



Application: Stator Mount in Electric Motor (in production since 2017)

Volume: 100K pieces/year and increasing per schedule

Customer: Tier 1 Automotive Supplier (Powertrain Division)

Product: Pump Motor

Background: Customer needed to reduce cost by eliminating adhesives and fasteners used to mount an electric motor stator in a housing. The redesign also sought to reduce material costs by using an aluminum housing but concerns regarding thermal growth in extreme temperatures (-40°C to 125°C) needed to be addressed to avoid torque hold loss. The solution was a custom tolerance ring that ensured the waveforms were able to exert a holding force, yet allow for ease of assembly between mating components. It also successfully compensated for dimensional changes due to thermal fluctuations, eliminated adhesives/fasteners and a shrink fitting operation; which ultimately reduced production costs for the customer. Thanks to our design and production flexibility, the custom ring was able to go through multiple iterations and ring configurations to exceed the customer's specification.

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

- Inside Member Diameter (OD): 4.1780" (106.12mm)
- Bore Diameter (ID): 4.2900" (108.97mm)

Typical BN ring used for stator mounts



Generic stator mount photo



Typical tolerance ring applications



BN429055S1

Characteristic	mm	inches
Diameter	108.97	4.290
Pitch	9.4	0.370
Corrugation Height	1.42	0.056
Gap	2.54	0.100
Width	13.97	0.55
Material Thickness	0.30	.012

Theoretical Performance Characteristics for BN429055S1

Compression (Inches)	Radial Capacity (lbs)	Torque Capacity (in-lbs)
0.0005 (0.9%)	152	14
0.0010 (1.8%)	152	27
0.0015 (2.7%)	152	41
0.0020 (3.6%)	152	54
0.0025 (4.5%)	152	68
0.0030 (5.4%)	152	82
0.0035 (6.3%)	152	95