Depressurization Testing

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Why bother?

- Radon mitigators are adding exhaust equipment to houses
- There may be “spillage-susceptible” appliances in the house
  - Furnaces, water heaters, fireplaces, etc.
- Attached garages can also be a problem with house depressurization
- Testing house depressurization ensures that your radon fan does not create spillage problems

What's most at risk?

- Any appliance with a chimney
  - Gas, oil, wood fuels can create carbon monoxide during combustion
  - Properly vented appliances will keep CO, particles, NOx, and other pollutants out of house air
- Most new gas installations are direct-vented or power-vented, which makes them spillage-resistant
- Some concern about automotive emissions coming in from attached garages
  - E.g. Higher levels of benzene are found in most houses with attached garages

Is there standardized testing?

- CSA F-300-13 Residential Depressurization
- It has two approaches:
  - Initial predicted depressurization calculation
  - Field test in house

Paper test

- Don’t bother UNLESS:
  - You are testing a very big, older house, and
  - It has one small bathroom fan
- Otherwise this conservative test will (almost) always fail the house and require the subsequent field test

What are depressurization limits?

- Basically the depressurization at which a venting system will fail
- A bit of a dog's breakfast in F300
- Gas industry pressure on the committee led to gross simplifications
- F300 limits:
  - No limit on direct or power-vented appliances
  - Manufacturer's specified limit on appliance (largely mythical)
  - 5 Pa limit on natural draft appliances (e.g. anything with a chimney)
    - Woodburning appliances may be exempt (or not)
  - Attached garages are referenced as a problem but no depressurization limits are assigned to their existence

The special case of woodburning appliances

- Almost all fireplaces, woodstoves have a chimney
  - Pellet stoves are an exception as many are power-vented
- Depressurization limit would then be 5 Pa
  - Chimneys for woodburning appliances may actually reverse at lower pressures at the end of a long burn
- National Building Code resolves this by saying that woodstoves protected by a smoke alarm and CO alarm do not necessarily need protection against depressurization
  - Recognizes that houses should not have expensive retrofits for combustion appliances that are usually infrequently used

Essence of the F300 test

- Make the house tight (close everything)
- Turn on all big exhaust appliances
  - Any exhaust on continuously
  - Dryer
  - Kitchen range hood (usually)
  - Any fan rated at 75 L/s or greater
- Test pressure difference across the house envelope
- Verify that it is less than depressurization limit

Details

- Best to follow instructions in the standard
- Recommends manometer type and placement
- Discusses wind effects during testing
- Deals with natural stack pressures
- Specifies what to do with:
  - House preparation
  - Furnace circulation fan (off or on)
  - Doors being closed
  - Supply fans (whether they are interconnected or not)

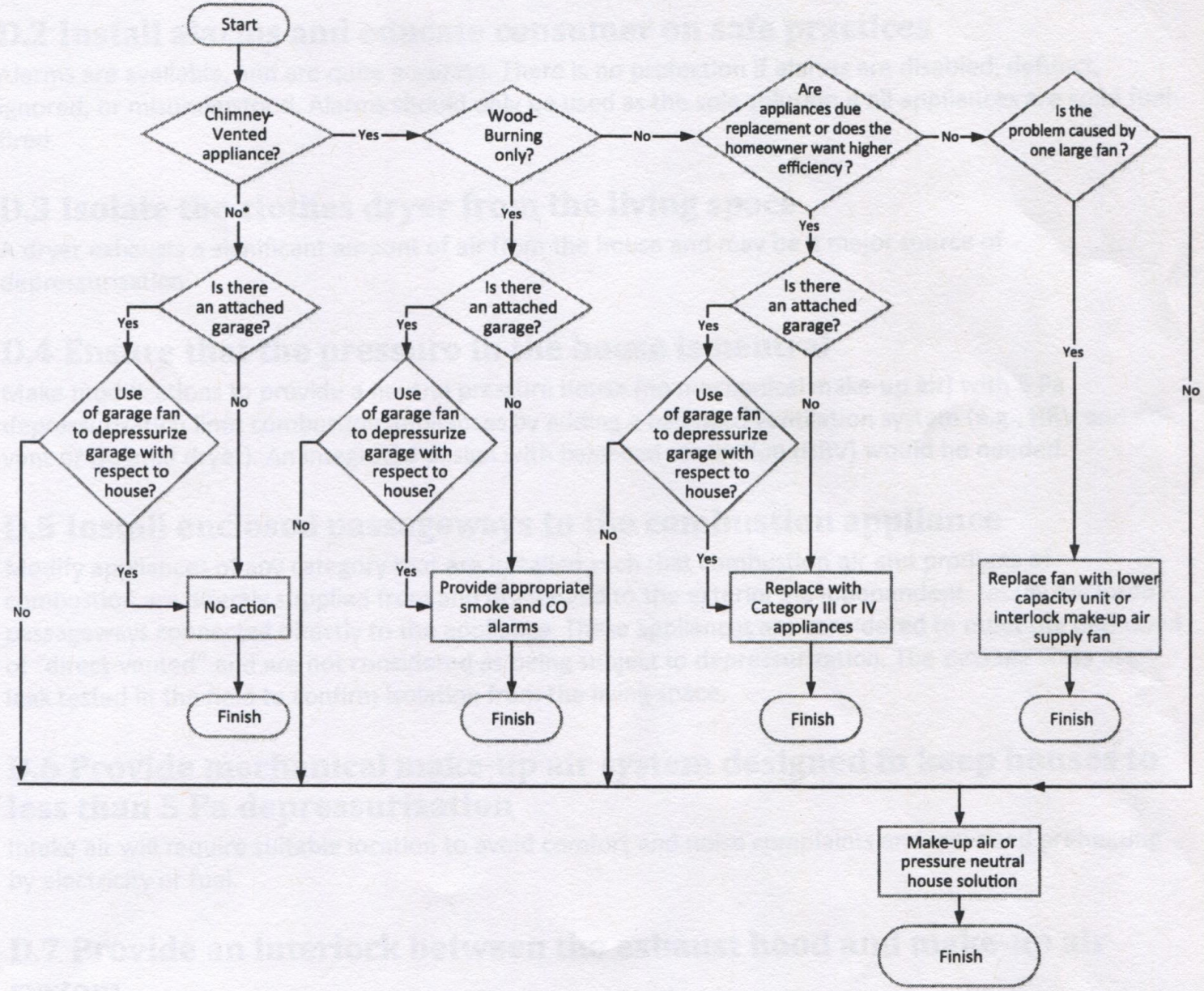
What to watch for as a radon mitigator

- Existing problems: you can be installing a radon system in a house with an existing depressurization problem (e.g. spillage when range hood operates)
  - You do not want your radon fan to be implicated in those events
- Leaky basement floors (and walls in some cases)
  - If you do not seal these, the radon fan may cause high levels of house depressurization

How do you resolve a depressurization problem?

- Maybe a bit beyond your responsibility but …
- Three basic approaches:
  - Reduce the exhaust capacity
  - Provide make-up air
  - Change out appliances to something with more spillage resistance

Figure C.1
Mitigation solution flowchart
(See Clause C.1.)



Questions?