



CASE STUDY

Application: Ball Bearing Mount in Electric Motor (in production since 2015)

Volume: 1MM pieces/year and increasing per 10 year schedule

Customer: Tier 1 Automotive Supplier (Powertrain Division)

Product: Engine Cooling Fan Motor

Background: A customer came to USA TR late in their design cycle due to issues with bearing retention and premature failure in an electric motor. This was in a critical automotive powertrain application that saw extreme temperature swings; resulting thermal growth. In order to keep an aluminum housing and their component diameters, USA TR designed a variant of the standard AN26X8S ring commonly used with 6000 series bearings. This customization included reducing the wave height and material thickness to accommodate the customer's bearing internal clearance concerns; avoiding changing the housing ID. Ultimately, this ring was able to save their design, while reducing material costs by using an aluminum housing vs. a precision machined steel alternative.

Case Study Data: The below characteristics of the ring and theoretical performance characteristics are based on component diameters:

- Inside Member Diameter (OD): 1.0236"
- Bore Diameter (ID): 1.0984"



generic AN rings

| AN26X8S5 | | |
|--------------------|------|--------|
| Characteristic | mm | inches |
| Diameter | 26 | 1.024 |
| Pitch | 3.43 | 0.1349 |
| Corrugation Height | 0.95 | .0374 |
| Gap | 1.27 | 0.05 |
| Width | 8 | 0.315 |

| Theoretical Performance Characteristics for AN26X8S5 | | |
|--|-----------------------|--------------------------|
| Compression (Inches) | Radial Capacity (lbs) | Torque Capacity (in-lbs) |
| 0.0005 (1.3%) | 91 | 3 |
| 0.0010 (2.7%) | 91 | 6 |
| 0.0015 (4.0%) | 91 | 9 |
| 0.0020 (5.3%) | 91 | 12 |
| 0.0025 (6.7%) | 91 | 15 |
| 0.0030 (8.0%) | 91 | 18 |
| 0.0035 (9.4%) | 76 | 21 |



AN rings with common bearing sizes



actual motor