Plasma cutter

Classroom Grant

Castle Rock Middle School

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Application Form

Report Fields

Project Name*
Name of project

Plasma cutter

Amount Requested
Amount requested on application.

$1,000.00

Grade Level
Please select grade level below.

Middle School (7-8)

Primary Subject Area
Please select the primary subject area of your grant.

Technology

School
Please select your school from the list below

[Unanswered]

Number of Students Served
Please enter the number of students that will be served by this grant.

1000

Project Cost
What is the total cost of your project?

6000

Statement of Need
Please describe the need for this project. For example, how will this project impact student learning?

I am requesting funds for purchase of a Torchmate plasma cutter. I would like the students of Castle Rock Middle School to have real world experience of manufacturing technology. With this equipment, students would simulate the real world of manufacturing. In today's world companies have up-graded to Computer Numerically Controlled Cutting Machines. These machines use a very hot torch to cut a piece of metal into a

unique design. In addition to the plasma cutter, an attachment for a router is also available. This would allow students to design and create realistic objects through these two CNC controlled machines. A student would design an object on the computer using Torch Lite Software, and then would cut the object with a plasma cutter or router. This technology has real world implications as many companies today are using and designing with CNC plasma cutting, CNC routing, CNC drilling, CNC millings and CNC engraving.

Currently there is a high demand in the Billings area for technicians in metal and machine manufacturing. What an opportunity for students to be initially exposed to this technology in middle school! With a pathway from middle school to high school, interested students would be well on their way preparing for a career in this field.

Primary Goal

Please describe the primary goal of the project and how it blends with School District 2 goals and curriculum.

The computer-aided design(CAD), computer-aided manufacturing(CAM), computer numerical control(CNC)/CNC manufacturing is included in our 7th and 8th grade technology education middle school curriculum. It is a part of our fabrication, production, and design objective. This purchase will bring this technology up to date.

The plasma cutter is the last component of a 4 part project that has been in the works for several years. I will use school funding, fundraising and this grant money to realize the completion of this project.

Project Description

Briefly identify the major activities and materials involved in your project.

With this project the student will draw a design on the Torchmate Lite software (a CAD software). The student will then export the design to another computer that will generate a cutting path for the CNC controlled plasma cutter. The plasma cutter will then cut through the metal, creating a real model the exact duplication of the student's design.

Professional Development

If your project includes professional development how will it improve student performance?

I have been working toward this objective for several years. The other middle schools in Billings have this technology. I have been researching the product and process for some time in order to implement it in my school. I have extensive experience with several CAD programs. Further professional development will be achieved in the classroom with hands-on operation and learning.

Project Timeline

When will you implement your project?

I will purchase the system immediately. I will use the remainder of this school year to set up and calibrate the machinery. I will also write the modules for using this new technology. I will add this module to my lesson plans at the beginning of the 2014-15 school year. I expect 400-500 students to use the CNC machine the first year, and the technology will be applicable for at least 10 years. Over the next several years thousands for students will have the opportunity to use the machine.

Plan for Evaluation

How will you evaluate student outcomes for your project?

This technology will allow for continuing expansion and application over the next many years. Evaluation of this project will be on-going as new processes and applications are introduced. Creative problem solving, design, and project completion will all be considered in the student's evaluation.

Project Budget

Please explain how the funds from this grant will be spent to support your project goal. You can either type or upload a project budget to show how funds will be used. Please identify other funding sources if applicable.

I will use $1500 of a very limited school budget to purchase a water table component of the system. Over the last five years, students have participated in fundraising to collect over $4600. This money will purchase the CNC Torchmate series Table top CNC system and software. This grant would enable the purchase of the plasma cutter itself.

The Lincoln Tomahawk 625 with 25' machine Torch plasma cutter is $1555. I am requesting the maximum amount of $1000 in grant money. My students and I have invested many hours in research and fundraising to make this module become a reality at CRMS

Supervisor Approval*

I have received approval from my supervisor to apply for this grant.

yes

Attachment 1

Please attach any photos, pages from catalogs, or other documents below. This is completely optional.

torchmate grant file.pdf

Attachment 2

Tomahawk® 625 Plasma Cutter.htm

Attachment 3

File Attachment Summary

Applicant File Uploads

- torchmate grant file.pdf
- Tomahawk® 625 Plasma Cutter.htm - File could not be converted

File Troubleshooting

Files not included will be available online when viewing the submission or request unless the file type is not compatible with software available on your computer. To view the file online, open the appropriate application or request and click on the file name link. The file will also be able to be printed separately from your computer.

Files unable to be included in the packets can affect the ease the packet may be read by the staff and evaluators at the grant maker. Please take a moment to read the common causes for files not converting and, if possible, resolve this issue.

Please note: If you have already submitted the form, you will need to contact the grant maker to request they return it to draft form for you to be able to make changes.

Common issues:
- The file type uploaded is not supported in print packets.
    - Supported file types are:
        - PDF files (Adobe Acrobat)
        - Common image formats (JPEG, GIF, PNG)
        - Microsoft Office formats (Word, Excel)
        - Text files (.txt)
        - Comma Separated Value files (.csv)

If you are using an unusual file type, please see if a more standard file format may be used. Often unusual file formats will not be able to opened or read by the staff or evaluators of the organization you are applying to for funds.

- The file caused an error while being converted to PDF.
    - The file path is too long or contains special characters such as (%&^*()@#$!)
        Example: c:/documents/foundant/marketing/spring2012/programs/events/walkathon2012.doc
        c:/documents/foundant/walkathon@mall.doc
    - The most common cause for errors is due to the document being password protected

      Please check your file to make sure password protection is turned off in the document. If your file name is too long or contains special characters, try saving the file to your desktop, removing any special characters and uploading the file again from your desktop to the application.

- A virus was detected in the file so it was not uploaded to the system

Torchmate® 2x2™ CNC Prototyping System / Tomahawk® 625 One-Pak®

Processes
Plasma Cutting and Gouging

Product Number
K3128-1

See back for complete specs

Input Power
2x2™ CNC Table: 110/1/60 (15 amp)
Tomahawk® 625: 208/230/1/50/60

Rated Output Current/Duty Cycle
Tomahawk® 625:
24A/89.6V/100%
29A/91.8V/60%
40A/96.0V/35%

Output Range
Tomahawk® 625: 10-40A

Air Pressure Required
80-110psi (6-7.5 Bar)

Air Flow Rate Required
70psi @ 125-200 SCFH
(5 bar @ 80 Liters/min)

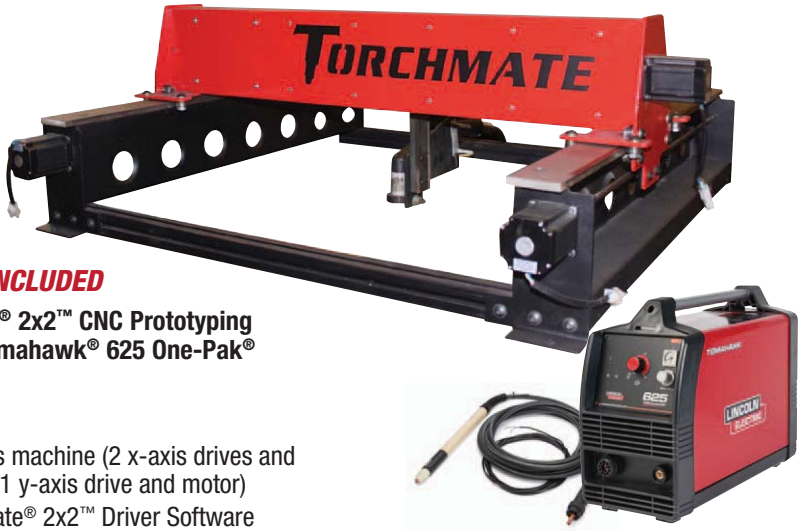
Weight/Dimensions (H x W x D)

Table:	Tomahawk®:
100 lbs (45 kg)	34lbs. (15.4 kg)
38 5/8 x 38 7/8 x 9 (981 x 987 x 229)	15.2 x 8.5 x 18.9 (385 x 215 x 480)

The Torchmate® 2x2™ Prototyping System changes the way you make parts in your home, school or small fabrication shop. Delivering enhanced control and repeatability over manual operations, this compact multi-use platform is designed to bring CNC plasma cutting, routing, drilling, milling and engraving to those who could not previously afford to enter the world of CNC technology. We included what's required to operate the system for CNC plasma cutting – expand with secondary tooling as your needs and expertise grow.

FEATURES

- **Small footprint and minimal weight** – Portable tabletop platform sets up in any shop.
- **Standard CAD Lite and Torchmate® Driver software** – Create your own parts or Import .dxf files from almost any CAD program.
- **Compatible with many CAD software suites** – Or, choose from a selection at torchmate.com
- **Standard Machine Torch Holder**
- **Rugged Construction**
  - Five piece steel assembly
  - 26 sealed ball bearings for smooth linear motion
  - Anti-backlash screw drive system
  - 2.5 amp micro-stepper motors
  - Two x-axis and one y-axis drive and motor systems



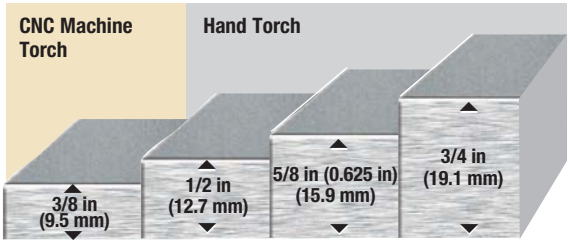
WHAT'S INCLUDED

Torchmate® 2x2™ CNC Prototyping System Tomahawk® 625 One-Pak® (K3128-1)

Includes:

- Two axis machine (2 x-axis drives and motors, 1 y-axis drive and motor)
- Torchmate® 2x2™ Driver Software
- Torchmate® CAD Lite Software
- Machine Torch Holder
- Tomahawk® 625 (K2807-2) Includes
  - Lincoln Electric LC40M torch 20 ft. (6 m) cable (K2847-2)
  - Air regulator and pressure gauge
  - Internal water separator
  - Work clamp and cable
  - Spare consumables
  - Shoulder strap

CUT PERFORMANCE



CNC Pierce/Cut	Recommended	Maximum	Severance
Rated Cut @ 36 ipm (0.91 m/min)	Rated Cut @ 20 ipm (0.51 m/min)	Maximum Cut @ 12 ipm (0.30 m/min)	Sever Cut @ 5 ipm (0.13 m/min)

INPUT 1 PHASE, 50/60 Hz **OUTPUT** DC

Tomahawk®

LINCOLN ELECTRIC 3 YEAR WARRANTY AÑOS DE GARANTIA ANS DE GARANTIE

Two Year Extended Warranty Available in U.S.A. and Canada

* 3 year warranty on machine
1 year on torch

IP21S Rated

C US

Torchmate® CNC Table 90 Days

Publication E11.500 | Issue Date 10/11

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
PH: +1.216-481-8100 • www.lincolnelectric.com

LINCOLN ELECTRIC® THE WELDING EXPERTS®

RECOMMENDED ACCESSORIES

CNC TABLE OPTIONS

2x2™ Water Table
Slats, leveling feet or casters are not included. Pre-drilled and tapped for 3/8 in. (9.5 mm) leveling feet or casters.
Available as Money Matters™ Program FREE Accessory

TOMAHAWK® 625 OPTIONS

Small Canvas Cover
Protect your Tomahawk™ when not in use. Made from red canvas that is flame retardant, mildew resistant and water repellent.
Order K2377-1

LC40M Machine Replacement Torch
Includes 20 ft. (6 m) torch cable and one set of all required torch expendable parts.
Order K2847-2

TOMAHAWK® 625 TORCH CONSUMABLES

Product Number	Description	
KP2843-1	Electrode	Standard
KP2843-2	Nozzle 40A	Standard
KP2843-3	Nozzle (Contact) 40A	Options
KP2843-4	Nozzle (Gouging)	Options
KP2843-5	Retaining Cap	Standard
KP2843-6	Retaining Cap (Gouging)	Options
KP2843-8	Gouge Shield	Options
KP2843-9	Nozzle (Contact) - 25A	Options
KP2843-10	Spacer	Standard

Software Minimum Computer Requirements

- Windows® XP/Vista® 2007
- 1 Ghz Processor
- 1 GB RAM
- 30 GB Hard Drive

PRODUCT SPECIFICATIONS

Product Name	Product Number	Input Power	Rated Output Current/Voltage/ Duty Cycle	Output Range	Cutting Capacity in (mm)	Cutting Speed ipm (m/min)	Machine Resolution:	Air Pressure Required	Air Flow Rate Required	Dimensions H x W x D in. (mm)
Torchmate® 2x2™ CNC Prototyping System / Tomahawk® 625 One-Pak®	K3128-1	2x2™ CNC Table: 110/1/60 (15 amp) Tomahawk® 625: 208/230/ 1/50/60	Tomahawk® 625: 24A/89.6V/100% 29A/91.8V/60% 40A/96.0V/35%	Tomahawk® 625: 10-40A	24 (610) x 24 (610) (machine can be re-indexed to cut larger materials) - CNC Pierce/Cut 3/8 (9.5) - Hand Torch Recommended: ½ (12.7) - Hand Torch Maximum: 5/8 (15.9) - Hand Torch Severance: ¾ (19.1)	2x2™ CNC Table: - Traverse: up to 200 (5.1) - Cut: up to 150 (3.8) CNC Pierce/Cut 36 (0.91) Recommended: 20 (0.51) Maximum: 12 (0.30) Severance: 5 (0.13)	.00125 in.	80-110psi (6-7.5 Bar)	70psi @ 125-200 SCFH (5 bar @ 80 Liters/min)	2x2™ CNC Table: - 100 lbs (45 kg) - 38 5/8 x 38 7/8 (981 x 987) Tomahawk® 625: - 34 lbs. (15.4 kg) - 15.2 x 8.5 x 18.9 in. (385 x 215 x 480 mm)

See bulletin E11.200 for more Tomahawk® 625 details