

Fatigue Strength Acceptability Factors for Crankpin Oil Bore Outlets

Amended Guidance

Guidance for the Survey and Construction of Steel Ships Part D

Reason for Amendment

IACS Unified Requirement (UR) M53 specifies design requirements for the fatigue strength of crankshafts and these requirements have already been incorporated into the Part D of the Guidance.

In fatigue strength evaluations involving the testing of full-sized crankpins, journal fillets and crankpin oil bore outlets, the acceptability factors for fatigue strength are specified according to Goff-Pollard's formula in which a multi-axial combined stress of bending and torsion is assumed.

However, since the stress acting on the outlets of crank pin oil bores can be considered to be in the uni-axial direction only, an acceptability factor of fatigue strength obtained by Goff-Pollard's formula that is based on the assumption of multi-axial combined stress is likely going to be overestimated.

Therefore, so as to properly evaluate fatigue strength based on measured data, IACS has revised the formula for calculating the acceptability factor of fatigue strength at crankpin oil bore outlets so that it is calculated using maximum principal stress assuming uni-axial stress. This revised formula was adopted as UR M53(Rev.4) in August 2019.

Accordingly, relevant requirements were amended in order to clarify their correspondence with UR M53(Rev.4).

Outline of Amendment

The formula for evaluating fatigue strength at crankpin oil bore outlets for full-sized testing was revised from being one based on Goff-Pollard's formula to being one based on maximum principal stress.

Amended Requirements

Guidance for the Survey and Construction of Steel Ships
Part D: Appendix D2 4.1.3