



Special Products Division

**The Perfect Integration of Metallurgical Expertise,
Production Management, and Execution Capabilities**



VALUE-ADDED CAPABILITIES THAT HELP YOU MEET THE MOST CRITICAL COMPONENT REQUIREMENTS

Carpenter's Special Products Division (SPD) is a significant resource for manufacturers seeking to improve the performance of components in their products or manufacturing processes.

Our team has the experience to assist customers in the development and production of components with tailored specifications required for higher performance characteristics, longer service life, reduced weight or size, and improved cost/value ratios.

We provide the post-production services you would expect from a world-class supplier, including special packaging, bar coding, just-in-time inventory programs, NDT inspection, mechanical testing, and e-business capabilities.

The Special Products Division can virtually eliminate the need for customer investment in machining, heat treating, assembly, inventory, and packaging capabilities. The Special Products Division is certified to standards ISO 9001 and AS 9100 to meet your demanding quality systems requirements.

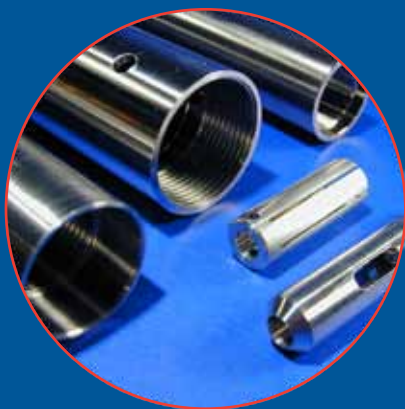
A WORLD OF EXPERIENCE IN COMPONENT AND APPLICATION ENGINEERING

The Special Products Division has been assisting customers in the grade selection for reliable product parts and tooling components for over 50 years. We have a long history in the development of specialized pre-forms and machined parts for highly critical aerospace and aircraft components, such as bearing cages, structural elements, missile cases, helicopter shafts, cams, and actuators. Additional capabilities include developing custom tooling, as well as molds and dies for automotive bearings and fasteners.

The Special Products Division has proven experience in the manufacturing of tooling for the Oil and Gas industry. SPD customizes work to your design for electronic housings, valve components, couplings, plugs, seats, sleeves and other wire-line logging instrumentation, measuring-while-drilling (MWD), logging-while-drilling (LWD), extraction, and distribution equipment.

COMPREHENSIVE FORMING, MACHINING, AND FINISHING CAPABILITIES

We can perform any or all of the forming, machining and finishing operations required to produce a ready-to-use component. SPD can reduce cost and streamline your manufacturing operations by providing "first step operations," including forging, cutting, and rough machining. Or, we can provide the complete manufacture of finished components and assemblies including precision machining, heat treating, finishing operations, inspection, and non-destructive testing.



Electronic housings and sleeves made from alloy MP35N* are precision machined components used for downhole oil exploration.



Ring rolling mandrels are finished tooling components that customers can use "out of the box" for hot working operations.



Valve components are made from MP35N* and used in oil exploration. Each part is machined to specific customer requirements.

Carpenter's Special Products Division has access to over 300 grades of high-performance specialty steels. Customers may use our vast variety of materials or they can supply their own.

Available machining operations include:

- turning
- milling
- drilling
- boring
- honing
- trepanning
- tapping
- threading
- profiling
- broaching
- slotting
- gundrilling
- knurling
- EDM
- surface grinding
- laser cutting
- water-jet cutting
- ECM

Special Products can provide any heat treating, inspection, testing and certification that your completed product may require.

- Dimensional inspection
- Magnetic particle testing
- Immersion or contact ultrasonic testing
- Dye penetrant testing

Mechanical Testing:

- Hardness
- Tensile strength
- Fracture toughness
- Cleanliness
- Macro etch quality

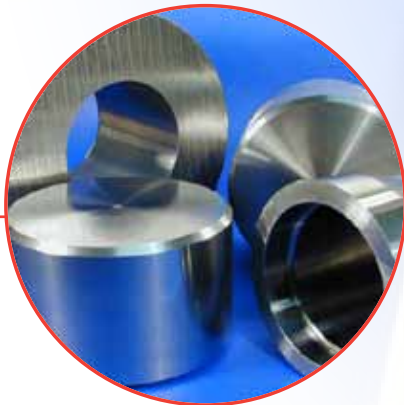
DEMANDING COMPONENTS? EXOTIC ALLOYS?

Carpenter's Special Products Division has the answers to your tough questions. SPD produces precision machined components in the quantities you want, from small prototypes to large production runs. SPD combines the tradition of strong technical expertise with industry-leading customer service to provide you with the solutions you need. When there are questions, SPD answers.

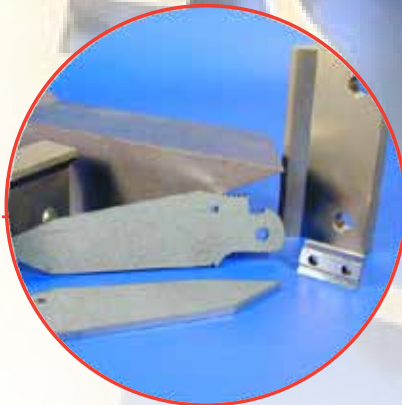
MANUFACTURING CAPABILITIES INCLUDE:

- Open and closed die forgings from 5 lb to 15,000 lb
- Ground flat blanks in specified tolerances to .0005" and dimensions as small as 1/16" or as large as 12 ft
- ID/OD blanks from tubing, forged rings, or bar stock as large as 40" diameter
- Finishing capabilities such as soft turned, hard turned, blanchard ground, surface ground, milled, or honed

Please contact the Special Products Division Team to learn about our tolerance capabilities. Visit our website at www.carttech.com/specialproducts.



Customized Aerospace pre-forms undergo initial machining or heat treating operations before they are sent to the customer for completion.



High speed steel cutting tools consist of laser cut knife blanks ready for the customer's finishing.



CNC Machining ready pre-forms can be provided in the annealed or vacuum heat-treated condition.



Carpenter Technology Corporation
Special Products Division
2626 Ligonier Street
P.O. Box 31
Latrobe, PA 15650

888-233-8258
724-532-6529 Fax

Email: SPDsales@cartech.com

For complete information on how Special Products Division can benefit your business, please contact our Special Products Division Team or visit our website at www.cartech.com/specialproducts.



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