

## Best Practice – Recommended Tools

**Date:** Revised May 2020

**Subject:** Recommended tools & diagnostic equipment for:

- Weatherization assessors- inspectors
- Weatherization contractor teams.

**Problem or Question:** What tools/diagnostic equipment should we make available for our assessors/inspectors when they go out in the field to do whole-house assessments or final inspections? What types of tools/diagnostic equipment should my contractor(s) have to effectively perform weatherization work?

### Discussion:

The following tools, materials, and diagnostic equipment should be available for assessors-auditors-inspectors:

- *Materials Installation Standards Manual*
- *Standard Work Specifications Field Guide (both Single Family and Manufactured Housing)*
- Diagnostic equipment/accessories:
  - Blower door and all components
  - Duct blower/blaster and all components
  - Duct mask or register covers (to cover vents, etc. when running a duct blaster or blower door.)
  - Pressure pan
  - Multiple manometers
  - Manometer hoses of various lengths & hose connectors
  - Metal extension tubes & static pressure probe for manometer (conduct duct operating pressures, ZPD, draft, WRTO testing, etc.)
  - Exhaust Fan Flow Meter
  - Infrared camera
  - Combustion analyzer with the ability to take CO as measured/air free readings, efficiency, stack temp, etc.
  - Combustible gas detector (sniffer) & leak detection fluid (to verify results)
  - Smoke puffer/pencil
  - Appliance energy consumption meter (refrigerator meter)
  - Thermometers
- Standard PPE (Coveralls, gloves, booties, safety glasses, mask, hard hat, knee pads, etc.)
- Personal CO detector (detect ambient CO/LEL)
- Clipboard **and/or** Tablet with assessment forms
- Digital camera
- Compass (determine home orientation)
- Common Hand tools:
  - Screwdrivers (all types)
  - Utility knife
  - Tape measure
  - Hammer
  - Pry Bar
  - Etc.
- Ladders & step stools
- Mirror with extendable handle
- Borescopes (flexible)
- Flash light and/or headlamp
- Cordless drill and assorted bits
- Assortment of screws/fasteners
- Insect repellent
- Caulk gun & caulk (to fill investigative holes)
- Items to seal flue penetrations after combustion testing (high temp sealant, plugs, foil tape, etc.)

The following tools, materials, and diagnostic equipment is strongly recommended for weatherization crews to assist them in successfully completing their work scope:

- Materials Installation Standards Manual
- Standard Work Specifications Field Guide *(both Single Family and Manufactured Housing)*
- All trade related tools to perform the identified work scope
- Standard PPE (Coveralls, gloves, booties, safety glasses, mask)
- Personal CO detector to detect ambient CO/LEL *(all crews)*
- Blower door and all components *(crews performing air sealing)*
- Duct blower/blaster and all components *(crews performing duct sealing)*
- Duct mast or register covers to cover vents/returns when running a duct blaster. *(crews performing duct sealing)*
- Pressure pan *(crews performing duct sealing or air sealing)*
- Exhaust Fan Flow Meter *(crews installing ASHRAE, Exhaust fans, etc.)*
- Multiple manometers with additional hoses and metal tubing options *(crews performing duct sealing, air sealing, CAZ testing, etc.)*
- Digital camera or camera phone *(all crews)*
- Combustion analyzer with the ability to take CO as measured/air free readings, efficiency, stack temp, etc. *(crews associated with gas appliances)*
- Combustible gas leak detector and/or leak detection fluid *(crews associated with gas line installation or appliances)*
- Thermometers *(crews associated with heating/cooling or water heater repair/installation)*
- Infrared Camera *(crews performing duct or air sealing)*

#### **Recommendation Summary:**

Agencies should review the list above to ensure all assessors, inspectors, and weatherization crews have the needed tools/diagnostic equipment to successfully administer WAP services. Having the correct tools/diagnostic equipment will eliminate assumptions, allow measures to be effectively installed, and improve final weatherization results.

For example: Having your contractor utilize diagnostic tools to perform air and duct sealing while running the appropriate diagnostic equipment will help locate actual air leakage sources, allow for sealing material to be installed effectively, and result in higher CFM reductions.

**Reminder:** all diagnostic equipment must be properly maintained and re-calibrated according to the manufacturer's specifications (2 CFR 200.313(d)).