

**Eastwood®**

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Item #33278

# HOTCOAT®

## PCS-250 DUAL-VOLTAGE POWDER COATING SYSTEM

### INSTRUCTIONS



Powder Coating provides a premium coating, ideal for many automotive, marine, home, and garden applications. **EASTWOOD'S HOTCOAT POWDER COATING SYSTEMS** are breakthrough refinishing systems for the home hobbyist providing professional performance at a fraction of the cost of industrial equipment. The cured finish resists most chemicals, fuels, acids, thinners, brake fluid, UV light, and is much more durable than liquid coatings (up to ten times). Powder coating is environmentally friendly! It produces no toxic wastes and uses no solvents. The Eastwood HotCoat PowderCoat Systems allows you to coat a part and return it to service in less than an hour! Now you can powder coat any part that can withstand the 400°F (204°C) cure temperature utilizing an electric oven or an Infrared Light Cure System.

The **HIGH-VOLTAGE CORONA CHARGE** design delivers a consistent, hard hitting flow of powder providing the maximum powder coverage and adhesion possible. The #33278 PCS-250 Dual-Voltage HotCoat Powder Coating System allows the user to select a normal setting of 15,000 Volts for most powder coating jobs, or the ability to switch to 25,000 Volts to cover larger areas, provide solid multiple coat coverage, or create custom effects, even with high metallic content powders.

Read and understand all instructions and precautions before proceeding. This unit uses high voltage, which can produce an electrical shock as well as powder, which may become flammable under certain circumstances. Eastwood shall not be held liable for consequences due to deliberate or unintentional misuse of this product.

## INCLUDES

- (1) HotCoat PCS-250 Dual-Voltage Powder Coating System
- (1) Powder Cup
- (1) Deflector

## SPECIFICATIONS

**Power Requirements:** 110-120 VAC, 50 or 60 hz., 0.24 mA., 28.8 watts

6 ft. 120-volt, 15 amp, grounded electrical input cord

6 ft. lead with ground clamp (for attachment to the part to be powder coated)

Remote activation switch with 6 ft. lead; applies voltage to emitter: hold-on, release-off

8 ft. high voltage gun power lead Converts 110-120VAC to 15KVDC or 25KVDC  
(no user-serviceable parts)

# IMPORTANT SAFETY INFORMATION

The following explanations are displayed in this manual, on the labeling, and on all other information provided with this product:

## **! DANGER**

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

## **! WARNING**

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

## **! CAUTION**

CAUTION used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

## **! NOTICE**

NOTICE is used to address practices not related to personal injury.

## GENERAL SAFETY RULES

## **! WARNING**

Read all instructions. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury. The term “power tool” in all of the warnings listed below refers to your mains-operated (corded) power tool or battery-operated (cordless) electrical tool.

## SAVE THESE INSTRUCTIONS

### 1) WORK AREA SAFETY

- a) Keep work area clean and well lit. Cluttered or dark areas invite accidents.
- b) Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.
- c) Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

## **2) ELECTRICAL SAFETY**

- a)** Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. Unmodified plugs and matching outlets will reduce risk of electric shock.
- b)** Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.
- c)** Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- d)** Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.
- e)** When operating a power tool outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.

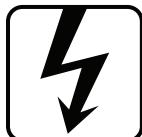
## **3) PERSONAL SAFETY**

- a)** Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.
- b)** Use safety equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- c)** Avoid accidental starting. Ensure the switch is in the off-position before plugging in. Carrying power tools with your finger on the switch or plugging in power tools that have the switch on invites accidents.
- d)** Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.
- e)** If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of these devices can reduce dust-related hazards.

#### **4) POWER TOOL USE AND CARE**

- a) Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- b) Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- c) Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.
- d) Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tools operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.
- e) Use the power tool, accessories and tool bits etc., in accordance with these instructions and in the manner intended for the particular type of power tool, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.

## **ADDITIONAL SAFETY INFORMATION**



### **HIGH VOLTAGE! READ AND UNDERSTAND ALL DIRECTIONS BEFORE PROCEEDING!**

- The power supply box is a sealed unit and contains no user serviceable parts!
- Contact with the emitter when the button is depressed will result in an unpleasant shock!
- If you have a medical condition or pacemaker check with your doctor before using.



## **⚠ WARNING SHOCK HAZARD!**

- Never bypass the ground plug. Grounding is necessary for proper operation of the unit and prevents shock.
- **DO NOT** touch the emitter until after the activation switch is released and the unit is unplugged.
- When applying powder to the part, **DO NOT** allow the emitter to come in contact with the part or other grounded objects.
- **DO NOT** step on, kink, or pull the wires. Before using the gun inspect the condition of all wires.
- **DO NOT** touch or hold the part while applying powder coating.
- **NEVER** operate or store HotCoat gun in damp or wet conditions.
- Plug into a minimum 15 amp, grounded circuit. If using an extension cord, it must be AWG 16 or greater, grounded and no longer than 25'.



## **⚠ WARNING HEALTH AND INJURY HAZARDS!**

- Dust and fine particles are dispensed in use which can contain hazardous or toxic substances. Breathing this dust can cause respiratory health problems. Always use NIOSH approved respiratory protection while using this Powder Coating Gun.



## **⚠ WARNING FLAMMABILITY HAZARD!**

- Powder coating dust, like common household dust, when confined and suspended in air, poses a fire and potential explosion hazard if ignited. Good housekeeping, adequate ventilation, dust control and isolation from potential ignition sources is required! Sweep up unused powder from the floor. Do not vacuum unless the vacuum is equipped with an explosion-proof motor. Never smoke while powder coating. Do not apply powder coat near any source of ignition, e.g. open flames, sparks, etc. Use the same precautions that you would for liquid solvent-based coatings.

### **DO NOT USE A GAS OVEN!**

- When coating internal areas such as boxes, tubing, inside corners etc., if using the Dual -Voltage gun, keep the Dual-Voltage power switch in the lower 15K setting and apply powder in stages so that a dense dust cloud will not form. Coat small areas one at a time and allow cloud to dissipate before moving to next area. **DO NOT TOUCH Emitter TO OBJECT!** This will create a spark which may ignite a dust cloud.



## **⚠ CAUTION BURSTING HAZARD!**

- **DO NOT** exceed 10 PSI (0.68 bar) of gun inlet pressure. Permanent equipment damage and/or bursting could occur and cause personal injury.

# REQUIRED ITEMS

Before you begin using the HotCoat Powder Coating System make sure you have the following items (not included):

- A dedicated electric oven (see “Additional Items” section) or toaster oven large enough to accommodate the parts to be cured. For curing larger parts that do not fit in an oven, an Infrared Curing Lamp (see “Additional Items” section) can be used.

## **⚠ CAUTION**

**DO NOT use an oven used for food preparation or located in a living area, as mildly toxic fumes are given off by the powder during the curing process!**

**DO NOT use a gas oven! Used household electric kitchen ovens can be obtained very easily for little or no money by checking your local online items for sale site or by calling appliance stores and remodelers in your area.**

- A sufficient air supply source for the gun. A small air compressor capable of providing a steady minimum 1 cfm at 5-8 psi is required. If a suitable air compressor is not available, a portable air tank with regulator can be used. The air supply must be dry, and the use of a moisture trap or desiccant system is strongly recommended.
- A grounded 110-120VAC 60/50hz. outlet or heavy-duty grounded extension cord to plug in the 6' power cord.

## **⚠ CAUTION**

**Unit must be grounded to work properly and safely!**

- A clean, safe, well-lit, well-ventilated work area.
- A NIOSH-approved respirator (see “Additional Items” section) to wear while handling and applying powder.
- Disposable vinyl or Nitrile gloves (see “Additional Items” section) to handle powder and cleaned parts.
- A pair of goggles (see “Additional Items” section) to provide eye protection during powder coating and gun cleaning operations.

# SUGGESTED ITEMS TO MAKE POWDERCOATING EASIER AND SAFER (not included)

- A dedicated spoon or funnel for transferring powder from supplying container to Gun Cup.
- A roll of aluminum foil for heat-resistant masking use.
- A roll of High-Temperature Masking Tape (Eastwood #16319) to mask threads, machined surfaces other areas where powder build is not desired (see *Masking Parts*, page 11).
- High-Temperature Silicone Plugs and Caps (Eastwood #58041) to seal threaded holes and close tolerance openings. These plugs also work great as “legs” to support parts in the oven during curing.
- A spool of Stainless Steel Wire (Eastwood #43045) to hold parts while powder coating and curing. (Always use a clean piece of wire to guarantee a complete ground)
- Clean cotton rags or lint free paper towels.
- A disposable “at-the gun” Moisture Separator (Eastwood #34066). It should be replaced monthly if used daily.
- A pair of leather heat-resistant gloves (Eastwood #21294) for use in placing powder coated items into and removing from a hot oven.
- A quick disconnect air coupler set (Eastwood #31521).
- A timer.
- IR thermometer.
- A can of Eastwood PRE-Painting Prep (#10041Z). Apply to parts prior to powder coating and allow to air dry, Proper surface preparation is the most important factor in achieving a durable finish

## SETTING-UP A POWDER COATING AREA

Because the charged powder cloud is electrostatically drawn to a grounded metal part, there is minimal powder waste as much of the powder “sticks” to the part including around edges, inside crevices and around to the back unlike the typical “line-of-sight” application of sprayed on liquid coatings. A minimal amount of powder will fall to the floor and settle on surrounding surfaces. This should be taken into consideration when choosing an area to apply powder coating.

- Work in a clean, well-ventilated area with plenty of light but without a direct draft and free of any airborne debris.
- Even though powder can be easily dusted or wiped off surfaces, surrounding surfaces and floor areas should be covered for easier clean-up.
- A dedicated spray booth is best however a temporarily constructed cardboard enclosure can be helpful in providing an optimal finish.
- Work with plenty of light available but direct, intense sunlight should be avoided as excessive heat from sunlight can cause a partial cure to occur on parts.

# PREPPING PARTS FOR POWDER COATING

## IMPORTANT NOTES:

- As with normal refinishing, powder can only be applied to clean surfaces and a successful finish will only be as good as the prep that goes into it.
- Properly clean the part to be coated by removing all traces of old paint, rust, grease, oil, etc. Impurities left on a metal surface will prevent proper powder coat adhesion.
- Old paints and coatings will generally burn and flake off at powder curing temperatures causing any newly applied Powder Coating to fail. It is absolutely necessary then to remove all traces of old paints or coatings.

## OLD PAINT AND COATING REMOVAL METHODS

There are basically two ways to effectively remove old paints and coatings from an item to be powder coated:

- Mechanical Stripping, which is done by wire brushing, abrasive blasting, sanding, or removal with a power tool and a Removal Disc (Eastwood #31094).
- Chemical Stripping, which is often the quickest way to remove heavy and thick coatings or when stripping large areas.

## RUSTY SURFACES

As with coating removal, there are basically two ways to effectively remove rust:

- Mechanical removal which is done by abrasive blasting, wire brushing, sanding or removal with a power tool and a Removal Disc (see [www.Eastwood.com](http://www.Eastwood.com)).
- Chemical treatment for removal of less severe and minor surface rust (see [www.Eastwood.com](http://www.Eastwood.com)).

## FILLING LOW SPOTS, PITS AND MINOR HOLES

- A filler capable of 400°F cure temperatures can be used as a filler for corroded or pitted areas prior to powder. Lab-Metal is a filler that works well and conducts an electrical charge for powder coating (see Eastwood #10288Z). Apply by the same methods as standard filler and finish by level sanding and feathering all edges with 180, 220, and 320 grit paper.
- Do not build filler more than 1/16" deep or lifting may occur during heat cure.
- Filler applications should be pre-baked at 400°F for 20 minutes before final sanding and powder coating to assure a full cure and prevent shrinkage.

## **GREASE AND OIL REMOVAL**

- Metal parts must be totally free of any traces of oil, dirt, or other contaminants before powder coating.
- Porous cast iron, die cast, cast aluminum and magnesium parts trap contaminants that when heated will outgas and cause porosity problems when the powder is cured. All cast parts should be pre-baked at **450°F** for an hour or more to burn out or “outgas” any oils or other impurities that are embedded in the surface prior to applying powder coat. Failure to do so will result in bubbles under the cured powder finish and poor adhesion.

To achieve this, heat the part to 450°F for 1 hour. Remove part from oven and allow to cool to the point where you can safely handle the piece. Apply PRE or acetone to a clean rag and wipe entire part of grease and oil residue.

### **▲ NOTICE**

**Die-cast metal varies widely in formulation, many of which can be difficult to powder coat and, in some cases may even melt at 450°F. Some aluminum and magnesium alloys can be weakened by exposure to the cure temperatures. Check with part manufacturer if unsure. Also, avoid coating metal items that are soldered together as the solder may fail after exposure to cure temperatures. Lastly, do not forget to return oven to 400°F before curing!**

- All parts must be degreased with Eastwood PRE-Painting Prep #10041 or acetone before applying powder (**FIG 1**). Wipe the part repeatedly until no further contaminants come off on a clean white rag. Let the part cool to room temperature before applying the powder.

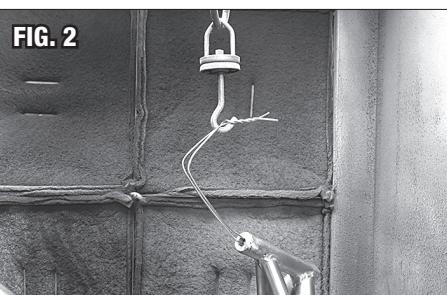


# PREPARING TO POWDER COAT PARTS

## HANGING OR SETTING UP A PART FOR COATING

Before coating anything it is very important to carefully examine the part to be powder coated and decide where the best location for a hook is. Consider balance of the part while hanging, avoidance of a hook creating a “shadow” in the applied powder finish and risk of the part swinging or falling.

- Bend wire hooks to hang the part during powder application and curing (**FIG 2**).
- Eastwood .041 Stainless Steel Safety Wire works well for hanging (#43045). Never use a coated wire as it will prevent good grounding.
- Often, threading or inserting scrap bolts or screws through holes in a part make a good hanging source.
- High-Temperature Silicone Plugs and Caps (Eastwood #58041) can often be used as “legs” to support the parts above the trays, and as plugs for bolt holes.
- Large or Jumbo paper clips bent to an open “S” configuration make excellent hanging hooks.



**FIG. 2**

## MASKING PARTS

In many instances, threaded holes, machined sealing surfaces and other areas where powder accumulation can affect the fit of parts should be masked before applying powder to a part.

- Once the part is thoroughly dry from degreasing, the powder can be applied. Handle the cleaned part with vinyl or Nitrile Disposable Gloves (Eastwood #16201) to avoid contamination. Finger prints can affect adhesion!
- Plan out how the part should be positioned in the oven before coating to avoid bumping the part and knocking off uncured powder.
- Use High-Temperature Silicone Plugs and/or High Temperature Tape (Eastwood #58041 or #16319) to mask threads critical tolerance areas. Both should be left on the part during the coating and curing process. Since the powder will coat around corners, be sure to mask all appropriate areas.
- Use aluminum foil as a masking material held in place with High-Temp Masking Tape to cover machined surfaces, mask large areas, create two-tone designs or coat intricate parts.

## USE OF OVEN RACKS

To minimize bumping a part after powder has been applied, it is best to hang the part from an oven rack or similar powder coating rack. First clamp the rack to a bench or a powder coating stand, apply the powder, and insert the entire rack with the part hanging into the oven to cure.

- Make sure the oven is clean. Cover the oven racks with aluminum foil to avoid having a build-up of cured powder on them
- To avoid bumping a coated part, practice moving part from the powder application area to inside the oven to avoid damaging the uncured powder you will soon apply.

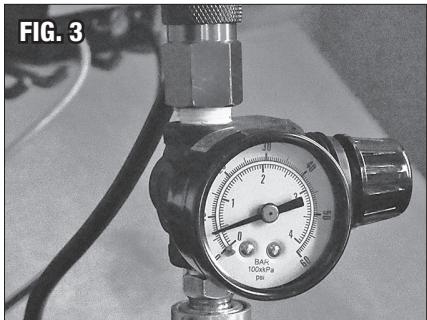
# POWDER GUN SET-UP

## CONNECTING AIR SUPPLY TO THE GUN

The HotCoat Gun requires 1 or more cfm at 5 - 10 psi, with 8 psi being ideal (**FIG 3**). If a suitable air compressor is not available, a portable air tank with regulator can be used.

### ▲ CAUTION

Never exceed 10 psi!



**FIG. 3**

- The air must be moisture and oil free. A good quality Filter/Regulator installed as close to the gun as possible is recommended for the best results. A disposable "at the gun" filter is strongly suggested to eliminate the possibility of moisture (Eastwood #34066).
- Use a good quality thread sealing tape on all air fitting threads to avoid air leaks.

## FILLING THE POWDER CUP

### ▲ NOTICE

Handle powder with the same considerations as handling liquid paint. Use clean disposable gloves when handling powder to avoid contamination. Keep powder containers tightly closed and in a dry, room temperature environment as excessive humidity and heat will damage the powder.

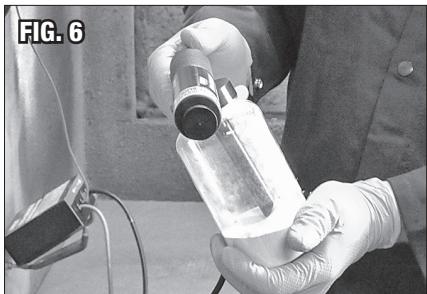


**FIG. 4**



**FIG. 5**

- Use a clean sheet of lint-free paper rolled into a conical shape, a spoon, or a funnel to pour the powder into the cup (**FIG 4**).
- Add the chosen color powder to the Gun Cup. A little goes a long way. Filling the Gun Cup to approx. 2" deep is ideal (**FIG 5**).



**FIG. 6**

### ▲ NOTICE

Never fill the Gun Cup more than 1/2 full or incomplete fluidization will occur resulting in clumps.

- Thread the Powder Cup onto the bottom of the Gun (**FIG 6**).

## USE OF THE DEFLECTOR

The HotCoat Guns are supplied with the Deflector installed on the Emitter Rod (**FIG 7**).

When powdercoating smaller parts or parts with irregular surfaces or where a tighter, more concentrated focus of powder is desired, the Gun will perform best with the Deflector removed (**FIG 8**).

When coating larger parts or panels with mostly flat expanses of surface area or where a diffused, spread-out fan of powder is desired, the Deflector should be used.

### **DANGER**

#### ELECTRIC SHOCK HAZARD!

**DO NOT** touch the emitter until after unit is unplugged.

- To remove the Deflector, grip it with two fingers and pull it straight out and off the Emitter (**FIG 10**). **NOTE:** The Deflector may be a tight fit and some slight side to side twisting may be required while pulling.
- Set the Deflector aside in a safe location for potential future use.
- To install Deflector, place the beveled edge inward toward the Gun Barrel with the center hole centered over the Emitter Rod.
- While firmly gripping it, push the Deflector onto the Emitter Rod. **NOTE:** The Deflector may be a tight fit and some slight side to side twisting may be required while pushing on.
- When properly installed, the Emitter Rod should protrude beyond the face of the Deflector by 1/8" to 3/16".
- Setting the Deflector closer to the Gun Barrel will produce a larger Fan Pattern (**FIG 9**) while a setting closer to the end of the Emitter Rod will produce a smaller Fan Pattern (**FIG 10**).
- With the unit unplugged and the air supply connected and set to 8 psi, some powder in the Gun Cup, and the Gun directed at a suitable waste powder receptacle; quickly pull the Gun Trigger to observe the Fan Pattern. Readjust Deflector if desired.

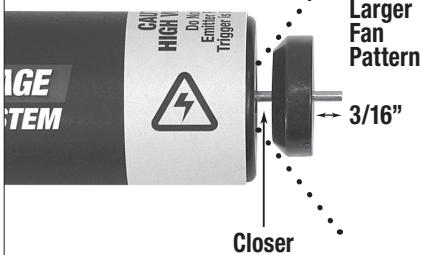
**FIG. 7**



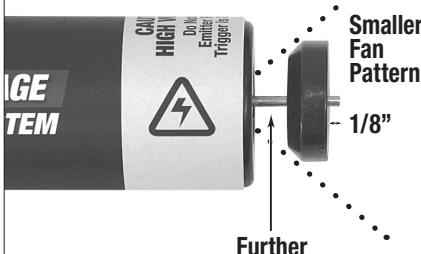
**FIG. 8**



**FIG. 9**



**FIG. 10**



## GROUNDING THE PART

Powder coating works by “fluidizing” the powder in the Gun Cup by infusing it with air when the Trigger is pulled. It then flows out of the Gun Cup, through the Gun Barrel and over the Emitter Rod where the powder particles pick up a high-voltage electrostatic charge. The electrostatically charged powder is then pulled directly toward a metal surface that is grounded by the attachment of the Ground Clip and Ground Lead of the High Voltage Box of the HotCoat system. This completes the electrical circuit and deposits the powder on the surface of the grounded metal part.

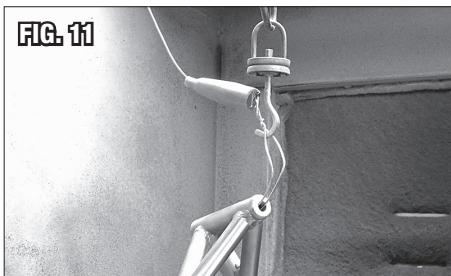
Without an adequately grounded part, the charged powder will not be drawn to the surface of the part and will fall away to the floor.

### **▲ NOTICE**

**A good grounding of the part is extremely crucial to the success of the powder coating process and is the #1 cause of failure of the powder to “stick” to the parts surface.**

- The Ground Clip should be attached directly to the part for best results however it may be also clipped to a screw or bolt which is secured to the part, clipped to a wire hanging hook or to a clean, bare oven rack (**FIG 11**). Keep in mind that the more connections between the part and the Ground Clip, the greater the chance of poor grounding and failure of the powder to “stick”.

**FIG. 11**



### **▲ NOTICE**

**The contact surfaces of the Ground Clip must always be kept clean and free of accumulated debris and sprayed powder. Never reuse hanging hooks as a cured powder accumulation will act as an insulator against the electrostatic circuit and grounding.**

**NOTE:** Check temperature with an oven thermometer or a Non-Contact Infrared Thermometer (Eastwood #31223).

## PREHEATING THE OVEN

- Before powder coating the part - preheat the oven to 400°F (204°C).
- Check temperature with a kitchen oven thermometer (available at virtually any volume discount store) or a Non-Contact Infrared Thermometer (Eastwood #31223).

### **▲ NOTICE**

**The #2 cause of a failed powder coating job is improper curing temperature and too short of a cure time. It is critically important to have an oven set at and able to maintain an accurate 400°F (204°C) curing temperature. Too low of an oven temperature will result in incomplete curing of the powder while too high can cause discoloration and cracking of a powder finish. Too short of a cure time results in an incomplete cure while longer time in the oven will not cause a problem. If in doubt, leave it in the oven for a longer period of time.**

# APPLYING POWDER

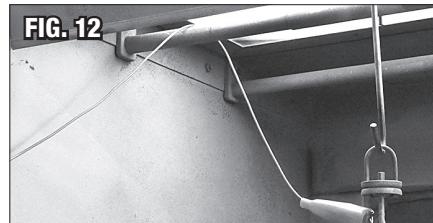
## **▲ CAUTION** TRIPPING HAZARD!

Unroll and separate all cords. It is best to plug in the unit at a receptacle that leads the Power Cord away from the work area.

## **▲ NOTICE**

Before plugging in the unit, inspect all cords for cuts, frays or other damage.

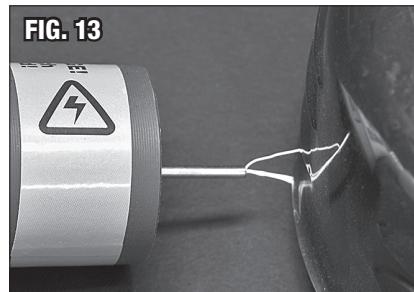
- Plug the power supply into a grounded 110-120 VAC, 60/50 Hz source of electrical power.
- Keep the Power Box up off the floor and placed on a workbench or other suitable surface.
- Route the Ground Lead overhead and off the floor if possible to keep it away from the walking area (FIG 12).



**FIG. 12**

## **▲ WARNING** SHOCK HAZARD!

- Never bypass the ground plug. Grounding is necessary for proper operation of the unit and prevents shock.
- DO NOT touch the emitter until after the activation switch is released and the unit is unplugged.
- When applying powder to the part, DO NOT allow the emitter to come in contact with the part or other grounded objects or intense sparking will occur between the emitter and part being coated (Fig 13). Maintain approximately 4 inches between the gun tip and part being coated.
- DO NOT step on, kink, or pull the wires. Before using the gun inspect the condition of all wires.
- DO NOT touch or hold the part while applying powder coating.



**FIG. 13**

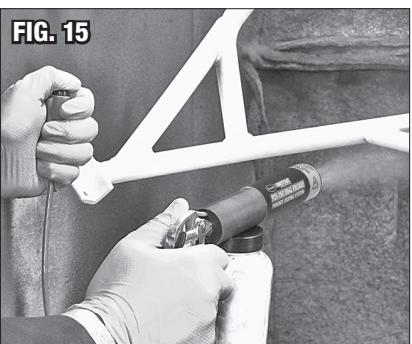
- For most applications, the lower 15KV Power Setting on the #33278 HotCoat PCS-250 Dual-Voltage Coating Gun System (**FIG 14**) is sufficient power for good powder coverage. Use of the higher 25KV setting is best suited for use on larger objects and flat panels. Also, the higher 25KV setting may be useful when applying second coats or clear coats to assure thorough coverage.



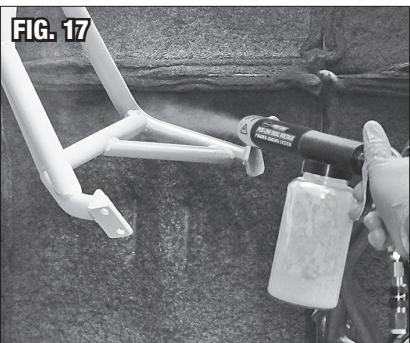
**▲ NOTICE**

On certain intricate part configurations, contours and inside corner areas, the use of the higher 25KV setting may be too high and induce a powder repelling magnetic field to the part known in the industry as the “Faraday-Cage Effect” which actually repels charged powder. Check position of the Dual-Voltage Switch. If this should occur, stop all work, blow off clinging powder film then either wash and dry the part in warm water or preheat the part in an oven to dissipate the repelling charge and re-apply powder at the lower power switch position.

- Depress the activation switch while triggering the gun. Depressing the Activation Button energizes the Emitter, charging the powder. Releasing the Button turns the power charge off (**FIG 15**).
- For use on coating smaller parts or irregular surfaces, be sure the Deflector is not in place on the Emitter Rod at the discharge end of the gun (**FIG 16**).
- Powder is difficult to apply in deep recessed areas or into corners. Try repositioning the part to allow gravity to help assure coverage in corners and reposition the gun. Practice on some scrap pieces of metal to obtain a uniform coating.



- Move the gun in slightly different angles and in a circular motion to ensure that all areas of the part are covered (**FIG 17**). Be sure to coat deeper crevices and inside corners first to prevent uneven coating. The coated surface will have a fuzzy, dull opaque coating of powder. Make sure all areas of the part are coated evenly. Bare metal should no longer be seen through the powder on the surface.
- If the part is bumped and some of the powder is brushed off, it is usually best to blow all the powder off with compressed air and start over. This is particularly important for the translucent colors which easily show blemishes.
- Inspect the coated part with a high intensity light to be sure no areas of bare metal show through. Apply additional powder to the area if necessary.
- The transfer of the static electrical charge becomes less efficient as powder builds up on the Emitter. This occurs most frequently with heavy metallic content powders (**FIG 18**).



**CAUTION**

Unplug Power Cord before touching Emitter.

- To remove powder build-up from the Emitter, wipe accumulated powder off the Emitter with a dry cloth.

# CURING POWDER

Powder coatings cure with heat. Baking at the 400°F changes the powder from it's dry solid state to a "glossy" liquid state. This is called the "flow out" or "gloss over". The time the powder is in this liquid state and "flows" is called the gel-time.

The remaining time at cure temperature activates a chemical bonding process that "thermosets" the powder.

To help maximize durability and produce a smooth coating, the substrate (part being coated) must be brought up to the cure temperature quickly and allowed to stay at that temperature for the specified cure time. To properly cure the HotCoat powders and achieve full chemical, heat (up to 400°F), chip and abrasion resistance, along with the smoothest possible finish, follow the steps below.

## **▲ NOTICE**

**Most powders inherently have a slight "orange peel" texture especially with polyester based powder formulations (the surface condition and preparation will affect smoothness). Cured powder may be "cut and buffed" just like liquid coatings to achieve a glass-smooth finish (not metallics).**

- Always preheat the oven to 400°F (Some clears, and low-cure temp powders may vary, check individual powder instructions for specific cure temperatures). All ovens vary; this may take 5-10 minutes to achieve 400°F.

## **▲ NOTICE**

**Use a Non-Contact Infrared Thermometer (Eastwood #31223) or kitchen oven thermometer to guarantee an accurate 400°F.**

- Carefully place the coated piece into the 400°F oven and close the door.
- Check the part every 5 minutes until the entire piece has flowed out or glossed over. Some edges or thinner cast sections of the part may flow out or gloss over early but wait until the entire piece has flowed out. Note that opening the oven door will cause a temperature drop and it must be allowed to return to 400°F.

## **▲ DANGER**

**DO NOT USE A GAS OVEN!**

- At this point, using a timer (Not Included) begin the 20-minute cure time.
- Always refer to individual powder instructions for specific cure temperatures.
- Allow the piece to cure with the oven on for the entire 20 minutes.
- After the 20-minute cure, remove the part from the oven or turn the oven off, crack the door open and allow the piece to slowly cool.
- Once cool, the piece can be second coated, or the tape, plugs, and other masking material can be removed, and the part returned to service.

**▲ NOTICE**

Larger and/or heavy cast pieces take longer to heat up and may take 10-30 minutes to flow out or gloss over – this is normal. Simply continue to check the piece until complete flow has been achieved, then set your temperature and timer as described above for curing. As always, longer cure times will not harm the powder. If in doubt, let it cure longer.

**▲ NOTICE**

Some clear and low cure temperature powders require lower cure temperatures. Curing at higher temperatures may cause yellowing. Check individual powder instructions for specific cure temperature instructions.

## CLEANUP

When you are finished using one color you must clean the gun before using another.

**▲ WARNING**

To avoid Electrical Shock: Unplug Power Cord before attempting any clean-up procedures. Disconnect the air supply.

**▲ WARNING**

Dust and fine particles are dispensed in use which can contain hazardous or toxic substances. Breathing this dust can cause respiratory health problems. Always use NIOSH approved respiratory protection while using this Powder Coating Gun. Also wear disposable gloves when handling powder.

**▲ WARNING**

DO NOT use solvents when cleaning your powder coating system. The gun and components are designed to be cleaned with compressed air only.

- If the Deflector is used, with gloves on, gently twist off and set it aside in a safe location.
- Unscrew the cup; pour the remaining powder back into the original powder container. Always store powder in the original powder container.

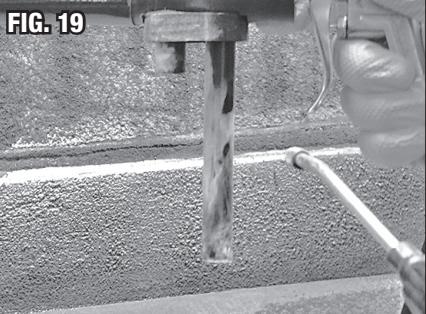
**▲ CAUTION**

Never use more than 30 psi of compressed air to clean the gun.

- Using a blow gun, thoroughly clean the inside and outside of all the tubes and deflector. Direct air into the nozzle and the pick-up tube to make sure no powder remains (FIGS 19 & 20).
- Blow out any remaining traces of powder in the Powder Cup.
- The only other cleaning required is to clean up the powder on the floor or workspace.

**⚠ WARNING**

Powder dust in heavy concentrations is potentially flammable! Due to the possible explosion risk, never use an electric vacuum, ShopVac or wet/dry vac to clean up powder! Always sweep up powder.



**FIG. 20**



## RE-USING CLEANED-UP POWDER

Recycling powder is not recommended as any debris will result in a rough surface and a compromised finish. Contaminated powder can be safely disposed of in the trash.

**⚠ CAUTION**

Before re-connecting your Powder Gun be sure to change the air pressure from 30 psi back to 8 PSI or damage will occur! The Cup and lid assemblies are designed for no more than 10 PSI.

Replace your moisture filter regularly, as moisture will build up even when the gun is not in use.

## PUTTING POWDER COATED PARTS BACK INTO USE

Powder coating is an extremely durable flexible coating that will withstand repeated bending and sharp impacts without chipping or flaking. However, care needs to be exercised when bolting powder coated components in place. To avoid chipping use steel or nylon washers under nut and bolt heads. Remove all traces of high temp masking materials and plugs from previously masked areas or threads.

## APPLYING SECOND COATS

Typically, one coat of powder is all that is needed. However, some metallic or “chrome” type finishes need to be top-coated with a clear or translucent finish to protect the metallic coatings from oxidation and dulling over time. Refer to individual powder specifications for guidance.

Powder can act as an electrical insulator. The higher 25KV switch setting is recommended to provide additional power to penetrate an existing powder coated surface for applying multiple coats.

- Once the first cure is complete, allow the part to cool without touching the surface.
- Once cool, support or hook the part as done for the first coat, in the spray booth or work area.
- Load the gun with the appropriate color or clear no more than half full.
- Switch the Dual-Voltage switch to the 25KV setting.
- Attach the ground clip directly to a bare metal area on your part. This can be done by threading in an old bolt into an existing hole, or simply scraping the powder from an inconspicuous area, and attaching the clip.
- Apply the second coat in the same manner as the first, concentrating on the deep recessed areas first. A good cloud of powder is critical in getting a good coating.
- After the part is properly coated, remove the ground clip.
- If a bare spot exists where the ground clip was connected, it can be relocated to another area and a small amount of powder can be applied to cover that spot.
- Cure this second coat in the oven, in the same manner as the first coat following the identical instructions as for the first coat.

## APPLYING 2ND COAT TO PRE-HEATED SURFACE

Powders can be applied to hot surfaces using a technique known in the industry as “Hot-Flocking”. Doing this causes the powder to “Flow-Out” immediately after landing on the hot surface.

To use this technique:

- Pre-heat the part in an oven set temporarily to 50° above cure temp. This may take 10-40 minutes depending on size. The time that a part needs to be preheated varies with size and density. Heavy cast parts will require more time, thinner lighter pieces, less time.
- After pre-heating, be sure to lower oven to the proper cure temperature, remove part from oven and immediately apply powder. The powder will “melt” and flow immediately upon contact.
- Exercise care to avoid drips and runs. Excessive powder application will cause this.
- Place coated part back into pre-heated oven set at cure temp for an additional 20 minutes to complete the cure.

## CARE OF POWDER COATED FINISHES

Powder coated finishes are easily cleaned and maintained. Wash with a dish soap or automotive washing products and water. Automotive (non-abrasive paint polish) may be used to remove water spotting and enhance the gloss.

Cured powder can be wet-sanded and buffed to rub out defects or achieve a glass-smooth surface using the same methods as for traditional painted finishes.

## REMOVING POWDER COATING

Powder coating can be removed from surfaces by using a dedicated chemical remover or stripping agents. Several choices are available from Eastwood. Softening of the cured powder can be speeded up by covering a part thoroughly with the stripper or removal agent then covering with a plastic bag or sheeting to prevent drying out or evaporation.

Abrasives blasting can also be used although due to its inherent toughness, powder coat removal will require more effort than liquid coatings. A full line of abrasive blasters and media is available from Eastwood. (See [www.Eastwood.com](http://www.Eastwood.com)).

# TROUBLESHOOTING

## PROBLEM: Powder Does Not “Stick” to Surface of Part

### • CAUSE: Poor Grounding of Part

- **SOLUTION:** Stop all work, unplug Gun then retrace all paths of ground. There must be a complete and solid ground path between the Grounding Clip and the part to be coated. Any dirt, surface rust, or any other insulating agent between the Grounding Clip, hanging wire, hook or rack MUST be eliminated before continuing.

To test for good ground:

### Method A:

1. Use a clean piece of scrap metal, tuna can, metal spoon or other known completely bare and clean piece of steel, iron or aluminum.
2. File the teeth of the Ground Clamp lightly and the point of the test piece where the Ground Clamp is to be attached and clamp it directly to it.
3. Plug Gun back into power source and apply powder to the object. Powder should be drawn directly to the test piece.

### Method B:

1. Unplug the Power Box from the electrical supply.
2. Thoroughly clean the HotCoat Gun of any powder.
3. Place the HotCoat Gun on its side on a non-flammable surface.
4. Use a clean piece of scrap metal, tuna can, metal spoon or other known completely bare and clean piece of steel, iron or aluminum.
5. File the teeth of the Ground Clamp lightly and the point of the test piece where the Ground Clamp is to be attached and clamp it directly to it.
6. Move the Emitter Rod of the HotCoat Gun to approx. 1/2" from the grounded metal object.
7. While keeping a safe distance from the HotCoat Gun, the metal object and the surface they are set on, plug in the HotCoat Gun.
8. **Momentarily** depress the Activation Button. A robust spark will jump from the Emitter Rod to the metal object and produce an audible snap (**Fig 21**). Release button immediately!

### ⚠ CAUTION

DO NOT continue to produce the spark or permanent damage will occur to the Power Supply.



FIG. 21

**PROBLEM:** Powder is Being Repelled From Surface of Part or Bare Areas are Appearing on Surfaces Where Powder Previously Attached

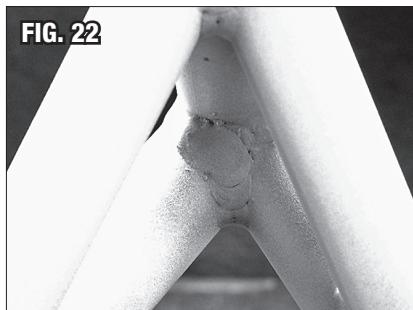
- **CAUSE:** A repelling magnetic field has built up on the part known in the industry as the “Faraday-Cage Effect” (Fig 22)

- **SOLUTION:** Stop all work, unplug Gun, blow off remaining clinging powder film then either wash and dry the part in warm water or preheat the part in an oven to dissipate the repelling field and re-apply powder.

Be sure the Power Switch is set to the lower 15K position before continuing to minimize re-occurrence of the condition.

Also, turn the Gun Barrel 90° to the surface of the part, keep the Gun 10"-16" from the surface and approach all inside corners first and to help avoid inducing a repelling field.

**FIG. 22**



- **CAUSE:** Air pressure supply to gun is too high

- **SOLUTION:** Required air supply is 1 cfm at 5-8 PSI. Furnish a clean, dry, steady regulated air supply from a suitable compressor or air tank. Eastwood has an array of compressor and regulator choices available.

**PROBLEM:** Powder finish has pits, holes, pockmarks or bubbles

- **CAUSE:** Surface of part is contaminated

- **SOLUTION:** Part may be wet sanded with 400 grit abrasive paper to level out pits. Apply second coat of powder.

- **SOLUTION:** Remove powder coating with a dedicated chemical remover or stripper

- **SOLUTION:** Remove powder coating by abrasive blasting.

- **SOLUTION:** Thoroughly clean part with Eastwood PRE-Painting Prep or acetone to remove all traces of contamination.

- **CAUSE:** Moisture or other contamination in air supply

- **SOLUTION:** Check for moisture or contaminates in air line and Powder Gun air inlet. Replace Air Supply Hose and eliminate source of moisture or contamination with a Coalescing Filter/moisture Separator and Disposable In-Line Filter.

## **PROBLEM:** Powder Finish Over a Casting Has Pits or Bubbles

- **CAUSE:** Impurities in pores of casting. Porous cast iron, die cast, cast aluminum, and magnesium parts trap contaminants that, when heated, will outgas and cause bubbles as the powder is cured
- **SOLUTION:** Powder finish must be removed from part (refer to preceding problem for removal) and the part must be Pre-heated and baked. For large or heavy parts, and to prevent pitting from occurring, preheat the part to 450°F for 30-60 minutes. The time that a part needs to be preheated varies with size and density. Heavy cast parts will require more time, thinner lighter pieces, less time. Once the part has cooled, use Eastwood PRE-Painting Prep or acetone to remove the newly exposed contaminants. Wipe the part repeatedly until no further contaminants come off on a clean white rag. Let the part cool to room temperature before re-applying the powder.

### **▲ NOTICE**

Die-cast metal and solders vary widely in formulation, many of which can be difficult to powder coat and, in some cases may even melt at 400° F.

## **PROBLEM:** Powder Finish “Orange Peel” Texture

### **▲ NOTICE**

A certain amount of orange peel is unavoidable especially with polyester based powders.

- **CAUSE:** Insufficient coating, over-temperature baking, or excessive powder build up at application. It is evident that excessive powder is applied when the powder particles begin to stand on end like hair. If this occurs, stop applying powder and with light air pressure blow off some of the excess powder.
- **SOLUTION:** Part may be wet sanded with 600 grit abrasive paper to level out surface. Continue with successively finer grades of abrasives then buff out with compound as with conventional automotive finishes.

## **PROBLEM:** Uneven Spray Pattern or Clumping of Powder

- **CAUSE:** Moisture in powder. Can occur from moisture in air supply or exposing the powder to extremely humid conditions
  - **SOLUTION:** Check for moisture in air line and Powder Gun air inlet. Replace Air Supply Hose and eliminate source of moisture or contamination with a Coalescing Filter/moisture Separator and Disposable In-Line Filter.
  - **SOLUTION:** Moisture can cause clumps in powder while it is in the Gun Cup or storage bottle. Use a kitchen flour sifter to break up clumps in the Gun Cup making it usable.
- **CAUSE:** Air pressure supply to gun is too low
  - **SOLUTION:** Required air supply is 1 cfm at 5-8 PSI. Furnish a clean, dry, steady regulated air supply from a suitable compressor or air tank. Eastwood has an array of compressor and regulator choices available.
- **CAUSE:** Powder was exposed to excessive heat during storage and has partially cured in the container
  - **SOLUTION:** A kitchen flour sifter may work to break up clumps. If this is unsuccessful, the powder must be discarded.
- **CAUSE:** Level of powder in Gun Cup is too high
  - **SOLUTION:** A little goes a long way. Filling the Gun Cup to approx. 2" deep is ideal. Never fill the Gun Cup more than 1/2 full or incomplete fluidization will occur resulting in clumps.

## **PROBLEM:** Powder Finish Flaking Off

- **CAUSE:** Generally, a powder coating fails because of improper prep where impurities, contaminates or traces of a previous coating prevent good adhesion
  - **SOLUTION:** Powder must be removed completely from surface, a proper prep done and powder re-applied.

## **PROBLEM:** Powder Finish Chipping

- **CAUSE:** Chipping or cracking will occur as a result of under-curing. The chemical reaction that takes place at the cure temperature is not finished and results in a weak film
  - **SOLUTION:** Part may be cleaned and re-exposed to cure temperature which may complete the cure however it is advisable that the powder film be removed completely from surface, a proper prep done and powder re-applied.

**PROBLEM:** Powder Darkens, Yellows or Develops Cracks After Cure  
(particularly clears and light colors)

• **CAUSE:** Powder was exposed to over temperature conditions at cure

- **SOLUTION:** A second coat may be applied over the 1st at the recommended cure temperature (400°F for most powders, check individual powder label for exact instructions).
- **SOLUTION:** Remove powder film, clean part and re-coat.

## **ADDITIONAL ITEMS**

- #15635 Eastwood Bench Top Powder Coating Oven
- #43045 0.041 Stainless Steel Safety Wire, 1lb. Spool
- #31521 Rockwood Air Coupler Set
- #31635 Eastwood In-Line Air Filter
- #31223 Eastwood Non-Contact, Infrared Thermometer
- #15556 Eastwood Paint and Powder Stand
- #58041 High-Temp Silicone Caps and Plugs
- #15862 Eastwood Powder Coating Polish
- #10288Z High-Temp Lab Metal Filler
- #43090 Eastwood Safety Goggles
- #13000 Dust Mask
- #31094 Cleaning Disk
- #10041 PRE Painting Prep
- #16201 Nitrile Gloves
- #21294 Welding Gloves (for handling hot parts taken from oven)
- #21109 Eastwood Blast Out of a Bucket Kit
- #10170 Infrared Powder Curing Lamp
- #10680A Infrared Powder Curing Lamp

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If you have any questions about the use of this product, please contact

The Eastwood Technical Assistance Service Department: 800.343.9353 >> email: [tech@eastwood.com](mailto:tech@eastwood.com)

PDF version of this manual is available at [eastwood.com](http://eastwood.com)

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