

Advanced Materials for Defense Applications



CARPENTER

**WHEN YOUR EQUIPMENT NEEDS TO BE
MISSION READY, COUNT ON
CARPENTER ALLOYS TO PERFORM.**



**EXPERT MATERIALS FROM
MATERIALS EXPERTS**

We understand the challenges design engineers servicing the defense industry face. A catastrophic failure could mean a loss of life. You need the highest quality materials that meet the most stringent of specifications. Carpenter materials perform, often combining multiple properties such as high strength, high toughness, and corrosion and wear resistance in a single alloy, resulting in increased readiness and a lower total life cycle cost for mission-critical equipment. What's more, Carpenter metallurgists, research scientists and engineers work closely with the industry's best to

continually define and redefine the leading edge of materials technology and find the best solutions to your design and production challenges.

**A WIDE RANGE OF ALLOYS
AND MATERIALS**

Every application presents its own set of challenges. No two conditions are the same, and solutions may require unconventional or out-of-the-box thinking.

At Carpenter, we've spent years manufacturing specialty alloys that helped to advance the aerospace,

automotive, energy, industrial and medical industries. The lessons learned have resulted in alloy improvements and one of the broadest ranges of specialty materials solutions available today.

For stainless, specialty and titanium in wrought and MicroMelt® powder metal forms, count on Carpenter to leverage our deep technical expertise and extensive experience to develop new or customized alloys for your application.

For more information on Carpenter Technology (NYSE:CRS), including detailed technical information on hundreds of alloys, visit www.carttech.com or, call 1-800-654-6543 in the United States.



The defense sector is under increased pressure to deliver improved corrosion resistance, wear resistance, lower weight, and smaller component footprint. Demands for faster, lighter, and enhanced life cycle of equipment is a considerable challenge. Carpenter's engineering expertise and alloys will help you work towards achieving these goals.

Carpenter manufactures an exceptional group of specialty alloys, titanium alloys and powder metal alloys. We combine an industry-leading product offering with knowledgeable materials support, lot-to-lot consistency, and responsive, on-time delivery.

Whatever the need—from aerospace applications such as landing gear, engine parts or fasteners; to armor plate for aircraft, land vehicles and personal protection; to vehicle suspension systems including springs and carriage components—you can count on Carpenter to deliver the specialty materials you need.



**TOTAL COMMITMENT IN
MANUFACTURING, DELIVERY
AND CUSTOMER SERVICE**

Carpenter products are manufactured to strict standards; Carpenter's quality systems are approved to ISO 9001:2008 and AS9100 standards.

We have strategically located warehouses and operations centers in Asia, Europe, Mexico, Canada and the United States. Our responsive sales and service professionals can quickly and accurately track order status, inventory and other essential delivery data.

**DEPENDABLE MATERIALS YOU
CAN COUNT ON WHEN MISSION
READINESS MATTERS**

Carpenter's legacy and continued commitment: Pioneering new materials. Employing state-of-the-art manufacturing. Supporting the innovation and success of the defense industry.

**For more information, visit
www.carttech.com. In the
United States call toll-free
1-800-654-6543.**



CARPENTER manufactures hundreds of specialty materials. Mill forms include round and shaped bar, plate, strip, hollow bar, wire and fine wire in wrought and Micro-Melt® powder metals. Below is a listing of some of our alloys that have been used for defense applications.

<p>Ultra High-Strength Alloys</p> <p>AerMet® 100 alloy AerMet 310 alloy AerMet 340 alloy NiMark® Alloy 250 NiMark Alloy 300</p> <p>High-Temperature Alloys</p> <p>Micro-Melt® L.C. Astroloy Pyromet® Alloy X-750 Pyromet Alloy 901 Pyromet Alloy 909 Pyromet Alloy 41 Pyromet Alloy A-286 Pyromet Alloy 355 Pyromet Alloy 718 Pyrowear® 675 stainless Waspaloy</p>	<p>Stainless Steels</p> <p>Ferritic, martensitic and austenitic grades</p> <p>High-Strength (PH) Stainless</p> <p>Carpenter 15Cr-5Ni stainless Carpenter 13-8 stainless Carpenter Stainless Custom 630 Custom 450® stainless Custom 455® stainless Custom 465® stainless Custom 475® stainless</p>	<p>Magnetic/Electronic Alloys</p> <p>Carpenter High Permeability "49"® alloy Hipercor® 50 alloy Carpenter HyMu "80"® alloy Kovar® alloy</p> <p>Titanium Alloys</p> <p>Ti 6Al-4V Ti 3Al-8V-6Cr-4Mo-4Zr Ti 3Al-2.5V</p> <p>Tool Steels</p> <p>Micro-Melt® Maxamet® alloy Micro-Melt T15 alloy Micro-Melt M4 alloy</p>	<p>Mold Steel</p> <p>Carpenter No. 158® alloy</p> <p>Bushing and Bearing Alloys</p> <p>ACUBE® 100 Gall-Tough® PLUS stainless Micro-Melt® 440C</p> <p>Surface Protection and Repair</p> <p>Micro-Melt® MCrAlY alloys Micro-Melt braze materials Micro-Melt weld repair materials</p>
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CARPENTER'S SPECIALTY ALLOYS HAVE BEEN USED IN A WIDE VARIETY OF DEFENSE APPLICATIONS

<p>Landing Gear – fixed wing and rotorcraft</p> <p>Armor – vehicles, helicopters, body armor</p> <p>Suspension systems – springs, suspension carriages</p>	<p>Bushings and bearings</p> <p>Helicopters – rotor gear</p> <p>Unmanned aircraft vehicles (UAVs)</p> <p>Engine parts</p>	<p>Night vision goggles</p> <p>Projectile and ordnance components</p> <p>Gun barrels – mortars, artillery</p> <p>Fasteners</p>	<p>Aircraft hardware</p> <p>Firearm components</p> <p>Turbine engine blades and exhaust ducts</p> <p>Valve components – ships and other vessels</p>
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All shipments must comply with United States DoD, ITAR and other governmental regulations. Cover photo (center) courtesy U.S. Navy.

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Carpenter Technology Corporation
Wyomissing, PA 19610 USA

1-800-654-6543 (toll-free inside U.S.)
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