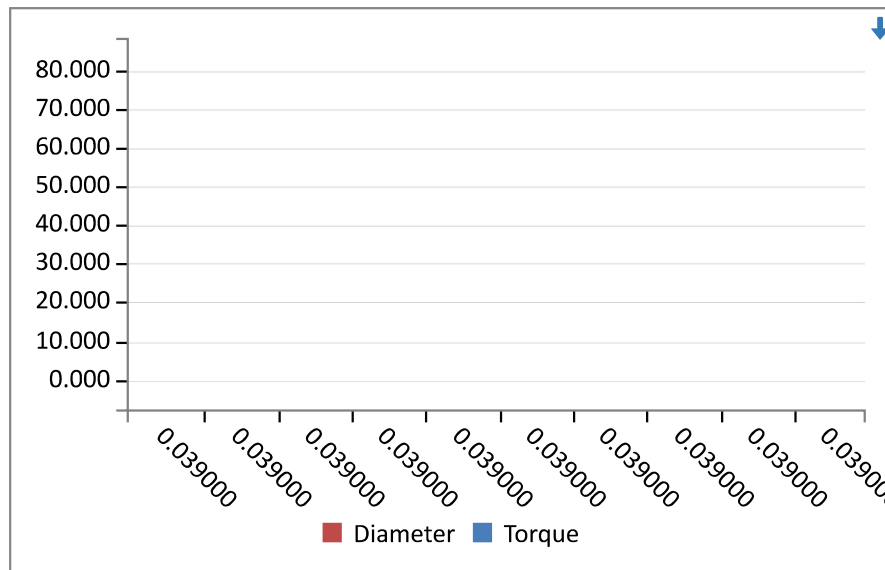


" />

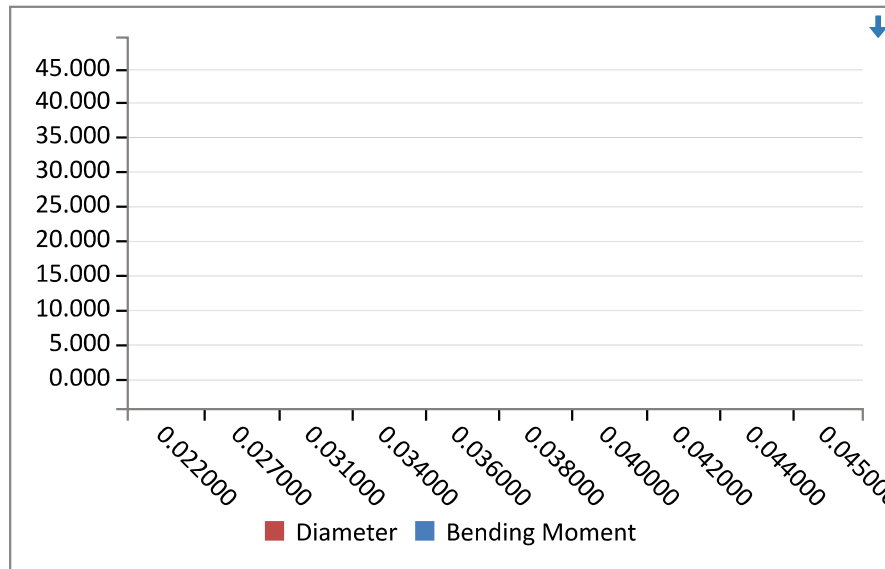
| Design of Rotating Shafts under Combined Loading Calculator | | |
|---|------------|------------------|
| Blue cells editable | | |
| identical bearings tested under loads Eq. 1 | | |
| bending moment M = | 30.000 | N-m |
| torque T = | 62.000 | N-m |
| yield strength σ_y = | 2.470e+008 | N/m ² |
| Ultimate tensile strength σ_{uts} = | 8.410e+008 | N/m ² |
| factor of safety n_s = | 1.250 | - |
| Surface finish factor calculation a = | 4.510 | - |
| Surface finish factor calculation b = | -0.265 | - |
| surface factor k_a = | 0.019 | - |
| size factor k_b = | 1.000 | - |
| reliability factor k_c = | 0.753 | - |
| temperature factor k_d = | 1.000 | - |
| duty cycle factor k_e = | 1.000 | - |
| fatigue stress concentration factor k_f = | 1.000 | - |
| miscellaneous effects factor k_g = | 1.000 | - |
| Results | | |
| σ'_e = | 4.239e+8 | N/m ² |
| endurance limit of the item σ_e = | 6.211e+6 | N/m ² |
| Shaft diameter d = | 0.03949 | m |
| Shaft diameter d = | 39.48643 | mm |

| Torque vs Diameter | | |
|--------------------|--------|-----|
| Torque low = | 20.000 | N-m |
| Torque high = | 80.000 | N-m |



| | | |
|--|--------|----------|
| Graph Collection Torque vs Diameter | Torque | Diameter |
| | 20.000 | 0.039475 |
| | 26.667 | 0.039476 |
| | 33.333 | 0.039477 |
| | 40.000 | 0.039479 |
| | 46.667 | 0.039481 |
| | 53.333 | 0.039483 |
| | 60.000 | 0.039486 |
| | 66.667 | 0.039489 |
| | 73.333 | 0.039492 |
| | 80.000 | 0.039495 |

| Bending Moment vs Diameter | | |
|----------------------------|--------|-----|
| Bending Moment low = | 5.000 | N-m |
| Bending Moment high = | 45.000 | N-m |



| | | |
|--|----------------|----------|
| Graph Collection Bending Moment vs Diameter | Bending Moment | Diameter |
| | 5.000 | 0.021979 |
| | 9.444 | 0.026943 |
| | 13.889 | 0.030584 |
| | 18.333 | 0.033527 |
| | 22.778 | 0.036032 |
| | 27.222 | 0.038231 |
| | 31.667 | 0.040203 |
| | 36.111 | 0.041999 |
| | 40.556 | 0.043654 |
| | 45.000 | 0.045192 |