



HAIL IMPACT PERFORMANCE OF ASPHALT SHINGLES

At A Glance

IBHS has tested commercially available asphalt shingles using both 1.5- and 2.0-in.-diameter laboratory manufactured hailstones. These tests were performed using the [IBHS hail impact testing protocol](#) on new products obtained through the typical consumer supply chain. Laboratory and field research by IBHS has shown that impact energy and material properties of laboratory hailstone sizes are directly related to typical natural hailstones for those sizes in non-wind-driven conditions.

IBHS did not test all available asphalt shingles. The products described here represent a large share of the market. Impact-rated (IR) products are those rated as Class 3 or 4 by the UL 2218 or FM 4473 testing program; all others are referred to as non-IR. Testing results at 2.0 in. for IR products are publicly available on the [IBHS impact ratings scorecard](#). Good and Excellent ratings qualify for use under the [IBHS FORTIFIED Home™—High Wind & Hail standard](#).

The products tested by IBHS were purchased through typical consumer supply channels and tested in their new state. IR products listed in the IBHS hail impact ratings scorecard are tested every 2 years. Any new products are tested at the time that product becomes available in the marketplace through the normal supply chain.

Key Findings

- The new IBHS testing protocol allows for quantification of damage, rather than a pass/fail rating, as shown in the figures below. As a result, product performance differentiation is now possible.
- All products tested with 1.5-in. laboratory hail were rated as Good or Excellent performers. In their new state, both IR and non-IR asphalt shingles should offer good protection for 1.5 in. or smaller hail impacts. The IR products generally offered about 16% better total performance scores.
- For manufacturers where the IR shingle performed better than the non-IR product against 2-in. impacts, performance scores for the IR products with Good and Excellent ratings average 14% higher than the non-IR shingles. For some individual manufacturers and products, the improvement was as high as 34%.
- For 2-in. impacts, all IR shingles rated Good or Excellent were polymer-modified asphalt (PMA) material. The only PMA product that scored lower is no longer available and has been replaced by a PMA product that received a Good performance rating.
- In a cost survey across seven US markets, cost per roofing square (100 sq ft of material) for Good and Excellent performers was 9% higher, on average, compared to costs for non-IR shingles. Prices varied significantly by market region. For example, in the Oklahoma City and Dallas-Fort Worth markets, cost differences for shingles with Good and Excellent IR ratings were, on average, only 2% and 4% higher, respectively. However, the availability of these IR

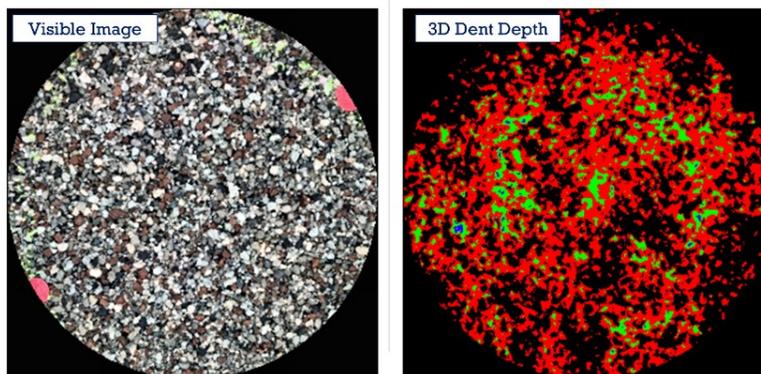
products decreased in the Southeast and Mid-Atlantic markets and cost differences increased.

- For manufacturers that had two different IR products, one product always performed worse than the non-IR counterpart product and used an older materials technology (e.g., scrim backing). IBHS is encouraging manufacturers to replace these old material designs with newer materials that have shown better performance.
- New products all received Good and Excellent granule loss scores, while dents/ridges were consistently the poorest scores in the ratings. Dents/ridges and tears are the types of damage most directly correlated to water penetration as described in our [report on water leakage vulnerability](#).

To review the comprehensive results, please [download our full hail impact performance report](#).

- [Additional Resources](#)
- [Data File](#)

2-Inch Impact with Little Damage



2-Inch Impact with Significant Damage

