Accelerating 3D Manufacturing

Additive Manufacturing • 3D Printing • Rapid Prototyping
Direct Digital Manufacturing • 3D Scanning

sme®

sme.org/3D

Revolutionizing manufacturing

Making the most of game-changing technology

Emerging 3D technologies are allowing manufacturers to increase speed to market, produce stronger and lighter parts, improve efficiency, reduce waste, lower emissions, eliminate costly tooling, and create products and geometries that couldn't be created before. These benefits are at the heart of every step forward in medical technology, and every breakthrough in the automotive and aerospace industry.

To make the most of this exciting technology, make the most of SME — the definitive industry source for knowledge, experience, education and connections.

Additive Manufacturing in Action

- Castings
- Custom jigs and fixtures
- Custom orthotics and prosthetics
- Dental implants and orthodontics
- Fuel injector assemblies
- Functional prototypes
- Robotic end effectors
- Rocket engine parts
- Surgical instruments and guides
- Tools and molds

Attracting students

Capitalizing on the excitement of 3D technology

Design for Direct Digital Manufacturing Competition

Design optimization is key to leveraging 3D technologies. In the Design for Direct Digital Manufacturing Competition, student designers use their imagination to design a product or subassembly that best utilizes the advantages of additive manufacturing.

SME Student Innovation Tour

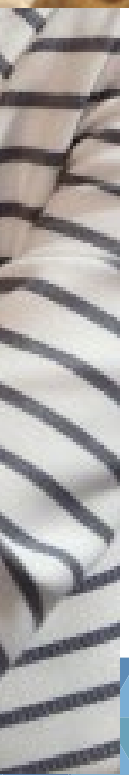
Hands-on access to technology and personal interaction with industry experts provides a dynamic experience for students at annual SME events. SME member advisors collaborate with high school and college students, educators and counselors, letting them know about exciting manufacturing careers.

SkillsUSA Contest

SME's Design for Digital and Additive Manufacturing contest — created for SkillsUSA — allows students to step into a real-world 3D production environment where they must follow design requirements, use specified resources and accomplish creative output within specific timeframes.

Rippl3d.com

Rippl3d challenges provide hands-on activities designed to engage students, teachers and parents in meaningful design and problem-solving experiences. Through 3D technologies, Rippl3d shows students and parents the motivation for — and rewards of — manufacturing careers.



Increasing technology adoption

Making the business case for additive manufacturing

While there's been a lot of hype about consumer adoption of 3D Printing, the real advancement and opportunities for the technology are in industrial applications — from custom jigs and fixtures to tool-and-die repair, castings and injection molding. Conformal cooling of molds and inserts — more widely available through additive manufacturing technology — increases part quality and reduces cycle time by 50% or more.

Challenging geometries, complex channels, and parts that are difficult or impossible to manufacture in any other way are well-suited for additive manufacturing technology. But it's not just about the technology, it's about making the business case.

Consider this: GE's LEAP Fuel Nozzle — manufactured with Direct Metal Laser Melting — is 25% lighter, five times more durable, and composed of just one part instead of 20 separate components. The end result? Higher performance. SME has the technology resources, industry contacts and expertise to help you determine your own ROI equation for utilizing additive manufacturing.

Building a community of practice

Creating a home for additive manufacturing users

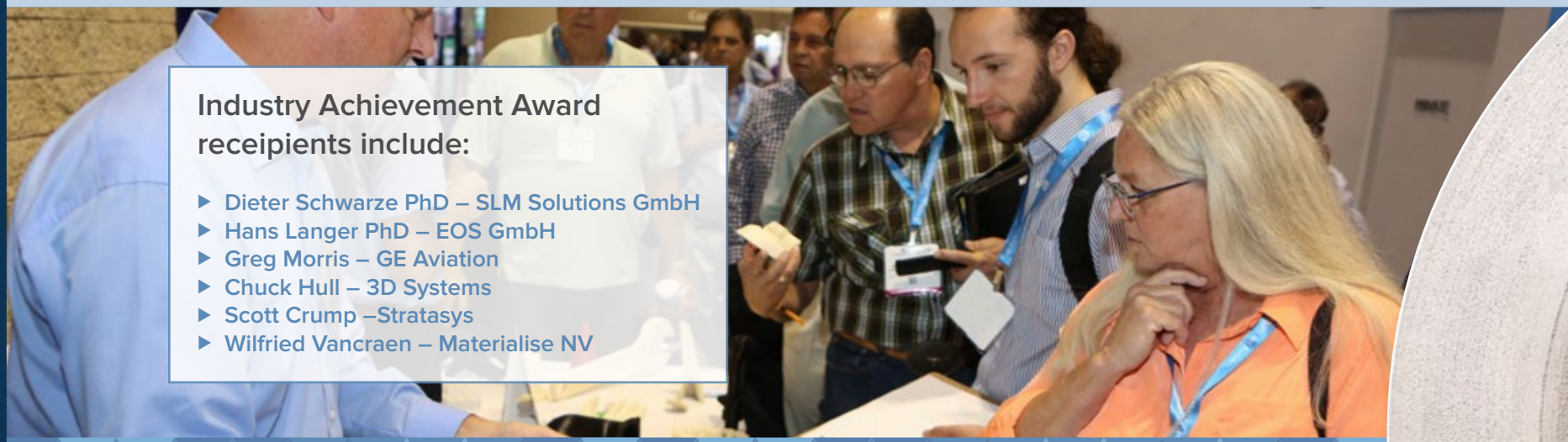
More than 25 years ago, SME's rich history of supporting manufacturers led the pioneers and innovators of 3D technologies to make SME the home for their new Rapid Prototyping technical group.

Today, SME connects some 200,000 people in additive manufacturing, continuing the original group's vision of — and commitment to — creating an extensive community.

SME's Additive Manufacturing Technical Community

Gaining Access to Experts
Decades of experience and a dynamic community define the SME Additive Manufacturing Technical Community. Thousands of SME members — many of whom are recognized industry authorities in 3D manufacturing — create content and programs, define industry standards, encourage and mentor the next generation, and work to solve technical challenges.

Recognizing Achievement
Industrial accomplishments deserve recognition. Our annual awards for Industry Achievement, Distinguished Technical Paper and Product Innovation honor companies and individuals who have had significant impact on additive manufacturing and its applications.



Industry Achievement Award receipients include:

- Dieter Schwarze PhD – SLM Solutions GmbH
- Hans Langer PhD – EOS GmbH
- Greg Morris – GE Aviation
- Chuck Hull – 3D Systems
- Scott Crump –Stratasys
- Wilfried Vancraen – Materialise NV

Advancing technology

Championing the advancement of 3D technology

Partnering with the R&D Community
SME stays on the forefront of development through our North American Manufacturing Research Institute (NAMRI) and its namesake conference, NAMRC, as well as through America Makes (the National Additive Manufacturing Innovation Institute) and other groups. We monitor industry needs and requirements through our member network and expert industry advisors, and then communicate those needs to technology developers.

Connecting Companies with Suppliers and Capabilities
Innovation doesn't just happen, it must be facilitated and developed. Each year, a community of 3D manufacturing visionaries, industry veterans and novices connects and collaborates at SME's RAPID + TCT, where ideas are born and concepts advanced.

Spreading the word

Promoting additive manufacturing

Via our expansive network of industry experts and influencers, SME creates and delivers leading-edge content on additive manufacturing.

- More than 160 technical papers
- 200+ technical articles
- 25+ technical videos and books
- Monthly webinars

SME Media

The leading source for news and in-depth technical information about advanced manufacturing in North America. From metalworking to 3D printing, we know how to make it.

Smart Manufacturing **magazine**
A magazine focusing on digital manufacturing, software, automation, advanced materials, additive manufacturing, and integration of these technologies.

3D Printing & Additive Manufacturing Channel
News, videos and information specific to additive manufacturing. Content includes articles, press releases and editor's picks.

AdvancedManufacturing.org

Building a skilled manufacturing workforce

Connecting skills with jobs while integrating new technologies

Experts debate about the number of additive manufacturing specialists our industry will need in the future. But they agree that all manufacturers need to understand the technology, including its mechanics, opportunities and best applications.

Competencies and Training
Tooling U-SME offers e-learning and instructor-led training in additive manufacturing fundamentals. Online training has four components, beginning with an introduction to Additive Manufacturing and progressing through safety, processes, and methods and materials. In-person training consists of a two-day overview course covering major technologies, best applications, and the case for using 3D printing instead of a traditional manufacturing method.

toolingu.com

Additive Manufacturing Certification Program
The Fundamentals Certification and Technician Certification are stackable, creating a flexible, modular pathway for mastering the principles and processes of additive manufacturing. The certifications align to the Additive Manufacturing Body of Knowledge.

It is ideal for individuals working in or seeking to work in additive manufacturing roles in automotive, aerospace, and medical equipment. It is also ideal for high schools and colleges as a capstone or standalone achievement to increase workforce readiness in additive manufacturing.

sme.org/certified-additive-manufacturing-fundamentals

ITEAM

Independent Technical Evaluation of Additive Manufacturing Consortium

SME and our partners are building an expert system that will answer the million dollar questions:

- ▶ Can I print it?
- ▶ Should I print it?
- ▶ What's the best machine, material and process for a particular part?

Working in collaboration with major industry users, the Independent Technical Evaluation of Additive Manufacturing (ITEAM) will provide a virtual repository of additive manufacturing machine/material capabilities. ITEAM will also provide a virtual, open platform to enable users to evaluate their parts' suitability to be manufactured additively against the available machines and materials.

sme.org/ITEAM

Industry Standards

A lack of standards and certifications threatens progress in additive manufacturing. To increase confidence in the technology, we must standardize industry practices. From file formats to material specifications to machine certifications, SME is collaborating with ASTM, America Makes and other standards development organizations to create standards and increase teamwork. SME's Standards, Specifications, and Guidelines database provides information on standards, specifications, and guidelines for use in additive manufacturing/3D printing.

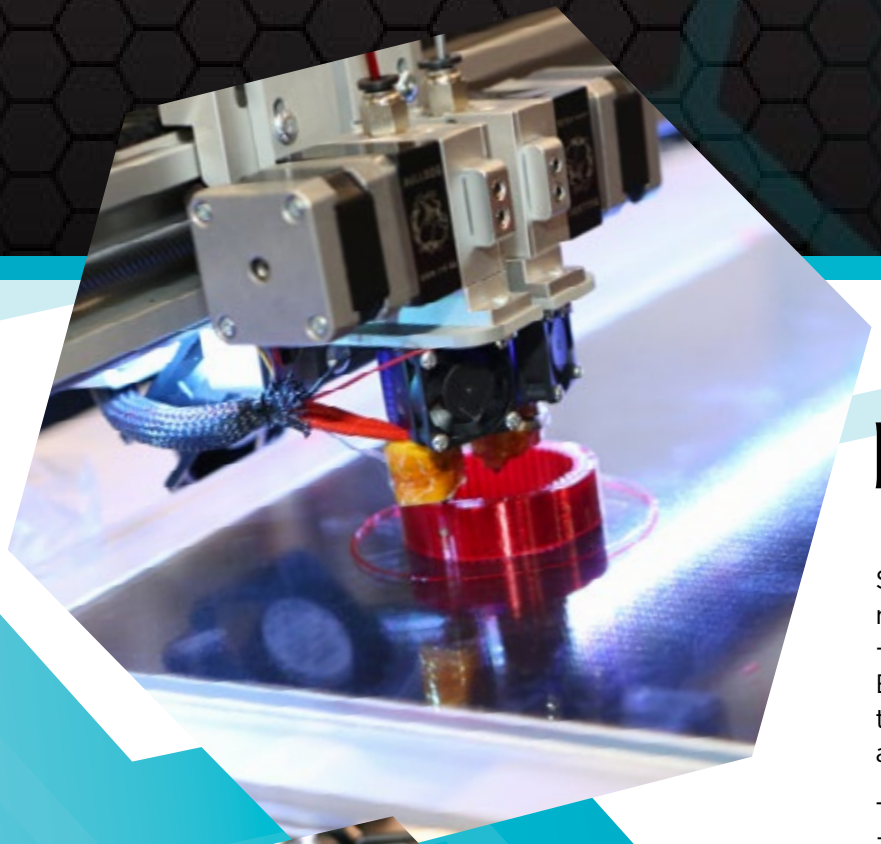
sme.org/am3dp

Medical additive manufacturing

Making a difference through collaboration

The SME Medical Additive Manufacturing/3D Printing Workgroup supports users of medical and biomedical application technology. Members represent medical device manufacturers, clinicians, technology providers and more, including Mayo Clinic, Biomet, University of Michigan, Smith & Nephew, Materialise, nScrypt, Leuven Medical Technology Centre, DePuy Synthes, Stryker Orthopaedics, Phoenix Children's Hospital, Johnson & Johnson and Northwestern University. By providing content to address the latest industry developments, identify gaps in standards, and build evidence for additive manufacturing applications in medicine, the group helps drive technology to improve and save lives.

sme.org/medical-additive



rapid + tct

SME's world-renowned RAPID + TCT Event plays a vital role in defining additive manufacturing. As the unrivaled leader and authority in 3D manufacturing, RAPID + TCT attracts the most experienced and influential community in the industry. Buyers, sellers and end users of design, prototyping, tooling and direct digital technologies attend the event for discovery, innovation and networking.

The RAPID + TCT conference is known worldwide as the ultimate resource for 3D knowledge and expertise. Every year, the conference brings together over 200 industry experts to speak on the latest processes, applications, materials, and research in additive manufacturing. You'll hear from the most influential leaders in the industry about how 3D technologies can cut costs, reduce time to market, produce stronger and lighter parts, improve efficiency, create complex geometries, and solve many other industry challenges.

The RAPID + TCT exposition — featuring a visually arresting, creativity-inspiring, hands-on learning playground — includes machine and materials manufacturers, software, 3D scanning, post-processing, service bureaus, and related technology consultants, providers and partners.

2018: April 24-26, Fort Worth, TX • **2019:** May 21-23, Detroit, MI

rapid3Devent.com