# MINHERS® Addendum 76
# RESNET® Software
# Impact Analysis

# Summary

MINHERS® Addendum 76 adopts ANSI/RESNET/ICC 301-2022 with addenda A and B in place of ANSI/RESNET/ICC 301-2019. Addenda C and E of ANSI/RESNET/ICC 301-2022 are not officially adopted in MINHERS® Addendum 76, but their adoption in rating software improves consistency and accuracy of ratings and does not contradict other requirements of the adopted standard.

This impact analysis assesses how the adoption of ANSI/RESNET/ICC 301-2022 with addenda A, B, C, and E, impacts the HERS® Index in Ekotrope, EnergyGauge USA, and REM/Rate. This report compares each software tool's implementation ANSI/RESNET/ICC 301-2019 (Ekotrope 4.2.0, EnergyGauge USA 8.1.00, and REM/Rate 2023) with their respective implementation ANSI/RESNET/ICC 301-2022 (Ekotrope 5.0-beta, EnergyGauge 8.1.06-beta, REM/Rate 2024-beta).

This analysis is primarily intended to inform RESNET® Standards Management Board in their decision of when to set the Voluntary Compliance Date and Mandatory Compliance Date for MINHERS® Addendum 76. It also provides limited insights for general RESNET HERS® stakeholders about what to expect upon adoption of the addendum as it relates to HERS® ratings relevant to their use cases.

The buildings and climates used to compare the impact of the new standard on the HERS® Index were designed to get a sense of changes, but do not cover the full range of homes that are rated. It is possible that there are situations where larger (or smaller) changes occur than indicated in the report.

## Changes Evaluated in this Report:

- **Addendum C Consistency Improvements (HERS® Impact: -1 to + 1)** - Addendum C to ANSI/RESNET/ICC 301-2022 contains several changes intended to improve consistency in modeling across software tools. Many of these changes apply to every rated home, and the magnitude of the impact of these changes will depend on how well assumptions made in the modeling software prior to this change align with the new normative specifications. These specifications include (but are not limited to):
    - Material thermal properties
    - Conversions between Infiltration Metrics
    - Hourly load profiles (e.g., for occupancy, lighting, and appliances)
    - Interior shading
- **Updated Publication 002 Acceptance Criteria (HERS® Impact: -4 to +3)** - All software tools must demonstrate compliance with more stringent accreditation test acceptance criteria under the new MINHERS® amendment. This requirement impacted Ekotrope almost exclusively, which contains several improvements to their underlying

building physics simulation, while other software tools test results were already within the new acceptance ranges.

- **Addendum E CFIS Duct Losses (HERS® Impact: +1 to +7)** - Addendum E to ANSI/RESNET/ICC 301-2022 states that simulations with a CFIS system shall account for duct losses when the system is providing ventilation air separate from heating or cooling operation. Significant changes in the HERS® Index were observed in the CFIS Ducts in Attic cases in all climates, with an average increase across all software and climates of 3.01.
- **Addendum E CFIS Fan Power (HERS® Impact: *Varies*)** - Addendum E to ANSI/RESNET/ICC 301-2022 states that "the blower fan efficiency used in the CFIS simulation shall employ the same W/cfm value used for simulation of heating and cooling by that forced-air HVAC system". Previous versions of the standard did not specify what efficiency should be used for the CFIS blower fan efficiency. Some software allowed this value to be user input, while others used a fix default. Now, the forced-air HVAC System fan efficiency (and therefore the CFIS blower fan efficiency) is determined through HVAC installation quality grading (or the Grade III default 0.58 W/cfm). The impact of this change depends on how the previous user input or default CFIS blower fan efficiency compares to that determined by the HVAC installation quality grading process.
- **Attic Insulation Reduction near Eaves (HERS® Impact: 0 to +1)** - ANSI/RESNET/ICC 301-2022 now specifies the derating of ceiling insulation where the eave height is less than the ceiling insulation thickness.
- **Default Framing Fractions (HERS® Impact: 0)** - ANSI/RESNET/ICC 301-2022 changed the default framing fraction for walls and ceilings. All three software tools showed a negligible increase in the HERS® Index going from the 301-2019 to 301-2022 default framing fractions in all climates.