FUJIKURA COMPOSITES

CFRP for high-speed rotor

CFRP is the best material for the cover to prevent from deforming of high revolution parts like a motor or a vacuum pump.

Comparison with metal

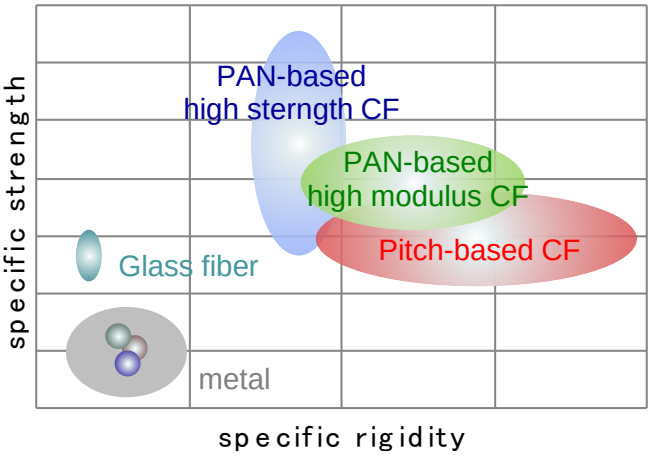


Fig.1 Specific rigidity and specific strength

Table.1 specific gravity and coefficient thermal expansion

materials	specific gravity	CTE(/K)
steel	7.9	12×10^{-6}
aluminum	2.7	23×10^{-6}
titanium	4.5	8.4×10^{-6}
CFRP (fiber direction)	1.5~1.7	$0\sim0.3\times10^{-6}$
CFRP (transverse direction)	〃	$45\sim65\times10^{-6}$

Deformation analysis

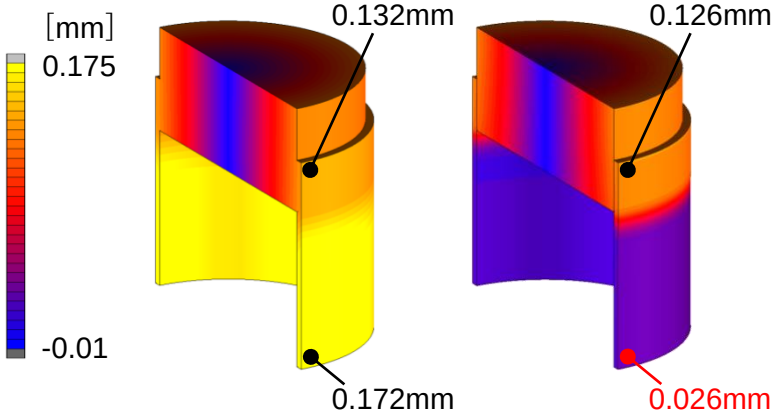
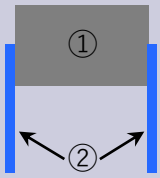


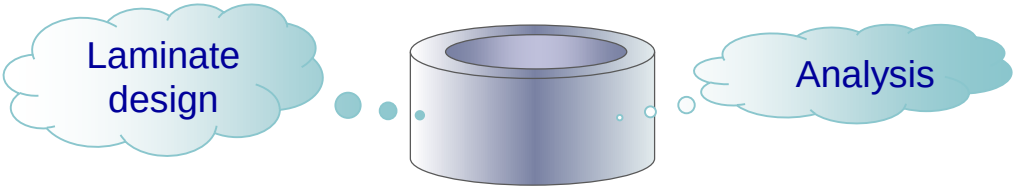
Fig.2 The results of deformation analysis on diameter direction :
A2017 (left) and CFRP (right)

Table.2 Analysis conditions

analysis conditions	
temperature conditions	25℃→125℃
speed	30,000rpm
materials	①solid shaft ・A2017 ②cylinder ・A2017 ・CFRP



Our appropriate laminate design enables the suppression of deformation of centrifugal load and thermal expansion.



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