

„Generation X-engines, experience with combustion chamber“

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Abstract

The layout of an engine is essential for its reliability. To ensure outstanding reliability, most of the design concepts of WinGD's X-engines were derived from the RT-flex engines. Next generation combustion chamber components are traditionally validated on lab and field testing engines. Already proven concepts are continuously optimised and adapted for the respective engine type.

Component temperature levels are such that they do not exceed material property-related limits while, at the same time, certain component temperatures should not fall below the levels given to avoid cold corrosion. Numerous publications have emphasized the positive effect of e.g. elevated liner wall temperature for that reason.

Today, a broad variety of fuels are used in marine engines. Gaseous and liquid, residuals, distillates and hybrid fuels with a sulphur range from close to zero up to 3.5% sulphur. This huge variety of fuels calls for a variety of adequately suitable lubricants. WinGD cooperates closely with the lubricant industry with the target to support the oil industry to have products available designed for the needs of the latest type, highly efficient engine generation. Cylinder lubricants are not seen as commodity anymore, but as an element of reliable engine design.

Optimal cylinder liner running surface temperature in combination with WinGD's unique Pulse Jet cylinder lubrication system, appropriately designed lube oil distribution grooves in combination with correct lubricant selection results in very low wear of cylinder liner and piston rings. This results in highly competitive maintenance intervals.

A correct lubricant selection is the ultimate prerequisite to achieve low lube oil feed rates. Low cylinder lubricant and system oil consumption is key for low operational cost. A clever designed stuffing box seals the crankcase from the combustion space during the entire engine lifetime. Piston rod and stuffing box sealing elements underlie wear. Elastic sealing elements that follow the shape of the piston rod well guarantee an efficient drain of system oil back to the crankcase. Measurements of drain oil out of the neutral space of the stuffing box give indication about the stuffing box efficiency. WinGD's latest stuffing box design shows very promising results during field validation.

This presentation gives insight into WinGD's design rules, experience with engines in service and an outlook on coming design updates.

