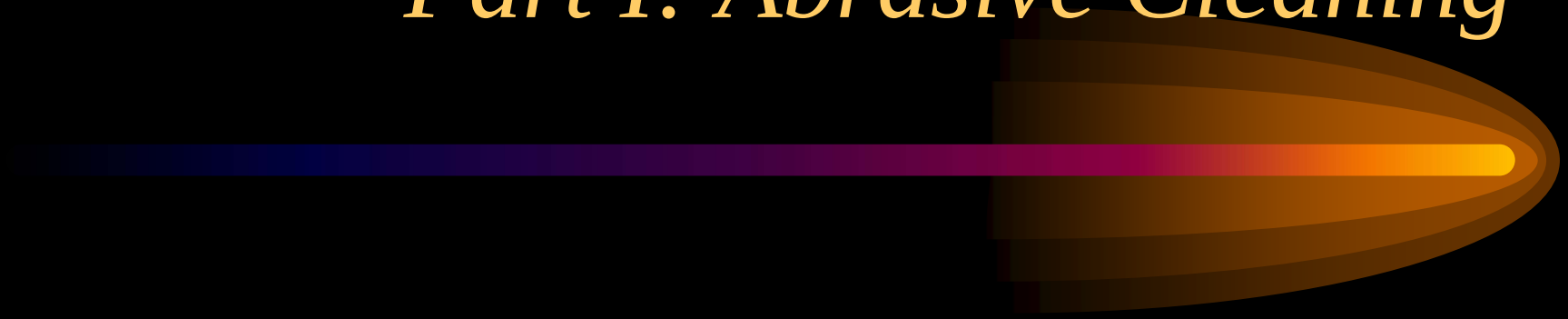
Abrasive Cleaning and Painting Basics

Harris County Pollution Control
Elizabeth Guynn
2005

Part I: Abrasive Cleaning



Applicable Rules

- 30 TAC 116.110 (a) - Permits
- 30 TAC 106.451 and 106.452 – Permit by Rule
- 30 TAC 111.111 (a) (1), (7), (8) – Visible and Particulate Emissions
- 30 TAC 330 or 335 - Waste Disposal

Types of Operations

- Cabinet abrasive cleaning
- Outdoor dry abrasive cleaning
- Outdoor wet abrasive cleaning
- Booth abrasive cleaning

Cabinet Abrasive Cleaning

- Abrasive cleaning is conducted in a large box or cabinet equipped with a window and holes for gloves.
- Limits the size of object to be cleaned.
- Does good job of containing dust and resulting abrasive cleaning waste.

Outdoor Dry Abrasive Cleaning

- No limits on size of object to be cleaned.
- Site must be carefully located to comply with environmental and safety regulations.
- Difficult to contain particulate emissions and resulting abrasive cleaning wastes.
- Weather dependant.

Outdoor Wet Abrasive Cleaning

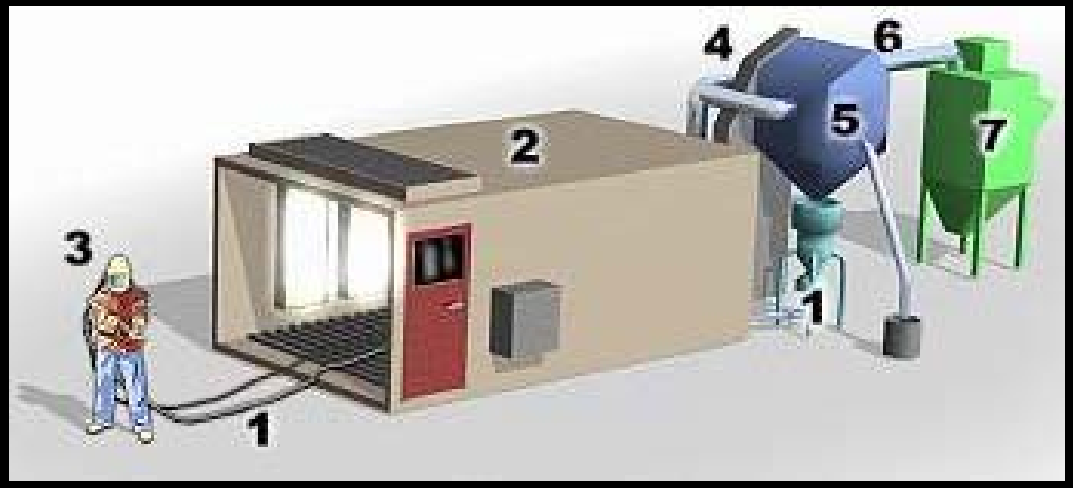
- No limits on size of object to be cleaned
- Distance requirements not as strict
- Weather dependant
- Must have way to collect wastewater runoff

Booth Abrasive Cleaning

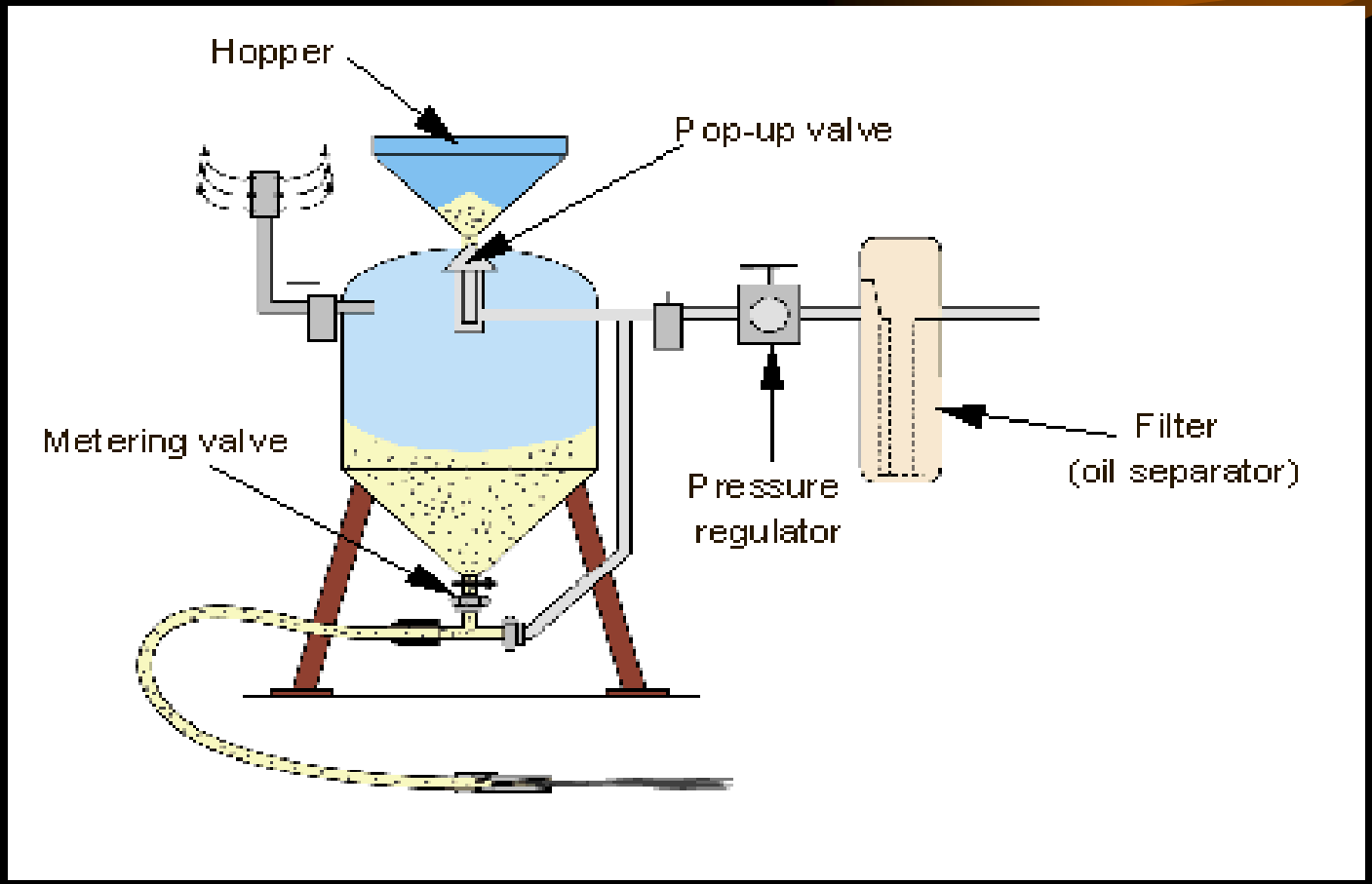
- Size of object to be cleaned is dependant on size of booth.
- Good for containing particulate and abrasive cleaning waste.
- Booth design may be such that collection of waste for recycling can be facilitated.
- Must comply with OSHA 1910.94.

Abrasive Cleaning Equipment

- Projection System
- Abrasive Trap (optional)
- Dust Collector (available for booth and cabinet operations)
- Grit retrieval system (available for booth and cabinet operations)
- Air separator



Typical Projection System



Grit Retrieval Systems

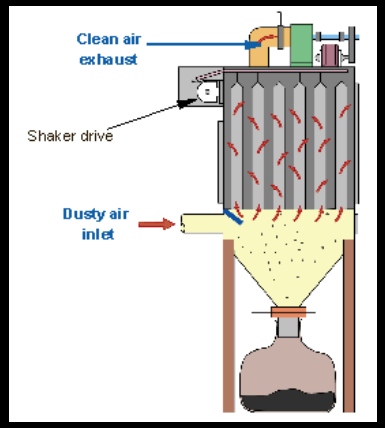
- Not available for most outdoor operations unless conducted in a semi-enclosure.
- Can be automated or manual.

Dust Collection

- Available on booths and cabinets.
- Basic filter mounted in wall (like a paint booth).
- Water wall
- Cyclone
- Baghouse
- Cartridge System

Dust Collection Systems

1



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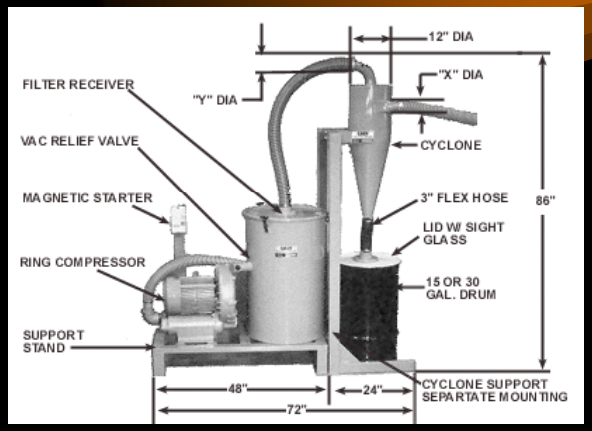

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1. Baghouse
2. Cyclone
3. Water wall

Abrasives

Abrasive	# of Uses	Abrasive	# of Uses
Silica Sand	1	Olivene	1
Coal Slag	1	Black Beauty	1
Garnet	3-5	Star Blast	
Aluminum Oxide	15-20	Silicon Carbide	80-100
Staurolite	1-5	Specular Hematite	6-7
Copper Slag	1	Nickel Slag	1
Steel Grit	200-1500	Crushed Glass	1
Plastic Media	20-30		

* Depends on what type of items are being cleaned and weather conditions.

Pollution Issues

Air

- Particulate emissions from several sources (most common)
- Exhaust vents on dust collection systems
- Exhaust vent on pressurized systems
- Leaking booth or cabinet
- Exhaust on external hopper
- Bounceback from blasting (outdoor)
- Overspray (outdoor)
- Leaking hoses

Solid Waste

- Waste abrasive material. May be contaminated with lead, chromium, paint, oil other metals.
- May be hazardous based on waste determination
- Waste abrasive may be recycled or reused after waste determination.
- Waste filters including cartridges, bags, fabric filters
- Wastewater (systems using water walls or similar)

Part II: Painting

Applicable Rules

- 30 TAC 116.110 (a) - Permits
- 30 TAC 106.8 and 106.432 to 106.436 – Permit by Rule
- 30 TAC 115. 420 to 115.429 – Solvent Using Coating Processes
- 30 TAC 335 - Waste Disposal

Common Painting Operations:

- Paint Booth Operations
- Outdoor Painting Operations

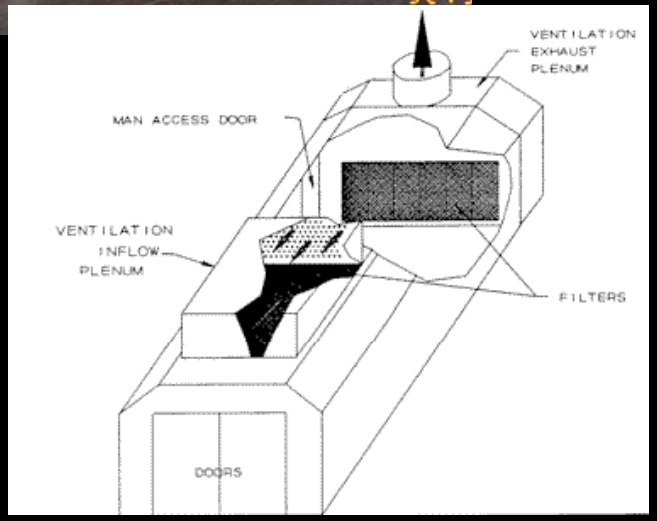
Paint Booth Operations

- Several different types of booths:
  - Industrial
  - Side draft
  - Cross Draft
  - Bottom Draft
- Stacks shall be located at least 50 feet away from any residence, recreation area, church, school, child care facility, or medical or dental facility

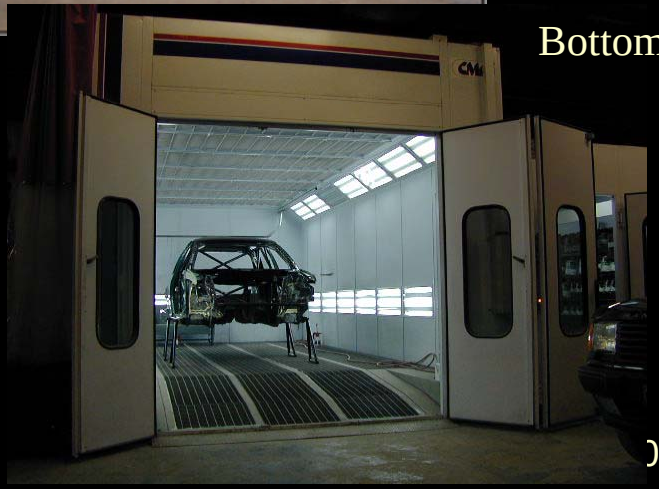
Types of Paint Booths:

Side Draft

Industrial



Cross Draft



Bottom Draft

Filter Media

- Paper
- Styrofoam
- Plastic (polyester etc.)
- Fiberglass
- Metal
- Glass Fiber

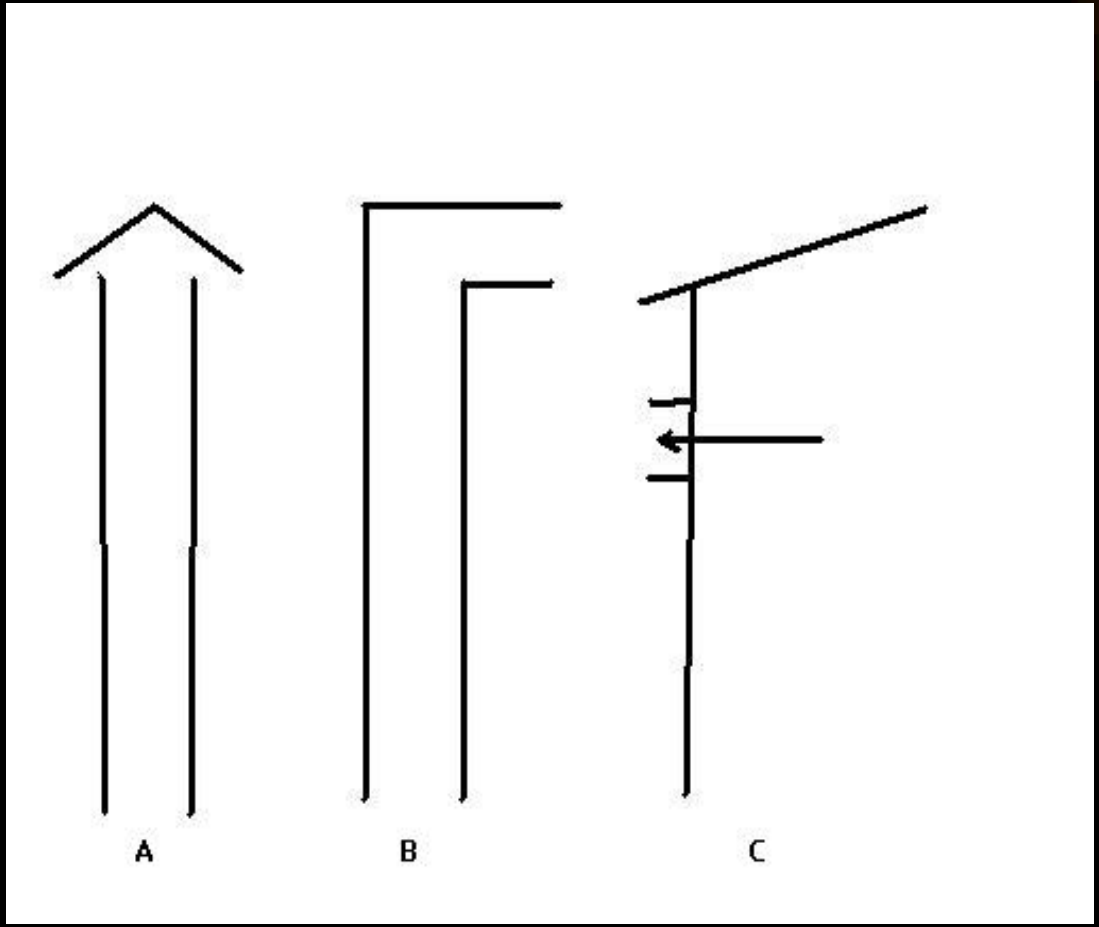
Selection of filter media depends heavily on the following factors:

- Type of coatings being used
- Air flow volume of booth

Paint Booth Exhaust Stacks

- Must be 1.2 X height of building as measured from the ground for auto refinishing
- Must be 1.5 X height of building as measured from the ground for all other painting activities
- If taller building is located within 200ft. height must be based on that building.
- Must have an unobstructed vertical flow when operating

Unacceptable Stack Designs



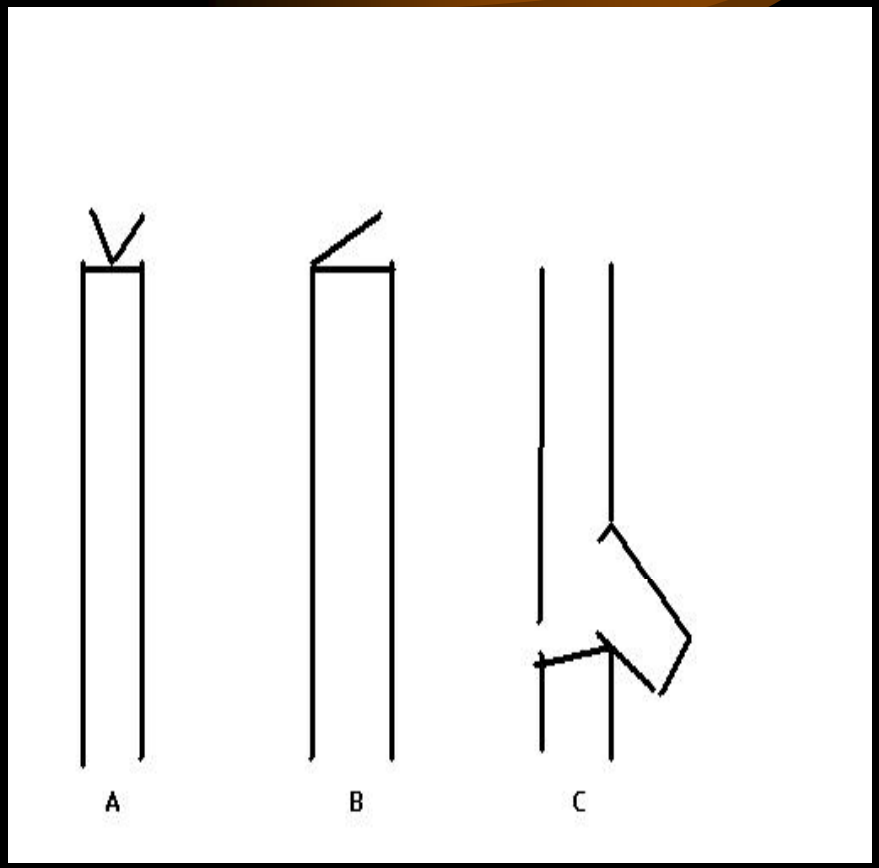
A: Rain cap on stack

B: 90 degree turn in stack

C: Horizontal exhaust

Acceptable Stack Designs

- A: Butterfly valve opens when compressor is on
- B: Flip valve opens when compressor is on
- C: Side pull compressor with rain valve below compressor pipe



Pollution Issues

Air

- Volatile emissions from several sources (most common)
- Rain caps on exhaust vents; stacks too short
- Missing or sagging filter media
- Filter system not turned on or not drawing properly
- Paint or solvent containers left open
- Paperwork not kept up
- Doors on closed booths left open
- Painting in room with no filter system
- Distance requirements not met

Solid Waste

- Generation of hazardous wastes in form of waste solvents, paint, and filters
- Waste containers not properly labelled
- No receipts/manifests for waste disposal
- Failing to clean up spills
- Containers not covered

Outdoor Painting Operations

- Must be conducted at least 50 ft. from a property line and at least 250 feet from any recreational area, residence, or other structure not occupied or used solely by the owner or operator of the facility or the owner of the property upon which the facility is located.

Pollution Issues

Air

- Distance requirements not met
- Facility is unpermitted or not registered with a PI-7
- Overspray
- Odor
- Paint or solvent containers left open
- Paperwork not kept up

Solid Waste

- Generation of hazardous wastes in form of waste solvents and paint
- Waste containers not properly labelled
- No receipts/manifests for waste disposal
- Failing to clean up spills
- Containers not covered

Water

•If facility is not covered, stormwater may come in contact with the process area. Any water in contact with the process area may be considered process water.

What is the problem with this picture?

And this one?

What about this one?

One last try…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