

10 Reasons Why Oversizing Persists

In order to address the oversizing problem, it's important to understand why this practice continues to be the status-quo, despite the overwhelming rationale against doing so.

1. Fear of undersizing

How many homeowners ever complain that their HVAC system is too large? On the other hand, they're quick to complain if they believe their system is too small.

2. That's how I've always done it

Many HVAC contractors still size by 'rules of thumb' developed decades ago when homes were far less efficient (and forgiving). And many who use software-based load calculation tools don't completely trust the results, rounding up at every chance to protect against undersizing.

3. Can't afford to do it right

Equipment is typically sized during the estimating process before the job is secured. At this point, it's hard to justify the time required to accurately model the home. Rather than tracking down detailed window, insulation, orientation and other construction details, most HVAC estimators use worst-case assumptions, resulting in larger equipment than necessary. Once a job is secured, it's the rare contractor that goes back to fine tune the load analysis.

4. Substituting size for quality

Comfort and HVAC complaints in general account for more callbacks than any other issue in new construction. Contrary to popular belief, undersized equipment is rarely the problem. The culprit is usually poorly designed and constructed ducts, or envelope issues. Consciously or not, HVAC contractors tend to compensate for substandard workmanship by upsizing source equipment.

5. The builder dilemma

Few builders understand the importance of proper sizing. And those who are, hesitate to push too hard. The last thing a builder wants is for his or her HVAC subcontractor to abdicate responsibility for customer satisfaction.

6. Quality isn't free

Consider the HVAC contractor who hires top notch labor and follows best practices. In all likelihood, his bids will be higher and systems smaller than the competition. Despite all efforts to convey the value proposition, this contractor routinely loses jobs to those who do only what they can get away with to satisfy the building inspector, a low hurdle indeed.

It's difficult for builders to accept paying more for less. In this scenario, the low bidder may be asked to downsize and re-bid. The standard response to that is to put doubts in the builder's mind whether a smaller system can handle the job. Or push oversized multi-stage equipment, falsely claiming higher efficiency when sized to operate on low stage. In the end, the builder usually opts for the low bidder with an oversized system 'just to be safe' (see Fear of undersizing, above).

7. Managing expectations

Homeowners expect their air conditioners to keep their homes cool even under the most extreme conditions. And why shouldn't they? Most folks have no clue about the consequences and trade-offs associated with excess capacity. With a bit of education, most people can understand the right-sizing rationale and will adjust their expectations accordingly.

8. No help from code officials

A growing number of state and municipal building codes now require load calculations. However, enforcement is almost non-existent in many areas. Even in jurisdictions that require load submittals during permitting, inspectors aren't in a position to question or verify their accuracy. This is also a problem for HERS raters who endeavor to follow Energy Star's requirement to verify proper sizing.

9. Financial disincentive

With no accountability, there's little incentive for an HVAC contractor to take the necessary time to perform accurate load calculations. If anything, he has the least incentive to sharpen his pencil and do it right, with plenty of forces pushing back. After all, larger systems mean bigger contracts and profits. On larger homes, the status quo often adds tens of thousands of dollars to the cost. No one seems to complain. Perhaps because they don't realize doing it right might actually cost less.

10. Outdated training

As with other building trades, the HVAC industry has been slow to embrace change. For the most part, training programs rely on curriculum materials developed decades ago. Trainers as well as those who train the trainers tend to be retired technicians who are largely unfamiliar with the unique challenges and nuances of high performance homes.

Nothing in a contractor's training or experience prepares him for homes sizing out to 1,000 square feet per cooling ton, sometimes much higher. A seasoned contractor was dumbfounded when confronted with my 3,000+ square foot home that had a nominal design cooling load of less than two tons. He retorted, "That'll never work... 800 CFM ain't enough air to blow out a candle!"¹

¹ This home illustrates how Energy Star's 6% duct leakage limit is meaningless when applied to moderately high performance homes. A Duct Blaster[®] result of 180 CFM(25) would pass muster even though the nominal fan flow is only 800 CFM!