

Essential information for whirling & axial vibration calculations

Reliability of shaft vibration calculations depends on the completeness and accuracy of propulsion shafting modeling. The shaft designer should have the complete information to model the propulsion shafting properly. There are two categories of essential information for shaft alignment calculation:

Category I – obligatory data, without this data it is not possible to make a calculation.

Category II – very important additional data, without this data, there will be a larger margin for error, with this data the calculation will be more reliable.

Pos	Description	Category	
		I	II
I. GENERAL			
1	Ship type and main particulars		*
2	Is the ship a new build or repaired		*
3	Set out the cause of the propulsion train repair including description of the failure nature and conditions, if the ship is under repair		*
5	What is the purpose of the calculation		*

SKF Solution Factory – Marine Services

Nikkelstraat 7, 2984 AM Ridderkerk, The Netherlands,
Tel. +31 (0)180 483828 Fax +31 (0)180 483829 www.skf.com/marine

VAT NL823505431B01

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II. SHAFTING			
1	General arrangement of propulsion train	*	
2	Production drawings of the shafts specifying their lengths and diameters	*	
3	Masses and center of gravity for heavy equipment associated with the shafting	*	
4	Information about filling of the shaft bore (oil, rods etc.)		*
5	Information regarding propeller shaft liner (material, thickness, length and position)		*
III. BEARINGS			
1	Stern tube drawing		*
2	Material and dimensions of the stern tube bearing bushes	*	
3	Stern tube bearing lubricator (water, oil)	*	
4	Diametric bearing clearance	*	
5	External / constructional stiffness of the bearing supports		*
6	For thrust bearings: Internal stiffness and (oil film) damping		*
IV. PROPELLER			
1	Diameter, pitch, number of blades, expanded area ratio	*	
2	Weight in the air / water	*	
3	Diametric / polar inertia in air	*	
4	Entrained water parameters (additional inertia and mass)	*	
5	Propeller thrust	*	
6	Propeller excitation (dynamic forces in operation)		*
V. GEAR BOX			
1	Output shaft drawing specifying shaft lengths, diameters and bearing positions	*	
2	Weight of the wheel	*	
3	Stiffness of the gear supports	*	
VI. COUPLINGS AND SLEEVES			
1	Overview drawing with dimensions	*	
2	Weight and center of gravity	*	
3	Radial, angular and axial stiffness of flexible couplings	*	
4	Axial damping of flexible couplings		*

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