developments on single stations
- Inspection of said stations through corresponding scavenging air ports
- Conspicuous damage symptoms



# Analysis II

- Determination of theoretical condensate amount per working stroke
- Discrepancy between nominal and actual values
- **Conclusion:** condensate is not caught effectively

Parameter	Value	Unit
Relative humidity	90,0	[%]
Temperature before blower	39,0	[°C]
Barometric pressure before blower	1,00	[bar]
Water content of air before blower	0,0417	[kg/kg]
Scavenge air pressure	2,5	[bar]
Pressure ratio	3,50	[-]
Temperature where condensation takes place	62,1	[°C]
Actual temperature after cooler	42,0	[°C]
Specific air flow	7,8	[kg/kWh]
Actual power on engine	39500,0	[kW]
Max. water content in CAC	0,0149	[kg/kg]
Spec. water content which condenses	0,0268	[kg/kg]
<b>Theoretical water content at separator</b>		
per hour	8259,2	[kg/h]
per day	198221,4	[kg/d]

Buttons: Calculate, Exit

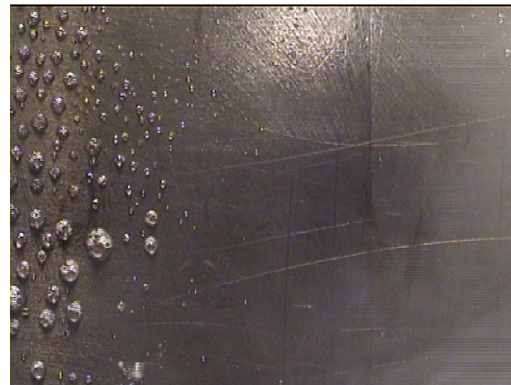
# Cause study of damages

- Imported condensate in combustion chamber precipitates on liner wall
- Rapid transition from liquid to gaseous phase (micro explosion), during this increase of volume with factor 800
- Lubrication film is eliminated
- Local solid object friction and overheating occurs– **liner and piston damages**

Laboratory test:



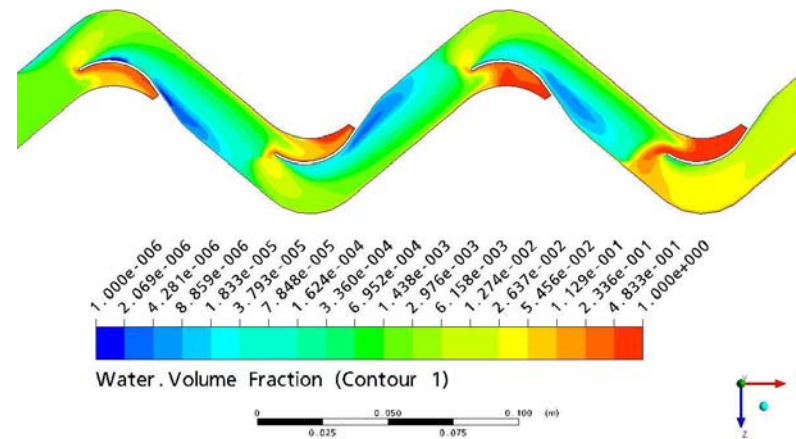
Liner wall with intact lubrication film



Liner wall without lubrication film after water spray

# Cause of condensate intake

- Traditional water mist catcher are not working properly in pulsating air flow
- Draining capacity not sufficient
- Deficiencies in design

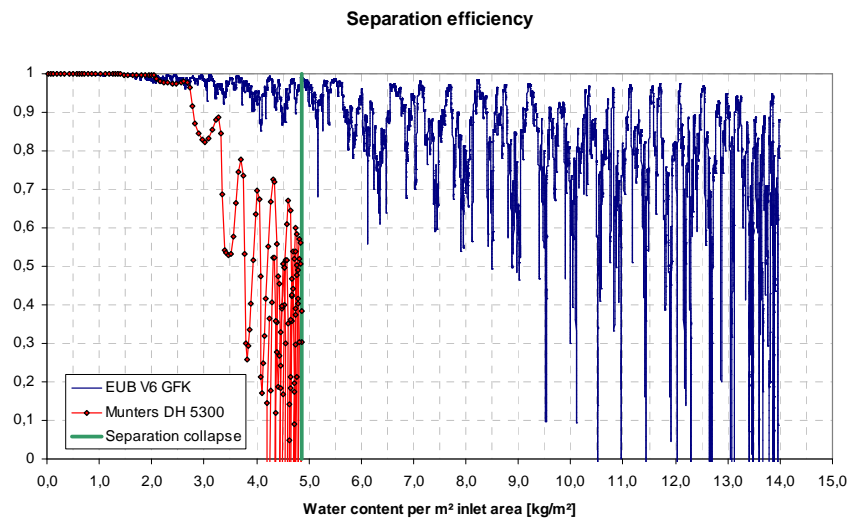
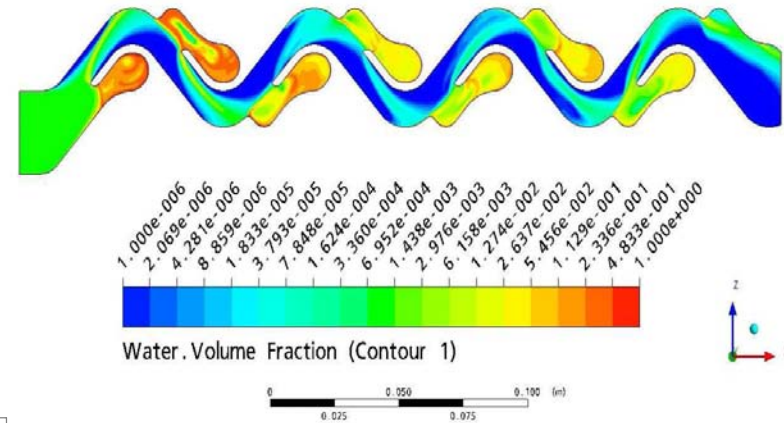


Result of simulation

➔ **With engines of series RTA 84 and 96 traditional WMC fail in service due to huge air intake volumes**

# Solution of the problem

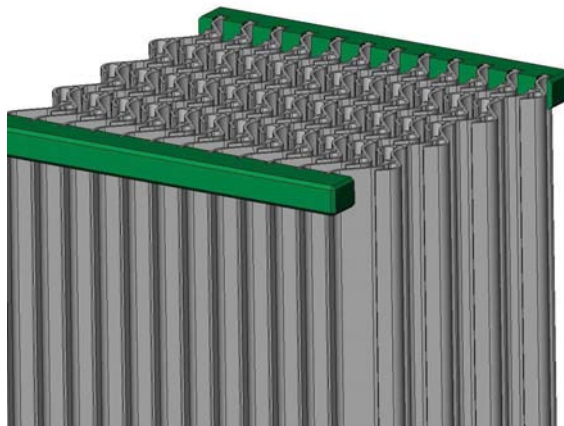
- Development of efficient catching profiles using numeric simulation
- Improvement of the whole construction
- Securing of easy to upgrade design
- Minimizing of pressure loss in charge air



→ Separation efficiency of EUBv6 significantly higher than OEM WMC

# Results in service

- Significant higher separation efficiency in high and low humidity environments
  - Massively reduced moisturisation of inner air receiver surfaces
  - Volume of drainage water via orifices nearly doubled
- No appearance of mist clouds
- Reducing of pressure loss about 5% - 15% depending of engine type



Blade package



Catcher module for RTA84