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A CASE STUDY OF THE APPLICATION OF THE AIR VENT BALANCED  
VENTILATION SYSTEM IN THE REAL WORLD

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A handwritten signature in black ink, appearing to read "David A. Weeks", written over a horizontal line.

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## EXECUTIVE SUMMARY

Risk Management and Engineering, Ltd. (RME) was retained by Air Vent Inc. to investigate the impacts of the Air Vent balanced ventilation system installed in an occupied home located in North Central Texas. RME measured air and surface temperatures in the attic and surface temperatures of the ceiling inside the home before and after the installation of the Air Vent balanced ventilation system. RME also read the electric meter at the beginning and end of the 12 hour testing periods to determine the impact of the system on electricity usage. Testing periods were selected to match the outdoor environmental conditions to the extent practicable between the before and after tests. The before test was conducted on July 22, 2008; and the after test was conducted on August 13, 2008.

The 1992 Residence is a greater than 4,000 square foot structure located in Mansfield, TX, suburb of the DFW Metroplex. The roof system is rather complicated and overlays three attic areas. The roof is comprised of gray asphalt shingles. The attic ventilation in the before tests consisted of a small ridge vent in the East Attic and two powered ventilation fans, including one that was not operable. No ventilation was present in the either the West Attic or the Garage Attic. Asphalt shingles of similar color and Air Vent's Edge Vent system were installed on all three attics in the after test. Additionally, Air Vent powered ventilation fans were installed in the East and West Attics and an Air Vent Ridge Vent was installed over the Garage Attic. The existing ridge vents in the East Attic were removed. Powered ventilation fans were installed in the East and West Attics because there was insufficient ridge length to install a ridge vent system in these areas. The East Attic was equipped with two 1,170 cfm fans and the West Attic was equipped with one 1,170 cfm fan. The fans were connected to the household electrical system. The Garage Attic is independent of the other two attics. Additionally, steps were taken to separate the East and West Attics where they were previously connected.

RME has reached the following conclusions based on its inspection, analysis, and review of the technical literature and data.

1. The environmental conditions on the before and after study dates are similar enough to make comparisons of attic air and surface temperatures between the two dates and determine that the differences are the result of the Air Vent balanced ventilation system.
2. Review of the technical literature suggests that a properly ventilated attic should have lower air and surface temperatures than an improperly ventilated attic.
3. The test data show that the air temperatures in the two attics on the after test date are less than the before date and that this decrease is the result of the Air Vent balanced ventilation system.

4. The test data show that the roof deck surface temperatures on the after test date are less than the before date and that this decrease is the result of the Air Vent balanced ventilation system.
5. The test data show that the interior building material surface temperatures on walls and ceilings common with the attics are less on the after test date than the before test date and that this decrease is the result of the Air Vent balanced ventilation system.
6. The available data show that use of an Air Vent balanced ventilation system could result in lower energy cost on a hot day in North Central Texas characterized by a mean ambient temperature of 86 °F. Assuming a cost of electricity of \$0.20 per kilowatt hour, a balanced Air Vent ventilation system may result in summer cost savings that could range from \$52.00 (assuming 10 days of similar temperature and solar insolation) up to \$312.00 (assuming 60 days of similar temperatures and solar insolation).
7. The available data and literature review show that the use of an Air Vent balanced ventilation system will result in lower attic roof deck temperatures and will result in longer asphalt shingle service life.