



TESTING SERVICES, INC.
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TEST REPORT

| | | | |
|---------|---------------------------------|------------------|---------------|
| CLIENT: | Robertson Industries | REPORT NUMBER: | 48512 |
| | 4401 E. Baseline Road Suite 105 | LAB TEST NUMBER: | 2178-3228 |
| | Phoenix, AZ 85042 | DATE: | June 25, 2010 |
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Product Description: 5.0" TT Classic

Tested Dimension: 18" x 18" X 5.0"

Sub Base: Concrete

Impact Location: Center of Test Material

Date of Receipt: May 10, 2010

Testing Period: June 22--24, 2010

Authorization: Steve Scaturro

Test Procedure: The submitted sample was evaluated for Shock Absorbing Properties in Accordance with the procedures outlined in ASTM F 1292-09; Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment

Missile: Hemispherical (Triaxial Accelerometer): Total Drop Assembly Weight (46g) 10 lbs

Test Equipment: Triax 2000 Surface Impactor
 Date of Last Calibration: 3/24/2010 by Alpha Automation

Sample Pre-Condition: 50±10 RH, 7sF±5F for a minimum of 24 hrs prior to testing

Sample Conditioning: 8 hrs @ each reference temperatures prior to testing

Temperature: Maximum Drop Height That Gives a Gmax of 200 or Less and A HIC of 1000 or less

| | |
|----------------------|-----|
| Ambient, 72°F (23°C) | 13' |
| Hot, 120°F (49°C) | 13' |
| Cold, 25°F (-6°C) | 12' |

| | |
|------------------------------------|------------|
| Critical Fall Height (CFH): | 12' |
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Reference Gmax Curves Included

Prepared and signed by:

 Erle Miles, Jr. VP
 Testing Services Inc.



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| | | | | | | | | |
|---|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| AMBIENT Sample Condition: Dry Temperature: 70°F (23°C) | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 27.7 | 6 | 12' | 11.92 | 112 | 788 | |
| | 2 | 27.7 | 3 | 12' | 11.92 | 118 | 840 | |
| | 3 | 27.7 | 6 | 12' | 11.92 | 120 | 869 | |
| | Average | | | | Drops 2, 3 | | 119 | 855 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 28.8 | 8 | 13' | 12.89 | 124 | 925 | |
| | 2 | 28.9 | 2 | 13' | 12.98 | 129 | 964 | |
| | 3 | 28.8 | 6 | 13' | 12.89 | 130 | 968 | |
| | Average | | | | Drops 2, 3 | | 130 | 966 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 30.1 | 2 | 14' | 14.08 | 136 | 1094 | |
| 2 | 29.9 | 8 | 14' | 13.89 | 140 | 1110 | | |
| 3 | 29.9 | 7 | 14' | 13.89 | 141 | 1119 | | |
| Average | | | | Drops 2, 3 | | 141 | 1115 | |

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|--|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| HOT Sample Condition: Dry Temperature: 120°F (49°C) | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 27.7 | 7 | 12' | 11.92 | 117 | 808 | |
| | 2 | 27.7 | 7 | 12' | 11.92 | 120 | 840 | |
| | 3 | 27.7 | 7 | 12' | 11.92 | 120 | 848 | |
| | Average | | | | Drops 2, 3 | | 120 | 844 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 28.8 | 7 | 13' | 12.89 | 128 | 947 | |
| | 2 | 28.9 | 8 | 13' | 12.98 | 131 | 978 | |
| | 3 | 28.8 | 9 | 13' | 12.89 | 132 | 984 | |
| | Average | | | | Drops 2, 3 | | 132 | 981 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 29.9 | 10 | 14' | 13.89 | 132 | 1055 | |
| 2 | 30.1 | 7 | 14' | 14.08 | 138 | 1129 | | |
| 3 | 29.9 | 6 | 14' | 13.89 | 140 | 1106 | | |
| Average | | | | Drops 2, 3 | | 139 | 1118 | |

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|--|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| COLD Sample Condition: Dry Temperature: 25°F (-6°C) | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 26.6 | 6 | 11' | 11.00 | 113 | 808 | |
| | 2 | 26.5 | 8 | 11' | 10.91 | 116 | 855 | |
| | 3 | 26.6 | 4 | 11' | 11.00 | 118 | 865 | |
| | Average | | | | Drops 2, 3 | | 117 | 860 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 27.7 | 9 | 12' | 11.92 | 119 | 895 | |
| | 2 | 27.7 | 4 | 12' | 11.92 | 122 | 957 | |
| | 3 | 27.7 | 8 | 12' | 11.92 | 125 | 966 | |
| | Average | | | | Drops 2, 3 | | 124 | 962 |
| | Drop # | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC | |
| | 1 | 28.8 | 10 | 13' | 12.89 | 128 | 1047 | |
| 2 | 28.9 | 7 | 13' | 12.98 | 133 | 1123 | | |
| 3 | 28.9 | 7 | 13' | 12.98 | 136 | 1157 | | |
| Average | | | | Drops 2, 3 | | 135 | 1140 | |