

# Partnering To Shape The Next Generation Manufacturing Workforce

By: **BRIAN GLOWIAK**  
Director of the SME Education Foundation



## Editor's Commentary

IMTS is not a Machine Tool Show anymore, now it's a Manufacturing Technology Show and this may be a much better defining nomenclature. Truth be told, I have the best way to describe IMTS ... It is an **EDUCATION SHOWCASE!** For years now we have heard that the workforce in our industry is short-handed and getting more so as the baby boomers have left or are leaving in droves ... The people to replace these artists and craftsmen must come from the ranks of young men and women now in high school, college and trade schools. IMTS showcases the latest technology for our industry and the young visitors are getting a first-hand education on not only the opportunities, but the wonders and excitement our industry can offer. The SME Education Foundation PRIME® Partnership has taken the lead in trying to fill the vacancies being left in our manufacturing workforce and the Industrial Diamond Association of America is in full support of this endeavor. So, this year as we walk the halls of IMTS let's all get better educated and pass this learning on to the next generation in every way as we become teachers and mentors!



Photos Courtesy of Precor



SME, as a nonprofit manufacturing association, works closely with manufacturers to share knowledge, resources, trends and best practices that generate solutions to meet industry needs – all to promote advanced manufacturing technology and the development of a skilled workforce. More than 35 years ago, seeing a need for additional resources, the organization created the SME Education Foundation to serve the manufacturing industry by inspiring, preparing and supporting young men and women for successful careers in manufacturing. Since 1979 the Foundation has been building students' awareness and interest in the industry, while filling the much-needed talent pipeline of manufacturing engineers and skilled technologists.

Today, perhaps more than ever, U.S. manufacturers are experiencing challenges in finding skilled workers to fill available openings. The industry is facing a trifecta of events that stands to only increase the skills gap problem – advanced technologies, an aging workforce, and misperceptions about the manufacturing industry. By 2025, an estimated 3.5 million manufacturing jobs are expected to become available in the U.S.; however there could be a potential shortfall of two million skilled workers – including manufacturing engineers, machinists, welders, CNC programmers, and robotics technicians – unless action is taken to attract and train the future workforce.

As technology advances, such as the increasing use of lasers in the processing of synthetic diamonds for tooling applications, it is becoming increasingly difficult for manufacturers to find the workers with the proper skills needed to compete in today's advanced manufacturing industry. Further exacerbating the talent shortage are several hundred thousand new positions that will be created due to economic expansion and an escalating number of baby boomers eligible for retirement. Within the next ten years, an estimated 2.7 million manufacturing workers are forecasted to reach retirement age. All too often, young people are not aware the jobs and opportunities in manufacturing exist, or they lack information about the training, skills, and resources available to secure these positions.

One of the contributing factors to the lack of interest among youth in manufacturing is the perceived image of the industry as being lowtech, unskilled, dangerous and obsolete. In a recent SME survey, parents were asked to share their views related to careers in manufacturing. Not too surprising, the results show that many

parents don't necessarily have the most current information or an accurate perspective of manufacturing and the available opportunities. For instance, 20 percent of parents surveyed believe manufacturing facilities are outdated and dirty, and half of the respondents don't perceive manufacturing as an exciting profession that will challenge their children. Moreover, almost onequarter of those who participated in the national survey do not believe that manufacturing pays well enough to support a comfortable living.

Here, perception does not equal reality. In the superabrasives industry, dirty and dangerous diamond mines have been all but replaced by scientific labs and cleanroom manufacturing facilities turning out synthetic diamonds. Across the industry, manufacturing today represents hightech and innovative facilities with advanced technologies increasingly requiring workers with strong technical training in math and science – as well as analytical and problem-solving skills.

The industry is experiencing a digital revolution through the use of machinery systems that are interconnected through computer networks that can control processes autonomously. Additional technologies, such as 3D printing and robotics, are also fostering the demand for an advanced workforce to operate, design and maintain complex equipment. To address this need for workers, the SME Education Foundation developed PRIME® – Partnership Response In Manufacturing Education – to help stimulate interest in manufacturing and provide students with the opportunity to acquire advanced manufacturing and STEM education with hands-on training, manufacturing industry credentials, and pathways to successful careers.

PRIME provides high school students with opportunities to pursue rewarding careers as engineers and technologists; this includes



vocations involving mechatronics, welding, CNC programming, robotics, and much more. Through PRIME, high schools have access to financial resources and real-life manufacturing curricula, teachers receive industry-relevant training, and students gain practical experience using state-of-the-art tools and equipment deployed within the industry. Additionally, students and teachers have opportunities to engage with manufacturing companies in their local communities.

The SME Education Foundation also provides opportunities for students – PRIME or otherwise – to receive scholarship awards to support their academic pursuits. PRIME's success is due in part to its tailored and consultative approach to engaging with regional manufacturers to identify their current and future workforce development needs, and then working with local school districts to design and implement customized educational programs to meet these requirements.

There are more than 185 manufacturing partners engaged in the PRIME network today, currently comprised of 38 schools in 22 states and growing. More than 60 percent of these schools have precision machining and metal processing/fabrication programs with dedicated pathways geared to industry standards and credentialing. And many of these programs are introducing students to the concepts and technology of superabrasives for the first time. PRIME exposes youth to the modern manufacturing environment and changes the image of manufacturing to one that is

engaging and full of exciting career opportunities. PRIME impacts over 7,500 students annually, with approximately 90 percent of participating high school seniors either entering the manufacturing workforce or pursuing postsecondary education in manufacturing or engineering fields of study.

However, to keep up with the demand for future workers and to strengthen PRIME's impact on preparing students for successful manufacturing careers, the Foundation is working to expand this network by 100 additional schools over the next five years. With the support of corporate partners like Alcoa, Emerson, and Honda, the Foundation is creating the next generation of manufacturing engineers and technologists and championing one of the most critical elements for innovation success. Through PRIME, companies can play an active role in the development of a trained future workforce specifically tailored to meet their needs.

Partnering with PRIME not only benefits students, educators, schools, and communities, it also allows companies to fulfill two key business objectives: achieve corporate citizenship goals and meet workforce development needs. To ensure our manufacturing sector remains robust and competitive requires a strong STEM-capable workforce. Through PRIME we are making a positive impact in shaping America's economic vitality in the 21st century. ●

*To learn more about the SME Education Foundation and sponsoring a PRIME high school, visit [smeef.org](http://smeef.org).*



## Crystallume CVD Diamond

**Crystallume has been manufacturing CVD Diamond since 1984 with nine CVD production systems available.**

- Diamond on Tungsten Carbide
- Diamond on Silicon
- Diamond on GaN
- Diamond on Silicon Carbide
- Diamond on Graphite
- Free Standing Diamond
- Complex Geometries
- SEM and TC Analysis In-house



**Crystallume**  
A DIVISION OF ROBBJACK CORPORATION

[crystallume.com](http://crystallume.com)