



# 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

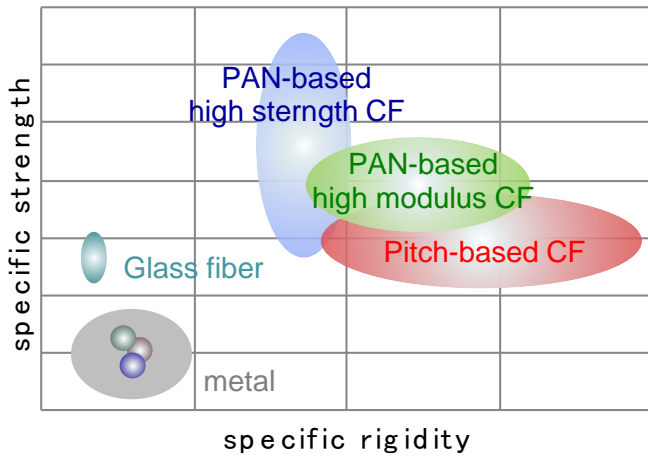


Fig.1 Specific rigidity and specific strength

Table.1 specific gravity and coefficient thermal expansion

materials	specific gravity	CTE(/K)
steel	7.9	$12 \times 10^{-6}$
aluminum	2.7	$23 \times 10^{-6}$
titanium	4.5	$8.4 \times 10^{-6}$
CFRP (fiber direction)	1.5~1.7	$0 \sim 0.3 \times 10^{-6}$
CFRP (transverse direction)	//	$45 \sim 65 \times 10^{-6}$

## Deformation analysis

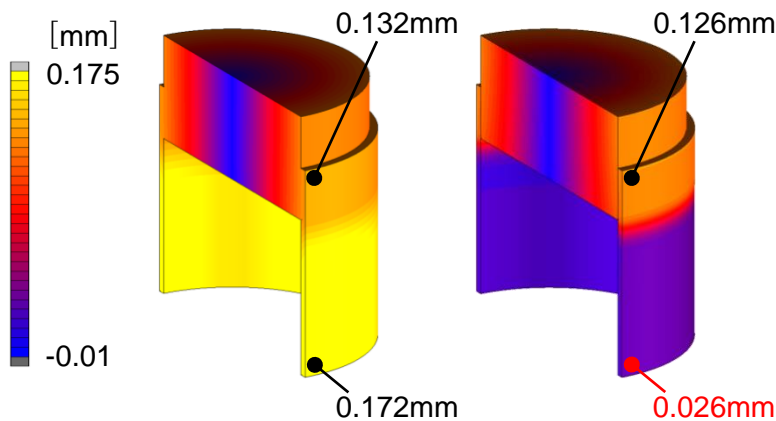
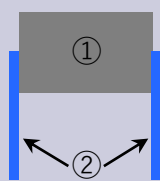


Fig.2 The results of deformation analysis on diameter direction :  
A2017 (left) and CFRP (right)

Table.2 Analysis conditions

analysis conditions	
temperature conditions	25°C→125°C
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.

