CONCENTRIC MAXI TORQUE

A primer on the technology and its application

Developed and patented by
Custom Machine & Tool Co., Inc.
tel (800)355-5949
www.cmtco.com

CMT® is a registered trademark of Custom Machine & Tool Co., Inc. Copyright © 1998-2017 Custom Machine & Tool Co., Inc. All rights reserved.
WHAT IS CONCENTRIC MAXI TORQUE?

- CMT® is a revolutionary new keyless tapered bushing, shaft to hub connection system.
- Developed initially for the synchronous drives market.
- Designed and patented by Custom Machine & Tool Co., Inc.
- Patent No. 6,568,063
WHY CUSTOM MACHINE & TOOL CO., INC. DEVELOPED THE CMT® BUSHING SYSTEM

Custom Machine & Tool Co., Inc, through 40 years of design and application experience in the synchronous drives market, saw a need for a technologically improved hub to shaft connection system.

- As machine speeds and indexing requirements continue to increase, reduction in inertia and vibration becomes important.
- Synchronous timing belts and system components will last longer, go faster and be more accurate when tension excursion is minimized through better run out control.
- Component alignment and run out are more critical at higher speeds.
- There was not a high quality compact bushing system available for shaft sizes one inch and smaller.
- Most connection systems require extra component mass to make the connection.
- Second and third generation synchronous timing belts are capable of producing higher torques requiring stronger shaft connections.
CMT® TECHNOLOGY

CMT® is a uniquely new bushing attachment system. A single set screw locks the low taper angle split bushing in place and eliminates all of the existing attachment issues.

- Bushing system is engineered to assure full surface contact and even clamping pressure without cocking with a single set screw.
- Set screw size optimized to provide holding torque in line with shaft diameters and component torques.
- Developed using mathematical and FEA modeling.
- Scalable to any shaft/bore size requirement.
- Lower inertia and better shaft to component balance.
- System design assures near perfect hub to shaft concentricity when assembled.
# CMT® BUSHING SYSTEM vs. OTHER SHAFT CONNECTION SYSTEMS

### Easiest and fastest system to assemble and disassemble

<table>
<thead>
<tr>
<th>Other Systems</th>
<th>CMT® Bushing System Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Screws</td>
<td>Higher torque capacity, lower component run out, better alignment, no shaft distortion</td>
</tr>
<tr>
<td>Keyways</td>
<td>No movement under reversing conditions, maintains both axial and rotational position, allows for phase control during assembly, increased shaft contact lower run out</td>
</tr>
<tr>
<td>Pins</td>
<td>Higher torque capacity, lower component run out, phase control during assembly, easier assembly and disassembly, reusable</td>
</tr>
<tr>
<td>Clamp Collars</td>
<td>Less space required, lower inertia, 360° uniform clamping pressure, lower cost, eliminates component wobble. Multiple bore sizes per component</td>
</tr>
<tr>
<td>Other Attachment Systems</td>
<td>Less space required, lower inertia, lower cost, smaller outside diameter for minimum component size with maximum bore</td>
</tr>
</tbody>
</table>
CMT®
PRODUCT FAMILY

Custom Machine & Tool Co., Inc. has developed its CMT® bushing system, through scalable technology, to meet a wide variety of popular, as well as custom, hub to shaft combinations.

- Twelve sizes cover bores from .125 in (2mm) to 1.1875 in (30mm)
- Torque capacities from 14 in-lbs (1.5Nm) to 2,795 in-lbs (315Nm)
- Multiple bore sizes per bushing size allowing maximum mix and match flexibility with minimum components.
- Withstands repeated assembly and disassembly with no shaft damage and without a reduction in torque capacity.
- Flexible positioning accuracy provides easy phase adjustment.
CMT® BUSHING SYSTEM APPLICATIONS

Custom Machine & Tool Co., Inc., an innovative designer and market leader, can apply the CMT® bushing system in solving your most demanding hi-tech synchronous drive and rotating component problems.

- High speed indexing and reversing in systems using timing belt pulleys and gears.
- Systems requiring a high level of component rotational positioning accuracy and precise run out control.
- Designs where reduced inertia and low vibration are desired.
- Components required to be assembled and disassembled multiple times during their life.
- Rotating mechanisms requiring compact space.
- Devices requiring high reliability with minimal maintenance.
CMT® BUSHING SYSTEM PRODUCT OFFERING AND CUSTOM SOLUTIONS

We do it all in small to mid-sized timing pulley applications. Our manufacturing capabilities provide flexibility and low total cost solutions. We are specialists in product customization.

<table>
<thead>
<tr>
<th>Timing Belt Pulleys</th>
<th>Custom Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ MXL(.080”), XL(.200”), L(.375”), H(.500”)</td>
<td>▶ Idler Pulleys</td>
</tr>
<tr>
<td>▶ 3M, 5M, 8M, HTD® Profile</td>
<td>▶ Round Belt Pulleys</td>
</tr>
<tr>
<td>▶ 2MM, 3MM, 5MM, PGGT® Profile</td>
<td>▶ Feed Rollers</td>
</tr>
<tr>
<td>▶ T2, T2.5, T5, T10</td>
<td>▶ Spur Gears</td>
</tr>
<tr>
<td>▶ AT2, AT2.5, AT5, AT10</td>
<td>▶ V-Ribbed Pulleys</td>
</tr>
<tr>
<td>▶ 40DP(.0816”)</td>
<td>▶ Sprockets</td>
</tr>
<tr>
<td>▶ Zero Backlash</td>
<td></td>
</tr>
</tbody>
</table>

HTD® and PGGT® are registered trademarks of Gates Corporation
WHERE CAN THE CMT® BUSHING SYSTEM HELP YOU?

- Component Alignment and Timing
- Reversing Problems
- Inertia and Space
- Vibration Issues
CONCENTRIC MAXI TORQUE
A Technically Superior Solution

- Quicker Assembly than other systems.
- Higher holding reliability-lower maintenance.
- Improved shaft to hub concentricity-less run out.
- Multiple bore sizes per bushing size.
- Reduced inertia for increased power savings.
- Compact design fits in tighter spaces.
- Cost competitive with all other attachment systems.