



**GENERALCARBIDE®**

SHAPING YOUR SUCCESS



**THE SOLID CHOICE  
FOR ALL OF YOUR  
CARBIDE NEEDS**

[WWW.GENERALCARBIDE.COM](http://WWW.GENERALCARBIDE.COM)



At General Carbide, we strive each day to maximize quality and minimize turnaround time on every order. We also attempt to be a company that is a pleasure for customers to deal with, and for employees to spend considerable portions of their waking hours. While trying to meet or exceed your expectations, we foster a spirit of mutual respect among ourselves, and with customers and suppliers.

Our beliefs that every order should have zero defects and be shipped on-time, and that every person deserves full consideration from others, have enabled us to promote a culture of continuous improvement. This attitude prevails on our production lines, in our offices and in our dealings with people outside of the company whose trust in our technical expertise and sense of fairness is responsible for our success.

Ever since my father, the late Premo Pappafava, founded the company in 1968, General Carbide has always adhered to the highest ethical standards. And we continue that tradition today.

Although you would be hard-pressed to find higher-quality carbide preforms elsewhere, it would be even more difficult for you to find a better group of people to help you meet your needs for carbide tooling and wear-resistant parts.

On behalf of everyone at General Carbide, we look forward to working with you soon.

Mona Pappafava-Ray  
President & Owner

## The Ideal Breadth & Depth of Technical Expertise

General Carbide manufactures more than 50 grades of tungsten carbide tooling for a variety of cutting and metal forming applications, including: ammunition manufacturing tooling, blanks for boring bars, can-making, electronic stamping die manufacturing, fastener and powder metal/compaction, size reduction and comminution, steel and wire manufacturing, woodworking, general industrial wear parts for industries such as concrete and roof tile, pulp and paper, oil and gas components, rotary cutting dies and tooling for stamping.

At General Carbide, our unsurpassed technical expertise helps you make sure that you're applying the proper grade of carbide to your specific application.

The company was established more than 40 years ago and is headquartered near Pittsburgh, Pennsylvania, USA. We sell our products throughout the United States, Canada, Mexico, Europe, Asia and Australia. General Carbide employs more than 150 highly-skilled professionals in production operations located in the United States and at our affiliate company in the United Kingdom. Those individuals produce metallurgical powders, as well as shape, sinter and finish-grind tungsten carbide.



### TABLE OF CONTENTS

Introduction .....	3
Basics of Cemented Carbide.....	4
Quality .....	5
Technical Expertise .....	6
Design Capabilities .....	7

## Helping You Change with the Times

Long turnaround times and generous budgets are things of the past. Today, your customers want products delivered quickly, and at competitive prices.

At General Carbide, our technical expertise and efficient production methods help to ensure the defect-free manufacturing of carbide preforms that set the industry standard.

Through our ongoing investments in automated technology, we are able to meet the tightest production and delivery schedules of highly complex parts.

Besides helping you meet your production deadlines, we're able to work closely with you to develop the ideal solutions for your customers' applications so you can give them maximum value for their tooling investment.

With General Carbide, you always get a partner that can help you solve problems, and meet your carbide needs.



■ *Mona Pappafava-Ray, president and owner, is closely involved in all aspects of the business. Under her direction, General Carbide has become a leader in the production of tungsten carbide tooling.*



## IMPROVING THE SCIENCE BEHIND OUR PRODUCTS



Our new Materials Laboratory enables us to be an industry leader in conducting evaluations of raw materials and grades, as well as improve quality control measurements for in-process procedures.

The expertise of our technical staff enables us to respond to customers' requests for new grades, product failure analysis, and adapt standard grades to specific applications in rapid fashion.

To verify the quality of our cemented carbide, we routinely examine grain structure and create photomicrograph images that we review thoroughly before production occurs.

## Cemented Carbide: A Brief Overview

To produce cemented carbide, we mix tungsten carbide powder with a metallic binder of cobalt, nickel or a combination of those materials. The mixture is held together by an organic binder and formed into a desired shape, known as a preform. We then place the preform into a furnace for sintering, which consolidates the metallic binder material around the carbide particles.

During sintering, the preform shrinks about 40% by volume, and 20% linearly. After sintering, we shape the preform to its final dimensions and ship it to the customer.



## Key Characteristics

The most significant mechanical and physical properties of cemented carbides are:

- > Abrasion resistance
- > Deflection resistance
- > Corrosion resistance
- > Wear resistance (low- and high temperature)
- > Torsional strength
- > Compressive strength
- > Toughness

Cemented carbide's abrasion resistance enables it to last up to 100 times longer than wear-resistant steel grades.

This tough material also offers one-third the deflection of steel bars that have the same geometry and loading.

Other significant features include:

- > Transverse Rupture Strengths that range from 400,000-560,000 psi
- > Compressive strength > 600,000 psi
- > High-temperature wear resistance up to 1000°F

Clearly, cemented carbide is a cost-effective solution for the toughest applications.



## Product Quality That Reflects Our Commitment to You

We know how important it is for you to provide your customers with superior products. That's why General Carbide is ISO compliant and has quality programs that are stronger than ever. In recent years, the company has invested significant resources in a variety of equipment and systems, including:

- > CAD/CAM systems that add speed and accuracy to the early stages of production
- > CNC machines that allow us to make complex shapes with superior dimensional control
- > All grades processed in sinter-HIP furnaces yielding preforms with little or no porosity
- > Stress-relieving of EDM-finished products to withstand aggressive processing
- > Rigorous inspections throughout production using coordinate measuring machines
- > Packaging systems that help to ensure your shipment arrives in perfect condition

The result of this commitment to excellence is production of carbide tooling in a wide range of binder concentrations and particle sizes that meets the most exacting specifications.

Regardless of whether your requirements are complex or simple, the metallurgical and dimensional characteristics of General Carbide preforms help you minimize stock removal, which means you're getting better value for carbide tooling than you can find anywhere else.



## QUALITY STATEMENT

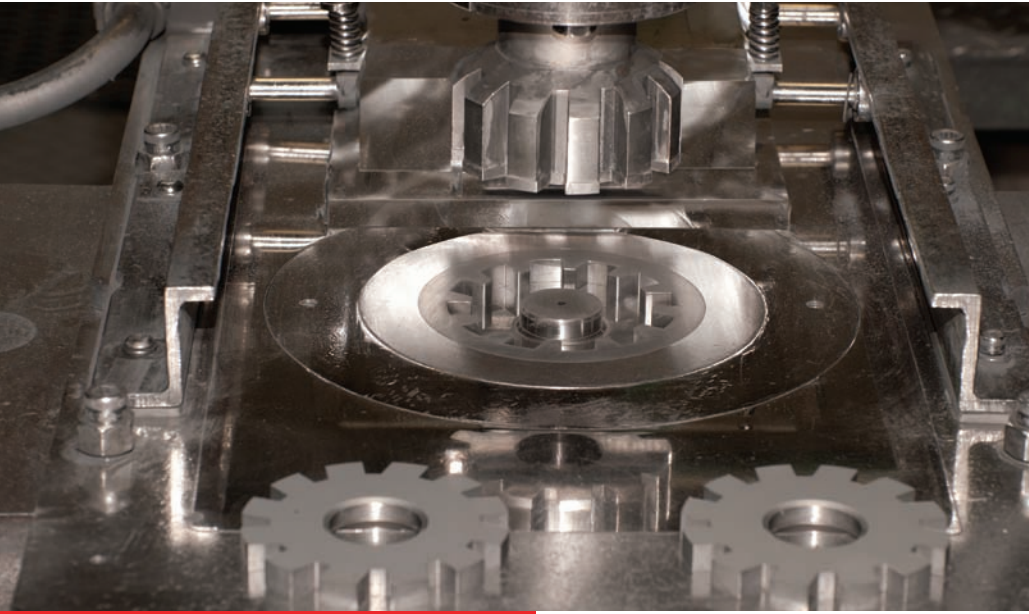


*Our state-of-the-art ZEISS Contourecord 1700 allows fast, easy, and precise completion of contour measuring tasks.*

At General Carbide, everything we do is focused on maximizing product quality and minimizing turnaround time. As a result of having these clear-cut goals, our Quality Policy is simple, yet powerful:

- > Consistently meet or exceed our customers' requirements for quality and performance.
- > Manufacture and ship zero defect products on time.
- > Cultivate a culture of continuous improvement.





## Unsurpassed Technical Expertise

At General Carbide, we're able to help you use the unique properties of cemented carbide to competitive advantage, as well as assist you with sorting through design considerations before deciding on the material composition for your carbide preforms. We also can provide you with:

- > Attaching & assembling techniques
- > Finishing techniques
- > Theoretical stress analyses
- > Application engineering
- > State-of-the-art manufacturing techniques
- > Tooling recommendations based upon our depth and breadth of experience

Regardless of your application, the professionals at General Carbide have the experience to equip you with the carbide preforms you need to get the job done on-time and on-budget.

## GOING "BY THE BOOK" TO THINK OUTSIDE-THE-BOX

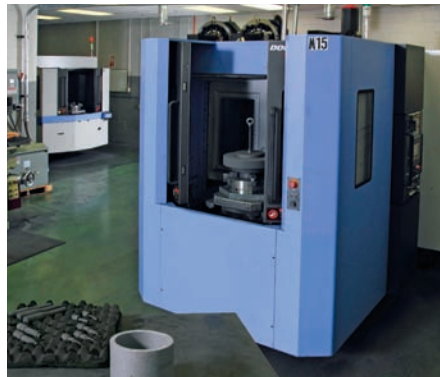


Our technical expertise is exemplified by the Designer's Guide to Tungsten Carbide. This publication is an essential reference guide for designers, engineers, fabricators and end users of tungsten carbide materials.

The Guide is a compilation of recommendations derived from practical experience, theoretical stress analyses, proven application engineering practices and modern manufacturing techniques. It enables you to understand why cemented carbide is one of the most useful engineering materials available today, focusing on:

- > History of cemented carbide
- > Unique properties
- > Design considerations
- > Techniques for attaching and assembling
- > Finishing techniques

The Designer's Guide is one of many resources that has made General Carbide a trusted and reliable source of application engineering expertise.

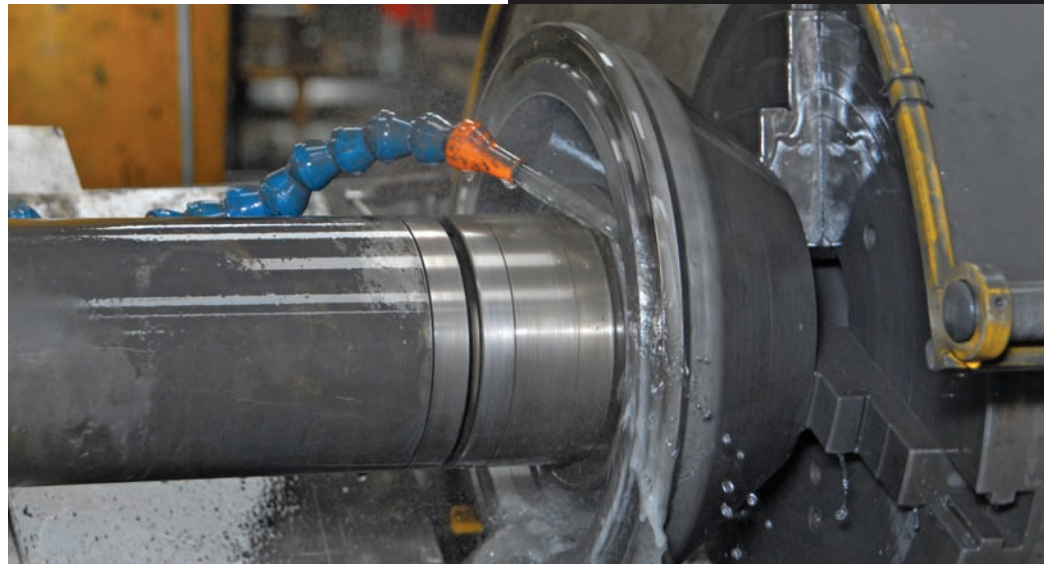


## Where it Happens

We serve customers worldwide from our facilities in Greensburg, PA, and through our affiliated company, General Carbide|UK, located in Daventry, Northants, UK. Sales offices in Essen, Germany and Milan, Italy, along with agents in China, India, Malaysia, Thailand and South Korea also help us to provide the highest quality carbide preforms available anywhere for a variety of tooling and wear applications, including:

- > Ammunition Manufacturing
- > Blanks for Boring Bars
- > Can Manufacturing
- > Cold Forging
- > Draw Dies
- > Fasteners
- > General Industrial Wear Parts
- > Knives & Cut-Off Tools
- > Measurement While Drilling (MWD)
- > Metal Extrusion
- > Oil & Gas Flow Control
- > Powder/Metal Compaction
- > Roof Tile Tooling
- > Rotary Cutting Dies
- > Saw Tips
- > Stamping & Blanking
- > Steel & Wire Manufacturing
- > Wear-Resistant Parts
- > Woodworking

To help ensure that every order meets specifications and is delivered on-time, we have invested in state-of-the-art CAD/CAM systems that add speed and accuracy to the early stages of production, and CNC machines that allow us to make complex shapes with superior dimensional control.



## MAKING THE GRADE: THE INDUSTRY'S ONLY ONLINE GRADE SELECTOR



To get an idea of which grades of carbide are best for your specific applications, General Carbide has developed a Grade Selector on our web site – [www.generalcarbide.com](http://www.generalcarbide.com)

Using the Grade Selector is easy. With help from a drop-down menu, all you need to do is identify your industry and what your operational parameters are.

Based on those criteria, several grade options will appear on-screen. You may then contact our technical experts to discuss your application.



### **The Leader in Carbide Preforms**

General Carbide manufactures more than 50 grades of tungsten carbide for a variety of industrial wear and metal forming applications. The company was established more than 40 years ago and is headquartered in the United States, in western Pennsylvania, near Pittsburgh.

General Carbide sells its products throughout the United States, Canada, Mexico, Europe, Asia and Australia. The company employs more than 150 highly-skilled professionals in its production operations. Those individuals produce metallurgical powders, as well as shape, sinter and finish-grind tungsten carbide. As a woman-owned business, General Carbide achieved initial certification in 2008 from the Women's Business Enterprise National Council (WBENC), and continues to re-certify annually.



**GENERALCARBIDE®**

SHAPING YOUR SUCCESS

#### **General Carbide Corporation**

1151 Garden Street • Greensburg, PA 15601-0076

TEL: 800.245.2465 • 724.836.3000

FAX: 800.547.2659 • 724.836.6274

[sales@generalcarbide.com](mailto:sales@generalcarbide.com)



**WWW.GENERALCARBIDE.COM**