

## 10 Reasons Why Oversizing Persists

In order to address the oversizing problem, it's important to understand why the practice continues, 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, 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 rare that the contractor will go back to fine tune the load analysis.

### 4. Substituting size for quality

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

### 5. The builder dilemma

Few builders understand the importance of proper sizing. And those who are aware that oversizing is a problem are hesitant to push too hard. The last thing a builder wants is an HVAC contractor who abdicates all 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 his systems smaller than the competition. Despite all efforts to convey his value proposition, this contractor routinely loses jobs to installers who do only what's required to meet code, a low hurdle indeed. It's difficult for builders to accept paying more for less. In this scenario, the builder may ask the low bidder to downsize his equipment, and his bid. Rather than back down on sizing, the standard response is to put doubts in the builder's mind as to whether a smaller system can handle the job. In the end, the builder usually opts for the low bidder and a larger 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 when it comes to 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

Although many state and municipal building codes require load calculations to be performed, enforcement is almost non-existent. Even in jurisdictions that require loads to be submitted during permitting, inspectors aren't in a position to question or verify their accuracy. This is also a problem for 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. After all, bigger systems mean bigger contracts and bigger profits. On supersized homes with multiple systems, the status quo approach can add tens of thousands of dollars to a contract. No one seems to complain.

## **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, and 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 two tons. He retorted, "That'll never work... 800 CFM ain't enough air to blow out a candle!"<sup>1</sup>

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<sup>1</sup> This home illustrates how Energy Star's 6% duct leakage requirement is meaningless when applied to a moderately high performance home. A Duct Blaster<sup>®</sup> result of 180 CFM(25) would pass muster, even though this system's nominal fan flow is only 800 CFM!