

RIGHT-SIZING MECHANICAL EQUIPMENT: F280-12 DATA COLLECTION

Tips for Building Professionals

This document provides tips to help contractors collect the key information needed for F280-12 calculations and proper mechanical equipment right-sizing.

Tip #1 – Use F280-12 Verified Software Tools

- Determining the right amount of heating and cooling for an existing or new home requires a CSA F280-12 compliant load calculation. A guesstimate method using “rules of thumb” does not work.
- Using F280-12 verified software tools is essential for proper sizing of heating and cooling equipment in new and existing Canadian homes.
- HVAC designers/contractors/Energy Advisors using verified software provide confidence that the software tool can generate the correct results that align with CSA F280-12.
- HVAC Designers of Canada has published an online listing of [F280-12 Verified Software Tools](#).

Tip #2 – Minimize F280-12 Load Calculation Assumptions

- Use of F280-12 verified software tools does not ensure that user errors or omissions will be prevented as part of the load calculation process. Increase confidence in load calculations by minimizing data input assumptions.
- Load calculation data input assumptions may include unknown air tightness (i.e. infiltration rates), unconfirmed building assembly details (e.g. R-values for insulation, U-values for windows), and inaccurate design conditions (e.g. winter design temps, number of occupants).
- Each assumption (e.g. design conditions, air tightness, building assembly details) used for the data input in a load calculation erodes the accuracy of the load calculation.
- For existing homes, it is rare to have accessible architectural plans with home performance details to support a load calculation. An EnerGuide for Existing Homes evaluation by an Energy Advisor is a solution to gather up-to-date building performance data to improve accuracy.
- For new homes, a complete set of architectural plans with accurate building assembly details, window/door/equipment schedule(s) should be used to inform an accurate F280-12 load calculation. An architect/designer and/or builder should be engaged directly to confirm performance information to avoid inaccurate assumptions.

Tip #3 – Understand Critical Inputs

- It is important to understand the critical inputs used to determine the load calculation for the home. Design conditions, building orientation, and building assemblies are critical components that will help inform an accurate F280 load calculation.
- The design condition details include specific building location, indoor and outdoor design temperatures, number of occupants, and other factors that will be contributing to the load. Design conditions should be customized (where possible) for the project based on information provided from the BC Building Code (e.g. winter and summer design temperatures), or discussions with project stakeholders for more precision with the load calculation.
- Orientation of the building can greatly affect the heat gain of the house depending on the ratio of windows to opaque walls, and the degree of shading from the sun. The solar heat gain can change based on window location and its exposure during different times of the day should not be underestimated.
- Building assemblies including proper detailing of performance is a critical component of the heating and cooling load calculation. The R-value of the home's wall, roof, and foundation construction components should be accurately calculated. The window performance including both the U-value and Solar Heat Gain Co-Efficient (SHGC) must be known and accurately represented by the data inputted into the load calculation.

Tip #4 – Ensure F280-12 Load Calculation Accuracy

- A major benefit of using F280-12 verified software is that regardless of the tool used, a standardized report is provided. Standardized F280-12 reporting includes: Output Report (whole home), Output Report (room-by-room), and Input Report.
- Using the standardized reporting package makes it easier to navigate and evaluate the data presented and spot check the load calculation for accuracy.
- For new construction, builders should ensure building elements presented in an F280-12 compliant load calculation meet code requirements, match the architectural plans, and are not modified during construction.
- HVAC Designers of Canada has developed a suite of [Building Official Tools](#) for enhanced compliance and verification practices with F280-12 load calculations.