HVAC and Duct Sealing Guide

Benefits
- Sealed ducts reduce the workload of the system, reducing the loss of conditioned air through cracks and gaps, saving energy and money on heating and cooling bills.
- Improves indoor air quality by keeping unwanted air that is in unconditioned and polluted spaces (such as the attic or crawlspace) out of living spaces.
- Improves home comfort by distributing the conditioned air where it is intended to be.

Requirements
- All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed with an approved sealant such as UL 181 rated tape, mastic, or a combination of these products.
- HVAC systems should be properly sized using Manual J and Manual D calculations. Improper sizing of equipment is a common mistake and will lower the efficiency of the equipment and shorten its life expectancy.

Common Problem Areas
- Seal all connections in mechanical cabinet including refrigerant lines, condensate lines, plenum connections and other seams and holes.
- Boots should be sealed at all connection points including the interior finish.
- Ducts should not be pinched or constricted to avoid restricted air flow.
- Trunk ducts should be sealed at all joints, seams, and corners with mastic.
- Seal seams in framed wall returns. Note: framed supply ducts are not permitted.
- Junction boxes and duct connections should be sealed with mastic.

Duct Insulation Requirements

<table>
<thead>
<tr>
<th>R-value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-8</td>
<td>Supply and return ducts in unconditioned spaces</td>
</tr>
<tr>
<td>R-4</td>
<td>Supply ducts in semi-conditioned space</td>
</tr>
<tr>
<td>R-0</td>
<td>Supply and return ducts in conditioned space unless insulation is needed to prevent condensation</td>
</tr>
</tbody>
</table>

Sealing Flex-duct Collar with Mastic:
1. Attach flex-duct to take-off collar with strap
2. Apply mastic to seal flex-duct to collar and collar to plenum
3. Pull outer liner over sealed take-off; attach strap

Duct testing is required in new homes unless ducts are in the conditioned space. Total duct leakage rate must be 6% or less, and recorded on the energy efficiency certificate.

Appalachian State University Department of Sustainable Technology and the Built Environment
North Carolina Energy Efficiency Alliance | ncenergystar.org