Dryer Exhaust Systems
Types of Clothes Dryers

- **Type 1 dryers**: “Domestic” dryers to be used primarily in a family living environment.
  - Residences
  - Individual apartments or condominiums

- **Type 2 dryers**: “Public” dryers designed to be used in business with direct intercourse of the function with the public.
  - Laundromats
  - Laundry rooms (apartment complexes, dormitories, etc.)
  - Business laundries (hotels, hospitals, health clubs, etc.)
Typical Dryer Manufacturer’s Requirements

- Where possible use a single exhaust duct per dryer

- Dryers are to run with a positive outlet pressure.
  - Type 1 dryers between +0.10 and +0.90 inch W.C.
  - Type 2 dryers between +0.10 and +0.30 inch W.C.

- Maximum exhaust duct length:
  - Type 1 dryers = 35 equiv. feet (each elbow = 5 feet)
  - Type 2 dryers = 15 equiv. feet (each elbow = 5 feet)
Use a Mechanical Dryer Exhaust to Extend Exhaust Duct

- Exhaust duct can be extended to almost any length
- No need to locate dryer near a secluded outdoor wall
- Reduce drying times by holding the correct outlet pressure
Typical Dryer Manufacturer’s Requirements for Multiple Dryers

- Vertical exhaust must not exceed 8 feet and can include up to 3 elbows.
- Horizontal exhaust cannot exceed 15 feet and 1 elbow.

### Table: Multiple Dryer Venting

<table>
<thead>
<tr>
<th>No. of Dryers</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Cross Section Area (sq.in.)</td>
<td>324</td>
<td>256</td>
<td>210</td>
<td>120</td>
</tr>
<tr>
<td>Minimum Round Duct Diameter (in)</td>
<td>20</td>
<td>18</td>
<td>16</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note: Diagram depicts venting configurations, including exhaust connections at a common duct, vertical and horizontal clearances, and inspection doors.*
Use a Mechanical Dryer Exhaust for Multiple Dryers

Multistory exhausting of dryers

Common exhausting of multiple dryers (Laundry Room)
Common Exhausting of Multiple Dryers (Laundry Room)

- By definition only Type 2 dryers should be used for this application.
- Connector from dryer outlet to common horizontal is metal duct with smooth interior finish.
- Connector diameter = dryer outlet diameter.
- Max connector length = 15 equivalent feet.
- Connector to be attached to common horizontal at no greater than 45°.
Common Exhausting of Multiple Dryers (Laundry Room)

- Common horizontal duct diameter is sized with maximum 0.10 inch W.C. pressure drop.
- Pressure drop in main exhaust shaft is only limited by fan’s total pressure capability.
- Cleanouts must be provided in the common horizontal as well as the main exhaust shaft for removal of lint.
- The fan can be located anywhere down-stream of the last dryer.
Multistory Exhausting of Dryers

- Type 1 or Type 2 dryers

- If main exhaust shaft does not need to be fire rated – attach connector to main shaft at 45° as previously shown

- If main exhaust shaft does need to be fire rated – attach connector via a 22 inch subduct riser as shown
  - Main exhaust shaft and subduct riser must be made of appropriate materials to meet local codes
  - In order to offset the subducts, a square or rectangular main exhaust shaft should be considered
Main Issues when Common Exhausting Dryers

- For multistory dryer systems where the 22 inch subduct is used to maintain fire rating, a fan MUST BE USED and it must be in operation at all times to comply with code requirements

  - IBC 2000 715.5.3.1 Penetrations of shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.
    **Exceptions:** Fire dampers are not required at penetrations of shafts where:
    1. Steel exhaust subducts extend at least 22 inches (559 mm) vertically in exhaust shafts provided there is a continuous airflow upward to the outside.
Multistory Exhausting of Dryers

- Dryer is connected to subduct riser using a transition duct
  - Type 1 dryers - total equivalent feet of subduct riser plus transition duct = 25 feet
    - Type 1 dryers can use an approved flexible metal duct of max 8 feet
  - Type 2 dryers – total equivalent feet of subduct riser plus transition duct = 15 feet
Multistory Exhausting of Dryers

- Main exhaust shaft is made of smooth (fire-rated) material
- Main exhaust shaft sized to max 0.10 inch W.C. pressure drop
- Access door or cleanout to be located at bottom of main exhaust shaft for lint removal
- Fan can be located anywhere above top most dryer
Main Issues when Common Exhausting Dryers

- No dampers (back-draft dampers, fire dampers) or baffles can be used IN the duct system unless approved by the dryer manufacturer. An approved back-draft damper can be used at the termination of the exhaust duct.

- Exhaust system must be able to unload so that off dryers will not be drawn into a deep negative

- The pressure drop between dryers must be maintained less than 0.10 in W.C.

- Fan must be of Spark Resistant Construction, able to handle lint, and allow easy access to the impeller in order to remove lint if needed

- Clean-outs must be provided in all sections of exhaust ducts that are larger than the outlet connection of the dryer
## Recommended Diversity Factors

<table>
<thead>
<tr>
<th>Application</th>
<th>Number of Dryers per Exhaust Shaft</th>
<th>Diversity Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Exhausting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 - 7</td>
<td>100 %</td>
</tr>
<tr>
<td></td>
<td>8 - 14</td>
<td>90 %</td>
</tr>
<tr>
<td></td>
<td>15 - up</td>
<td>80 %</td>
</tr>
<tr>
<td>Multistory Exhausting (One dryer per apartment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 - 5</td>
<td>100 %</td>
</tr>
<tr>
<td></td>
<td>6 - 10</td>
<td>80 %</td>
</tr>
<tr>
<td></td>
<td>11 - 14</td>
<td>70 %</td>
</tr>
<tr>
<td></td>
<td>15 - 19</td>
<td>60 %</td>
</tr>
<tr>
<td></td>
<td>20 - up</td>
<td>50 %</td>
</tr>
</tbody>
</table>
## Variable Speed vs. Single Speed

<table>
<thead>
<tr>
<th>Variable Speed</th>
<th>Single Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Usually runs at low rpm = low power</td>
<td>• Runs at full rpm 24 hr/day X 365 days/yr = high power</td>
</tr>
<tr>
<td>• Uses little to no conditioned air = low additional building heat or A/C</td>
<td>• Uses a large quantity of conditioned air = large additional building heat and A/C</td>
</tr>
</tbody>
</table>
## Variable Speed vs. Single Speed

### 20 Dryer Multistory Apartment

\[ 200 \text{ cfm} \times 20 \times 50\% = 2000 \text{ cfm} \]

<table>
<thead>
<tr>
<th></th>
<th>MDVS</th>
<th>Single Speed</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fan Power</strong></td>
<td>41 KW/yr</td>
<td>4368 KW/yr</td>
<td>$437 /yr</td>
</tr>
<tr>
<td><strong>Loss of heated air</strong></td>
<td>1,454,200 (BTU/yr)</td>
<td>155,520,000 (BTU/yr)</td>
<td>$1,555 /yr</td>
</tr>
<tr>
<td><strong>Loss of A/C air</strong></td>
<td>824,100 (BTU/yr)</td>
<td>88,128,000 (BTU/yr)</td>
<td>$557 /yr</td>
</tr>
</tbody>
</table>

**Location** = Atlanta, GA (3000 DD\(_H\), 1700 DD\(_C\))

Power = $0.10 per KW/h

Heating = $1.00 per therm

A/C = 0.75 KW/ton X $0.10 per KW/h

**Total Annual Savings** = $2525
MDVS – Mechanical Dryer Venting System
Mechanical Dryer Venting Systems
ABC’s of the MDVS

A Aesthetics
   ➢ Exhaust your dryers out a less visible wall
   ➢ Locate dryers where you want

B Back Pressure
   ➢ Maintain the back pressure required by the manufacture to keep drying time down and reduce the risk of fires

C Cost reduction
   ➢ Reduce the size of the exhaust vent
   ➢ Reduce operating costs by keeping drying times down
Make-Up Air Supply for Dryers
Make-Up Air.

• Z223.1-2002

9.4 Clothes Dryers.

9.4.3.2 Provisions for Make-Up Air. Provisions for make-up air shall be provided for Type 2 clothes dryers, with a minimum free area of 1 sq.in. for each 1000 Btu per hr total input rating of the dryer(s) installed.
National Fuel Gas Code requires a minimum free area opening of 1 sq.in./1000 Btuh

Most manufacturers require even larger – approximately 1 sq.in / 700 Btuh. Ex. A twin 30# tumbler dryer with a total input of 204,000 Btuh (1100 cfm) requires a minimum 2 sq.ft. free area opening.

Most laundry facilities have problems with make-up air. The industry believes it is one of their biggest problems.
Thank You!