

ITS LISTING REPORT #3004534

REPORT

OF

IMPACT RESISTANCE

TESTS OF

CELESTIAL ROOFING TILES

FOR

ECOSTAR, INC.
230 CENTER DR. #201
VERNON HILLS, IL 60061

BY

INTERTEK TESTING SERVICES NA INC.
8431 MURPHY DRIVE
MIDDLETON, WISCONSIN 53562

TEST DATE: SEPTEMBER 10, 2001
REPORT DATE: SEPTEMBER 10, 2001

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Warnock Hersey



ITS LISTING REPORT #3004534
MODEL: CELESTIAL ROOFING TILES
CLIENT: ECOSTAR, INC.
TEST DATE: SEPTEMBER 10, 2001

IMPACT RESISTANCE TEST #UL2218-1996

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INTRODUCTION

This report gives the results of the evaluation of the provided sample (Job #3004534). The test results described in this report are limited to the submitted items. On September 10, 2001 Intertek Testing Services conducted tests on Celestial Roofing Tiles at the ITS Middleton, Wisconsin facility for Ecostar, Inc. The tests conducted are listed in the procedure section. The samples were tested according to UL 2218-1996, "Impact Resistance of Prepared Roof Covering Materials. All reported measurements were made with 95% confidence level using a tape measure (+/- 1/8") and scale (WHI # 8 +/- 0.1 lbs.)

SPECIMEN DESCRIPTION

CELESTIAL ROOFING:

Shingle Type: Injection Molded Polymer Roofing Tile
Dimensions: 18 inches long by 12 inches wide by 1/4 inch thick-tapered
Weight per Square: 252 lbs.
Color: Smoke

PROCEDURE

A 3 foot by 3 foot square base frame was constructed, using nominal 2 inch by 4 inch wood studs, with a stud positioned centrally, running parallel to the edges. The frame was sheathed with 15/32 inch A-C Grade plywood, with the 'A' side facing up. The roofing material was applied with the recommended exposure of 6 inches using galvanized 1-1/2 inch long roofing nails with 3/8 inch diameter heads (2 nails per tile). All materials used in construction of the test samples were stored at ambient temperatures of approximately 70 degrees F for 48 hours prior to testing. The test decks were then placed on a concrete floor and a 2 inch diameter stainless steel ball, weighing 1.18 lbs., was elevated to 20 feet with an electromagnetic clamp and then released. The ball was dropped twice on the same impact location, and depression measurements and observations were made. This procedure was repeated for 6 different impact locations on each test deck. Observations were made using 5X magnification.

RESULTS


CELESTIAL ROOFING TILES

<u>Drop Location</u>	<u>Distance Between Depressions</u>	<u>Depth of Depression</u>	<u>Observations</u>
Center over joint	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system
Right corner	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system
Edge at joint	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system
Left corner	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system
Right center lower edge	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system
Lower edge over joint	Less than 1/2"	No Visible Depression	No evidence of tearing, fracturing, cracking, splitting, rupture, crazing, or other evidence of opening in the roof covering system

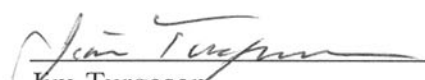
CONCLUSION

The Celestial roofing tiles, as described herein, met the requirements of UL 2218-1996 "Impact Resistance of Prepared Roof Covering Material" after testing with a 2.00 inch diameter ball at a 20 foot drop distance.

Test Conducted by:


Russ Burt
Engineering Technician

Report Reviewed by:


Jim Turgeson
Project Manager- Fenestration

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IMPACT LOCATIONS

