Project Application
Land Use Department

P.O. Box 660; 333 Calef Hwy, Barrington, NH 03825 ♦ Phone: 603-664-5798 ♦ Fax: 603-664-0188

220-18-GR-14-SR
Case Number:_______ **Project Name:** Powder Coating / CNC Machine **Date** 5/21/14

Staff Signature required PRIOR to submittal

PRELIMINARY APPLICATION: Preliminary Conceptual Review ____ Design Review____ Development of Regional Impact ____

FORMAL APPLICATION:
Subdivision Type: Major____ Minor____ Conventional____ Conservation____
Site Plan Review: Major____ Minor____
Conditional Use Permit ____ Sign Permit ____ Boundary Line Adjustment ____ Special Permit ____
Change of Use ____ Extension for Site Plan or Subdivision Completion ____
Amendment to Subdivision/Site Plan Approval ____ Other ____

Project Name: Powder Coating / CNC Machine **Area** (Acres or S.F) ______
Project Address: 78 - 84 Greenhill Rd.
Current Zoning District(s): General Residential (GR) **Map(s)** 220 **Lot(s)** 18
Request: ____________

The property owner shall designate an agent for the project. This person (the applicant) shall attend pre-application conferences and public hearings, will receive the agenda, recommendations, and case reports, and will communicate all case information to other parties as required.

All contacts for this project will be made through the *Applicant* listed below.

Owner: Stephen M. Flynn
Company Flynn and Sons Contractors
Phone: 603 817-5158 Fax: ______ E-mail: SMFTBIRD@COMCAST.NET
Address: 54A Rutland ST., Dover, NH

Applicant (Contact): ______
Company ______
Phone: ______ Fax: ______ E-mail: ______
Address: ______

Developer: ______
Company ______
Phone: ______ Fax: ______ E-mail: ______
Address: ______

Architect: ______
Company ______
Phone: ______ Fax: ______ E-mail: ______
Address: ______

Engineer: ______
Company ______
Phone: ______ Fax: ______ E-mail: ______
Address: ______

Owner Signature ______ Applicant Signature ______
Barbara Irvine 5/21/2014
Staff Signature Date

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ABUTTER LIST

Town of Barrington, NH
Please Print or Type

Applicant: Stephen M. Flynn **Phone** 603 817-5158

Project Address: 78-84 Greenhill Rd.

List the names and addresses of all parties below. For abutting lot owners, list each owner whose lot adjoins or is directly across the street or a body of water from the subject property. This form may not be completed more than five (5) days prior to the application deadline.

LEGAL OWNER OF SUBJECT LOT

Map	Lot	Zone	Owner Name	Mailing Address
220	18	GR	Stephen M. Flynn	54A Rutland St. Dover NH 03820

ABUTTING LOT OWNERS

Map	Lot	Owner Name	Owner Mailing Address (NOT property location)
220	19	Deborah + Craig Rogers	68 Greenhill Rd.
220	17	N-BAR-H Riding Club	PO Box 127
220	18	Stephen + Lorraine Flynn	78 Greenhill
220	10	Charles + Sarah Brown	134 Collett Ct. Weatherford, TX 8292
220	11	Edwin + Aida Aviles	89 Mast Rd. Lee, NH 3824
		Berry Surveying	148 Second Crown Pt. Rd.

PROFESSIONALS AND EASEMENT HOLDERS. Engineers, Surveyors, Soil Scientists, and Architects whose seal appears or will appear on the plans (other than any agent submitting this application); holders of conservation, preservation, or agricultural easements; and upstream dam owners/NHDES.

Name of Professional or Easement Holder	Mailing Address

P

I, the undersigned, acknowledge that it is the responsibility of the applicant or his/her agent to fill out this form. I understand that any error or omission could affect the validity of any approval. The names and address listed on this form were obtained from the Town of Barrington *Assessing Office*

on this date: 5/1/14**, This is page** 1 **of** 1 **pages.**

Applicant or Agent: [signature]

Planning Staff Verification: ____________ **Date:** ____________

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FEES:	
Application $150.00	Public Notice: 75.00 per submission
Abutters @_____X $7.00 each=____	Other_____
Total Received: $____Cash___ Check#_____	
Date Received____________	

SECTION 3.4 CONDITIONAL USE PERMIT APPLICATION

TOWN OF BARRINGTON
PO Box 660; 333 Calef Highway
Barrington, New Hampshire 03825

220-18-GR-14-SR

A CONDITIONAL USE PERMIT (CUP) allows the Town of Barrington to permit uses which may be essential or desirable to a particular community, but which are not allowed as a matter of right within a zoning district, but rather only through a CUP. A public hearing is required. A conditional use permit can provide flexibility within a zoning ordinance.

This application may not be used for those seeking a Special Permit for Construction in a Wetland Buffer pursuant to Section 9.6 of the town zoning ordinance. There is a separate application for a Special Permit in a Wetland Buffer, which is also available at the town Land Use office.

Is the proposed use related to a Site Plan or Subdivision Application? Yes___ No ✓

Name of Project Powder Coating/CNC Machine

Address of Property 78-84 Greenhill Rd.

Tax Map 220 Lot 18 Zoning District(s) GR Overlay _____ Total Area of Site_____

Name of Applicant/Agent Stephen M. Flynn

Mailing Address of Applicant/Agent____________

Telephone: 603 817-5158 Email: Fax:

Name of Property Owner Stephen M. Flynn

Mailing Address of Property Owner 54A Rutland St. Dover, NH 03820

Telephone: (603) 817-5158 Email: SMFTBIRD @comcast.net Fax:

Letter of Authorization Provided___

Signature of Owner [signature]

Deed Provided ___

Describe in detail all existing uses and structures on the subject property (You may attach a separate typed sheet):

Pole barn storing remodeling tools/ladders
Single family home

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Describe in detail all proposed uses, structures, construction, or modifications requiring a Conditional Use Permit:

Powder Coating business with a CNC Machine to make custom parts

Describe in detail how the following conditions of the Town of Barrington Zoning Ordinance under Section 3.4 "Conditional Use Permits Issued by the Planning Board" have been satisfied by your proposal. (You may attach a separate sheet.)

1. The building, structure or use is specifically authorized under the terms of this Ordinance.

small scale Allowed by conditional use home business

2. If completed, the development in its proposed location will comply with all requirements of this Ordinance, and with specific conditions or standards established in this Section for the particular building, structure or use.

existing building

3. The building, structure or use will not materially endanger the public health or safety.

there will be no chemicals released into the atmosphere

4. The building, structure or use will not substantially de-value abutting property.

using existing structure improving with updated electric and exterior painting

5. The building, structure or use will be compatible with the neighborhood and with adjoining or abutting uses in the area in which it is to be located.

existing structure, family occupied home with multiple improvements

6. The building, structure or use will not have a substantial adverse impact on highway or pedestrian safety.

not a retail location

7. The building, structure or use will not have a substantial adverse impact on the natural and environmental resources of the town.

no outside impact

8. Adequate public utilities, community facilities, and roadway capacity are available to the property to ensure that the proposed use will not necessitate excessive public expenditures in providing public services.

not applicable

9. Where deemed necessary when considering an application for Conditional Use approval, the Planning Board may require that adequate visual buffers be established.

existing building with activity within the building

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* Revised for Received on this page 6/23/14 BD with photos, waiver + Equipment information

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Statement of Assurance and Agreement:

I hereby certify that to the best of my knowledge this submitted application information is true and correct. All proposed development will be in conformance with the information contained on the application and in the approved plan as well as the provisions of the Town of Barrington ordinances and regulations.

The Owner/Agent, by filing an application, hereby grants permission for members of the Board and staff to enter onto the subject property for the purposes of this review.

Applicant/Agent Signature — Date

Owner Signature Stephen M. Foley — Date 5/1/14

Owner Signature — Date

Staff Signature — Date

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Revised 7/24/2012

FEES:
~~Application $150.00~~
~~Public Notice: 75.00 per submission~~
~~Abutters @____ X $7.00 each=____~~
~~Other____~~
~~Total Received: $____ Cash____ Check#____~~

SIGN PERMIT APPLICATION PLANNING BOARD
TOWN OF BARRINGTON
PO Box 660; 333 Calef Highway
Barrington, New Hampshire 03825

220-18-GR-14-SR

Project Address: 78 Greenhill **Map** 220 **Lot** 18
Project/Business Name: Pending **Current Zoning District(s)** GR
Name of Applicant: Stephen M. Flynn
Address: 54A Rutland ST. Dover, NH 03820
Telephone: 603 817-5158 **Email:** SMFTBIRD@Comcast.net
Name of Project/Business Owner: Name Pending (sign)
Address: 78 Greenhill Road
Telephone: 603-817-5158 **Email:** Smftbird@ Comcast.net
Sign Contractor: ____
Address ____
Telephone: ____ **Email:** ____
Written Authorization of Property Owner ____
Location of proposed sign As on plan **Illuminated Yes** ___ **No** ✓
Reference Article 7.4 (8) Home Business

Type of Sign: (circle all that apply)

☒ New Sign ☐ Existing Sign-Replacement ☐ Existing Sign-Renovations/Changes/Expansion

Proposed Sign: ☐

(Free Standing) Building Mounted Awning ☐ Banner☐
One-Sided Two-sided ☐ Permanent lettering Manually changeable lettering
Home Business/Occupation ☐Temporary-Purpose ____ Dates: From ____ To ____
Park/Business Complex Sign

New Sign Dimensions:

Height-Feet 2' Inches ____
Width- Feet 2' Inches ____
Distance from ground to top of the sign: ____

Lighting: (Non-illuminated) ☐ Externally illuminated

(Electrical permit required for electrical signs. Lighting shall not impact abutters and/ or traffic.)

The undersigned guarantees that the proposed work will be done in accordance with above statements and all work associated will be in accordance with all applicable Town Ordinances and regulations.

[signature] **Owner Signature** ____ **Applicant Signature**

Barbara Irvine **Staff Signature** 6/23/2014 **Date**

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Sketch location on lot with ALL SETBACKS

(Attach a sketch of proposed sign showing the color breakdown)

The undersigned guarantees that the proposed work will be done in accordance with above statements and all work associated will be in accordance with all applicable Town Ordinances and Regulations.

Owner Signature	**Applicant Signature**
Staff Signature	**Date**

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Rev 09/13/2011

TOWN OF BARRINGTON - LAND USE DEPARTMENT

PROJECT NARRATIVE

PROJECT NAME Powder Coating | CNC Machine CASE FILE NUMBER 220-18-GR-14-SR

PROJECT LOCATION 78 - 84 Greenhill Rd.

DATE OF APPLICATION 5/1/14

Property Details:

Single-Family ✓ Residential ✓ Multi-Family Residential Commercial Industrial

Current Zoning: Lot Area Size

Setbacks: Front Side Rear

Parking Spaces Required: Parking Spaces Provided:

Please describe your project and its purpose and intent. You may attach a typed description.

Open Powder coating business Also With capacity to machine custom small parts with a CNC milling machine. (metal parts)

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Site Plan Waiver Request Form

Under Site Plan Regulations 3.9.8-Waivers and Article 8-Waiver Procedure

If there is more than one waiver requested, each waiver request is to be individually listed and described, as each waiver is considered individually by the Town of Barrington Planning Board. A petition for waiver shall be submitted in writing by the applicant with the application for review. The request shall fully state the grounds for which the waiver is requested and all facts supporting this request with reference to the applicable Barrington Site Plan Regulations article, section and paragraph. **Each waiver granted shall be listed on the approved site plan.**

Name of Site Plan (See Title Box): n/a

Case Number: 220-18-GR-14-SR

Site Location: 78 Greenhill Road

Zoning District(s): General Residential

Owner (s): Stephen M. Flynn

Address of Owner(s): 54A Rutland Street, Dover, NH 03820

Address Line 2: —

Name of Applicant (if different from owner): —

Phone Number — Email —

Land Surveyor: n/a

I Stephen M. Flynn seek the following waiver to the Town of Barrington Site Plan regulations for the above case submittal:

Waiver from providing new siteplan. Section II.
No changes to site proposed.

[signature]
Signature of Owner/Applicant

6/23/14
Date

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Revised 06/23/2011

Numerical control

From Wikipedia, the free encyclopedia

Numerical control (**NC**) is the automation of machine tools that are operated by precisely programmed commands encoded on a storage medium, as opposed to controlled manually via hand wheels or levers, or mechanically automated via cams alone. Most NC today is **computer numerical control** (**CNC**), in which computers play an integral part of the control.

A CNC turning center

In modern CNC systems, end-to-end component design is highly automated using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. The programs produce a computer file that is interpreted to extract the commands needed to operate a particular machine via a post processor, and then loaded into the CNC machines for production. Since any particular component might require the use of a number of different tools – drills, saws, etc., modern machines often combine multiple tools into a single "cell". In other installations, a number of different machines are used with an external controller and human or robotic operators that move the component from machine to machine. In either case, the series of steps needed to produce any part is highly automated and produces a part that closely matches the original CAD design.

Contents

History

The first NC machines were built in the 1940s and 1950s, based on existing tools that were modified with motors that moved the controls to follow points fed into the system on punched tape. These early servomechanisms were rapidly augmented with analog and digital computers, creating the modern CNC machine tools that have revolutionized the machining processes.

Description

Modern CNC mills differ little in concept from the original model built at MIT in 1952. Mills typically consist of a table that moves in the X and Y axes, and a tool spindle that moves in the Z (depth). The position of the tool is driven by motors through a series of step-down gears in order to provide highly accurate movements, or in modern designs, direct-drive stepper motor or servo motors. Open-loop control works as long as the forces are kept small enough and speeds are not too great. On commercial metalworking machines closed loop controls are standard and required in order to provide the accuracy, speed, and repeatability demanded.

As the controller hardware evolved, the mills themselves also evolved. One change has been to enclose the entire mechanism in a large box as a safety measure, often with additional safety interlocks to ensure the operator is far enough from the working piece for safe operation. Most new CNC systems built today are completely electronically controlled.

CNC-like systems are now used for any process that can be described as a series of movements and operations. These include laser cutting, welding, friction stir welding, ultrasonic welding, flame and plasma cutting, bending, spinning, hole-punching, pinning, gluing, fabric cutting, sewing, tape and fiber placement, routing, picking and placing (PnP), and sawing.

Examples of CNC machines

Mills

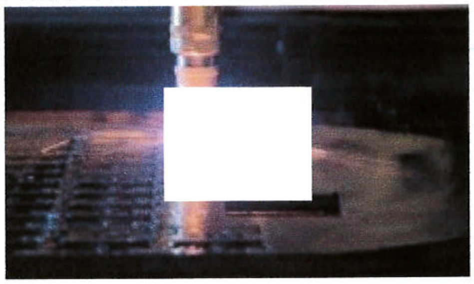
CNC mills use computer controls to cut different materials. They are able to translate programs consisting of specific number and letters to move the spindle to various locations and depths. Many use G-code, which is a standardized programming language that many CNC machines understand, while others use proprietary languages created by their manufacturers. These proprietary languages while often simpler than G-code are not transferable to other machines.

Lathes

Lathes are machines that cut spinning pieces of metal. CNC lathes are able to make fast, precision cuts using indexable tools and drills with complicated programs for parts that normally cannot be cut on manual lathes. These machines often include 12 tool holders and coolant pumps to cut down on tool wear. CNC lathes have similar control specifications to CNC mills and can often read G-code as well as the manufacturer's proprietary programming language.

Plasma cutters

Plasma cutting involves cutting a material using a plasma torch. It is commonly used to cut steel and other metals, but can be used on a variety of materials. In this process, gas (such as compressed air) is blown at high speed out of a nozzle; at the same time an electrical arc is formed through that gas from the nozzle to the surface being cut, turning some of that gas to plasma. The plasma is sufficiently hot to melt the material being cut and moves sufficiently fast to blow molten metal away from the cut.



CNC Plasma Cutting

Electric discharge machining

Electric discharge machining (EDM), sometimes colloquially also referred to as spark machining, spark eroding, burning, die sinking, or wire erosion, is a manufacturing process in which a desired shape is obtained using electrical discharges (sparks). Material is removed from the workpiece by a series of rapidly recurring current discharges between two electrodes, separated by a dielectric fluid and subject to an electric voltage. One of the electrodes is called the tool-electrode, or simply the 'tool' or 'electrode', while the other is called the workpiece-electrode, or 'workpiece'.

When the distance between the two electrodes is reduced, the intensity of the electric field in the space between the electrodes becomes greater than the strength of the dielectric (at least in some point(s)), which breaks, allowing current to flow between the two electrodes. This phenomenon is the same as the breakdown of a capacitor. As a result, material is removed from both the electrodes. Once the current flow stops (or it is stopped – depending on the type of generator), new liquid dielectric is usually conveyed into the inter-electrode volume enabling the solid particles (debris) to be carried away and the insulating proprieties of the dielectric to be restored. Adding new liquid dielectric in the inter-electrode volume is commonly referred to as flushing. Also, after a current flow, a difference of potential between the two electrodes is restored to what it was before the breakdown, so that a new liquid dielectric breakdown can occur.

Wire EDM

Also known as wire cutting EDM, wire burning EDM, or traveling wire EDM, this process uses spark erosion to machine or remove material with a traveling wire electrode from any electrically conductive material. The wire electrode usually consists of brass or zinc-coated brass material.

Sinker EDM

Sinker EDM, also called cavity type EDM or volume EDM, consists of an electrode and workpiece submerged in an insulating liquid—often oil but sometimes other dielectric fluids. The electrode and workpiece are connected to a suitable power supply, which generates an electrical potential between the two parts. As the electrode approaches the workpiece, dielectric breakdown occurs in the fluid forming a plasma channel) and a small spark jumps.

Water jet cutters

A water jet cutter, also known as a waterjet, is a tool capable of slicing into metal or other materials (such as granite) by using a jet of water at high velocity and pressure, or a mixture of water and an abrasive substance, such as sand. It is often used during fabrication or manufacture of parts for machinery and other devices. Waterjet is the preferred method when the materials being cut are sensitive to the high temperatures generated by other methods. It has found applications in a diverse number of industries from mining to aerospace where it is used for operations such as cutting, shaping, carving, and reaming.

Other CNC tools

Many other tools have CNC variants, including:

- Drills
- EDMs
- Embroidery machines
- Lathes
- Milling machines
- Wood routers
- Sheet metal works (Turret punch)
- Wire bending machines
- Hot-wire foam cutters
- Plasma cutters
- Water jet cutters
- Laser cutting
- Oxy-fuel
- Surface grinders
- Cylindrical grinders
- 3D Printing
- Induction hardening machines
- submerged welding
- knife cutting

- glass cutting

Tool / machine crashing

In CNC, a "crash" occurs when the machine moves in such a way that is harmful to the machine, tools, or parts being machined, sometimes resulting in bending or breakage of cutting tools, accessory clamps, vises, and fixtures, or causing damage to the machine itself by bending guide rails, breaking drive screws, or causing structural components to crack or deform under strain. A mild crash may not damage the machine or tools, but may damage the part being machined so that it must be scrapped.

Many CNC tools have no inherent sense of the absolute position of the table or tools when turned on. They must be manually "homed" or "zeroed" to have any reference to work from, and these limits are just for figuring out the location of the part to work with it, and aren't really any sort of hard motion limit on the mechanism. It is often possible to drive the machine outside the physical bounds of its drive mechanism, resulting in a collision with itself or damage to the drive mechanism. Many machines implement control parameters limiting axis motion past a certain limit in addition to physical limit switches. However, these parameters can often be changed by the operator.

Many CNC tools also don't know anything about their working environment. Machines may have load sensing systems on spindle and axis drives, but some do not. They blindly follow the machining code provided and it is up to an operator to detect if a crash is either occurring or about to occur, and for the operator to manually abort the cutting process. Machines equipped with load sensors can stop axis or spindle movement in response to an overload condition, but this does not prevent a crash from occurring. It may only limit the damage resulting from the crash. Some crashes may not ever overload any axis or spindle drives.

If the drive system is weaker than the machine structural integrity, then the drive system simply pushes against the obstruction and the drive motors "slip in place". The machine tool may not detect the collision or the slipping, so for example the tool should now be at 210mm on the X axis but is in fact at 32mm where it hit the obstruction and kept slipping. All of the next tool motions will be off by −178mm on the X axis, and all future motions are now invalid, which may result in further collisions with clamps, vises, or the machine itself. This is common in open loop stepper systems, but is not possible in closed loop systems unless mechanical slippage between the motor and drive mechanism has occurred. Instead, in a closed loop system, the machine will continue to attempt to move against the load until either the drive motor goes into an overcurrent condition or a servo following error alarm is generated.

Collision detection and avoidance is possible, through the use of absolute position sensors (optical encoder strips or disks) to verify that motion occurred, or torque sensors or power-draw sensors on the drive system to detect abnormal strain when the machine should just be moving and not cutting, but these are not a common component of most hobby CNC tools.

Instead, most hobby CNC tools simply rely on the assumed accuracy of stepper motors that rotate a specific number of degrees in response to magnetic field changes. It is often assumed the stepper is perfectly accurate and never mis-steps, so tool position monitoring simply involves counting the number of pulses sent to the stepper over time. An alternate means of stepper position monitoring is usually not available, so crash or slip detection is not possible.

Commercial CNC metalworking machines use closed loop feedback controls for axis movement. In a closed loop system, the control is aware of the actual position of the axis at all times. With proper control programming, this will reduce the possibility of a crash, but it is still up to the operator and tool path programmer to ensure that the machine is operated in a safe manner. However, during the 2000s and 2010s, the software for machining simulation has been maturing rapidly, and it is no longer uncommon for the entire machine tool envelope (including all axes, spindles, chucks, turrets, toolholders, tailstocks, fixtures, clamps, and stock) to be modeled accurately with 3D solid models, which allows the simulation software to predict fairly accurately whether a cycle will involve a crash. Although such simulation is not new, its accuracy and market penetration are changing considerably because of computing advancements.[1]

Numerical accuracy vs equipment backlash

Within the numerical systems of CNC programming it is possible for the code generator to assume that the controlled mechanism is always perfectly accurate, or that accuracy tolerances are identical for all cutting or movement directions. This is not always a true condition of CNC tools. CNC tools with a large amount of mechanical backlash can still be highly accurate if the drive or cutting mechanism is only driven so as to apply cutting force from one direction, and all driving systems are pressed tight together in that one cutting direction. However a CNC device with high backlash and a dull cutting tool can lead to cutter chatter and possible workpiece gouging. Backlash also affects accuracy of some operations involving axis movement reversals during cutting, such as the milling of a circle, where axis motion is sinusoidal. However, this can be compensated for if the amount of backlash is precisely known by linear encoders or manual measurement.

The high backlash mechanism itself is not necessarily relied on to be repeatedly accurate for the cutting process, but some other reference object or precision surface may be used to zero the mechanism, by tightly applying pressure against the reference and setting that as the zero reference for all following CNC-encoded motions. This is similar to the manual machine tool method of clamping a micrometer onto a reference beam and adjusting the Vernier dial to zero using that object as the reference.

See also

- Binary Cutter Location
- Computer-aided technologies
  - Computer-aided engineering (CAE)
- Coordinate-measuring machine (CMM)
- Direct numerical control (DNC)
- Design for Manufacturability for CNC machining
- Gerber format
- Multiaxis machining
- EIA RS-274
- EIA RS-494

- G-code
- Part program
- Wireless DNC

References

1. ^ Zelinski, Peter (2014-03-14), "New users are adopting simulation software" (http://www.mmsonline.com/blog/post/new-users-are-adopting-simulation-software), *Modern Machine Shop*.

Further reading

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External links

- Media related to Computer numerical control at Wikimedia Commons

Retrieved from "http://en.wikipedia.org/w/index.php?title=Numerical_control&oldid=611921361"
Categories: Computer-aided engineering

- This page was last modified on 7 June 2014 at 08:08.

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6x6x8 Kool Koat Kure Powder Coat Coating Batch OVEN Industrial High T NEW

LP Natural Gas MADE IN USA Columbia TN USA

Have one to sell? Sell it yourself

Item condition: **New** | Add t

Quantity: 1 2 available / 1 sold

Price: **US $8,900.00** Buy It Now

Add to cart

33 watchers Add to watch list

Add to collection

New condition Located in United States

BillMeLater **12 months financing available**
Subject to credit approval. See terms

Shipping: Freight - Read the item description or contact the seller for details |
Item location: **Columbia, Tennessee, United States**
Ships to: **United States**

Delivery: Varies

Payments: PayPal, Bill Me Later |

Returns: Seller does not offer returns. You are covered by the eBay Money Back Guarantee if you received an item that is not as described in the listing.

Guarantee: |

Get the item you ordered or get your money back.
Covers your purchase price and original shipping.

Seller information
clmbiacoat (1574)
99.6% Positive feedback

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See other items
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Feedback on our

4x6x8 Kool Koat Kure Powder Coat Coati...
$7,900.00
Buy It Now

(NEW) POWDER COAT OVEN, BATCH OVEN,...
$8,195.00
Buy It Now

Kool Koat Kure Complete Powder...
$11,599.99
Buy It Now

powder coat coating electric curing oven ...
$2,485.00
Buy It Now

Rapid Batch pc coating oven
$5,000.00
0 bids

Description Shipping and payments Print | Re

eBay item number: 281205

Seller assumes all responsibility for this listing.
Last updated on Jan 08, 2014 07:27:06 PST View all revisions

Item specifics

Condition:	New: A brand-new, unused, unopened, undamaged item in its original packaging (where packaging is ... Read more	Brand:	Kool Koat
Country of Manufacture:	United States	Model:	CCOC3
Type:	Powder Coating System		

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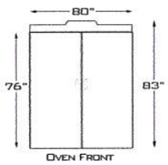
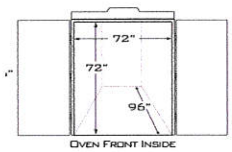
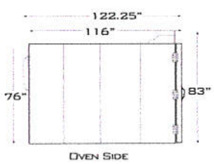
Powders | Ovens & Booths | Powder Guns | Tools | Supplies

6x6x8 Kool Koat Kure Powder Coat Coating Batch OVEN Industrial High Temp NEW

Drying Pre-Heating Curing MADE IN USA Columbia TN USA







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- We offer a 100% Satisfaction Guarantee

- We offer a 100% Satisfaction Guarantee
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Powder coating is a combination of pigment and resin that is ground into a powder form and is sprayed on an item to be coated. Powder coated surfaces are more resistant to chipping, scratching, fading, and wearing than other finishes. Color selection is virtually unlimited with high and low gloss, metallic, textures, and clear finishes available. By combining a base coat with a top coat, incredible custom powder coat colors can be created. Not only are unique, personalized colors created, but the durability, impact, scratch and wear resistance of the coating is enhanced with a two coat application as well.

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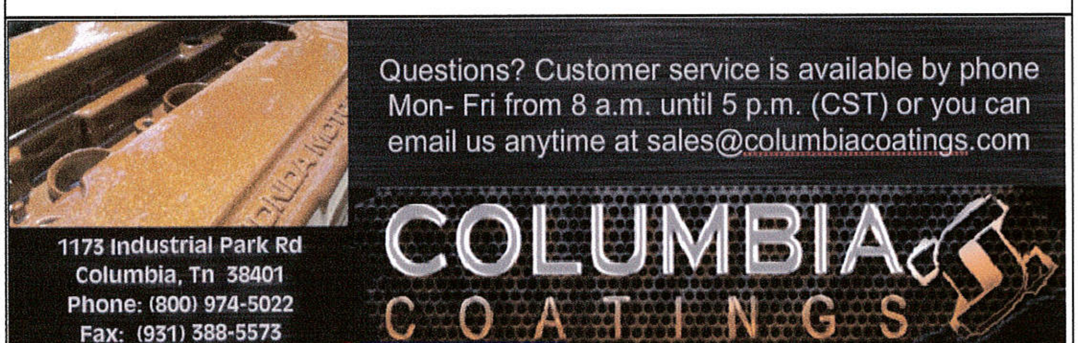

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HAAS SUPER MINI MILL

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SPECS

X:	16 "	# ATC:	10
Y:	12 "	Taper:	CT or BT 40
Z:	10 "	Table-W:	12 "
Power:	15 hp	Table-L:	36 "
RPM:	15000 rpm	Control:	HAAS

PRODUCT OVERVIEW

Vertical Machining Center; 16" x 12" x 10" (406 x 305 x 254 mm), 40 taper, 15 hp (11.2 kW) vector drive, 10,000 rpm, 1200 ipm (30.5 m/min) rapids, high-speed 10-station automatic tool changer, coolant pump, 1 MB program memory, 15" color LCD monitor, USB port, memory lock keyswitch, rigid tapping and clear plastic top cover. Three-phase power only.

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Specs	Year	Location	
X: 16 " **Y:** 12 " **Z:** 10 " **Power:** 15 hp **RPM:** 10000 rpm **# ATC:** 10 **Table-W:** 12 " **Table-L:** 36 " **Taper:** CT or BT 40		Illinois United States	View Wanted (http://yoururlhere.com/en/wanteds/45366-haas-super-mini-mill)
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Powder coating

From Wikipedia (View original Wikipedia Article) Last modified on 20 February 2014 at 13:19.

Powder coating is a type of coating that is applied as a free-flowing, dry powder. The main difference between a conventional liquid paint and a powder coating is that the powder coating does not require a solvent to keep the binder and filler parts in a liquid suspension form. The coating is typically applied electrostatically and is then cured under heat to allow it to flow and form a "skin". The powder may be a thermoplastic or a thermoset polymer. It is usually used to create a hard finish that is tougher than conventional paint. Powder coating is mainly used for coating of metals, such as household appliances, aluminium extrusions, drum hardware, and automobile and bicycle parts. Newer technologies allow other materials, such as MDF (medium-density fibreboard), to be powder coated using different methods.

Aluminium extrusions being powder coated

Powder coated bicycle frames and parts

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Properties of Powder Coating

Because powder coating does not have a liquid carrier, it can produce thicker coatings than conventional liquid coatings without running or sagging, and powder coating produces minimal appearance differences between horizontally coated surfaces and vertically coated surfaces. Because no carrier fluid evaporates away, the coating process emits few volatile organic compounds (VOC). Finally, several powder colors can be applied before curing them all together, allowing color blending and bleed special effects in a single layer.

While it is relatively easy to apply thick coatings which cure to smooth, texture-free coating, it is not as easy to apply smooth thin films. As the film thickness is reduced, the film becomes more and more orange peeled in texture due to the particle size and glass transition temperature (Tg) of the powder.

Most powder coatings have a particle size in the range of 30 to 50 μm, a softening temperature Tg around 80°C, a melting temperature around 150°C, and are cured at around 200°C.[1] For such powder coatings, film build-ups of greater than 50 μm may be required to obtain an acceptably smooth film. The surface texture which is considered desirable or acceptable depends on the end product. Many manufacturers actually prefer to have a certain degree of orange peel since it helps to hide metal defects that have occurred during manufacture, and the resulting coating is less prone to showing fingerprints.

There are very specialized operations where powder coatings of less than 30 micrometres or with a Tg below 40°C are used in order to produce smooth thin films. One variation of the dry powder coating process, the *Powder Slurry* process, combines the advantages of powder coatings and liquid coatings by dispersing very fine powders of 1–5 micrometre particle size into water, which then allows very smooth, low film thickness coatings to be produced.

For garage-scale jobs, small "rattle can" spray paint are less expensive and complex than powder coating. At the professional scale, the capital expense and time required for a powder coat gun, booth and oven are similar to a spray gun system. Powder coatings have a major advantage in that the overspray can be recycled. However, if multiple colors are being sprayed in a single spray booth, this may limit the ability to recycle the overspray.

Types of powder coatings

There are two main categories of powder coatings: thermosets and thermoplastics. The thermosetting variety incorporates a cross-linker into the formulation. When the powder is baked, it reacts with other chemical groups in the powder to polymerize, improving the performance properties. The thermoplastic variety does not undergo any additional actions during the baking process, but rather only flows out into the final coating.

The most common polymers used are polyester, polyurethane, polyester-epoxy (known as hybrid), straight epoxy (fusion bonded epoxy) and acrylics.

Production:

1. The polymer granules are mixed with hardener, pigments and other powder ingredients in a mixer
2. The mixture is heated in an extruder
3. The extruded mixture is rolled flat, cooled and broken into small chips
4. The chips are milled and sieved to make a fine powder

The powder coating process

The powder coating process involves three basic steps:

1. Part preparation or the pre-treatment
2. The powder application
3. Curing

Part preparation processes and equipment

Removal of oil, soil, lubrication greases, metal oxides, welding scales etc. is essential prior to the powder coating process. It can be done by a variety of chemical and mechanical methods. The selection of the method depends on the size and the material of the part to be powder coated, the type of soil to be removed and the performance requirement of the finished product.

Chemical pre-treatments involve the use of phosphates or chromates in submersion or spray application. These often occur in multiple stages and consist of degreasing, etching, de-smutting, various rinses and the final phosphating or chromating of the substrate. The pre-treatment process both cleans and improves bonding of the powder to the metal. Recent additional processes have been developed that avoid the use of chromates, as these can be toxic to the environment. Titanium zirconium and silanes offer similar performance against corrosion and adhesion of the powder.

In many high end applications, the part is electrocoated following the pretreatment process, and subsequent to the powder coating application. This has been particularly useful in automotive and other applications requiring high end performance characteristics.

Another method of preparing the surface prior to coating is known as abrasive blasting or sandblasting and shot blasting. Blast media and blasting abrasives are used to provide surface texturing and preparation, etching, finishing, and degreasing for products made of wood, plastic, or glass. The most important properties to consider are chemical composition and density; particle shape and size; and impact resistance.

Silicon carbide grit blast medium is brittle, sharp, and suitable for grinding metals and low-tensile strength, non-metallic materials. Plastic media blast equipment uses plastic abrasives that are sensitive to substrates such as aluminum, but still suitable for de-coating and surface finishing. Sand blast medium uses high-purity crystals that have low-metal content. Glass bead blast medium contains glass beads of various sizes.

Cast steel shot or steel grit is used to clean and prepare the surface before coating. Shot blasting recycles the media and is environmentally friendly. This method of preparation is highly efficient on steel parts such as I-beams, angles, pipes, tubes and large fabricated pieces.

Different powder coating applications can require alternative methods of preparation such as abrasive blasting prior to coating. The online consumer market typically offers media blasting services coupled with their coating services at additional costs.

Powder application processes

The most common way of applying the powder coating to metal objects is to spray the powder using an electrostatic gun, or *corona* gun. The gun imparts a positive electric charge to the powder, which is then sprayed towards the grounded object by mechanical or compressed air spraying and then accelerated toward the workpiece by the powerful electrostatic charge. There are a wide variety of spray nozzles available for use in electrostatic coating. The type of nozzle used will depend on the shape of the workpiece to be painted and the consistency of the paint. The object is then heated, and the powder melts into a uniform film, and is then cooled to form a hard coating. It is also common to heat the metal first and then spray the powder onto the hot substrate. Preheating can help to achieve a more uniform finish but can also create other problems, such as runs caused by excess powder. See the article "Fusion Bonded Epoxy Coatings"


Example of powder coating spray guns

Another type of gun is called a *tribo* gun, which charges the powder by (triboelectric) friction. In this case, the powder picks up a positive charge while rubbing along the wall of a Teflon tube inside the barrel of the gun. These charged powder particles then adhere to the grounded substrate. Using a tribo gun requires a different formulation of powder than the more common corona guns. Tribo guns are not subject to some of the problems associated with corona guns, however, such as back ionization and the Faraday cage effect.

Powder can also be applied using specifically adapted electrostatic discs.

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Another method of applying powder coating, called the fluidized bed method, is by heating the substrate and then dipping it into an aerated, powder-filled bed. The powder sticks and melts to the hot object. Further heating is usually required to finish curing the coating. This method is generally used when the desired thickness of coating is to exceed 300 micrometres. This is how most dishwasher racks are coated.

Electrostatic fluidized bed coating

Electrostatic fluidized bed application uses the same fluidizing technique and the conventional fluidized bed dip process but with much less powder depth in the bed. An electrostatic charging medium is placed inside the bed so that the powder material becomes charged as the fluidizing air lifts it up. Charged particles of powder move upward and form a cloud of charged powder above the fluid bed. When a grounded part is passed through the charged cloud the particles will be attracted to its surface. The parts are not preheated as they are for the conventional fluidized bed dip process.

Electrostatic magnetic brush (EMB) coating

A coating method for flat materials that applies powder with a roller, enabling relative high speeds and accurate layer thickness between 5 and 100 micrometre. The base for this process is conventional copier technology. Currently in use in some coating applications and promising for commercial powder coating on flat substrates (steel, aluminium, MDF, paper, board) as well in sheet to sheet and/or roll to roll processes. This process can potentially be integrated in an existing coating line.

Curing

When a thermoset powder is exposed to elevated temperature, it begins to melt, flows out, and then chemically reacts to form a higher molecular weight polymer in a network-like structure. This cure process, called crosslinking, requires a certain temperature for a certain length of time in order to reach full cure and establish the full film properties for which the material was designed. Normally the powders cure at 200°C (390°F) for 10 minutes. The curing schedule could vary according to the manufacturer's specifications. The application of energy to the product to be cured can be accomplished by convection cure ovens, infrared cure ovens, or by laser curing process. The latter demonstrates significant reduction of curing time.

Removing powder coating

Methylene chloride and Acetone are generally effective at removing powder coating, however most other organic solvents (thinners, etc.) are completely ineffective. Most recently the suspected human carcinogen methylene chloride is being replaced by benzyl alcohol with great success. Powder coating can also be removed with abrasive blasting. 98% sulfuric acid commercial grade also removes powder coating film.[citation needed] Certain low grade powder coats can be removed with steel wool, though this might be a more labor-intensive process than desired. Powder coating can also be removed by a burning off process, in which parts are put into a large high-temperature oven with temperatures typically reaching an air temp of 1100 to 1500 degrees with a burner temperature of 900. The process takes about four hours and requires the parts to be cleaned completely and repowdered. Parts made with a thinner-gage material need to be burned off at a lower temperature to prevent the material from warping.It is also Known as Stripping Process.

Market

In 2010, the global demand for powder coatings amounts to approximately US$5.8 billion. Driven by the development of new material, new formulations and advancement of equipment and application processes, the powder coating market presents a rapid annual growth of around 6% from 2012 to 2018. Currently, the industrial uses are the largest application market of powder coatings. Automotive industry experiences the most dynamic growth. Steady and strong growth is also expected by furniture and appliance markets. Furthermore, the application of powder coatings in IT & Telecommunication is also being widely explored.[2]

See also

- Laser printer
- Fusion bonded epoxy coating
- Sandblasting

References

1. ^ DSM Coating Resins (October 2004). "Enlarging the Cure Window of Powder Coatings" . *Paint & Coatings Industry*.
2. ^ "Market Report: Global Powder Coating Market" . Acmite Market Intelligence .

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