

Lincoln Electric's Torchmate CNC Plasma Cutting System and FlexCut™ Plasma Cutting Equipment Grant-Writing Guide

by Robert J. Vidos

Product Overview

The Torchmate® product line of automated plasma cutting tables encompasses a broad scope of machines: from entry-level CNC machines—the Torchmate 4400, to industrial plasma cutting table—the TMX Pro, and everything in between.

The utility of the plasma tables goes beyond the normal scope of what customers classify as a fabrication machine. The Torchmate table can easily adjust as your company expands into new markets and makes new products. Torchmate has been making affordable cutting tables since 1979, and have accelerated their technological advances in motion control, height control, and manufacturing as a result of their acquisition by Lincoln Electric® in 2011. Lincoln Electric has made this international brand of CNC plasma tables a top-tier product in the world of plasma automation, and will continue to offer the affordability and quality that made Torchmate a household name in the fabrication industry.

Lincoln Electric engineers have designed the 4400/4800 series CNC machine to change the way you can make small parts at home, at school, or in the shop. The ACCUMOVE® motion controller, included with each machine, uses technology developed for our most advanced motion control systems. The Torchmate 4400 is available as a 4x4 cutting system and the Torchmate 4800 is available as a 4x8 cutting system. The entire 4x00 line offers a waterbed to reduce plasma dust without the use of an expensive and potentially hazardous downdraft system. The automated power source for the Torchmate Tables is the Flexcut™ Plasma Cutting Equipment. Lincoln Electric also offers the Tomahawk which is a handheld power source.

Torchmate is offering their affordable robotic metal cutting machinery to shop classes in schools throughout the country, giving teachers a real world manufacturing tool to teach CAD software and CNC operations to the next generation. Versatile, technologically advanced, and backed by the most comprehensive technical support in the industry, Torchmate CNC machines are the perfect fit for high school and community college vocational training classes.

The machine your students will use in the classroom is no different than the machine they will see in the real world. As the industry leader in CNC plasma cutting technology, Lincoln Electric has sold more machines than any other competitor on the market. Student investment in learning the technology in the classroom will likely save time in training with their employer after graduation.

Each machine has the most advanced technological features like, a touch-friendly user interface, integration with CAD and CAM software, Ethernet connectivity, and digital torch height control. The Torchmate machine allows students to grasp CAD and CAM design, as well as see the completion of

their design in a final product. Cut out parts on a Torchmate machine can be welded and finished — allowing students to get the full educational experience in hands-on manufacturing. Students are able to put multiple skills together using a Torchmate machine, allowing them to leave school not as an entry-level worker, but as a skilled CNC machine operator.

Educational programs using the standard Torchmate software can now upgrade to the EDU package. This provides educators with the ability to give their students the full CAD/CAM experience. EDU software includes unlimited Student Licenses and one Master Teaching License and with EDU software educational institutions no longer need to purchase multiple dongles/drives for their students.

Torchmate 4400 - A CNC Cutting Solution for Educators

The Torchmate 4400 series is our new CNC product line in the education market. Its size, utility, and ease of use make it a perfect fit for students and teachers alike. This 4x4 cutting table comes fully assembled with a Lincoln Electric® plasma cutter, water table, height control, ACCUMOVE® motion control technology, and the CAD/CAM EDU software package. The computer and the power supply that best suits your needs can be identified and added on in constructing your order.

When the Torchmate 4400 is received, it's ready to cut within an hour of its uncrating. Simply connect the power and air supply, hook up the computer, and you are ready to cut. The wiring of the motors, the construction of the water table, and the connection of your controller were already completed prior to shipping.



Torchmate 4400 CNC System Plasma Machine

The 4400 Includes:

- 4'x4' CNC system with cable carriers
- Water table for fume control and material support
- ACCUMOVE 2 next generation height control
- Ethernet electronics box - all cabling included
- Full Torchmate CAD/CAM shape creation software includes nesting, scanning, tool pathing, kerf compensation and importing of 32 different file formats
- Visual Machine Designer software accepts straight G-Code
- Built in touchscreen HMI display
- Machine is completely assembled with water table and slats
- Machine is tested before shipping
- Phone and email tech support via a trained, dedicated and professional support staff

CNC Plasma Arc Cutting Curriculum

The Torchmate curriculum is the first of its kind in the industry. It allows schools to teach CNC technology as an independent course, rather than an addition to a much broader subject. It is an involved course study with homework assignments, end-of-chapter quizzes, and suggested lesson plans. This curriculum takes out the guesswork that has previously been associated with teaching CNC technology in the classroom.

The Torchmate curriculum includes 11 comprehensive chapters created by a team of professional welding and fabricating educators. Topics include: CNC Related Software and Coordinate Systems, Introduction to Torchmate CAD, Tool Paths, and G-Code Programming. Students will be able to cycle through the curriculum from beginning to end, learning about the history of the technology, its applications, and finally how to program and operate the table.

The CNC Plasma Arc Cutting Curriculum puts Torchmate tables in a field of their own. There is no other company that can be your single-source provider for a machine and a course curriculum. Students take this technology seriously, knowing that their professional course book and work will have a direct impact on their future employment in the manufacturing and fabricating industries.

The current curriculum can be applied to all Torchmate tables that have been manufactured from 2001 to 2014. Newer Torchmate tables come standard with ACCUMOVE® motion control technology, and curriculum is available just for the ACCUMOVE systems.

Computer Aided Design and Computer Aided Manufacturing Education Software Packages

Understanding and becoming comfortable with CAD/CAM software can take the value of vocational education to the next level. Graduates become savvy with the programming of a powerful manufacturing tool, and become more attractive to future employers. Students are able to program and design CAD files from home, giving them access to the software at their convenience. Teachers are given the freedom to assign homework and issue tests based on the design software, building the skills of their students through each chapter of the curriculum.

Each Torchmate EDU software package comes with one master license and an unlimited supply of student licenses. The only difference between the two licenses is in the exporting of files. The master license is the only license allowed to export readable CAD/CAM files. Student licenses are limited to exporting .edu files, which allows the teachers to moderate and approve student-designed artwork, giving them more control of how the table is used in the classroom.

No other CNC plasma-cutting table on the market today offers such a powerful and affordable CAD/CAM software package. It has been designed specifically for the vocational classroom, empowering both the students and their teachers in furthering the knowledge of the next generation of metal fabricators and CNC machine operators.



4x4 and 4x8 CNC Plasma Cutting Packages Ready to Run in 30 Minutes or Less

Lincoln Electric® has built these CNC plasma cutting tables to integrate 100% of the machine under a single warranty. This means that one company is solely responsible for the development and support of these products, making it even easier for customers to use one phone number to answer their questions. These fully assembled machines come with everything you need to start metal cutting immediately. The cutting tables are built to handle long working hours with minimal required maintenance.

Reliable and Robust Table Mechanics and Easy-To-Use CNC Software

These tables were engineered to withstand industrial shop environments and long work hours. Fabricators from every industry can rely on this machine to consistently cut accurate metal parts day in and day out. It was made to be easy-to-use and intuitive. Users from every background will find the Visual Machine Designer software to be simplistic and easily programmable. The Torchmate 4400 and 4800 are also delivered fully assembled and can be routed to your business or school within a week. You will only need power, water, compressed air, and an installed ground rod before you are able to cut your first job. Lincoln Electric also offers a full online training course allowing you to begin learning how to operate your machine before it arrives.

Spend Less | Get More | Out Perform Your Consumable Life Expectations

Torchmate CNC plasma cutting tables are configured with a motion controller that sets the bar for acceleration and deceleration rates, a plasma cutter that increases cut speeds and outlasts competing consumable life cycles by nearly 3x, and a linear motion system that hits gantry and torch travel speeds of up to 500 ipm. All of these features accelerate cost savings for our customers. The faster cut speeds and higher acceleration and deceleration rates reduce job cycle times and increase the amount of metal parts your shop is able to sell. Longer lasting consumables endure pierce counts

in excess of 500 pierces before needing a consumable change. Lincoln Electric customers save 45% on consumable usage each month when compared to the competition. These cost savings can translate directly into the bottom line profit for your fabrication business or your school.

Unrivaled Technical Support and Customer Service

Competing CNC plasma cutting table manufacturers use a combination of different suppliers to build a pieced-together machine. This leaves their customers looking for help amongst a myriad of companies. Lincoln Electric knows how complicated CNC plasma cutting technology is and how hard it can be to learn. We go the extra mile by equipping our customers with the largest technical support team in the industry and 24-hour access to all of our online resources through Torchmate University. The support that comes with the purchase of a Torchmate 4400 or 4800 is, without question, the best in the business.

The Lincoln Electric® FlexCut™ 80 Plasma Cutter

FLEXCUT® 80

The Most Efficient Plasma Cutter In The Industry

- Extended consumable life
- Faster cut speeds
- Superior cut quality
- Lower price



The FlexCut™ 80 plasma cutter by Lincoln Electric has achieved a new industry standard in both consumable life cycle and metal cutting speed. This combination has raised the bar in the plasma cutting industry – giving more money and more time back to our customers. The FlexCut 80 can attribute these achievements to a patented consumable design and a reengineered power supply that has concentrated the plasma in a new way. The end result is a plasma cutter that gives our users unparalleled plasma cutting efficiency.

Long Lasting, Cheaper Consumables

The FlexCut™ patented consumable design lasts up to 3x longer than the competition and comes in at a price that is 45% lower than the competition. This makes the FlexCut 80 the clear choice for a business or educational institution looking to maximize their return on investment

Grant Overview

The Lincoln Electric Company, the world's leading manufacturer of arc welding equipment, consumables, and cutting solutions, has been asked by community colleges and vocational and technical schools for help in obtaining grants from government programs and community and corporate foundations to purchase the Torchmate systems and curriculum, as well as the FlexCut™ Plasma Cutting Equipment. In response, the company has prepared this Grant-writing Guide as a supplement for grant writers. This document is not intended to supplant the grant-writer, but to make the grant-writer's task easier.

The guide describes the Torchmate system, curriculum and other related products and answers common grant application questions. The answers to those questions can be easily modified by your staff to create an institutional specific response, or one that is specific to local industry needs, which can then be inserted into a grant application.

This document does not represent a complete grant application. Instead it provides information regarding the products and typical responses that a grant-writer can use in responding to a Request for Proposals (RFP), a Request for Qualifications (RFQ), or a Funding Opportunity Announcement (FOA). Funding from government agencies and foundations are different and each solicitation for a grant or request for proposal requires a different approach.


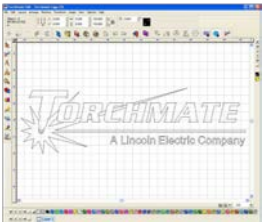

The guide began with a "Product Overview" regarding the Torchmate Systems and the Flexcut™ Plasma Cutting Equipment. The next section provides specific information about the Torchmate line and its uses in the classroom environment and in manufacturing settings which may be useful in completing a grant application. The second section contains grant sources, types of grants and strategies for obtaining them. The third section contains templates and aids for answering grant application questions and making a convincing case for your application.

Section # 1 - Getting Started – Understanding the Torchmate System and its Use

Before you begin to write a proposal it is important to understand why you are pursuing the grant funds. Typically when a grant application is written it is for one of three reasons: 1) to develop a new program or service; 2) to upgrade an existing program or service to make it more relevant to the needs of students, local employers or both; and/or, 3) to expand the capability and capacity to deliver new or modified programs or services by acquiring equipment, possibly modifying classroom space and adding or upgrading curriculum.

In that regard it is important to understand how equipment is used, how it will fit into the curriculum that is developed or modified, and why it is needed. Torchmate equipment is unique and has specific applications in advanced manufacturing, design, and commercial art. The remainder of this section describes the equipment, key terms related to its use and the support that is provided to institutions that purchase Torchmate systems.

Key Terms for the Torchmate CNC systems include:

Key Terms Explained	
	<p><u>Plasma Cutting</u></p> <p>Plasma cutting is the most common thermal cutting method used in industry. This process is similar to welding, except the arc is used to cut metal, not bind it together. Plasma cutting is a fast, accurate, and efficient metal cutting process. Plasma cutting is the most frequently used process on the Torchmate CNC system.</p>
	<p><u>CAD/CAM</u></p> <p>Computer Aided Design (CAD) involves the use of computer hardware and graphics software to generate design drawings. CAD is widely accepted in industry today for designing and drawing parts. Computer Aided Manufacturing (CAM) is a system that automatically produces finished products by using computer controlled production machines. The Torchmate CNC system uses CAD/CAM software to design and produce parts.</p>
	<p><u>CNC</u></p> <p>CNC stands for Computer Numerically Controlled and refers to how a machine's movement is controlled. Put another way, a CNC machine uses a stream of digital information (code) from a computer to move motors and other positioning systems in order to guide the tooling of materials.</p>

CNC machines allow a user to create unique parts that previously had never been conceived, as a result the software to design parts and operate the machine are extremely versatile. Technical support is provided by company representatives who can answer questions that may come up while using a CNC system. Torchmate strives to make these technical support representatives diverse in both their background and the cross section of experiences they can draw upon in responding to your technical assistance and innovation needs.

- The system also offers a complete drawing package for the creation of parts that can be used independent of any other design software or in conjunction with other CAD programs.

The most critical component in CNC operation is the design of the parts to be cut. In industry there are many software packages capable of designing parts. Torchmate is no exception; Torchmate's CAD/CAM allows users to conceive a part, design the part, and optimize the part for machining. With Torchmate CAD/CAM no additional software is needed to create parts on a CNC system. On the other hand, there is such a diverse range of software packages in the CNC industry that some users may have extensive experience using an existing CAD/CAM software package other than those that are provided by Torchmate. Torchmate's CAD/CAM software is designed with the same industry standards as other software packages and may use drawings created in these other packages.

- The system is capable of importing shapes from other CAD programs and scanning any bitmap, jpg, gif, or other image formats

In the industrial and graphic design industries multiple file formats exist for conveying a design or piece of artwork. Torchmate's CAD/CAM program is able to accept all popular formats for images, clipart, and drawings. This allows a user to utilize multiple sources to complete the designs they want. The ability to scan drawings directly into Torchmate CAD/CAM creates another avenue of design by allowing hand drawn elements to be incorporated using a scanner.

- The system also provides the ability to convert drawn shapes for cutting

In the CNC industry there are two groups of software, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). Some software packages like Torchmate CAD/CAM span the two groups. In other cases these two important functions may be accomplished with two separate software packages, many times developed by two companies. By combining both functions into one software package, Torchmate CAD/CAM seamlessly transitions the files from a design environment to a manufacturing environment. This synchronicity also decreases time from part conception to reality, and eliminates the possibility for errors to be introduced between one software package and another.

- The system is capable of importing any vector file or pictures from a digital camera and scaling shapes to any desired size

Similar to the ability to scan an image, a picture may be taken of an object or drawing. This image may then be opened in Torchmate's CAD/CAM software. The image may be scaled and manipulated the same as any other part. This allows small representations to be sized to the finished product's size, or adjustments to different dimensions. This feature simply adds another method of incorporating various elements into a finished design.

- The system can duplicate shapes in any number & pattern

The Torchmate software allows for the custom arrangement of your shapes into patterns for unlimited possibilities and creativity.

- The system is capable of nesting, including rotation, multiple sheet fill, variable spacing, and flipping

Automatic nesting is an industrial standard for reducing wasted material and increasing the amount of parts cut per sheet of material. The software will take a group of parts and fit them as tightly as possible together by rotating and flipping the parts. This automatic nesting results in minimal material being cut, reducing cost per part and scrap metal. By fitting more parts in a given sheet of material the number of sheet changes for production runs is reduced, further increasing efficiency.

- The system provides automatic insertion of lead-ins and lead-outs

The plasma cutting process requires a violent and inaccurate starting point to pierce through the material being cut. If this piercing is done on the edge of a part the result may be unacceptable for the part's application. To eliminate this occurrence CAM software packages will use what is referred to as a lead in. The lead in placed the pierce point away from the edge of the finished part (in a scrap area) and allows a cutting process to be established and stable before encountering a critical cut area. Lead outs accomplish a similar result at the end of the cut where the cutting will continue into a scrap area. In certain cutting processes, such as oxy-fuel cutting, the lead out can improve the finished part's edge quality. In Torchmate's CAD/CAM software the lead in and lead outs are created automatically.

- The system provides automatic kerf (width of cut) compensation

In any cutting process a certain amount of material is removed to define a shape. The width of material removed is called the kerf. When designing a part in the CAD aspect of Torchmate's CAD/CAM software, the part is drawn to the size of the finished dimension of the part. When the CAM aspect is incorporated the actual motion of the machine is adjusted to account for the physical material that was removed during the cutting process. The resulting machine path produces a part that is the same size as it was drawn.

- The system provides a custom materials library

In thermal cutting applications there are different machine settings required for different types and thicknesses of materials. Torchmate's CAD/CAM software allows these different settings to be saved and used for future parts of the same material.

- The system provides automatic control of torch travel direction

When a plasma arc is created there is a swirl of shielding gas that stabilizes the process. This swirl causes one direction of cutting to be of a higher quality than another. Torchmate's CAD/CAM system enables the user to specify which direction, clockwise or counter clockwise, to use for a specific process.

- The system provides control of cut order (sequence)

Many times the cut order for parts is not critical. However in certain applications or under certain conditions this feature may benefit a user. Torchmate's CAD/CAM software enables a user to specify the order in which multiple parts are cut. This can be beneficial when using a high heat process and the heat applied to a certain area needs to be controlled.

- The Torchmate Visual Machine Designer Driver Software provides the digital read out (DRO) for cut time

How long will it take to cut my file? How long will it take to cut a full sheet of parts? No more guessing- the Torchmate VMD software tells you how long, so you can budget or charge accordingly.

- The system is capable of exporting finished shape patterns as dxf files

Drawing eXchange Format (DXF) is the industrial standard file format for design. The Torchmate CAD/CAM software is able to read and create DXF format files to exchange between software packages.

Section 2: Grant Strategy, Funding Sources and Writing Tips

Grant Writing Strategy

Matching your needs with a grant funder's priorities or specifications is critical to your success whether it is a government or foundation funding source. There are more projects and people who want money than there are funders and people with money to give away, which makes applying for and obtaining funding highly competitive.

To obtain a grant you need to understand what the funder wants to fund and make your needs fit those of the funder. You may encounter different types of grants that will fund the:

- Direct purchase of training equipment, like a Torchmate CNC system
- Design and delivery of manufacturing training
- Design and delivery of metal working training
- Design and delivery of CNC training

- Design and delivery of computer-aided drafting and design training
- Development of new curriculum or modifications to existing curriculum which may include new training equipment, like the Torchmate, to ensure that the program is offering state-of-the-art training capability and capacity
- Improvements to a school's capacity and capability to provide top quality training
- Training of instructors on the effective use of CNC systems, including the Torchmate, as part of a new or modified curriculum
- Training for young people, the unemployed, ex-offenders, members of disadvantaged groups, Native Americans, and/or veterans so they can enter the workforce and qualify for manufacturing jobs
- Design and delivery of programs that improve the performance of companies by improving the skills of incumbent workers (employees) in the operation of CNC systems
- Attract under-represented groups and populations to CNC, manufacturing, metalworking, including women, the disabled and people with negative views of manufacturing jobs
- Design and delivery of training that integrates basic academic skills with training for a skilled trade.
- Design and delivery of innovative training that is tied to Science, Technology, Engineering, and Mathematics (STEM) disciplines.

Although this grant template focuses on grant opportunities for direct equipment purchase, any one of the types of grant priorities listed above can help a school obtain the Torchmate CNC system to improve its training and the success of its students. For example, grants that do not support the direct purchase of the Torchmate may reduce other costs that can in turn free up money for the purchase of equipment. Some grants will allow a fee for every hour of training or a fee for every placement in a CNC job. These fees can be aggregated and used to purchase equipment.

Other grants allow charges equivalent to the lease cost of equipment over a prescribed useful life, with the balance of the equipment cost paid from non-grant sources. A grant may pay nothing for equipment but pay costs of instructor time, freeing up other funds to pay for the equipment. Accounting at secondary and post-secondary schools can be as complex as grant accounting and the rules of each must be respected and followed. But with a flexible approach, schools can meet their objectives for acquiring equipment while complying fully with the legal and ethical responsibilities of accepting grant funding.

Identifying Funding Opportunities

This section of the guide provides the user with Requests for Proposals (RPFs), Funding Opportunity Announcements (FOAs) and Solicitations for Grant Applications (SGAs). There is a variety of Federal Funding opportunities that grant seekers can explore for acquiring training equipment from the Torchmate Product Line as part of an effort to develop or strengthen their welding, welding technician or welding engineering technician training program. The following table provides an overview of grant opportunities that warrant consideration. Later in the guide specifics for each of

these programs and others are depicted to help the user as they identify funding opportunities for their organization. Opportunities that are listed with an XX designation versus a number in the left hand column of the table represent past grant opportunities that may potentially resurface.

Possible Funding Opportunities for Acquiring the Torchmate CNC Systems and Products

If outside funding is needed for your organization to acquire the Torchmate CNC Systems and Products, there are a variety of government, public and private funding opportunities that warrant consideration. To search for available Federal Grants, you should visit www.grants.gov and search by subject (the type of program you want to fund), the name of the Federal Program you are interested in (e.g. – Carl Perkins funds, American Apprenticeship Initiatives, America’s Promise Grants, etc.), or the Federal Agency.

U.S. Department of Labor (DOL) Grants

The majority of U.S. Department of Labor grants are awarded by the Employment and Training Administration (ETA) within the Department or the Job Corps. These opportunities are typically available once per year and usually are solicited annually.

In 2016 the Department published solicitations for the following grants, many of which are currently available or are projected to be available in 2017. The issue and closing dates that are listed for each of the funding opportunities have been included so that you can watch for them around the same time periods in 2017-18.

Training Working Families Initiative: FOA-ETA-16-05

This announcement solicited applications for the Strengthening Working Families Initiative (SWFI) grant program. On June 23, 2014, President Obama convened the White House Summit on Working Families, which was jointly hosted by the Department of Labor, Center for American Progress and the White House Council on Women and Girls. To help meet White House objectives, the Department is interested in supporting evidence-based strategies or innovations based on these models that remove a range of barriers to training, including child care and other needs that working families face, by investing in education and skills training in combination with customized participant supportive services. Of particular interest are new promising ideas developed through human centered design methodology and behavioral insight research. To support these efforts, applicants are required to leverage cash or in-kind resources amounting to at least 25 percent of the total award.

Issue Date: Dec 17, 2015 Closing Date: Mar 16, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

TechHire Partnership Grants: FOA-ETA-16-01

ETA announced the availability of approximately \$100,000,000 in grant funds for the TechHire partnership grant program. This grant program is designed to equip individuals with the skills they need through innovative approaches that can rapidly train workers for and connect them to well-paying, middle- and high-skilled, and high-growth jobs across a diversity of H-1B industries such as Information Technology (IT), healthcare, advanced manufacturing, financial services, and broadband. Projects funded by this grant program will help participants begin careers in H-1B occupations and industries which are in-demand and/or high growth in the area applicants are proposing to serve.

On a limited basis, this grant program will also enable applicants to work with companies on increasing the skills of existing workers in lower-skilled jobs to move into more highly skilled positions requiring technology-related skills. These grants will pilot and scale public-private partnerships among the workforce investment system, education and training providers, and business-related nonprofit organizations to address the following goals for the target populations. Grants will be awarded to the lead applicant, which will serve as the grantee and have overall fiscal and administrative responsibility for the grant.

Issue Date: November 17, 2015 Closing Date: March 11, 2016

[Full Announcement \(pdf format\)](#)

Training to Work 3 - Adult Reentry: FOA-ETA-15-07-A

The Employment and Training Administration (ETA), U.S. Department of Labor (DOL) announced the availability of approximately \$20 million in grant funds authorized by the Workforce Innovation and Opportunity Act (WIOA) and the Second Chance Act of 2007 for Training to Work 3 - Adult Reentry.

This Training to Work 3 - Adult Reentry (T2W3) Funding Opportunity Announcement (FOA) provided the opportunity for up to 14 organizations to develop and implement career pathways programs in demand sectors and occupations for men and women, including veterans, and people with disabilities, who are at least 18 years old and who are enrolled in work release programs (WRP). Additionally, grantees must provide a strategy to prioritize services to veterans that are in these WRPs. Career pathways are frameworks that help to define and map out a sequence of education, training and workforce skills training resulting in skilled workers that meet employers' needs. Career pathways link and coordinate education and training services in ways that enable workers to attain necessary credentials and, ultimately, employment. T2W3 is aligned with the Department's goal to make our Federal employment and training programs more job-driven.

Issue Date: October 29, 2015 Closing Date: January 15, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

Summer Jobs and Beyond: Career Pathways for Youth (CPY): FOA-ETA-16-08

ETA announced the availability of up to \$20,000,000 in grant funds to provide employment-related services to eligible youth who are new entrants to the workforce, including those with limited current or past work experience. The program will provide youth with work experience opportunities, including summer and year-round part-time job opportunities for ISY and employment and work experience opportunities throughout the year for OSY, and exposure to career pathways in in-demand job sectors. This program will fund projects designed to link existing summer employment programs, including the LWDB-administered local summer employment programs and non-LWDB programs run by cities/counties (where they exist), with LEAs, re-engagement centers (where they exist), employers, and other community partners to streamline service delivery, align resources, and assist youth in preparing for successful entry into the workforce. To be eligible for a CPY grant, applicants must administer an existing summer employment program or partner with an existing summer employment program that is not administered by the LWDB. The Department expects that most LWDB-administered programs will be WIOA-funded.

Issue Date: February 4, 2016 Closing Date: March 25, 2016

[Full Announcement \(pdf format\)](#)

[Amendment One \(pdf format\)](#)

[Amendment Two \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

YouthBuild 2016: FOA-ETA-16-10

The Employment and Training Administration announced the availability of approximately \$80 million in grant funds for YouthBuild. WIOA further engages the YouthBuild program by making it a required One-Stop partner, providing the opportunity for YouthBuild to share its expertise in serving out-of-school youth. In Fiscal Year (FY) 2016, DOL hopes to serve approximately 5,250 participants during the grant period of performance, with approximately 80 projects awarded across the country. Individual grants will range from \$700,000 to \$1.1 million and require an exact 25 percent match from applicants, using sources other than federal funding.

Issue Date: May 17, 2016 Closing Date: July 6, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

Linking to Employment Activities Pre-Release through Specialized America Job Centers (AJCS) - ("LEAP-2"): FOA-ETA-16-03

The purpose of this pilot program is to provide incarcerated individuals with workforce services prior to release and link them to a continuum of services offered through their community-based AJCs post-release. These grants are job-driven and build connections to local employers that will enable transitioning offenders to secure employment. The jail-based specialized AJCs will enable transitioning offenders to prepare for employment prior to release and continue with Individual Employment Plans (as described in Section IV) in the community once released. Eligible applicants are Local Workforce Development Boards (LWDBs). LWDBs must apply in partnership with their

county or municipal governments and their county, municipal, or regional correctional facilities (this excludes any state or Federal correctional facilities that may be located in the local commuting area) and provide evidence of this partnership in their application. *This could be a front-end component to ex-offenders entering a CNC or other advanced manufacturing or welding program.*

Issue Date: January 13, 2016 Closing Date: February 26, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

Re-Entry Demonstration Projects for Young Adults: FOA-ETA-16-06

This Reentry Demonstration Projects for Young Adults Funding Opportunity Announcement (FOA) provided the opportunity for organizations to build a customized project built on evidence-based and informed interventions. These projects will serve young adults between the ages of 18 to 24 who have been involved in the juvenile or adult justice system and reside in high-poverty, high-crime communities. The focus of this initiative is to assist communities in planning and implementing comprehensive "reentry" programs to address the full range of challenges involved in helping young offenders released from incarceration make a successful transition back to the community. The intent of this initiative is to protect community safety through the successful reintegration of offenders returning to the community by ensuring that offenders: • become productive, responsible, and law-abiding citizens; • are provided with positive opportunities to engage in pro-social activities such as employment or education; • maintain long-term employment; • sustain a stable residence; and • successfully address their substance abuse issues and mental health needs. *This could be a front-end component to ex-offenders entering a CNC or other advanced manufacturing or welding program.*

Issue Date: March 17, 2016 Closing Date: April 19, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

America's Promise Job Driven Grant Program: FOA-ETA-16-12

ETA announced the availability of approximately \$100,000,000 in grant funds for America's Promise Job-driven Grant Program. We expect to fund approximately 20-40 grants, with individual grant amounts ranging from \$1 million to \$6 million. This competitive grant program will build on the momentum of WIOA to develop and expand regional partnerships and training opportunities particularly for middle- to high-skilled H-1B industries and occupations, ensuring that communities fully maximize their Federal, state and local funds to build a competitive workforce.

Grants will be awarded to a regional workforce partnership of public and private sector entities that includes the following partners: Employer and industry representatives that align with the partnership's regional sector strategies; Workforce investment system representing the regional service area; Economic development agencies representing the regional service area; and Education and training providers representing the regional service area.

Issue Date: June 06, 2016 Closing Date: August 25, 2016

[Full Announcement \(pdf format\)](#)

[Amendment One \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

National Guard Youth Challenge: FOA-ETA-15-01

The Employment and Training Administration (ETA), U.S. Department of Labor (DOL, or the Department), announces a funding opportunity to develop the Job Challenge program, an expansion of the existing National Guard Youth Challenge program.

Developed in the early 1990s, the National Guard Youth Challenge program seeks to improve the employment and life prospects of youth ages 16 to 18 who have dropped out of high school and are disconnected from the labor market. The program currently operates in 27 states, Puerto Rico and the District of Columbia. The department will award three currently operating National Guard Youth Challenge programs up to \$4,000,000 each through this competition.

Issue Date: December 10, 2014 Closing Date: February 10, 2015 Possible in 2016

[Full Announcement \(pdf format\)](#)

[Amendment One \(pdf format\)](#)

American Apprenticeship Initiative: FOA-ETA-15-02

The Employment and Training Administration (ETA), U.S. Department of Labor (DOL, or the department, or we), announces the availability of approximately \$100 million in grant funds authorized by Section 414(c) of the American Competitiveness and Workforce Improvement Act of 1998 (ACWIA), as amended (codified at 29 USC 2916a), for the American Apprenticeship Initiative. This initiative is intended to provide a catalyst in supporting a uniquely American Apprenticeship system that meets our country's particular economic, industry and workforce needs. American Apprenticeships (also referred to as Registered Apprenticeships) are innovative work-based learning and post-secondary earn-and-learn models that meet national standards for registration with the U.S. Department of Labor (or federally recognized State Apprenticeship Agencies).

Approximately \$100 million is expected to be available to fund approximately 25 grants. Grant awards will range from \$2.5 - 5 million. Grant awards will be made only to the extent that funds are available.

Issue Date: December 11, 2014 Closing Date: April 30, 2015 FOA in 2016-17 is possible

**Women in Apprenticeship and Nontraditional Occupations (WANTO) Technical Assistance (TA)
Grants: FOA-ETA-16-11**

DOL Agencies ETA, Women's Bureau, and the Office of Apprenticeship announced the availability of approximately \$1,988,000.00 in grant funds to solicit applications for the WANTO TA Grants program. These grants will be awarded competitively to CBOs to set up and administer Regional/Multi-State TA Resource Center that will focus on conducting innovative projects to improve the recruitment, selection, training, employment, and retention of women, women of color and women with disabilities in A/NTO. Through this competition, DOL is interested in establishing a national network of TA Resource Centers, to assist in the recruitment and retention of women in A/NTO.

The text of Funding Opportunity Announcement FOA-ETA-16-11 is inconsistent as it applies to the requirement that a consortium of Community-based Organizations applying for grant funding must provide a Consortium Agreement with the application package. Though Section III.C.1 and Section IV.B.4 of the FOA require a consortium applicant to provide a copy of the consortium agreement in order for their application to be deemed responsive, the consortium agreement was inadvertently omitted from the applicant checklist provided in Section III.C.1 of the FOA. In light of this discrepancy, the Employment and Training Administration (ETA) will not deem a consortium applicant as non-responsive should this agreement not be included in the application. In this case, ETA will request that the Consortium Agreement be provided by the applicant prior to grant award, or as a term and condition of the grant award. *Identifying whether or not your community is part of this network may be helpful in the outreach and recruitment of women into advanced manufacturing related programs.*

Issue Date: April 5, 2016 Closing Date: May 6, 2016

[Full Announcement \(pdf format\)](#)

[Click here for the Grants.gov posting page](#)

Department of Labor Funding on the State and Local Levels

Workforce Investment Act (WIA) funding will be available on the State and Local levels through June 30, 2016 at which time the Act will be replaced by the Workforce Innovation Opportunities Act (WIOA). Each State and local jurisdiction establishes program funding priorities to prepare youth, adults and dislocated workers for employment which includes training. Some of these opportunities may provide funding that can be used to acquire needed equipment, especially if they are targeting a certain population to be served (see following section on targeted populations).

Institutions should contact their State and Local Workforce Investment Boards (WIBs) to gain more information about priorities for industry sectors to be served and opportunities for related funding. To find out more about your local American Career Centers that administer the WIA system (as well as information on the local WIBs) go to <http://www.servicelocator.org/>

U.S. Department of Education – search by program - www2.ed.gov/programs/find/elig/index.html

Multiple opportunities exist for institutions to acquire funding either directly or indirectly through the Department of Education to start new programs or to modify and strengthen existing programs. There are two primary program areas that should be explored: 1) Discretionary Grant programs, and 2) Formula funding that flows typically through the State Department of Education.

Program Office: [Grants and Programs for Career and Technical Education/Community Colleges](#)

CFDA Number: 84.048A **Program Type:** *Formula Grants*

Program Description

Federal funds are made available to develop more fully the academic, career, and technical skills of secondary and postsecondary students who elect to enroll in Career and Technical Education (CTE) programs. In accordance with the statute, states must allocate at least 85 percent of the funds to eligible recipients, which include local education agencies (LEAs), two- and four-year colleges and universities that offer sub-baccalaureate CTE programs, area CTE centers, and postsecondary education institutions controlled by the Department of the Interior's Bureau of Indian Education (BIE).

Types of Projects

This program provides states with support for state leadership activities, administration of the state plan for vocational and technical education, and sub-grants to eligible recipients to improve vocational and technical education programs. To be eligible for a sub-grant, an eligible recipient must operate a vocational and technical education program that:

- Strengthens the academic, vocational, and technical skills of students participating in vocational and technical education programs, achieved by integrating core academic subjects into vocational and technical education programs through a coherent sequence of courses;
- Provides students with strong experience in and understanding of all aspects of an industry;

- Develops, improves, or expands the use of technology in vocational and technical education;
- Provides professional development programs to teachers, counselors, and administrators;
- Develops and implements evaluations of the vocational and technical education programs carried out with funds under the Perkins Act, including an assessment of how the needs of special populations are being met;
- Initiates, improves, expands, and modernizes quality vocational and technical education programs;
- Provides services and activities that are of sufficient size, scope, and quality to be effective; and
- Links secondary vocational and technical education, including Tech-Prep programs, with postsecondary vocational and technical education programs.
- Perkins IV Programs of Study: State by State Reviews, Program Year 2007-2008

Additional Information

State grants help State and local schools offer programs to develop the academic, vocational and technical skills of students in high schools, community colleges, and regional technical centers. Funds from this program can be used for a broad range of programs, services, and activities designed to improve career–technical education programs and ensure access to students who are members of populations with special needs.

Foundation Funding Opportunities – to search for funding

Go to <http://foundationcenter.org/>

Foundations may also provide support for improving the educational capability and capacity of schools to better meet the needs of sectors and industries that are considered economic drivers, this may include the local manufacturing community. If that is the case, frequently you can include the purchase of manufacturing equipment such as the Torchmate CNC System in your funding application. You can effectively research foundation by using the online Foundation Library at foundationcenter.org.

To explore corporate, community, family and charitable foundations in your area, it is recommended that you begin your search using the Foundation Center’s online resources. Remember that you are looking for foundations that fund activities for your type of organization, the type of program you are wanting to offer, and for your jurisdiction or the community where you want to offer your program.

Other Sources of Grants

Among the best sources for a grant is one that is local and specifically aimed at your particular community college, school or organizations like yours in your community. For example, grants are occasionally made by central school systems to individual schools, from international unions to local apprenticeship committees, and from local businesses or corporate foundations. You and your colleagues are in a better position to know about these grants than any outsider.

States and local school districts often have equipment, curriculum development and teacher training grants that could be applicable to CNC training. Special funds are often targeted to career and technical education (CTE) schools. Statewide community college systems or higher education system offices also offer similar funding on occasion. Governors also often have biennium budget funds which may have discretionary grant opportunities that are tied to key sectors or industries that are drivers in the State's economy and are critical to economic development efforts.

The federal Workforce Innovation Opportunity Act (WIOA) funds training, usually through local One-Stop Centers or Workforce Development Boards. WIOA funds are also sometimes available from state level allocations or grant competitions, as well as through targeted federal grant competitions. At the local level, these programs usually do not fund equipment costs, but they fund training, which can make money available for equipment. At the state and federal level, especially through targeted programs, funds for expanding institutional capability and capacity in high demand occupational areas often times can include the purchase of training-related equipment.

If you are exploring the potential for seeking funds under the WIA it is important to know that it will come to an end on June 30, 2016, at which time it will be replaced by the Workforce Innovation Opportunity Act (WIOA) which begins on July 1, 2016. The programs will more than likely be governed by the same or a pared down version of the local Workforce Development Board in your region. There will be some programmatic changes that may impact grant funding including an increased emphasis on providing services to incumbent workers. More information on those changes and others will be better understood once the U.S. Department of Labor's Employment and Training Administration publishes the regulations for the new WIOA Act in Spring 2016. You can follow those changes by periodically visiting the Department of Labor's Employment and Training Administration's website at doleta.gov.

Most states operate customized training programs for businesses and groups of businesses training new and/or existing employees, especially in high demand occupations in key sectors or industry clusters. These programs frequently target manufacturers, including those that may need CNC training. To better understand the key industry or sectors in your state and then your community, you should first search for the governor's economic development plan and then the corresponding local (municipal, county or regional) economic development plan. Both of those plans should depict the key industries and sectors that will be targeted by economic development and often times your institution can work with the economic development agencies to target training to companies that they are working with in their respective jurisdictions.

Grant Writing Tips

Common sense is the best guide to grant writing. Preparing a grant application is not rocket science and common sense should be your guide. There is no certainty that you will win every award, but here are some tips which may increase your likelihood for success:

- Follow the rules set by your customer—which is the funding source.
- Make sure to use the format that is prescribed by the funder, especially page limits, minimum size for fonts, font type, specifics for margins, tables, charts, etc. Often times with federal grant applications, if you do not follow the requirements your application will be rejected and not be reviewed.
- Give yourself enough time to submit your application in advance of the published deadline, hopefully at least 24-48 hours before it is due, especially if the application is web-based or must be submitted using the internet.
- Answer every question and every part of every question—even if they seem silly or duplicative or do not seem to apply to your situation. For federal and state grants the funding agency will usually provide scoring criteria that are directly tied to your proposal's responsiveness to those questions and sometimes sub-questions (questions within questions).
- Be specific and realistic about deliverables. Promise as much as you know you can deliver, but no more.
- Translate what you want into the language and specific topics, activities, and deliverables that the funder wants to fund.
- Don't write more than you need to just to fill up space. This is particularly important when you are following scoring parameters. If a section of questions is worth 40 points and another is worth 10 points you want to dedicate about 4X as much space to answering the 40 point questions.
- Use charts and pictures, including those in this document, to help make a convincing argument.

Section 3: Templates for Completing Common Sections of Grant Applications

The remainder of this document is divided into sections that are often contained in grant applications with language that you can insert, adapt, or rewrite to help you complete an actual application. Notes to grant writers using this document are in *black italic*. Material that may be suitable for use in grants is in regular type. This section contains common grant application elements. Note that not all sections will be appropriate for every grant application.

Grants for Purchasing Equipment

These are the common grant sections covered in this document for a grant to purchase equipment:

1. A project or executive summary
2. A statement of need and a statement of how the proposed project addresses that need. This document includes four different needs statements for four different types of programs and is designed so you may select the need or needs most appropriate to your program. These include statements for (1) Career and Technical Education programs in CNC machine technology, (2) cabinetmaking and wood products, (3) commercial arts, and (4) multiple programs.
3. A description of each of the Torchmate products. This section is designed so you may select the product you are seeking in your grant.
4. Budgeting information for equipment and curriculum purchase including data that can be inserted in your budget narrative that is used to justify your proposed project costs.

In addition to the grant elements listed above which are targeted toward equipment purchase grants, this document also contains brief summaries of grant elements suitable for insertion into a grant that combines equipment purchase with training design and the delivery of training. These elements include: a description of various target populations and how they could be selected for training; a model project work plan and timeline that lists steps needed to implement training using the Torchmate System; sample project outcomes; suggested evaluation criteria; a description of how the use of the Torchmate product builds the education and training capacity of the school; the cost-saving, economical features of the system; and a summary of how the Torchmate's characteristics can be used for "green" training, training that combines theory and practice, and STEM training.

Project or Executive Summary

Application cover sheets often require a brief project summary (usually 1-2 pages in length) which may include specified subsections or questions that must be included in your response. Consider this section a chance to reach top policy makers at the funding agency and write the equivalent of a press release to sell the public and outsiders about the project. This section should be tailored to the specific terms of each grant application and to the specific needs of manufacturers or other related-sectors/industries for CNC training in your area. Following is one example of a project summary.

This application will help Anywhere Community College (ACC) expand and improve its CNC manufacturing and allied trades training so we can better serve local manufacturers. Local employers, including Able Automotive Components and Delta Appliances, are expanding their plants and workforces and are in need of a pool of well-trained potential employees for high demand occupations including Computerized Numerical Controlled (CNC) machinery. This project will help increase the number of local residents qualified for advanced manufacturing jobs at these and other plants throughout the region that is served by ACC.

To meet industry standards for manufacturing jobs today, workers need skills ranging from design to production, including analytical and computer skills needed to operate CNC equipment. To fill

these needs, Anywhere Community College will provide hands-on experience on the use of a variety of industry-level manufacturing equipment as part of its advanced manufacturing technology program. For this project, ACC will purchase a Lincoln Electric Torchmate CNC Plasma Cutting System and a Flexcut™ Plasma Power Source. This new equipment will enable students to gain experience using an industrial CNC tool to design, lay-out, set-up and produce manufactured parts. The system is made up of a table to hold the material being worked on, a gantry fixed on rails above the table, a CNC controller unit, and specialized software and a complete educational curriculum. Students will use the system’s professional CAD/CAM software to design and draw parts from blueprints, and then learn to set-up and operate the CNC system. They will run the system in “virtual” mode, produce designed parts, inspect parts, and troubleshoot parts, if necessary. Approximately 50 students a year will be trained using the system, beginning in the fall semester.

Need Statement

Grant applications often begin with a statement of a problem or need that the proposed project is designed to solve. This document includes options for four different needs statements for four different types of programs and is designed so you may select the need or needs most appropriate to your program. Be sure to add a discussion of locally important companies and/or industries that need the general CNC training you plan to provide with the Torchmate.

In developing a needs statement in response to an RFP, SGA or FOA you will more than likely need to identify occupations that your organization will be training students to enter into upon graduation. The Torchmate system can be used to prepare students for CNC and CNC-related occupations.

The table below depicts Standard Occupational Classification (SOC) Codes for those occupations along with a corresponding Occupational Title.

SOC Code	Occupational Title	2012 Jobs	2022 Jobs	% of Change	New and Replacement Jobs
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51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	61,500	67,700	10.2%	9,600
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	40,200	45,700	13.5%	16,600
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	140,300	160,700	14.5%	59,600
17-3023	Electronics Engineering Technicians	146,500	146,500	0.00%	30,400
47-2111	Electricians	583,500	698,200	19.7%	224,600
47-2211	Sheet Metal Workers	142,300	164,300	15.5%	48,900
51-1011	First-Line Supervisors of Production and Operating Workers	594,700	584,200	-1.8%	83,700
51-2031	Engine and Other Machine Assemblers	42,000	41,400	-1.4%	6,700
51-2041	Structural Metal Fabricators and Fitters	79,700	85,900	7.7%	38,200
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	24,300	31,000	27.6%	13,500
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	184,700	168,200	-8.9%	15,700
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	20,900	16,200	-22.5%	4,000
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	71,500	62,500	-12.6%	16,000
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	38,600	33,200	-14.0%	7,400
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	23,100	20,200	-12.6%	4,500
51-4041	Machinists	397,500	432,400	8.8%	125,900
51-4061	Model Makers, Metal and Plastic	6,100	6,300	2.2%	1,300
51-4062	Patternmakers, Metal and Plastic	4,400	4,700	6.0%	1,100
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	85,900	74,500	-13.2%	16,600
51-4111	Tool and Die Makers	78,600	77,500	-1.4%	4,700

51-4194	Tool Grinders, Filers, and Sharpeners	12,600	12,600	0.4%	2,500
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	15,500	11,300	-27.1%	2,500
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	30,200	29,500	-0.7%	8,500

*The following table provides a description from O*Net Online for each of the occupations listed above.*

Woodworking Machine Setters, Operators, and Tenders, Except Sawing

Set up, operate, or tend woodworking machines, such as drill presses, lathes, shapers, routers, sanders, planers, and wood nailing machines. May operate CNC equipment.

Sawing Machine Setters, Operators, and Tenders, Wood

Set up, operate, or tend wood sawing machines. May operate CNC equipment. Includes lead sawyers.

Computer-Controlled Machine Tool Operators, Metal and Plastic

Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.

Electronics Engineering Technicians

Lay out, build, test, troubleshoot, repair, and modify developmental and production electronic components, parts, equipment, and systems, such as computer equipment, missile control instrumentation, electron tubes, test equipment, and machine tool numerical controls, applying principles and theories of electronics, electrical circuitry, engineering mathematics, electronic and electrical testing, and physics. Usually work under direction of engineering staff.

Electricians

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

Sheet Metal Workers

Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and

operating fabricating machines to cut, bend, and straighten sheet metal; shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; or inspecting, assembling, and smoothing seams and joints of burred surfaces. Includes sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.

First-Line Supervisors of Production and Operating Workers

Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.

Engine and Other Machine Assemblers

Construct, assemble, or rebuild machines, such as engines, turbines, and similar equipment used in such industries as construction, extraction, textiles, and paper manufacturing.

Structural Metal Fabricators and Fitters

Fabricate, position, align, and fit parts of structural metal products.

Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic

Develop programs to control machining or processing of metal or plastic parts by automatic machine tools, equipment, or systems.

Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend machines to saw, cut, shear, slit, punch, crimp, notch, bend, or straighten metal or plastic material.

Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend drilling machines to drill, bore, ream, mill, or countersink metal or plastic work pieces.

Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend grinding and related tools that remove excess material or burrs from surfaces, sharpen edges or corners, or buff, hone, or polish metal or plastic work pieces.

Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend lathe and turning machines to turn, bore, thread, form, or face metal or

plastic materials, such as wire, rod, or bar stock.

Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend milling or planing machines to mill, plane, shape, groove, or profile metal or plastic work pieces.

Machinists

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.

Model Makers, Metal and Plastic

Set up and operate machines, such as lathes, milling and engraving machines, and jig borers to make working models of metal or plastic objects. Includes template makers.

Patternmakers, Metal and Plastic

Layout, machine, fit, and assemble castings and parts to metal or plastic foundry patterns, core boxes, or match plates.

Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Set up, operate, or tend more than one type of cutting or forming machine tool or robot.

Tool and Die Makers

Analyze specifications, lay out metal stock, set up and operate machine tools, and fit and assemble parts to make and repair dies, cutting tools, jigs, fixtures, gauges, and machinists' hand tools.

Tool Grinders, Filers, and Sharpeners

Perform precision smoothing, sharpening, polishing, or grinding of metal objects.

Textile Cutting Machine Setters, Operators, and Tenders

Set up, operate, or tend machines that cut textiles.

Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders

Set up, operate, or tend machines to crush, grind, or polish materials, such as coal, glass, grain,

stone, food, or rubber.

The following table depicts U.S. Labor Market Information for the occupations listed above from the Bureau of Labor Statistics. For further statistics or to provide a citation for these statistics go to www.data.bls.gov/projections/occupations

SOC Code	Occupational Title	2012 Jobs	2022 Jobs	% of Change	New and Replacement Jobs
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	61,500	67,700	10.2%	9,600
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	40,200	45,700	13.5%	16,600
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	140,300	160,700	14.5%	59,600
17-3023	Electronics Engineering Technicians	146,500	146,500	0.00%	30,400
47-2111	Electricians	583,500	698,200	19.7%	224,600
47-2211	Sheet Metal Workers	142,300	164,300	15.5%	48.9%
51-1011	First-Line Supervisors of Production and Operating Workers	594,700	584,200	-1.8%	83,700
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51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	24,300	31,000	27.6%	13,500
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	184,700	168,200	-8.9%	15,700
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	20,900	16,200	-22.5%	4,000
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	71,500	62,500	-12.6%	16,000
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	38,600	33,200	-14.0%	7,400

51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	23,100	20,200	-12.6%	4,500
51-4041	Machinists	397,500	432,400	8.8%	125,900
51-4061	Model Makers, Metal and Plastic	6,100	6,300	2.2%	1,300
51-4062	Patternmakers, Metal and Plastic	4,400	4,700	6.0%	1,100
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	85,900	74,500	-13.2%	16,600
51-4111	Tool and Die Makers	78,600	77,500	-1.4%	4,700
51-4194	Tool Grinders, Filers, and Sharpeners	12,600	12,600	0.4%	2,500
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	15,500	11,300	-27.1%	2,500
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	30,200	29,500	-0.7%	8,500

Note – Things are not as they always seem when using labor market information. For example using 51-4081 above, while there is a loss of 11,400 positions during the period from 2012 through 2022, there are 16,600 replacement jobs that are projected to be filled due to labor market churn including retirements, firing, and other factors. While that occupation is in decline there is still strong demand to train people for those replacement positions. In manufacturing and related positions, that churn is primarily as a result of “baby boomers” exiting the workforce.

The following examples of needs statements cover different options for using the Torchmate System:

Option #1 - Career and Technical Education Program in CNC Machine Technology



Figure 3: 4400 Series Torchmate Machine

Needs Statement (for CNC Machine Technology)

A comprehensive Career and Technical Education program in machine technology includes everything from design to production. To meet industry standards¹ students need to understand and be able to interpret planning and layout operations used in machining, follow blueprints, perform calculations, and use computer tools appropriately to plan, lay-out and produce parts or finished products. They should understand the qualities of various raw and industrial materials and how those materials can be processed and used in manufacturing. Students need to be able to select and use the proper tools for cutting, milling, drilling, turning, shaping, and forming. They need to understand machining and forming processes for the creation and assembly of parts and products. They need to understand inspection and quality control systems and be able to troubleshoot design, set-up, and production problems. They should be able to select and operate the machines best suited for prototype and production work. Meeting these needs requires a broad variety of industrial equipment so students can have a wide range of experiences to prepare them for a wide range of jobs in machine technology.

Proposal

This proposed project requests funding for the purchase of a Torchmate 4400 CNC System and the supporting curriculum to augment our existing machine technology program. The Torchmate

¹ For example, the National Institute for Metalworking Skills and the manufacturing Skill Standards Council

system will enable students to gain experience with an industrial CNC tool to design, lay-out, set-up and produce a metal part or complete product. The system is made up of a table¹ to hold the material that is being worked on, a plasma cutter², a gantry³ fixed on rails⁴ above the table that holds a number of tools⁵ and accessories, a CNC controller unit, and specialized software. The gantry can hold a variety of accessories, including a plasma cutter, or an engraver.

Anywhere Community College proposes to use the Torchmate in its manufacturing program primarily as a CNC plasma cutting table. Plasma cutting is the most common cutting method used in industry. This process is similar to welding, except the arc is used to cut metal, not bind it together. Plasma cutters work by sending an electric arc through a gas as it passes through a constricted opening. The temperature of the gas rises to the point where it enters the plasma state. Because the metal being cut is part of the circuit, the electrical conductivity of the plasma causes the arc to transfer to the work. The restricted opening or nozzle that the gas passes through causes it to accelerate to high speeds and cut through the molten metal. The gas is also directed around the perimeter of the cutting area to shield the cut. The Torchmate acts as a CNC controller for the plasma cutter, holding it in place and precisely moving it over the metal plate attached to the Torchmate table for cutting.

Students will use the Torchmate as described below for learning experiences from the design to finished part stages:

Computer-Aided Drafting and Design

Students will use CAD/CAM software, which is widely utilized in industry to design and draw parts. They will gain experience in creating parts in a CAD environment, entering specifications, setting tolerances, and checking tool paths. The CAD/CAM training will take place in the college's existing computer lab.

The CAD/CAM system is a complete drawing package for part creation. The design software can import shapes from other CAD programs, scan any bitmap, jpg, gif, or other image formats, and import any vector file. The system can also convert drawn shapes for cutting, scale shapes to any desired size, and duplicate shapes in any number and pattern. It includes nesting, including rotation, multiple sheet fill, variable spacing, variable flipping, automatic insertion of lead-ins and lead-outs, automatic kerf compensation, and automatic control of the travel direction of the torch or tool. Finally, the Torchmate software controls cut order, exports finished shape patterns as industry standard dxf files and supports multiple processes. Students will gain experience in each of these functions that directly correlates to industry-based practices.

Setting up the Torchmate CNC System for Prototyping or Production

Students will have the ability to import the CAD design into the machine's driver software. The student selects the plasma cutter or another tool that is attached to the gantry. The student also

positions the material on the table. Then the CNC control parameters are set up for the tool type and material being cut.

Operating in “Virtual Mode”

Students can also use the Torchmate as a green, “virtual” training tool. The CNC system can be programmed and operated as it would be in an industrial setting. Operating in virtual mode reduces material waste and improves safety. Once the set-up is confirmed by a virtual “cut,” a real cut can be performed. Using this feature will result in cost savings for the college, as students will not be using actual materials during this process.

Operating the Torchmate CNC system

Students will experience the actual operation of the CNC plasma cutting system to make the parts they have designed, drafted and programmed into the Torchmate. They will inspect the parts against original drawings and specifications and troubleshoot out-of-specification dimensions.

Option #2 - Commercial Art



Figure 4: Metal Artwork

Needs Statement (Commercial Art)

A commercial art program uses tools and material as the primary means of creative expression. Students participating in the Commercial Arts Program learn to express themselves through manipulation of physical objects. They learn to identify and use the principles of design in their own work and the work of others. They learn craftsmanship, technical skills, and how to manipulate digital imagery

Proposal

Anywhere Community College (ACC) is requesting funding to purchase a Torchmate CNC system to augment our commercial art program (see Figure 4 for an example of a finished art project). The system will enable students to gain experience with a CNC plasma cutting table to cut metal art pieces. The system includes a table to hold the metal that is being worked on, a gantry fixed on rails above the table that holds a plasma cutting tool that can be moved to any coordinate on the table, a CNC controller unit, and specialized software. The gantry can also hold a variety of tools, including a plasma cutter or a simple pen.

The college will use the Torchmate in our commercial art program primarily as a CNC plasma cutting table. Plasma cutting is a common industrial process that is similar to welding, except the arc is used to cut metal, not bind it together. Plasma cutters work by sending an electric arc through a gas that is passing through a constricted opening. The temperature of the gas rises to the point where it enters the plasma state. As the metal being cut is part of the circuit, the electrical conductivity of the plasma causes the arc to transfer to the work. The restricted opening or nozzle that the gas passes through causes it to squeeze by at a high speed and cut through the molten metal. The gas is also directed around the perimeter of the cutting area to shield the cut. The Torchmate acts as a CNC controller for the plasma cutter, holding it in place and precisely moving it over the metal plate attached to the Torchmate table for cutting.

Students will use the Torchmate as described below for learning experiences from the design to finished part stages:

Computer-Aided Drafting and Design

Students will use CAD/CAM software, which is widely accepted in industry, to design and draw parts. They will gain experience in creating parts in a CAD environment, entering specifications, setting tolerances, and checking tool paths. The CAD/CAM training will take place in the college's existing computer lab.

The CAD/CAM system is a complete drawing package for part creation. The design software can import shapes from other CAD programs, scan any bitmap, jpg, gif, or other image formats, and import any vector file. The system can also convert drawn shapes for cutting, scale shapes to any desired size, and duplicate shapes in any number and pattern. The system includes nesting, including rotation, multiple sheet fill, variable spacing, variable flipping, automatic insertion of lead-ins and lead-outs, automatic kerf compensation, and automatic control of the travel direction of the torch or tool. Finally, the Torchmate software controls cut order, exports finished shape patterns as industry standard dxf files and supports multiple processes. Students will gain experience in each of these functions that directly correlates to industry.

Setting up the Torchmate CNC System for Prototyping or Production

Students import the CAD design into the machine's driver software. The student then selects the plasma cutter or other tool that is attached to the gantry. The student also positions the material on the table. Then the CNC control parameters are set up for the tool type and material being cut.

Operating in "Virtual Mode"

The Torchmate can be used as a green, "virtual" training tool. The CNC system can be programmed and operated as it would be in an industrial setting. Operating in virtual mode reduces material waste and improves safety. Once the setup is confirmed by a virtual "cut," a real cut can be performed. By using the virtual mode, ACC will realize cost savings related to actual materials.

Operating the Torchmate CNC System

Students will experience the actual operation of the CNC plasma cutter to make the parts they have designed, drafted and programmed into the Torchmate. They will inspect the parts against original drawings and specifications and troubleshoot out-of-specification dimensions.

Option #3 - Career and Technical Education - Multiple Programs



Figure 5: Oxyfuel, Plasma, Engraver attachments

Needs Statement (for Multiple Programs)

CNC skills are needed in career exploration and multiple Career and Technical Education programs. In many programs students need to understand and be able to interpret planning and lay-out operations, follow blueprints or other designs, perform calculations and use computer tools appropriately for design and production. They should understand the qualities and uses of different materials and tools. The students should also understand how to test and prototype work. They need to understand the basics of production, inspection, and finishing. These skills are needed across a variety of careers, including CNC machining, welding, and certain drafting, design, and commercial art occupations.

Proposal

Anywhere School is requesting funding for the purchase of a Torchmate CNC system to augment our Career and Technical Education programs. The system will enable students to gain experience with an industrial CNC tool to design, lay-out, set-up and produce metal parts. The system is made up of a table to hold the material that is being worked on a gantry fixed on rails above the table that holds a tool that can be precisely moved to any coordinate on the table, a CNC controller unit, and specialized software. The gantry can hold a variety of tools, including but not limited to a plasma cutter, engraver, or a simple Oxy Fuel Torch.

Students will use the Torchmate as described below for learning experiences from the design to finished part stages:

Computer-Aided Drafting and Design

Students will use CAD/CAM software, which is widely accepted in industry today, to design and draw parts. They will gain experience in creating parts in a CAD environment, entering specifications, setting tolerances, and checking tool paths. The CAD/CAM training will take place in the school's existing computer lab.

The CAD/CAM system is a complete drawing package for part creation. The design software can import shapes from other CAD programs, scan any bitmap, jpg, gif, or other image formats, and import any vector file. The system also can convert drawn shapes for cutting, scale shapes to any desired size, and duplicate shapes in any number and pattern. The system includes nesting, rotation, multiple sheet fill, variable spacing, variable flipping, automatic insertion of lead-ins and lead-outs, automatic kerf compensation, and automatic control of the travel direction of the torch or tool. Finally, the Torchmate software controls cut order, exports finished shape patterns as industry standard dxf files and supports multiple processes, including marking, as well as plasma cutting. Students will gain experience in each of these functions that directly correlates to industry functions.

Setting up the Torchmate CNC System for Prototyping or Production

Students will import the CAD design into the machine's driver software. The student then selects the plasma cutter or other tool that is attached to the gantry. The student also positions the material on the table. Then the CNC control parameters are set-up for the tool type and material being cut.

Operating in "Virtual Mode"

The Torchmate can be used as a green, "virtual" training tool. The CNC system can be programmed and operated as it would be in an industrial setting. Operating in virtual mode reduces material waste and improves safety. Once the set-up is confirmed by a virtual "cut," a real cut can be performed. Using the Torchmate in the virtual mode will result in cost savings for the college versus the use of actual materials.

Operating the Torchmate CNC System

Students will experience the actual operation of the CNC plasma cutting system to make the parts they have designed, drafted and programmed into the Torchmate. They will inspect the parts against original drawings and specifications and troubleshoot out-of-specification dimensions.

Equipment Specifications

Following are specifications for each of the Torchmate products. Insert the specification for the product you are seeking in your application. The specifications for each product should also be briefly described in the proposal's budget narrative.

Torchmate 4400™ CNC Plasma Cutting System

The Torchmate 4400 CNC Cutting System (Figure 8) is designed as a multi-use platform to which you may mount secondary tooling for which you would like CNC control and repeatability. The driver software and CAD/CAM Software is included with every system, into which you import your file to be cut. A generic mounting plate is also included that works with a variety of tools for plasma cutting and engraving. Torchmate CNC systems are described by the size of the work area. The 4400 supports a 3/4" thick 48" x 48" inch metal plate.



Figure 8: Torchmate 4400 CNC Plasma Cutting System

- **Model Features:** Small footprint, integrated cable carrier, multiple tool mounting configurations
- **Machine Size:** 74" x 67"
- **Cutting Area:** 48" x 48"
- **Table Type:** Assembled; One piece
- **Standard Equipment:** Three motor driven, Ethernet Control Box
- **Construction:** Five Piece Fabricated Steel construction
- **Electronics/Motion System:** 2.5 amp micro-stepping motor drives, 396 oz. in. motors
- **User Controls:** PC based control software
- **Input Power:** 15 amp/110 volt for controls, FlexCut™ 80 plasma cutter requirements 208-575/1/3/50/60
- **Drive System:** Hardened Rack and Pinion

- **Traverse Speed:** Up to 500 ipm
- **Cut Speed:** Up to 400 ipm
- **Machine Resolution:** Approximately .0013”
- **Available Plasma Units:** Lincoln Electric FlexCut™ 80 or 125
- **Standard Software:** Torchmate Visual Machine Designer Driver Software, Torchmate CAD/CAM v9
- **Warranty:** 2 year warranty on electronics, parts, and table; phone and web technical support for the life of the product. 3 year warranty on FlexCut™ plasma cutters.

Curriculum

For grant applications related to the design and delivery of training, you can acquire the Torchmate Curriculum “Introduction to CNC Plasma Arc Cutting”. Torchmate has designed this reference material with the educator in mind by providing 11 comprehensive chapters crafted by welding and fabrication educators. In addition, a comprehensive glossary is included that provides standard terms and definitions that are used in industries that include CNC CAD/CAM. While programs at each educational institution vary in terms of instructional rigor, it is Torchmate’s intent to streamline the process of incorporating CNC plasma cutting into existing welding and metal fabrication programs at multiple levels of instruction using this curriculum.

The following curriculum outline can be inserted in total or in part to help substantiate your training program design.

Introduction to CNC Plasma Arc Cutting
 by
Tim Baber, Welding Technology Department Chair,
College of the Canyons, Santa Clarita, California
Deanna Duche’, CWI/CWE; Director of Welding Education
Zane State College, Zanesville, Ohio
A. Chad Spradlin, Technical Trainer,
Lincoln Electric Cutting Systems, Reno, Nevada

Chapters

Introduction
 Chapter 1 – The History of Plasma Arc Cutting
 Chapter 2 - Plasma Arc Cutting Safety
 Chapter 3 – CNC Plasma Cutting Machine
 Chapter 4 – CNC Related Software
 Chapter 5 – G-Code Programming
 Chapter 6 – Introduction to Tool Paths
 Chapter 7 – Torchmate Driver Software

Chapter 8 – Test Cutting
Chapter 9 – Introduction to Torchmate CAD
Chapter 10 – Importing Images with Torchmate CAD
Chapter 11 – Basic CNC Project
Glossary

Project Budget*

For pricing please go to: www.lincolnelectric.com or www.torchmate.com.

Cost information for commonly requested Torchmate 4400 option packages can be found on the websites. Just select the option package you want for your project and insert the pricing information into the budget section of your proposal. Options can be changed to suit your needs.



Figure 9: Torchmate 4400 System with FlexCut™ Plasma Cutting Automated Equipment

Option Package #1

Torchmate 4400 CNC System (4x4 Package) Includes the complete system comprising of the water table, plasma power supply, ethernet controller, Torchmate CAD/CAM, and VMD Driver software that accepts G-Code, detailed instructions and phone and web tech support for the life of the product.

4400 - \$ insert price**

Option Package #2

Torchmate 4800 CNC System CNC System (4x8Package) Includes the complete system comprising of the water table, plasma power supply, ethernet controller, Torchmate CAD/CAM, and VMD Driver software that accepts G-Code, detailed instructions and phone and web tech support for the life of the product.

4800 - \$ insert price**

Plasma Cutter Specifications

The Lincoln Electric® FlexCut™ 80 Plasma Cutter



FlexCut™ 80 Specifications

Product Name	Product Number	Input Power Voltage/Phase/HZ	Rated Output Current/Voltage/Duty Cycle	Input Current at Rated Output	Output Range	Air Pressure Required	Air Flow Rate	H x W x D in. (mm)	Net Wt. lb (kg)
FlexCut 80	K4809-1	208/230/400/460/575/3/50/60	60A/140V/100%	3PH/100%/31/28/16/14/12	3PH	87 to 109 PSI (6.0 to 7.5 Bar)	380 SCFH @ 80 PSI (180 SLPM @ 5.5 Bar)	179 x 11.8 x 25.4 (455 x 301 x 645)	96 (44)
			80A/140V/80%	3PH/80%/41/37/21/18/14	25-80A				
		230/1/50/60	60A/140V/100%	1PH/100%/48	1PH				
			80A/140V/80%	1PH/80%/62	25-80A				
		200-208/1/50/60	60A/140V/100%	1PH/100%/52	1PH				
			80A/140V/60%	1PH/60%/71	25-80A				

Mechanized Cut Capacity – Material Thickness	
Recommended Cut Capacity at 24 ipm (pierce at rated current)	¾ in.
Recommended Cut Capacity at 13 ipm (edge start at rated current)	1 in.
Severance Capacity at 8 ipm	1 ¼ in.
Pierce Capacity – Material Thickness	
Pierce Capacity With Programmable Torch Height Control	¾ in.
Maximum Cut Speeds – Mild Steel	
¼ in.	148 ipm
½ in.	52 ipm
¾ in.	26 ipm
1 in.	14 ipm

Patented Conventional Air Plasma Cutting Torch

In comparison to the top competitors in the conventional air plasma cutting industry, the FlexCut™ 80 (in recent tests) surpassed the competition by withstanding nearly 3x the amount of pierces before needing a consumable change. It also matched the industry’s finest cut quality; based on three characteristics that define edge quality: dross accumulation, bevel edge, and surface finish. We further strengthen our offering with a three-year warranty and a comprehensive post-sale support plan.

Industry Leading Duty Cycle

The FlexCut™ 80 plasma cutter utilizes a programmable torch height control that comes standard on all Torchmate plasma cutting tables to obtain a thicker pierce capacity — up to ¾ inch mild steel plate. Users can cut this material at 80 amps while holding an 80% duty cycle. This industry leading duty cycle for 80 amp plasma cutters is ideal for CNC applications. Plasma cutting tables allow the machine to cool while it moves to pierce points around the metal plate. In addition, a hand torch option is available as an add-on.

A grant may pay the entire cost of the equipment. Or the grant may pay a pro-rated portion of the total cost based on a useful life calculation and the proportion of the useful life that occurs during the grant period. Or the grant may pay an actual or equivalent cost of a lease of the equipment during the project period. Circumstances vary, and grant writers should consult with their accounting offices to determine which budgeting process should be used for the grant application.

Other project costs that can be included in grants for a comprehensive training program include:

- Cost of premises (space being used for the project)
- Utility costs
- Training books and supplies
- Personnel costs for administration
- Personnel costs for trainers, training assistants, and laboratory support personnel
- Taxes and employee benefits for administrative and training personnel.

Target Population

CNC trainees can be recruited from a wide variety of targeted resources and environments. Specific trainee recruitment will depend upon the circumstances of applicants and requirements of individual grant applications including trainee eligibility requirements. Some possible recruitment targets are:

- Vocational students at the high school or community college level
- Customers of WIA (now through 2016) or WIOA (starting in July 2016) One Stop career centers
- Local metal working programs
- Recently discharged military personnel
- Dislocated workers, especially from manufacturing jobs
- The long-term unemployed
- High school dropouts
- High school students at risk of dropping out
- Women interested in non-traditional careers
- Incumbent workers
- Graduates of two- and four-year colleges who are unemployed and desire a good-paying vocational skill
- Inmates of correctional facilities
- Ex-offenders

The recruitment processes included in applications will vary depending on specific targeted groups. Following are common processes:

- Distribute flyers at One Stop Career Centers
- Meet with or contact One Stop Career Center counselors
- Meet with or contact high school counselors and speak to high school groups
- Meet with or contact veterans groups
- Meet with or contact community-based organizations
- Meet with or contact Chambers of Commerce or local associations of manufacturers

Project Work Plan

Grant applications often require a work plan that specifies dates and numerical goals for each phase of the work plan. The requirements vary depending on the project and its duration. This section applies to those applications that propose a complete training program, not solely the purchase of equipment. An example of a plan for an 18-month project follows:

Project Work Plan	
Hire project staff and convene administrative work group	Month 1
Perform project administration activities	Months 1-18
Convene employer advisory group	Months 1, 4, 8, 12, 15, 18
Procure and set up Torchmate CNC system	Month 1
Recruit potential participants	Months 2-12
Screen participants for interest and aptitude	Months 2-12
Enroll participants in training	Months 3-13
Conduct training	Months 3-17
Issue completion certificates	Months 4-17
Place trainees in jobs	Months 4-18
Perform program evaluation	Month 17-18
Complete final report	Month 18

Model Partner Roles

Many funders, ask applicants to partner with other entities and agencies to leverage outside resources and expertise in a comprehensive training program. Following are some common partners and a statement of their possible role in a grant application.

Workforce Development Boards (WDBs) and/or their One Stop Career Centers will recruit potential trainees from among target groups, assist in screening, and provide supportive services, including transportation and child care vouchers, protective clothing and equipment for students, and payments for training materials. *Name specific target groups for recruitment (unemployed, veterans, specific disadvantaged groups, etc.)*

Community based organizations (*Funders often ask for names of specific organizations*) will assist in recruiting potential trainees, including non-traditional trainees, including women and the disabled.

Employers (*Funders often ask for names of specific employers*) participating in this project have agreed to interview and consider hiring qualified program graduates as openings occur. Employers

also agree to participate on an employer council that will meet quarterly to assess the training program, review its progress, and make recommendations to the school to improve its program.

Anywhere Community College (Anywhere School) will provide advanced manufacturing training, including Torchmate CNC system training.

Outcomes from Project

Following are examples of potential project goals. Of course, requirements vary by grant and local circumstances.

Sample Training Outcomes	
Goal	Number
Number of potential trainees recruited for screening	XXX
Number of trainees enrolled following recruitment and screening	XXX
Number of trainees who successfully complete training	XXX
Number of trainees placed into employment	XXX
Average wage at time of placement into employment	\$XX.XX
Number of placed graduates retained in employment after six (6) months	XXX
Average wage of placed graduates six (6) months after placement occurs (2 quarters)	\$XX.XX
Number of instructors trained to use Torchmate CNC system	XX
Revisions completed to incorporate Torchmate CNC system in school curriculum	If appropriate

Project Evaluation

Following are possible project evaluation criteria.

- Student evaluations of training experience.
- Instructor evaluations of training experience.
- Number of persons who successfully complete training.
- Employer evaluation of program graduates hired.
- Wage progression of program graduates following hire.

Torchmate CNC System Builds School Capacity

In addition to direct benefits to persons trained during the grant period of the training project, the Torchmate CNC system increases the capacity of the school to provide training over the long term. The training equipment, which will be integrated into the school curriculum, allows the school to offer CNC training on a continuing basis. In addition, the “wow factor” of the operation of the

equipment will help us recruit more students and more non-traditional students into the training program.

Torchmate CNC System Combines Basic Skills and Career Knowledge

The Torchmate CNC system is an ideal platform for teaching mathematics as part of a Career and Technical Education program or academy. Mathematics is applied to parts specifications, schematics, programming and checking quality of production. Students see the relationship between their calculations and a finished product.

Torchmate CNC System can be Part of a STEM Curriculum

In addition to preparing advanced manufacturing workers for jobs, the Torchmate CNC system can be an effective part of broader manufacturing and STEM curricula. The Torchmate can give students an introduction to CNC as part of these curricula. It can also be used to introduce secondary and even primary school students to advanced manufacturing.

Further Information

For general information about the Torchmate, see this web site: www.torchmate.com

For specific questions about the Torchmate send email to: sales@torchmate.com

Robert Vidos

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