



# DETROIT TESTING LABORATORY, INC.

27485 George Merrelli Drive, Warren, MI 48092 • (586)754-9000 • FAX (586)754-9045 • www.dtl-inc.com

## TEST REPORT

**ROBERTSON INDUSTRIES**  
4145 W. Mercury Way  
Chandler, AZ 85226

**DTL REPORT NO** 7028006-1  
**REPORT DATE** 5/8/07  
**RECEIVE DATE** 3/27/07

**ATTN: Mr. Richard Hawley**

### SAMPLE DESCRIPTION

Robertson Industries submitted one 5 foot X 5 foot X 1.5in thick sample of unitary rubber material identified as TotTurf. Testing was performed on 5/7/07.

### WORK REQUESTED/TEST SPECIFICATIONS

1. Wheelchair work measurement method – straight propulsion with no material on a flat surface with a grade of 7.1%.
2. Wheelchair work measurement method – straight propulsion with material and no grade.
3. Wheelchair work measurement method – turning 90° with no material on a flat surface with a grade of 7.1%.
4. Wheelchair work measurement method – turning 90° with material and no grade.

### REFERENCE DOCUMENTS

ASTM F1951-99 - Determination of Accessibility of Surface Systems Under and Around Playground Equipment

### CONCLUSION

The average work force over one foot, in pound force-inch values measured lower when propelling the wheelchair the 1.5in.TotTurf material than when propelling the wheelchair over a flat surface with a grade of 7.1%. The material met the requirements of ASTM F1951-99.

Detroit Testing Laboratory, Inc. letters, reports and data are for the exclusive use of our customers to whom they are addressed and shall not be reproduced, except in full, without the written approval of the Laboratory. Our letters and reports apply only to those samples tested, and are not necessarily indicative of the qualities of apparent identical or similar products. Samples not destroyed in testing are retained for a maximum of thirty (30) days. The use of the name Detroit Testing Laboratory, Inc. or its Seal or Insignia, are not permitted to be used by the customer on their communications, brochures, advertising, reports or other forms of media, without prior written approval. Reported test parameters are generally specified as set points of testing equipment. All documentation and data utilized in the generation of this report are available upon request.

QCF1090 12/4/06

**TEST RESULTS**

Wheelchair Measurement Test

Procedure:

The sample material was prepared by Robertson Industries in a 5 foot X 5 foot wooden frame at a depth of 1.5 inches. The sample was cut by DTL enabling appropriate test arrangement. The sample was tested by propelling the wheelchair with four (4) even pushes across the material 6.56 feet within eight (8) seconds. This process was repeated five (5) times for each test (straight and 90° turn propulsions).

Results

The table below shows the results for each trial. Per ASTM F1951-99, the work force averages were determined averaging the three median trials, discarding the highest and lowest values.

| Run #          | No Material work per foot<br>in pound force-inch | With Material work per foot<br>in pound force-inch |
|----------------|--|--|
| Straight Run 1 | 109.28   | 39.13  |
| Straight Run 2 | 118.53   | 39.45  |
| Straight Run 3 | 109.10   | 31.94  |
| Straight Run 4 | 109.06   | 34.74  |
| Straight Run 5 | 109.52   | 31.17  |
| <b>Average</b> | <b>109.30</b>                                    | <b>35.27</b>                                       |
| Turn Run 1     | 118.34   | 41.51  |
| Turn Run 2     | 111.81   | 39.65  |
| Turn Run 3     | 109.51   | 44.37  |
| Turn Run 4     | 110.68   | 41.10  |
| Turn Run 5     | 114.21   | 44.48  |
| <b>Average</b> | <b>112.23</b>                                    | <b>42.33</b>                                       |

Remarks:

The wheelchair rider weight was 172lbs., which combined with the wheelchair for a total of 207lbs.

**REQUIREMENTS**

The average work per foot in pound force-inch values for straight propulsion and for turning with material should be less than the average work per foot values for straight and turning on flat surface with a grade of 7.1% .

**TEST EQUIPMENT**

Detroit Testing Laboratory, Inc.'s calibration system meets the requirements of ISO 17025:1999.

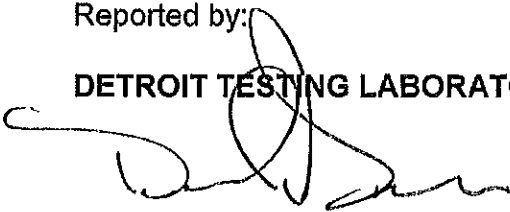
| DTL ID | Description            | Manufacturer | Model      | Calib. Due |
|--------|------------------------|--------------|------------|------------|
| 09357  | Signal Conditioner     | Daytronics   | 3370       | 7/07       |
| 09715  | Reaction Torque Sensor | Lebow        | 2110220500 | 7/07       |
| 09696  | Digital Protractor     | Mitutoyo     | Pro 360    | 4/08       |
|        | Wheelchair             | Quickie      | Q2         | NCR        |
|        | Wheelchair Fixture     | DTL          | -          | NCR        |

**SAMPLE DISPOSITION**

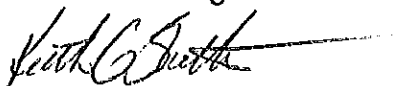
The sample material will be retained for fifteen (15) days, then disposed of at the discretion of DTL unless otherwise requested.

Reported by:

**DETROIT TESTING LABORATORY, INC.**



David Splane  
Certification Programs Coordinator



Keith G. Shelton  
Certification Program Manager

DS

**Enclosure: Terms and Conditions**