

# Rolling Bearing Unit Usable at High Temperature and High Speed Application for Supercharger

Demands for lower fuel consumption and lower gas emissions in automobiles continue to rise, with engine downsizing being promoted as a countermeasure. The ability of superchargers is being considered to compensate the reduction in engine power output resulting from engine downsizing. To achieve the high efficiency and improved response required for superchargers, it is beneficial to employ rolling bearings on the support structure of the supercharger rotary shaft. The below content introduces a rolling bearing unit which exhibits high performance, even in the supercharger operating conditions of high temperature and high speed.



Ceramic angular contact ball bearings



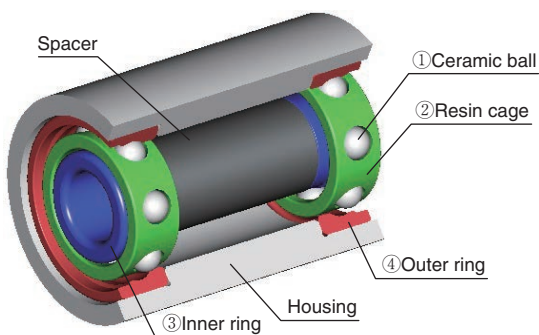
Ceramic balls (silicon nitride)



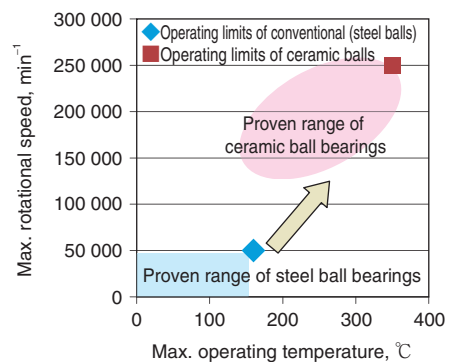
Rolling bearing unit

## 1. Features

For each of the ball bearing parts, the employed is a material able to be used during high-speed rotation (maximum rotational speed: 250 000 min<sup>-1</sup>) and in high temperature environments (maximum 350°C). This has expanded the bearing unit's range of application to five times higher rotational speed and two times higher operating temperature than the conventional product.



Structure



Application range

Part	Features
Rolling bearing unit	Improved ease of assembly onto turbocharger by unitizing bearing and housing
①Ceramic ball	Operating temperature limit: 800°C    Mass: 40% of bearing steel
②Heat-resistant resin cage	Exhibits high strength and high wear resistance, and can be used in high temperature environments (heat distortion temperature: 410°C)
③④Inner ring, Outer ring	Uses material with excellent heat resistance among bearing steels (heat resistance limit: 350°C)

## 2. Applications (actual use)

- Turbochargers for passenger vehicles
- Superchargers for motorcycles

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