dwa Technologies, Inc.

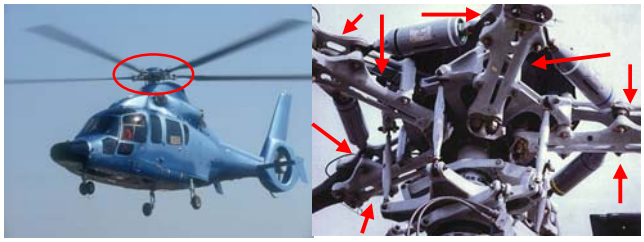
www.dwatechnologies.com

DWA's Micro & Nano MMCs for Performance and Racing

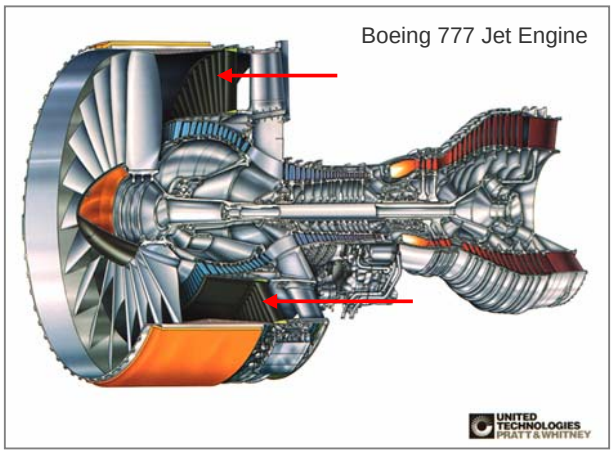
- Driveshafts
- Connecting Rods
- Pistons
- Others

Micro & Nano Metal-Matrix-Composites

DWA Technologies' sister company has a long history of providing Metal-Matrix-Composites ("MMCs") to the aerospace industry. Some aerospace applications include the replacement of Titanium Alloy for critical Main Rotor Blade Sleeves in European helicopters and for use in Boeing jet engines, F-16s, F-18s and satellites.



MMC Replaced Titanium Alloy for Critical Main Rotor Blade Sleeves on Eurocopter N4 & EC120 for Lighter Weight and Infinite Fatigue Life



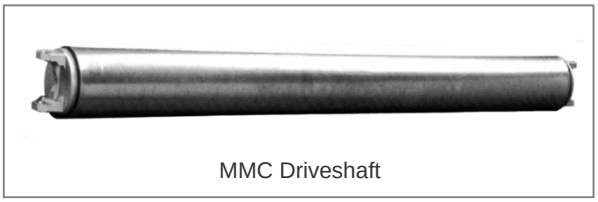
DWA was established to bring these capabilities and the benefits of new patent pending MMC breakthroughs together to provide high-performance, low-cost Micro & Nano MMCs for racing and other performance-driven commercial markets.

DWA's Micro & Nano MMCs are micro and nano phase reinforced aluminum matrix composites. They are lightweight and have high specific strength and stiffness, high fatigue resistance, high wear resistance and low Coefficient of Thermal Expansion ("CTE"). The advanced properties of the DWA Technologies products cannot be matched by aluminum alloys and other materials used in racing applications. DWA has developed special compositions and processing to achieve unique sets of properties needed for specific racing applications.

Driveshafts

DWA's performance and racing driveshaft tube has lower density and higher Critical Rotation Speed than those of steel, 6061-Al and Al_2O_3-MMC driveshaft tubes. It is stronger than 6061-Al and Al_2O_3-MMC. It can be easily welded to 6061 yokes. DWA's MMC driveshaft enables high acceleration and reduces driveshaft vibration.

DWA can supply its customers and distributors driveshaft tubes and assembled driveshafts.



MMC Driveshaft

Typical Property Comparison of Driveshaft Tubes

Driveshaft Tube	Density (g/cm^3)	Specific Modulus (vs. 6061Al)	Yield Strength (ksi)[MPa]	Shear Strength (ksi)[MPa]	Elongation (%)
6061-Al	2.70	100%	40 [276]	27 [186]	12
6061/Al_2O_3 MMC	2.95	130%	45 [310]	27 [186]	1
DWA Nano-6 MMC	**2.68**	**136%**	**60 [413]**	**45 [310]**	**7**

Connecting Rods

DWA's Nano-7/MMC performance and racing connecting rods are as light as aluminum rod, but stronger, stiffer and have a higher fatigue resistance than those of 7075-Al rods.

Typical Property Comparison of Connecting Rods

Connecting Rod	Specific Modulus (vs. 7075-Al)	Yield Strength (ksi)[MPa]	Elongation (%)
Forged 7075-Al	100%	75 [517]	10
Forged DWA Nano-7 MMC	**113%**	**102 [703]**	**6**

DWA can supply its customers and distributors forged rod blanks and finished connecting rods.

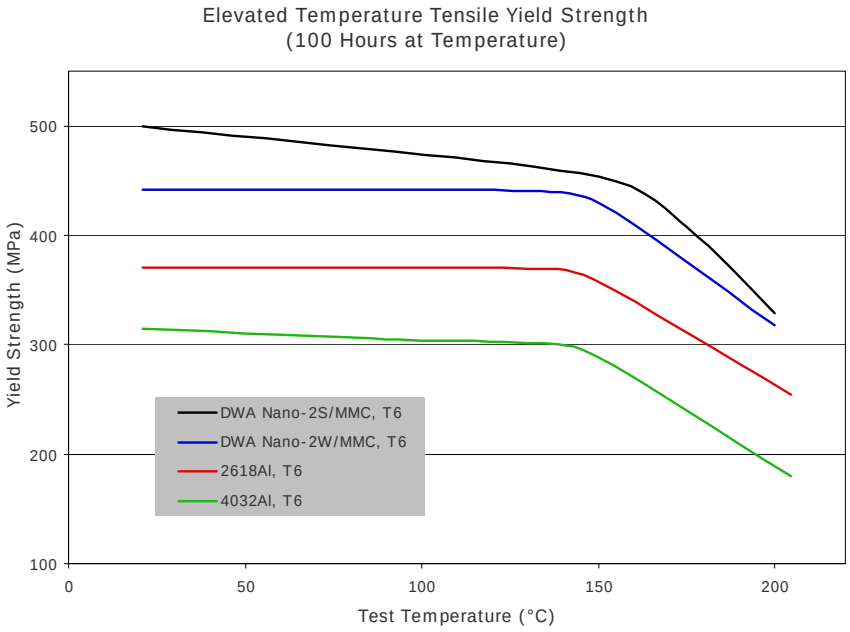
DWA Micro & Nano Metal-Matrix-Composites

From Aerospace To Racing

Pistons

Pistons made of DWA's MMCs have been used in performance and racing industry for some time. DWA has developed Nano-2/MMCs that have higher strength, lower CTE, higher thermal conductivity, higher wear resistance and higher fatigue resistance than forged 2618-Al and 4032 high silicon alloy.

Forged Piston Material	CTE (PPM/°C)	Thermal Conductivity (W/m K°)
4032-Al, 13% Si	20.2	140
2618-Al	23.2	146
Nano-2/MMCs	**17.5**	**154**



DWA can supply its customers and distributors forged piston blanks, semi-machined and finished pistons.

Others

The superior properties of DWA's Micro & Nano MMCs are excellent for other performance and racing applications, such as break calipers, cylinder liners, rocker arms and valve guides. For example, rims that spin formed from MMC sheets process nets 50% higher yield strength and 32% higher stiffness than 6061-Al. The MMC wheel rim is about 30% lighter than spin formed 6061 rim.

DWA can supply its customers and distributors semi-finished and finished components.

Industrial Partners and Distributors

DWA is looking for OEM applications, industrial partners and distributors to market its semi-finished and finished Micro & Nano MMC performance and racing products.

Contact

DWA Technologies, Inc.
21100 Superior Street
Chatsworth, CA 91311

Information:
(818) 998-1504 Ext. 424
Fax: (818) 998-0343
info@dwatechnologies.com