

Table 1. Circular sample dimensions

| | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| ID of the test sample used* | | | |
| Dimensions (mm) | GL: _____ OD: _____ ID: _____ | GL: _____ OD: _____ ID: _____ | GL: _____ OD: _____ ID: _____ |
| J** (m⁴) | | | |
| <i>k_{total}</i> (N-m/rad) | | | |
| <i>k_{sample}</i> *** (N-m/rad) | | | |
| G (N/m²) | | | |
| T_y or T_u# (N-m) | | | |
| T_{max} (N-m) | | | |
| τ_y or τ_u # (N/m²) | | | |
| Fracture Description | | | |

*Data file name

**To convert mm⁴ to m⁴, multiply by 10⁻¹².

***Corrected for machine compliance

T_y and τ_y for ductile materials, T_u and τ_u for brittle materials.

Table 2.Comparison sheet (Circular samples)

| Specimen | 1 | 2 | 3 |
|--|---|---|---|
| ID of test sample used | | | |
| Material | AL 2024-T3 | AL 2024-T3 | AL 2024-T3 |
| Reference material properties## | G= $\tau_y =$ | G= $\tau_y =$ | G= $\tau_y =$ |
| Nominal dimensions | GL: <u>88.9 mm</u> OD: <u>12.7 mm</u> ID: <u>0.0 mm</u> | GL: <u>88.9 mm</u> OD: <u>12.7 mm</u> ID: <u>10.16 mm</u> | GL: <u>44.5 mm</u> OD: <u>12.7 mm</u> ID: <u>10.16 mm</u> |
| Measured size | GL: _____ OD: _____ ID: _____ | GL: _____ OD: _____ ID: _____ | GL: _____ OD: _____ ID: _____ |
| J (m⁴) | | | |
| Torsional stiffness, k_{sample} (N-m/rad) | | | |
| T_y or T_u * (N-m) | | | |
| Length ratio | $\frac{L\#1}{L\#1} = 1$ | $\frac{L\#2}{L\#1} =$ | $\frac{L\#3}{L\#1} =$ |
| Polar moment of inertia ratio | $\frac{J\#1}{J\#1} = 1$ | $\frac{J\#2}{J\#1} =$ | $\frac{J\#3}{J\#1} =$ |
| Stiffness Ratio | $\frac{k\#1}{k\#1} = 1$ | $\frac{k\#2}{k\#1} =$ | $\frac{k\#3}{k\#1} =$ |
| T_y ratio | $\frac{T_y\#1}{T_y\#1} = 1$ | $\frac{T_y\#2}{T_y\#1} =$ | $\frac{T_y\#3}{T_y\#1} =$ |

##You can find these values in many mechanics of materials textbook. A quick web reference is www.matweb.com