Eastwood® Elite

HOTCOAT® PCS-1000 POWDER COATING SYSTEM
INSTRUCTIONS

The **EASTWOOD ELITE SERIES, HOTCOAT® PCS-1000 POWDER COATING SYSTEM** is a true professional, production capable unit featuring a high volume, Gun-controlled Hopper system.

The High-Voltage Corona Charge design utilizes state of the art electronic circuitry to deliver up to a full 100,000 Volts of consistent, hard hitting flow of power providing the maximum powder coverage and adhesion possible. The Control Unit offers full control over a wide range of voltage output and powder flow settings to fine tune the Gun to allow full powder coverage in tight, intricate areas to larger expanses, provide solid multiple coat coverage or allow the creation of 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.

INDEX

SECTION I: SAFETY INFORMATION

GENERAL 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.

SECTION I: SAFETY INFORMATION

⚠ 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) power tool.

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

⚠ READ INSTRUCTIONS

- Thoroughly read and understand these product instructions before using this tool.
- Keep these product instructions for future reference.

⚠ **DANGER**   HIGH VOLTAGE! READ AND UNDERSTAND ALL DIRECTIONS BEFORE PROCEEDING!

- The Control Unit and the Gun are sealed units and contain no user serviceable parts!
- Contact with the emitter when the Trigger 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 CONNECTIONS!**
  DO NOT attempt to use the Powder Coating system without secure grounding!
  Complete grounding is necessary for proper operation of the powder coating system and prevents shock.
- Follow all instructions in the Grounding section.
- **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 or hoses. Before using the gun inspect the condition of all wires and connections.
- **DO NOT** touch or hold the part while applying powder coating.
- **NEVER** operate or store the Professional Hot-Coat gun in damp or wet conditions.
- Plug into a min. 15-amp, grounded circuit. If using an extension cord, it must be AWG 14 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 powder poses a fire and explosion hazard when suspended in air. Keep away from ignition sources such as sparks open flames! Never smoke when powder coating.
- **DO NOT** vacuum powder coating powder unless the vacuum is equipped with an explosion-proof motor.
- **DO NOT** cure powder powder coating powder in a gas oven.
- **DO NOT** touch emitter to object being coated! This will create a spark which may ignite the powder coating powder cloud.

⚠ **CAUTION**   BURSTING HAZARD!

- **DO NOT** exceed 50 PSI (3.4 bar) of Control Unit inlet air pressure. Permanent equipment damage and/or bursting could occur and cause personal injury.

⚠ **NOTICE**   STATIC CHARGE BUILDUP

- To protect the user, the metal shell of the Powder Gun Handle is integrated with the grounding system. Although gloves should be worn when handling powder, always operate the Powder Gun with a bare hand to avoid static buildup in the body of the user.

REQUIRED ITEMS

Before you begin using the PCS-1000 Powder Coating System make sure you have the following items (not included):

- A dedicated electric oven (see "Additional Items" for Eastwood #) 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" for Eastwood #) 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!**

- A sufficient air supply source for the gun. An air compressor capable of providing a steady minimum 7 cfm @ 50 PSI [198 L/min @ 3.4 bar] 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 50/60hz 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 dust mask (see "Additional Items" for Eastwood #) to wear while handling and applying powder.
- Disposable vinyl or Nitrile gloves (See "Additional Items" for Eastwood #) to handle powder and cleaned parts.
- A pair of goggles (see "Additional Items" for Eastwood #) to provide eye protection during powder coating and gun cleaning operations.

INCLUDES

(1) 100kv HotCoat PCS-1000 Powder Coating Gun Assembly with Integral 16' [4.9m] Cable **[A]**

(1) Emitter Retaining Cap **[B]** (Supplied attached to gun)

(1) Standard Emitter **[C]**

(1) High Performance Fogging Nozzle **[D]**

(1) Fan Pattern Emitter **[E]**

(2) 15mm Deflectors **[F]**

(2) 24mm Deflectors **[G]**

(1) Powder Hopper Assembly, 5lb. Capacity **[H]** with Ground Wire **[J]** attached

(1) Powder Hopper Lid **[K]**

(1) Hopper Manifold Block **[L]**

(1) Powder Pick-Up Tube **[M]**

(1) Hopper Vent Hose Fitting **[N]**

(1) 13' (33cm), Grounded Clear Vinyl Powder Flow Hose **[P]**

(1) 5' (1.52m), Grounded Clear Vinyl Hopper Vent Hose **[Q]**

(1) 30" (76.2cm), Black Polyurethane Fluidizer Air Feed Tubing **[R]**

(1) 30" (76.2cm), Black Polyurethane Powder Gun Air Feed Tubing **[S]**

(1) 7" (17.8cm), Black Polyurethane Input Air Supply Tubing **[T]**

(1) Compression to 1/4" MNPT Air Inlet Fitting **[U]**

(1) 20' (6m) Part Grounding Wire & Clamp **[V]**

(1) 4' (1.2M) Hopper Grounding Wire **[J]** supplied pre-attached to Hopper

(1) 10' (3m) Control Unit to true earth ground Wire **[W]**

(1) Power and Flow Control Unit **[Y]**

(1) 6' (1.8m), Grounded Power Cord **[Z]**

(1) Gun Cleaning Brush **[AA]**
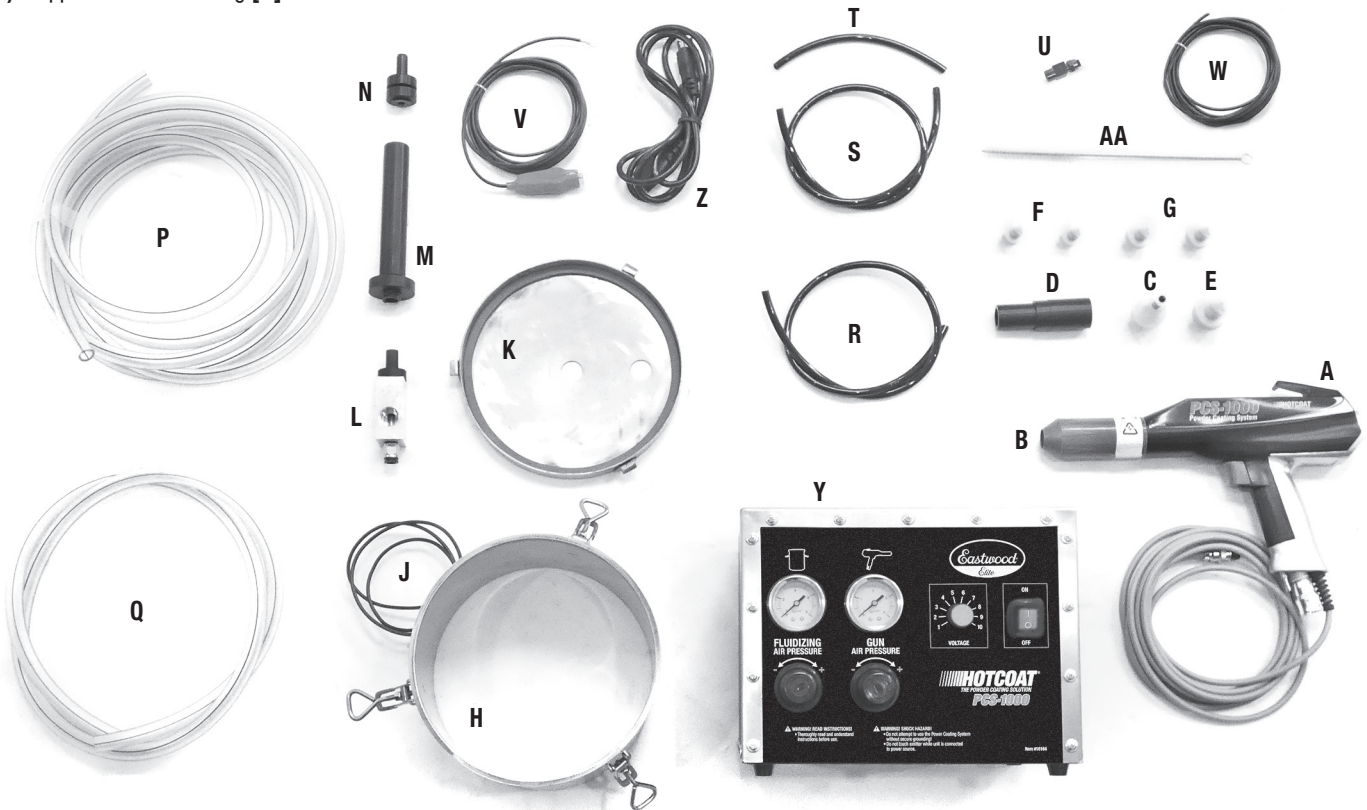
SPECIFICATIONS

Power Requirements: 110-120 VAC 50/60 hz., 40 watts

Air Supply Requirements: 7 cfm @ 50 PSI [198 L/min @ 3.4 bar]

6 ft. [1.8m] 120-volt, 15 amp, grounded electrical input cord

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

5lb. Capacity Powder Hopper

CONTROL UNIT FRONT PANEL FEATURES (FIG 1)

FP1 – FLUIDIZING AIR PRESSURE
- Controls the flow of fluidizing air to the Hopper – See "Adjusting Fluidizer Flow" under Hopper Section of this manual.
  - This is a Regulator Style Control – Pull the Lock Knob outward and turn Clockwise to increase flow and Counter-clock wise to decrease flow.

FP2 – GUN AIR PRESSURE
- Controls the flow of Powder Propelling air to the Powder Gun – See "Adjusting Gun Flow" under Gun Section of this manual.
  - This is a Regulator Style Control – Pull the Lock Knob out ward and turn Clockwise to increase flow and Counter-clockwise to decrease flow.

FIG. 1
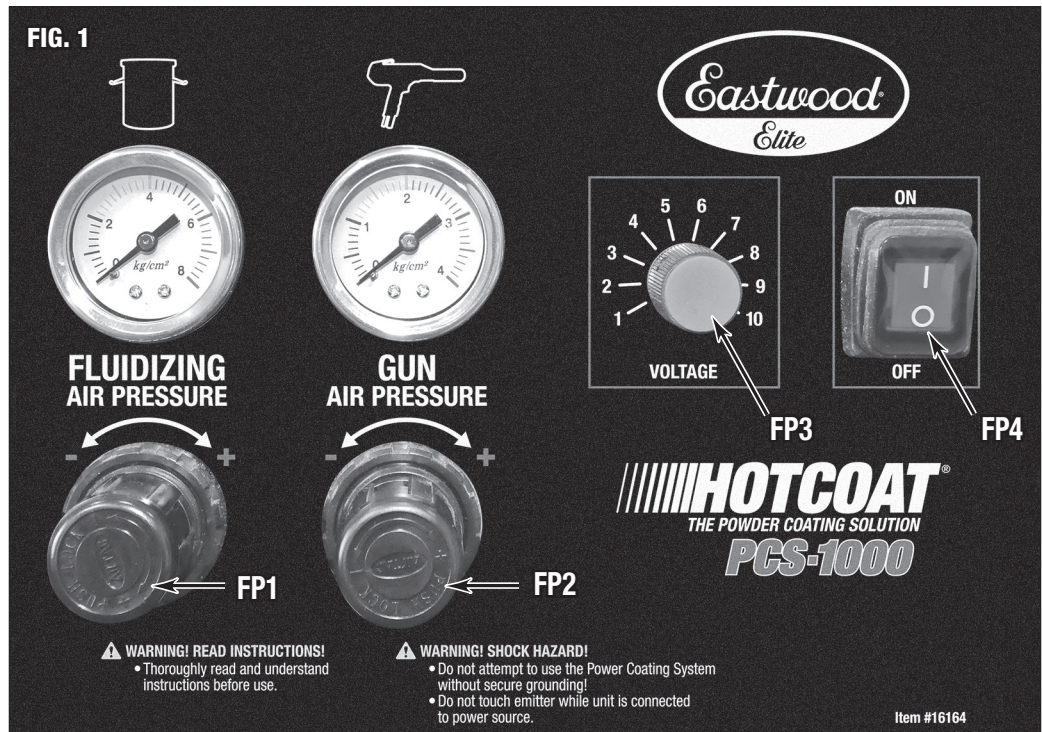
FP3 – VOLTAGE
- Controls the Voltage Output to the Powder Gun from 10,000 to 100,000 Volts – See "Adjusting Gun Voltage" under Gun Section of this manual.
  - Rotate the Knob Clockwise to increase Voltage output and Counterclockwise to lower Voltage output.

FP4 - POWER SWITCH
- Controls Main Power to the Control Box and Gun.
  - Move the switch UP (|) to switch power on and DOWN (O) to switch power OFF.

CONTROL UNIT REAR PANEL FEATURES (FIG 2)

RP1 - POWER CORD
- The Power Cord is plugged into the 3 Pin Receptacle.

RP2 - GUN INPUT
- The Gun Cable is attached to this connector.
  - The Notch at the Top of the 5 Pin Cable Connector must be aligned with the Tab located at the 12:00 position of the Panel Connector.
  - Push in then rotate the Lock Ring clockwise until seated.

RP3 - FUSE
- The Fuse is a standard F1A/250, 1 Amp Fuse.
  - Use a medium screw driver and turn the Fuse Holder 1/4 turn counter-clockwise to remove.
  - Pull Fuse from Holder.
  - Insert new Fuse.
  - Replace Fuse Holder and rotate clockwise 1/4 turn to lock.

RP4 - GROUND POST
- The Ground Post is a central terminal for all 3 of HotCoat Pro Gun grounding lines.
  - Remove Wing Nut, Place Ground Wires over Post, replace Wing Nut and tighten securely.
  - Refer to Ground Wire Connections section of this Manual.

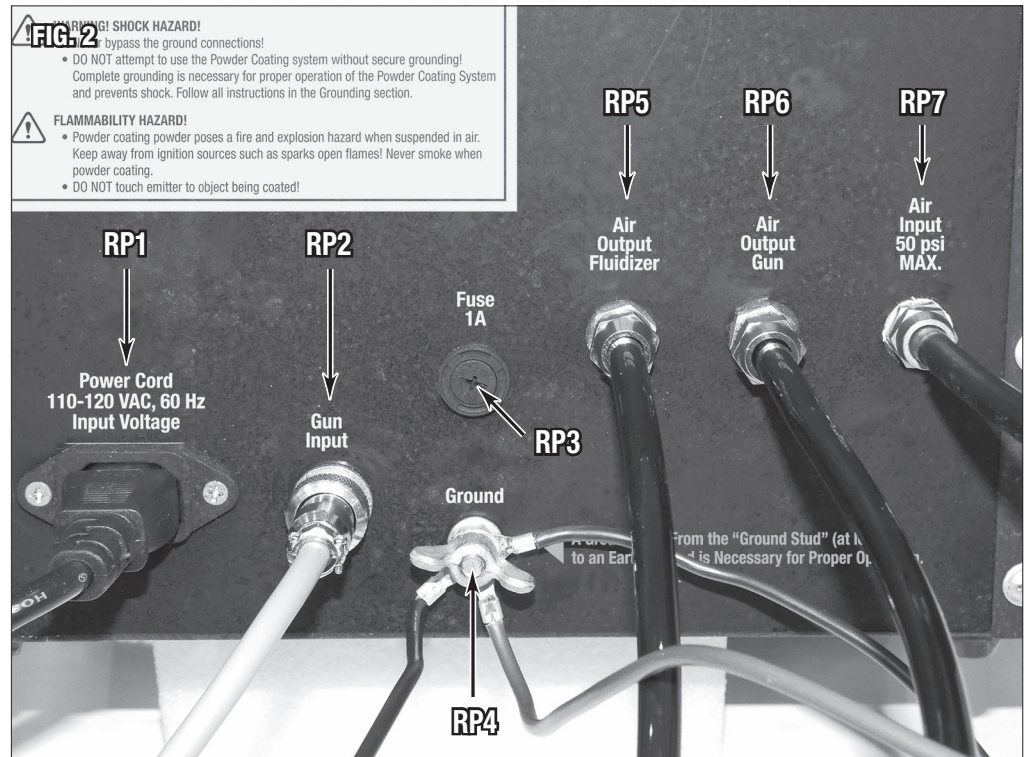**RP5 - AIR OUTPUT - FLUIDIZER**
- The Air Output Fluidizer connection is the air feed outlet to the Powder Hopper Fluidizing Port.
  - This is a compression type fitting.
  - Refer to Air Line Connections section of this Manual.

RP6 - AIR OUTPUT - GUN
- The Air Output Gun connection is the air feed outlet for the Powder Gun and connects to the Powder Hopper Manifold Port.
  - This is a compression type fitting.
  - Refer to Air Line Connections section of this Manual.

RP7 - AIR INPUT – 50 PSI [3.4 bar] MAX.
- The Air Input connection is the air feed inlet from the user supplied compressed air supply.
  - This is a compression type fitting.
  - Refer to Air Line Connections section of this Manual.

FIG. 2

WARNING! SHOCK HAZARD!
- Never bypass the ground connections!
- DO NOT attempt to use the Powder Coating system without secure grounding! Complete grounding is necessary for proper operation of the Powder Coating System and prevents shock. Follow all instructions in the Grounding section.

FLAMMABILITY HAZARD!
- Powder coating powder poses a fire and explosion hazard when suspended in air. Keep away from ignition sources such as sparks open flames! Never smoke when powder coating.
- DO NOT touch emitter to object being coated!

RP5 — Air Output Fluidizer
RP6 — Air Output Gun
RP7 — Air Input 50 psi MAX.
RP1 — Power Cord 110-120 VAC, 60 Hz Input Voltage
RP2 — Gun Input
Fuse 1A
RP3
Ground
RP4

ASSEMBLY/SET-UP OF POWDER GUN AND SYSTEM (FIG 3)

FIG. 3
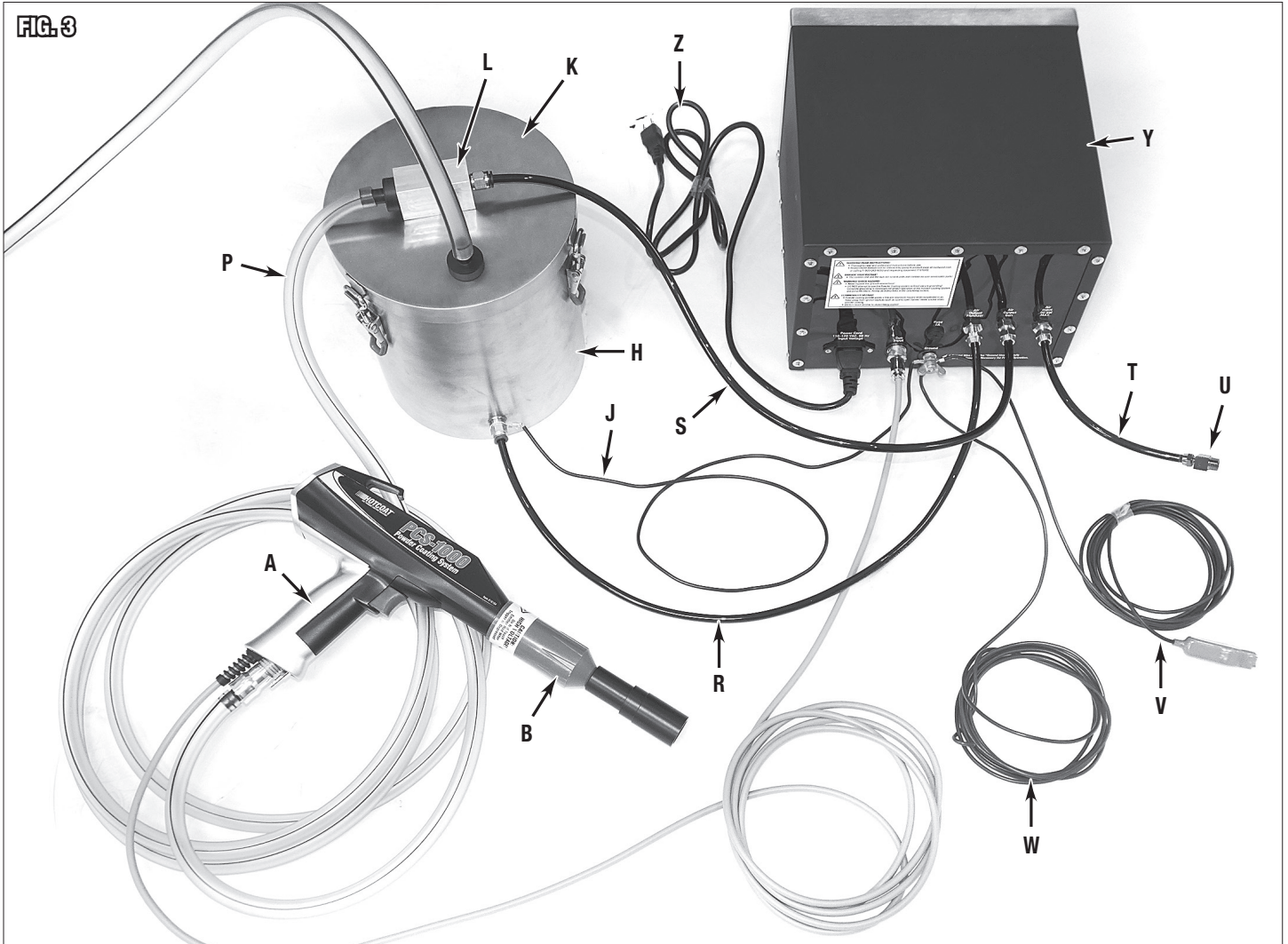
POWDER HOPPER LID ASSEMBLY [L], [M] & [N] TO [K]

- Insert the threaded section of the Powder Pick-Up Tube **[M]** through the center hole of the Powder Hopper Lid **[K]** from the inside with the lock collar in place **(FIG 4)**.

- Place the Hopper Manifold Block **[L]** over the exposed threads of the Powder Pick-Up Tube **[M]** and thread it in securely **(FIG 5)**.

- Unthread and remove the lock collar from the Hopper Vent Hose Fitting **[N]**

FIG. 4

FIG. 5

- Insert the threaded section of the Hopper Vent Hose Fitting **[N]** through the offset hole of the Powder Hopper Lid **[K]** from the inside.

- Thread the lock collar back onto the Hopper Vent Hose Fitting to secure it in place.
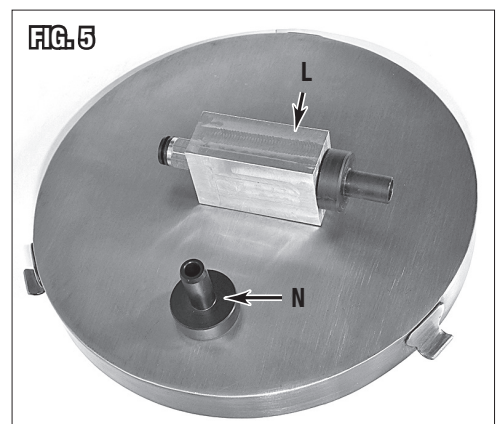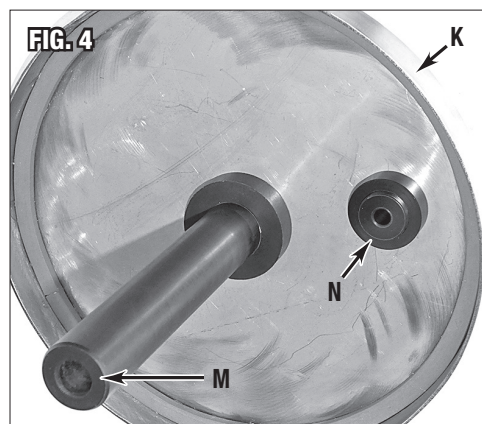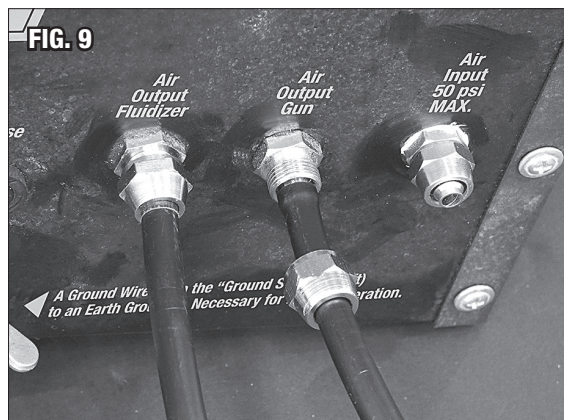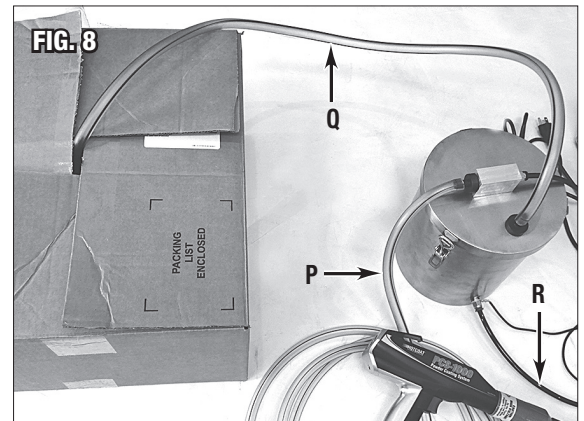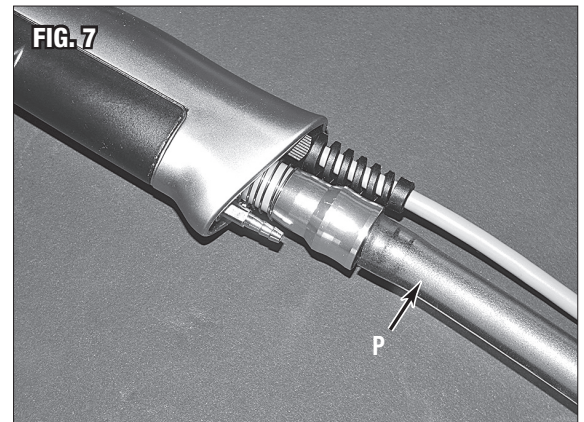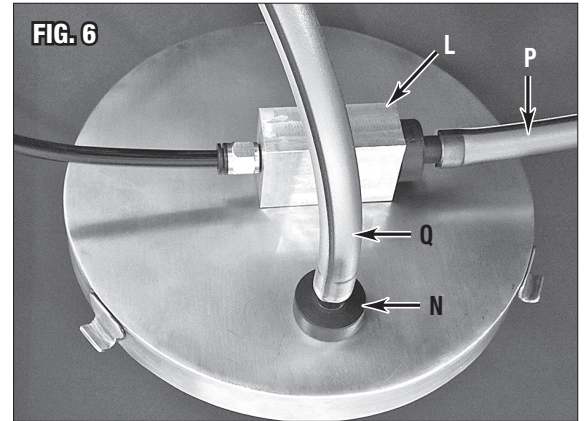
POWDER FEED HOSE [P]

- The Grounded Clear Vinyl Powder Flow Hose **[P]** is connected to the Powder Feed outlet of the Hopper Manifold Block **[L]** by slipping the open end of the Hose over the black plastic nipple attached to the Block **(FIG 6)**.

- Push the opposite end of the Grounded Clear Vinyl Powder Flow Hose **[P]** over the large barbed plastic nipple at the base of the Gun **(FIG 7)**.

HOPPER VENT HOSE [Q]

- The Grounded Clear Vinyl Hopper Vent Hose **[Q]** is pushed onto the Hopper Vent Hose Fitting **[N]** attached to the Powder Hopper Lid **[K] (FIG 6)**.

- Route the opposite end of the Hopper Vent Hose to the powder booth or a discharge vessel (a closed cardboard box or covered bucket works well) **(FIG 8)**.

FLUIDIZER AIR FEED TUBE [R]

- The Black Vinyl Fluidizer Air Feed Tube **[R]** is attached to the "Air Output Fluidizer" fitting at the rear of the Control Unit **(FIG 9)**. To do so:

  - Unthread the conical-faced compression nut from the fitting at the rear of the Control Unit.

  - Slide the conical end of the compression nut over the end of the Tube **(FIG 9)**.

  - Push the open end of the Tube securely over the barb of the fitting **(FIG 9)**.

  - Thread the compression nut onto the fitting at the rear of the Control Unit **(FIG 9)**.

  - Pull on the tube to test the connection and make sure it is secured.

- The opposite end of the Black Vinyl Fluidizer Air Feed Tube **[R]** is attached to the inlet compression fitting at the lower side of the Hopper **[H] (FIG 10)**. To do so:

  - The Hopper utilizes a push-in type compression fitting. Simply push the square cut end of the tubing directly into the opening of the fitting until it is securely seated **(FIG 10)**.

  - Pull outward to test for complete insertion. It should not pull out.

  - To remove tubing, push inward on the plastic collar of the fitting while pulling outward on the tubing to release **(FIG 10)**.

FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10

Push in Ring and pull Tube to release

Push in fully to install
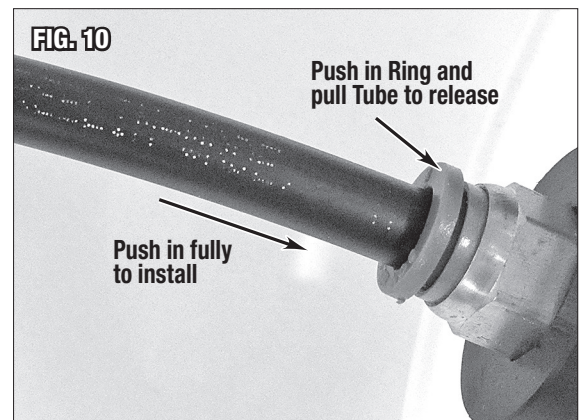
SECTION II: HOTCOAT PCS-1000 SET-UP AND USE INFORMATION

GUN AIR OUTPUT TUBE [S]

- The Black Vinyl Powder Gun Air Feed Tubing **[S]** is attached to the "Air Output Gun" fitting at the rear of the Control Unit **(FIG 9)**. To do so:
  - Unthread the conical-faced compression nut from the fitting at the rear of the Control Unit.
  - Slide the conical end of the compression nut over the end of the Tube **(FIG 9)**.
  - Push the open end of the Tube securely over the barb of the fitting **(FIG 9)**.
  - Thread the compression nut onto the fitting at the rear of the Control Unit **(FIG 9)**.
  - Pull on the tube to test the connection and make sure it is secured.
- The opposite end of the Black Vinyl Powder Gun Air Feed Tubing **[S]** is attached to the Powder Feed outlet of the Hopper Manifold Block **[L] (FIG 10)**. To do so:
  - The Hopper Manifold Block utilizes a push-in type compression fitting. Simply push the square cut end of the tubing directly into the opening of the fitting until it is securely seated **(FIG 10)**.
  - Pull outward to test for complete insertion. It should not pull out.
  - To remove tubing, push inward on the plastic collar of the fitting while pulling outward on the tubing to release **(FIG 10)**.

AIR INPUT TUBE [T] AND COMPRESSION FITTING [U]

- Black Vinyl Input Air Supply Tube **[T]** is attached to the "Air Input 50 PSI Max." fitting at the right rear panel of the Control Unit **(FIG 9)**. To do so:
  - Unthread the conical-faced compression nut from the fitting at the rear of the Control Unit.
  - Slide the conical end of the compression nut over the end of the Tube **(FIG 9)**.
  - Push the open end of the Tube securely over the barb of the fitting **(FIG 9)**.
  - Thread the compression nut onto the fitting at the rear of the Control Unit **(FIG 9)**.
  - Pull on the tube to test the connection and make sure it is secured.
- Black Vinyl Input Air Supply Tube **[T]** to the Compression to 1/4" MNPT Air Inlet Fitting **[U]** To do so:
  - The Compression to 1/4" MNPT Air Inlet Fitting is a push-in type compression fitting. Simply push the square cut end of the tubing directly into the opening of the fitting until it is securely seated **(FIG 10)**.
  - Pull outward to test for complete insertion. It should not pull out.
  - To remove tubing, push inward on the plastic collar of the fitting while pulling outward on the tubing to release **(FIG 10)**.
- Compression to 1/4" MNPT Air Inlet Fitting **[U]** connection to customer supplied air regulator.
  - Thread the 1/4 MNPT Air Inlet Fitting **[U]** into the regulated output side of a suitable customer supplied air regulator (not included).
    NOTE: The HotCoat PCS-1000 Powder Coating Gun requires a compressor capable of 7 cfm @ 50 PSI [198 L/min @ 3.4 bar].

> **⚠ CAUTION**   NEVER EXCEED 50 PSI [3.4 bar] TO THE CONTROL UNIT!

  - The air must be moisture and oil free. A good quality Filter/Regulator such as a #31633 Eastwood Air CFS Filter/Regulator is strongly recommended for the best results. A disposable "Last Chance" filter such an Eastwood #31635 in conjunction with a quality Air Inlet Regulator (not included) is strongly suggested to eliminate the possibility of moisture.

GROUND WIRE CONNECTIONS

> ⚠ **NOTICE**   **SHOCK HAZARD!**
> **Never bypass the ground connections!**
> **DO NOT attempt to use the Powder Coating system without secure grounding! Complete grounding is necessary for proper operation of the powder coating system and prevents shock.**


FIG. 11

- Control Unit to Part Grounding Wire & Clamp **[V]** to Power and Flow Control Unit **[Y]**.
    - Attach the Lug Terminal end to the Grounding Lug at the lower rear panel of the Control Unit **(FIG 11)**.
    - The Ground Clamp at the opposite end is attached directly to the part, hook or booth hanger as required. This is necessary to complete the powder charging circuit **(FIG 12)**.
- Hopper Grounding Wire **[J]** to Control Unit.
    - Attach the Lug Terminal end to the Grounding Lug at the rear of the Control Unit **(FIG 11)**.
    NOTE: The opposite end is supplied pre-attached to the Fluidizer Inlet Fitting at the lower side of the Hopper **(FIG 13)**.
- Control Unit to true earth ground Wire **[W]**.
    - Attach the Lug Terminal end to the Grounding Lug at the rear of the Control Unit **(FIG 11)**. The opposite end must be securely attached to shop true earth ground. This can be a water pipe, an outside electrical grounding rod, grounding bus bar of a breaker box or any other suitable known true earth ground. If necessary, contact a local electrician to establish a true earth ground. Proper and safe operation of the Powder Coating System is not possible without it.

FIG. 12

GUN CABLE CONNECTION
- The 16' [4.9m] Gun Control Cable (permanently connected to Gun) is attached to the round metal 5 pin DIN Connector at the rear panel of the Control Unit **[Y]** by aligning the indexing notch at the top of the cable connector with the tab at the 12:00 position of the panel connector, pushing in and threading the metal lock ring Clockwise to secure it **(FIG 14)**.

POWER CORD
- The Grounded Power Cord **[Z]** is plugged into the three bladed connector at the lower left rear panel of the Control Unit **[Y] (FIG 11)**.

FIG. 13

FIG. 14
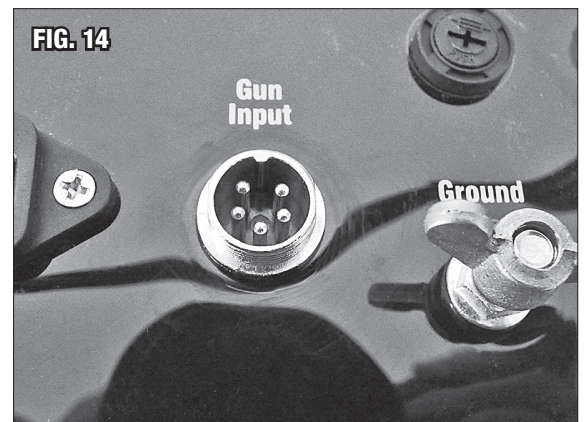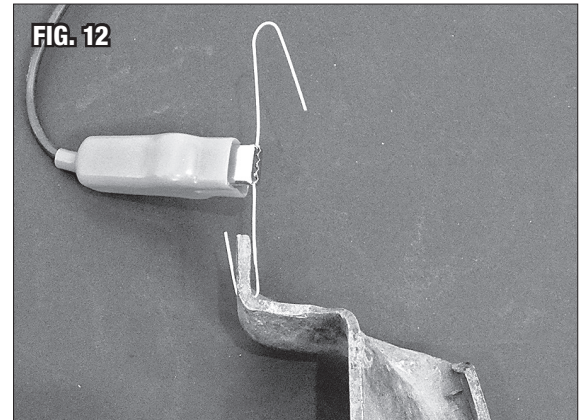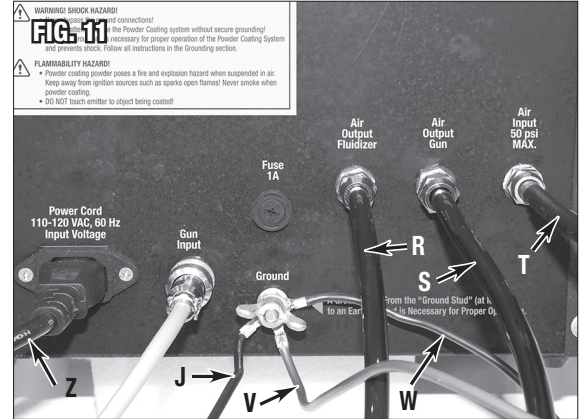
SECTION II: HOTCOAT PCS-1000 SET-UP AND USE INFORMATION

GUN ASSEMBLY

- The HotCoat PCS-1000 Powder Coating Gun Assembly **[A]** is supplied with the Emitter Retaining Cap **[B]** in place, threaded onto the end of the Gun body **(FIG 15)**. It must be unthreaded and removed, then replaced over the chosen Emitter/Deflector for Gun set-up.

- One of the following powder flow attachments must be selected for use at the output end of the Gun to direct the size of the fan, dispersal and speed of the powder flow.

  - Standard Emitter **[C]** – Used alone, it serves well as a general purpose, powder dispersal nozzle for everyday use **(FIG 16)**.

  - High Performance Fogging Nozzle **[D]** - Excellent all-purpose Nozzle (used by sliding over the Standard Emitter **[C]** only) **(FIG 17)** concentrates and accelerates the flow of powder. It is ideal for directing powder into tight places or covering wide areas when pulled farther away from powder coated surface.

  - 15mm Deflector **[F]** – (used over the Standard Emitter only) **(FIG 18)** For limited access places or interior of tubular items.

  - 24mm Deflector **[G]** - (used over the Standard Emitter only) **(FIG 19)** For very tight places or intersections of small diameter tubing, welded wire or railings.

  - Fan Pattern Emitter **[E]** – Creates a large, long and narrow, concentrated fan shaped pattern for quick, even powder dispersal over large expanses **(FIGS 20-21)**.

- To switch Emitters, Unthread the Emitter Retaining Cap **[B]**, pull out the Emitter, replace with the alternate Emitter by pushing it full into the bore of the Gun body and thread the Emitter Retaining Cap **[B]** back on to secure it.
  NOTE: The black, carbon ring at the rear of each Emitter must be in full contact with the high voltage contact at the end of the Gun Body **(FIG 22)**.

- To switch Deflectors, carefully twist and pull the Deflector from the nose of the Standard Emitter **[C]**, replace with the alternate Deflector by pushing it onto the nose of the Standard Emitter **[C]**.

FIG. 15

FIG. 16

FIG. 17

FIG. 18

FIG. 19

FIG. 20

FIG. 21

FIG. 22
High Voltage Contact
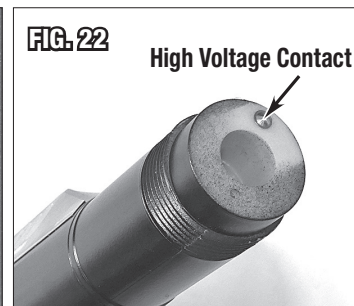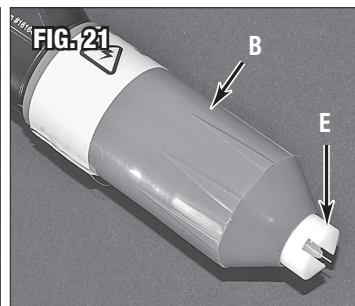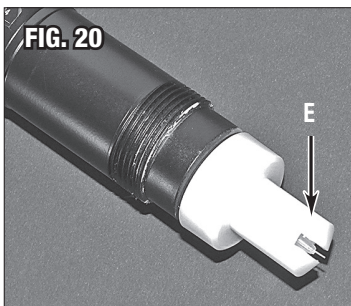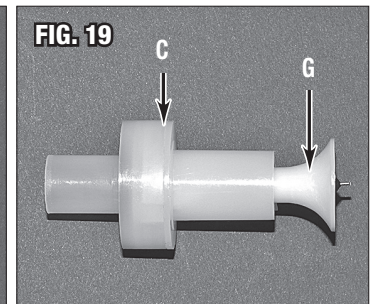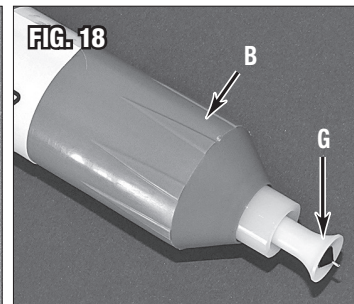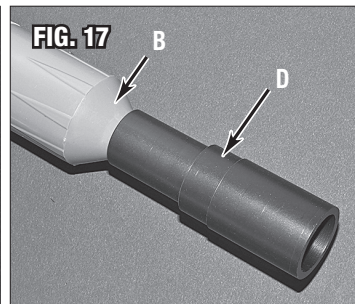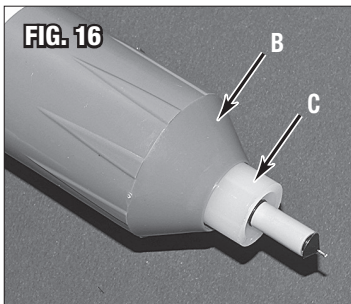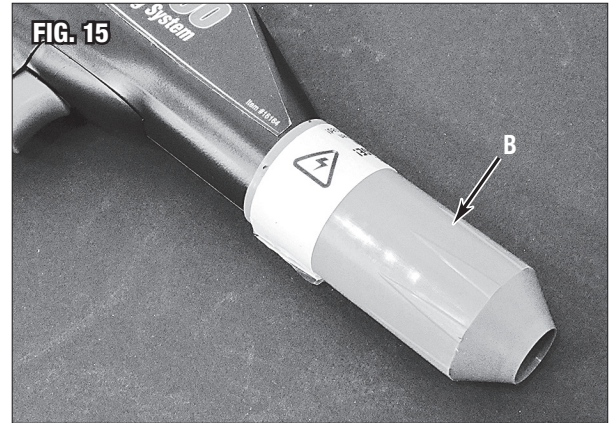
HOTCOAT PRO POWDER COATING SYSTEM OPERATION

GROUNDING THE PART

Powder coating works by "fluidizing" the powder in the Hopper by infusing it with air when the Trigger is pulled. It then flows out of the Feed Hose, 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 Control Unit of the Pro 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.

Carefully follow the Ground Wire Connection instructions in the Set-Up section of this manual.

> ⚠ **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 23)**. 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. 23

> ⚠ **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.**

- To avoid static charge buildup and possible shock, the ground connection between the Control Unit and the Hopper MUST be solid.

- In order to provide the best ground circuit possible for static powder adhesion and shock avoidance, the Control Unit MUST be fully grounded to a true earth ground.

> ⚠ **NOTICE**   STATIC CHARGE BUILDUP!
> **To protect the user, the metal shell of the Powder Gun Handle is integrated with the grounding system. Although gloves should be worn when handling powder, always operate the Powder Gun with a bare hand to avoid static buildup in the body of the user.**
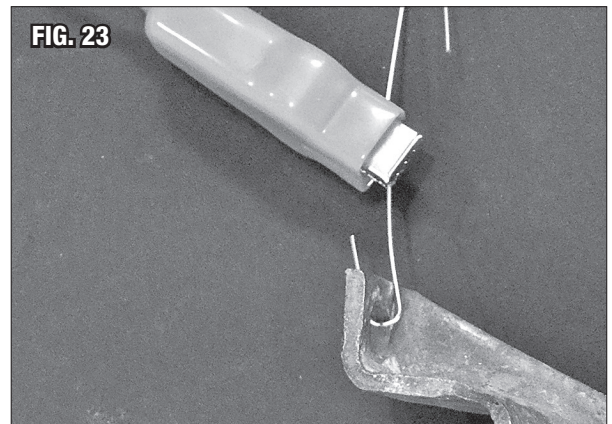
SECTION II: HOTCOAT PCS-1000 SET-UP AND USE INFORMATION

SETTING CONTROLS

> ⚠ **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.

> ⚠ **WARNING**   SHOCK HAZARD!
> DO NOT attempt to use the Powder Coating system without secure grounding! Complete grounding is necessary for proper operation of the powder coating system and prevents shock.

> ⚠ **NOTICE**
> Before plugging in the unit, inspect all cords for cuts, frays or other damage.
>
> • Plug the power cord into a grounded 110-120 VAC, 50/60Hz source of electrical power.
> • Keep the Control Unit up off the floor and placed on a workbench or other suitable surface.
> • Route the Ground Leads overhead and off the floor if possible, to keep them away from the walking area.

> ⚠ **NOTICE**   STATIC CHARGE BUILDUP!
> To protect the user, the metal shell of the Powder Gun Handle is integrated with the grounding system. Although gloves should be worn when handling powder, always operate the Powder Gun with a bare hand to avoid static buildup in the body of the user.

SETTING OUTPUT VOLTAGE

The Voltage Output is controlled by the Voltage Output Knob and gauge on the front panel of the Control Unit **(FIG 24)**. It ranges from 1 (10,000 volts) to 10 (100,000 volts).

- For most powder applications, a lower 30KV to 40KV Power Setting is sufficient power for general overall coverage.

- The higher (80KV to 100KV) settings are best suited for large, flat objects.

- Keep Gun-to-part distance of 8"-10" to eliminate back ionization.

FIG. 24
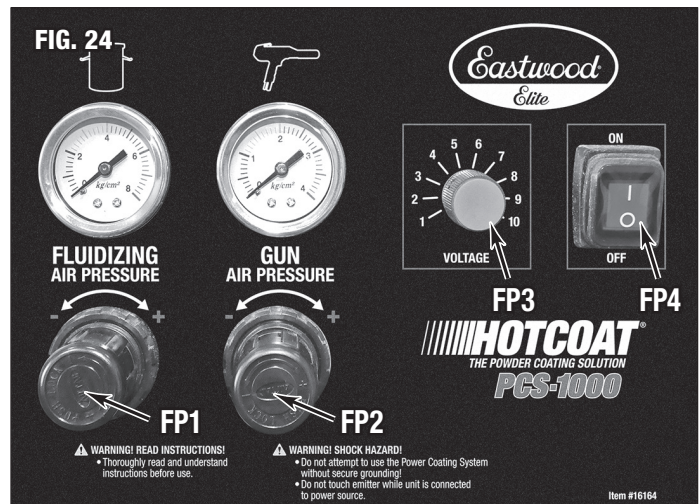
> ⚠ **NOTICE**
> On certain intricate part configurations, contours and inside corner areas, the use of a higher than 40KV voltage setting may be too high and induce a powder repelling magnetic field to the part, known in the industry as the "Faraday-Cage Effect", which actually repels charged powder. Check position of the Current Output Control Knob. 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 knob setting.

FILLING THE HOPPER

> ⚠ **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.

- Unlatch and remove the Lid from the Hopper.
- Use a funnel, or a clean sheet of lint-free paper rolled into a conical shape, to pour the powder into the Hopper.
- Place a minimum depth of 1" of powder over the Fluidizing Disk in the Hopper. Filling the Hopper to approx. 3" deep is ideal **(FIG 25)**. (Do not exceed 5 lbs. of powder or more than 1/2 full in the Hopper).

FIG. 25

> ⚠ **NOTICE**
> Powder Coating powders vary widely in specific density and will displace a greater or lesser volume for a given identical weight. Powder coating quantities are always measured by weight and not by volume.
> Example: An 8oz. (1/2 lb.) amount of most white or clear powders will nearly fill an 8oz. HotCoat Powder Bottle while an 8 oz. amount of a red, orange or a dense metallic may only fill the bottle to 1/3 depth. Both, of course, are still 1/2lb.
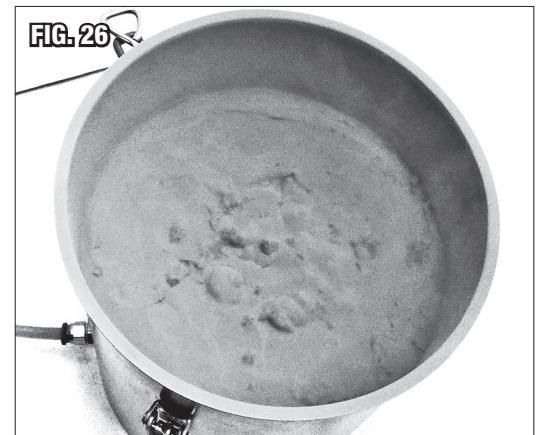
FLUIDIZING AIR PRESSURE SETTINGS

Fluidizing refers to the use of low-pressure air, forced through a porous "Fluidizing Disk" in the bottom of the Hopper, acting on a quantity of powder coating powder. The air percolates up through the powder causing it to act as a fluid. Too little pressure and the air will pop through the powder and out of the surface in random areas. Too much air and the powder is rapidly discharged out of the Hopper in a cloud.

When the pressure is set correctly, the surface level of the powder over the "Fluidizing Disk" will rise to twice it's depth and bubble in what resembles gently rolling boiling water.

Controlling Fluidizing Air Pressure controls the intensity of the bubbling.

FIG. 26

> ⚠ **NOTICE**
> Always fill the Hopper at least 1" above the white Fluidizing Disk or incomplete fluidization will occur resulting in clumps.

- With the Lid still removed from the Hopper, Set the Fluidizing Air Pressure initially to read 8 PSI [0.55 bar] and depress Gun Trigger to allow powder flow to the Hopper.
- With the Gun Trigger still depressed, observe powder Fluidizing activity in the Hopper. The ideal fluidized powder condition resembles a gently rolling "boil" **(FIG 26)**.
  - If it pops in random locations and emits small bubble-like eruptions, it needs more air. Keep Trigger depressed and very slowly turn up the Fluidizing Air Pressure until the powder takes on a gentle, rolling, fluid like appearance.
  - If a powder cloud begins to form and rolls over the sides of the Hopper, decrease the level of the Fluidizing Air Pressure.
  - This is a standard but very necessary "Trial-and-Error" process that may require several attempts to achieve.
  - Note that as the amount of powder in the Hopper is depleted during use, the Fluidizing Air Pressure will need to be gently tweaked downward to compensate and keep the "Fluidizing" in tune.
- When the Fluidizing has been optimized, place the Lid back on the Hopper and latch it in place.
- Route the end of the Vent Hose to a proper location as some excess powder may be released during the application process.
  NOTE: A box or bucket with a towel over the top works well to contain excess powder form the Vent Hose.

SECTION II: HOTCOAT PCS-1000 SET-UP AND USE INFORMATION

GUN AIR PRESSURE SETTINGS
The Gun Air Pressure Knob controls the flow speed and amount of powder through the gun.

- Initially set the Gun Air Pressure to 10 PSI [0.7 bar]. Generally, it should never be necessary to set the Gun Air Pressure any higher than 50 PSI [3.4 bar].

> **⚠ NOTICE**
> As noted previously in "Fluidizing Air Pressure Settings", Powder Coating powders vary widely in specific density and will displace a greater or lesser volume for a given identical weight. Denser powders may require slightly more air pressure than less dense powders.

All items to be powdercoated will benefit from an optimal "Flow" setting where the maximum amount of powder is delivered to the surface with a minimum amount of wasted powder that would blow by and fall to the floor.

- Set the Gun Air Pressure initially to read 8 PSI [0.55 bar] and depress Gun Trigger to allow powder flow to the Hopper.
- Depress the Gun Trigger and observe powder flow onto and around an object to be coated.
  - If excess powder blows by the part and is wasted, lower the Gun Air Pressure to decrease flow slightly.
  - If the powder being applied to a surface has a thin, sparse appearance, raise the Gun Air Pressure to increase flow slightly.
  - This is a standard but necessary "Trial-and-Error" process that may require several attempts to achieve and will vary with each type of powder and part surface configuration. Note that most tubular and round objects will, by nature, produce more powder waste than a flatter, larger object will.

USE OF NOZZLES AND DEFLECTORS (for use with Standard Emitter only)
One of the following powder flow attachments must be selected for use at the output end of the Gun to direct the dispersal and speed of the powder flow.

The included attachments are as follows:

- **High Performance Fogging Nozzle [D]** – Excellent all-purpose Nozzle (used over the Standard Emitter only) **(FIGS 17, 27)** concentrates and accelerates the flow of powder. It is ideal for directing powder into tight places or covering wide areas when pulled farther away from powder coated surface.

FIG. 27

> **⚠ WARNING SHOCK HAZARD!**
> DO NOT touch the emitter until after unit is unplugged.

  - To install the Nozzle, align the smaller end with the Standard Emitter Barrel and push on, twisting the Nozzle, if required.
  - To remove the Nozzle, carefully twist and pull it straight off the Barrel of the Standard Emitter.
- **15mm Deflectors [F]** – (used over the Standard Emitter only) **(FIGS 18, 27)** For limited access places or interior of tubular items.
- **24mm Deflectors [G]** – (used over the Standard Emitter only) **(FIGS 18, 27)** For very tight places or intersections of small diameter tubing, welded wire or railings.

> **⚠ WARNING 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 of the bore of the Gun Body.
    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 a Deflector, place the reduced diameter inward toward the Gun Barrel with the center hole centered over the Emitter Rod.
  - While firmly gripping it, push the Deflector into the Gun Body Bore.
    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".
- A larger Deflector will produce a larger, soft round powder spray pattern while choosing a smaller one will produce a smaller soft round powder spray pattern.

With the unit unplugged and the air supply connected and set 30 to 40 PSI [2.0 to 2.75 bar], at least 3" powder in the Hopper and the Gun directed at a suitable waste powder receptacle, quickly pull the Gun Trigger to observe the powder spray pattern. Choose another Attachment if desired.
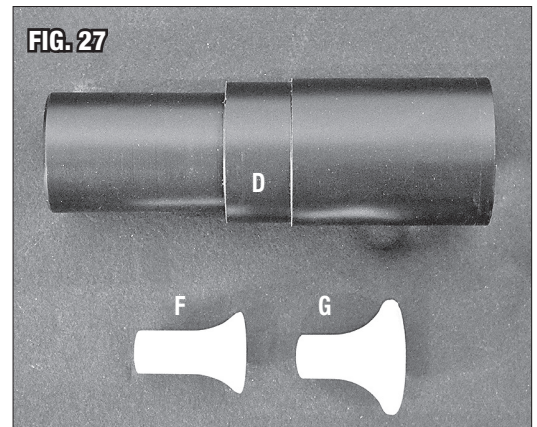
POWDER GUN CLEANUP

> **⚠ WARNING** SHOCK HAZARD!
> 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.

> **⚠ NOTICE**
> When finished with one color, the Gun, Hose and Hopper must be cleaned before using another.

- With gloves on, gently pull the Powder Feed Hose **[P]** from the barbed fitting at the underside of the Gun base.
- Gently twist off the Deflector or Nozzle **[F]**, **[G]** or **[D]**, if used and set it aside in a safe location.
- Unthread the Emitter Retaining Sleeve **[B]**.
- Very gently and carefully, pull the Emitter Element **[C]** or **[E]** from the Gun Body.

> **⚠ CAUTION**
> Never use more than 30 PSI [2 bar] of compressed air to clean the gun.

- Using a blow gun, very gently direct air into the bore at the end of the Gun Body to blow out powder.
- Direct blow gun through barbed fitting at the underside of the Gun base removing all traces of powder.
- Using the included Gun Cleaning Brush, clean the outlet bore of the Powder Gun by inserting the brush fully into the bore, rotating then pulling straight out **(FIG 30)**.
- Once again, very gently direct air into the bore at the end of the Gun Body removing all remaining traces of powder.
- Using the included Gun Cleaning Brush, clean the barbed, powder inlet fitting of the Powder Gun by inserting the brush fully into the bore, rotating then pulling straight out **(FIG 31)**.
- Once again, very gently blow gun through barbed fitting at the underside of the Gun base removing all remaining traces of powder.
- Blow off any remaining powder from the outside of the gun Body.
- Very carefully, blow all powder residue from the Emitter Element, align it carefully and place it back into the bore of the Gun Body.
- Remove all powder from the Emitter Retaining Sleeve, place it over the Emitter element and gently thread it back onto the Gun Body.

FIG. 30

FIG. 31

HOPPER CLEANUP

- With gloves on, gently pull the Powder Feed Hose **[P]** from the barbed fitting on the Hopper Manifold Block **[L]**.

- Using a blow gun, blow out all powder from the Powder Feed Hose **[P]**.
  NOTE: For frequent, dedicated hose use with specific colors and to minimize repeated cleanings, extra 16.5' lengths of Grounded Clear Vinyl Powder Hose **[P]**, **[Q]** are available (Eastwood #54308).

- Unlatch the Hopper Lid and carefully pour out any remaining powder from the Hopper.

- Place any unused powder in the original container.

- Using a blow gun (not included), blow out remaining powder left in the corners and crevices of the Hopper paying attention to cleaning the white Fluidizing Disk at the floor or the Hopper.
  NOTE: For frequent, dedicated Hopper use with specific colors and to minimize repeated cleanings, extra Powder Hoppers are available (Eastwood #54300 – 5lb. Hopper and Eastwood #54313 – 2lb. Hopper).

⚠ 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.

USING THE HOTCOAT PCS-1000 POWDER COATING GUN WITH THE OPTIONAL EASTWOOD #54313 2LB. POWDER HOPPER (not included)

The HotCoat PCS-1000 Powder Coating Gun may be used with an optional #54313 2lb Powder Hopper **(FIG 32)**. It does not have or require the adjustable flow characteristics of the included Hopper however it is excellent for small jobs and quick color changes.

The Powder Gun Air Supply Line **[S]** and the Powder Feed Hose **[P]** require minor connection changes. The supply Air Inlet Connection **[T]** remains the same.

> ⚠ **NOTICE**
>
> **All grounding must be complete between Control Unit, Part to be Powdercoated, and True Earth Ground as described in Grounding section of Manual.**

SET-UP WITH 2LB POWDER HOPPER

- Connect The Gun Control Cable (permanently connected to Gun) to the round metal 5 pin DIN Connector at the rear panel of the Control Unit **[Y]** by aligning the indexing notch at the top of the cable connector with the tab at the 12:00 position of the panel connector, pushing in and turning the metal lock ring several turns Clockwise **(FIG 14)**.

- Connect the Black Vinyl Air Feed Hose **[S]** into the Air Output Gun slip-in fitting on the rear panel of the Control Unit **(FIG 33)**.

- Connect the opposite end of the Black Vinyl Air Feed Hose **[S]** to the slip-in compression fitting on the lid of the Powder Hopper **(FIG 33)**.

- Push the Grounded Clear Vinyl Powder Hose **[P]** onto the barbed fitting on the lid of the Powder Hopper **(FIG 33)**.

- Slip the opposite end Grounded Clear Vinyl Powder Hose **[P]** onto the barbed fitting at the underside of the Gun Base **(FIG 33)**.

- Unlatch and remove the Lid from the Hopper.

- Use a clean sheet of lint-free paper rolled into a conical shape, or a funnel to pour the powder into the Hopper.

- Place a minimum depth of 1" of powder into the Hopper.

- Re-install and latch Lid.

OPERATION WITH 2LB POWDER HOPPER

> ⚠ **NOTICE**   STATIC CHARGE BUILDUP!
>
> **To protect the user, the metal shell of the Powder Gun Handle is integrated with the grounding system. Although gloves should be worn when handling powder, always operate the Powder Gun with a bare hand to avoid static buildup in the body of the user.**

- Turn the Gun Pressure Control to 0.

- Connect to the Inlet Air Supply.

- Plug Control Unit into 110-120VAC power supply.

- Set Power Switch to the "ON".

- Depress Gun Trigger while slowly turning up the Gun Pressure until satisfactory powder flow is achieved.

- Powder Coat parts as desired.

FIG. 32

FIG. 33
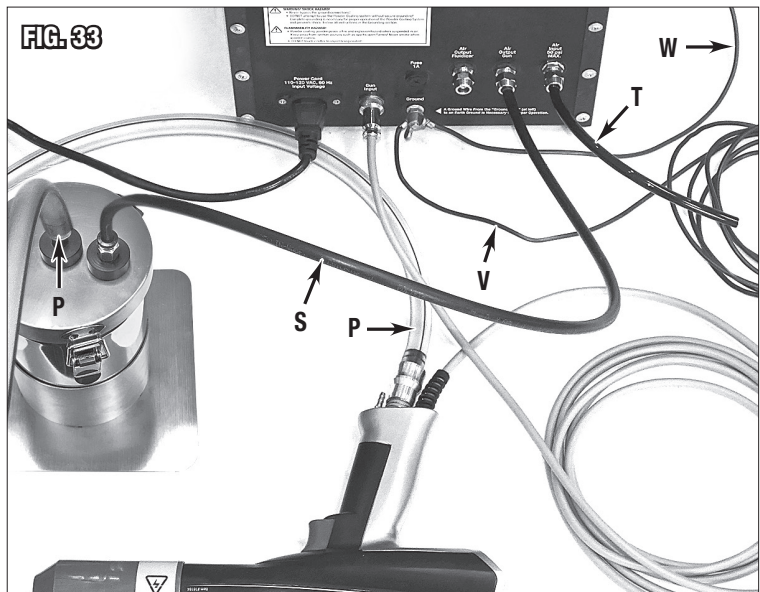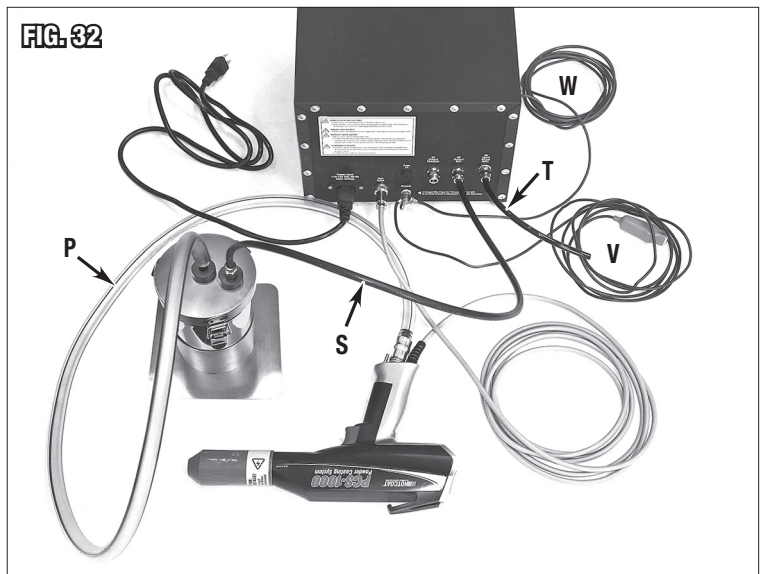
CLEAN-UP

- Turn Control Unit "OFF"
- Unplug from 110-120 VAC power supply.
- Disconnect Inlet Air Supply.
- Unlatch Lid and pour out remaining unused powder into original container.
- Blow out remaining powder in the Grounded Clear Vinyl Powder Hose and Hopper.

⚠ **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.

⚠ **NOTICE**
When finished with one color, the Gun, Hose and Hopper must be cleaned before using another.

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 sunlight should be avoided as excessive heat from sunlight can cause a partial cure to occur on parts.

SUGGESTED ITEMS FOR IMPROVED POWDER COATING (not included)

- A dedicated spoon or funnel for transferring powder from supplying container to Powder Hopper.
- A commonly available kitchen flour sifter to crumble minor powder clumps
- A roll of aluminum foil for heat-resistant masking use.
- A roll of High-Temperature Masking Tape (Eastwood #16315 – 16319 & 16321) to mask threads, machined surfaces and other areas where powder build is not desired (see "Masking the Part").
- 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). Large wire type Paper Clips when opened to an "S" configuration make excellent hooks.
- Clean cotton rags or lint free paper towels.
- A Filter/Regulator (Eastwood #31633). It must be maintained 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 (Rockwood #31521).
- Oven thermometer
- A timer.

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.

PREPPING PARTS FOR POWDER COATING

IMPORTANT NOTES:

- As with normal refinishing, powder can only be applied to clean, bare metal 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 to remove all traces of old paints or coatings.

OLD PAINT AND COATING REMOVAL METHODS

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

- Mechanical Stripping, which is done by scraping, wire brushing, 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 generally 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).
- Chemical removal for removal of less severe and minor surface rust. (see 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.

> **⚠ 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. 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.

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 12)**.
- Eastwood .041 Stainless Steel Safety Wire (#43045) works well for hanging.
- 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.

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. Fingerprints 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 #16315-16319 and #16321) to mask threads and 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 the part from the powder application area to inside the oven to avoid damaging the uncured powder you will soon apply.

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).

> **⚠ 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

- Depressing the Trigger energizes the Emitter and enables powder flow, charging the powder. Releasing the Trigger cuts power to the Emitter and stops powder flow.

- Powder is difficult to apply in deeply recessed areas, into corners and complex intersections of tubing. 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. 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.

> ⚠ **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 its 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 350°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. Cutting and buffing is not recommended on metallic powders that do not have clear applied over top.

- 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 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 in 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.

SECTION III: GENERAL POWDER COATING PROCEDURES

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 the HotCoat PCS-1000, the air pressure MUST be decreased from blow-gun cleaning pressure or damage will occur! The Gun and Hopper assemblies are designed for no more than 50 PSI.

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 machined 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. Changing to a higher 60+Kv Voltage setting is recommended to provide additional power to penetrate an existing powder coated surface for applying multiple coats.

> ⚠ **NOTICE**   STATIC CHARGE BUILDUP!
> To protect the user, the metal shell of the Powder Gun Handle is integrated with the grounding system. Although gloves should be worn when handling powder, always operate the Powder Gun with a bare hand to avoid static buildup in the body of the user.

- 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.
- Thoroughly clean the Gun, Powder Feed Hose and Hopper of the previous color by blowing out with clean, dry compressed air.
- Load the Hopper with the appropriate color or clear no more than half full.
- 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. **DO NOT** attempt to attach the ground clip to a previously powder coated surface as it acts as an insulator and will not allow a good ground.
- 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 ("HOT-FLOCKING")

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.
  NOTE: This method of "Hot Flocking" may be used on many non-conductive materials such as wood, ceramics, glass and more if it will withstand exposure to 400°F+ temperatures without harm.

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.

Abrasive 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).

PROBLEM	CAUSE	CORRECTION
Powder Does Not "Stick" to Surface of Part.	Poor grounding of part. The most common cause of failure of powder to stick to a part is poor grounding.	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: 1. Unplug Control Unit from power source. 2. Use an electrical multimeter set to the audible "buzz" or sound position and check for continuity between the Ground Post at the rear of the Control Unit and the part to be powder coated. A self-powered test light may also be used. 3. Correct the cause of poor ground and re-test.

PROBLEM	CAUSE	CORRECTION
Powder is Being Repelled From Surface of Part or Bare Areas are Appearing on Surfaces Where Powder Previously Attached	A repelling magnetic field has built up on the part known in the industry as the "Faraday-Cage Effect".	Stop all work, unplug Gun then retrace all paths of ground as described in the Ground Wire Connection section these instructions. Lower the Voltage Control Knob to the 40Kv or lower 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.
	Air pressure supply to gun is set too high.	Reduce the Gun Air Pressure setting on the Control Unit. 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	CAUSE	CORRECTION
Powder finish has pits, holes, pock-marks or bubbles	Surface of part is contaminated.	Part may be wet sanded with 400 grit abrasive paper to level out pits. Apply second coat of powder.
		Remove powder coating with a dedicated chemical remover or stripper
		Remove powder coating by abrasive blasting.
		Thoroughly clean part with Eastwood PRE-Painting Prep or acetone to remove all traces of contamination.
	Moisture or other contamination in air supply	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	CAUSE	CORRECTION
Powder finish over a casting has pits or bubbles	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.	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. **NOTE:** 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	CAUSE	CORRECTION
Powder finish "Orange Peel" texture. **NOTE: A certain amount of orange peel is unavoidable, especially with polyester-based powders.**	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.	Part may be wet sanded with 600 grit abrasive paper to level out surface. Continue with successively finer grades of abrasive then buff out with compound as with conventional automotive finishes.

PROBLEM	CAUSE	CORRECTION
Uneven spray pattern or clumping of powder	Moisture in powder. Can occur from moisture in air supply or exposing the powder to extremely humid conditions.	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.
		Moisture can cause clumps in powder while it is in the Hopper or storage bottle. Use a kitchen flour sifter to break up clumps in in the Hopper making it usable.
	Air pressure supply to gun is too low.	Increase Gun Air Pressure setting on Control Unit. 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.
	Powder was exposed to excessive heat during storage and has partially cured in the container.	A kitchen flour sifter may work to break up clumps. If this is unsuccessful, the powder must be discarded.
	Level of powder in Hopper is too high.	A little goes a long way. Filling the Hopper to approx. 3" deep is ideal. Never fill the Hopper more than 1/2 full or incomplete fluidization will occur resulting in clumps.

SECTION IV: TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Powder Finish Flakes Off In Use	Generally, a powder coating fails because of improper prep where impurities, contaminates or traces of a previous coating prevent good adhesion.	Powder must be removed completely from surface, a proper prep done and powder re-applied.

PROBLEM	CAUSE	CORRECTION
Powder Finish Chips In Use	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.	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	CAUSE	CORRECTION
Powder darkens, yellows or develops cracks after cure (particularly clears and light colors).	Powder was exposed to over temperature conditions at cure.	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).
		Remove powder film, clean part and re-coat.

NOTES

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Eastwood Technical Assistance: 800.343.9353 >> tech@eastwood.com

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SECTION V: AVAILABLE ITEMS

#15635	Eastwood Bench Top Powder Coating Oven
#54313	Eastwood Elite HotCoat 2lb. Powder Hopper with Stand
#54300	Eastwood Elite HotCoat 5lb. Powder Hopper
#54308	16.25' (5m), Grounded Clear Vinyl Powder Hose
#54309	8mm x 30" Polyurethane Air Feed Tube
#43045	0.041 Stainless Steel Safety Wire, 1lb. Spool
#31521	Rockwood Air Coupler Set
#31633	Eastwood CFS, Complete Filtration System
#31635	Eastwood In-Line Air Filters, Pack of 2
#31223	Eastwood Non-Contact, Infrared Thermometer
#15556	Eastwood Paint and Powder Stand
#16315-16319 & 16321	High-Temp Powder Coating Masking Tape
#58041	High-Temp Silicone Caps and Plugs
#15862	Eastwood Powder Coating Polish
#10207Z or 10288Z	Lab Metal Filler
#43090	Eastwood Safety Goggles
#13000	3M 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 & 10680A	Infrared Powder Curing Lamps