# Owen Certified Playground Mulch, Engineered Wood Fiber

Owen Mulch, a division of Owen Tree Service Inc, has been producing "Certified Playground Mulch" since 2004. Our base of operations, and service area, is SE Michigan. All mulches produced by Owen Mulch are made from virgin wood fiber. No dimensional lumber is used in producing our Organic Landscape, or Engineered Wood Fiber Playground Mulches.

Our Certified Playground Mulch has been tested, and has passed 5 different categories from the American Society for Testing Materials (ASTM) standards: ASTM F1951-14, Determination of Accessibility of Surface Systems Under and Around Playground Equipment; ASTM F1292-13 - Surface Materials; ASTM F 2075-15 per Section 4.4 and Section 7 - Sieve Analysis; ASTM F 2075-15 Section 4.5.2 per 8.0 - Hazardous Metals Test; ASTM F 2075-15 - Tramp Metals Test for Engineered Wood Fiber for use as a Playground Safety Surface Under and Around Playground Equipment, Section 4.6 and Section 9

The following documents include report number 72118964-5, showing our ASTM Approved certification test results for our Certified Playground Mulch - Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment.

**For further information, or to contact us:**

Website: http://www.owentree.com/mulch.php

By e-mail: mulch@owentree.com

By Phone: 810-724-6651

By Mail: 225 N. Lake George Rd, Attica, MI 48412

**REPORT NUMBER**
**72118964-5**


**PREPARED FOR**
OWEN TREE SERVICE, INC.
225 N. LAKE GEORGE RD.
ATTICA, MI 48412

**ATTENTION**
RANDY OWEN

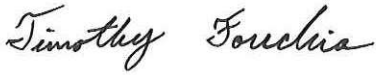
**PO#**
M07272016

**REPORT DATE**
AUGUST 11, 2016

**TÜV SÜD America, Inc.**
1755 Atlantic Blvd.
Auburn Hills, MI 48326
Phone: 616.546.4600
Fax: 248.393.6994
www.TUVAmerica.com

**REPORTED / APPROVED BY:**

**TÜV SÜD America, Inc.**



Reported by: Timothy Fouchia, Project Coordinator
CERTIFICATION TEST PROGRAMS

Approved by: Joe McGuan, Project Coordinator
CERTIFICATION TEST PROGRAMS

## PURPOSE

The purpose of this test report is to present the test results obtained during the performance of a test program. This report includes a brief description of the samples presented for test, a list of the documents presented as test instructions, and a summary of the testing performed and the results obtained. Applicable requirements and conclusions are based on the criteria provided by our client, or as specified in the reference document(s).

## WORK REQUESTED / REFERENCE DOCUMENT(s)

Perform testing in accordance with ASTM F1951-14, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

## TEST SEQUENCE

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.

Testing was performed August 11, 2016.

## SAMPLE DESCRIPTION

Owen Tree Service, Inc., submitted approximately 60 cubic feet of loose fill wood material identified by Owen Tree Service, Inc., as Engineered Wood Fiber.

## TESTING PERFORMED

ACCESSIBILITY OF SURFACE SYSTEMS

### Procedure

Sample material, Engineered Wood Fiber, was installed in four inch layers, and tamped using a 10 inch X 10 inch hand tamper until a depth of twelve inches was achieved. The sample material was tested, propelling the wheelchair with four even propulsion strokes, per trial, across the material 5.56 feet, within eight seconds. This process was repeated five times for each test, (straight and 90 º turn).

Per ASTM F1951-14, section 5.1, no additional modification occurred between propulsion trials. Installation instructions were not provided by the manufacturer.

### Results

The average work force over one foot, in pound force-inch values, for straight propulsion and for turning with material surface in place, shall be less than the average work per foot values for straight propulsion and for turning, respectively, on a hard, smooth, surface with a grade of 7.1% ± 2% (1:14).

Discard the high and low work per foot values and average the remaining three trials to determine the average work per foot required to negotiate the test surface and the hard, smooth surface with a grade of 7.1% ± 2% (1:14).

### Conclusion

The average work force over one foot, in pound force-inch values, measured **less** when propelling the wheelchair over the Engineered Wood Fiber surfacing material than when propelling the wheelchair over a flat surface with a grade of 7.1%.

The material **met** the requirements of ASTM F1951-14.

### Sample Disposition

The sample material will be retained by TÜV SÜD America, Inc., for fifteen (15) days, then disposed of at the discretion of TÜV SÜD America, Inc., unless otherwise requested by Owen Tree Service, Inc.

## TEST EQUIPMENT

TÜV SÜD America, Inc.'s calibration system meets the requirements of ISO 17025.

| TÜV ID | Description | Manufacturer | Model | Calibration Due |
|---|---|---|---|---|
| PLYP00043 | Signal Conditioner | Daytronics | 3370 | 10/16 |
| PLYP00047 | Reaction Torque Sensor | Lebow | 2110220500 | 10/16 |
| PLYP00015 | Digital Protractor | Mitutoyo | Pro 360 | 05/17 |
| PLYP00151 | Wheelchair | Quickie | Q2 | NCR |
| PLYP00166 | Penetration Thermocouple | Omega | 88312K | 01/17 |
| PLYP00143 | Digital Thermometer | Fluke | 51-2 | 01/17 |
| PLYP00152 | Accessibility Fixture | DTL | N/A | NCR |
| PLYP00136 | Balance | Toledo Scale | 4181 | 10/16 |
| PLYP00145 | Air Pressure Gauge | Westward | 2HKX9 | 04/17 |
| PLYP00071 | Thermohygrometer | Extech Instruments | 445702 | 01/17 |
| PLYP00114 | Tape Measure | Stanley | 25ft. (7.6m) LeverLock | 12/16 |

NCR – No Calibration Required

## REMARKS

- Per ASTM F1951-14, section 7.1.2 Test Wheelchair Rider; a 165 + 11, -4.4lb test wheelchair rider shall propel the wheelchair during testing. The rider's weight was measured at 185 pounds prior to testing, thus deviating from the standard requirement.
    - The wheelchair rider weight was 185 pounds, which combined with the wheelchair for a total of 233.7 pounds.

  Per section 7.1.3 Weight of Total System - The total weight of the wheelchair Rider System, including any distance measurement or data acquisition equipment residing on the wheelchair shall be a minimum of 187.2 lb and a maximum of 255 lb.

Page 6: Appendix A - Test Data (1 Page)

**Test Date:** 8/11/2016 Surface Temperature: 25.9°C

**Project No.:** 72118964-5 Ambient Temperature: 25.8°C

**Customer:** **Owen Tree Service, Inc.** Ambient Humidity: 39%

**Product Brand Name:** **Engineered Wood Fiber**

| Run # | No Material (work per foot) (lbf-in) | With Material (work per foot) (lbf-in) |
|---|---|---|
| Straight Run 1: | **141.099** | **141.991** |
| Straight Run 2: | **143.904** | **132.481** |
| Straight Run 3: | **135.937** | **142.805** |
| Straight Run 4: | **133.274** | **142.411** |
| Straight Run 5: | **149.262** | **121.47** |
| **Average:** | **140.314** | **138.961** |
| | | |
| Turn Run 1: | **198.465** | **182.047** |
| Turn Run 2: | **205.005** | **162.964** |
| Turn Run 3: | **202.508** | **158.728** |
| Turn Run 4: | **196.569** | **186.835** |
| Turn Run 5: | **200.424** | **178.698** |
| **Average:** | **200.466** | **174.57** |

**Results are specific to the samples described above.**

**Wheelchair Rider Weight: 185Lbs.**
**Wheelchair tire pressures checked/confirmed: Yes**

**TÜV SÜD America Inc.**
**Product Safety Services**
1755 Atlantic Blvd.
Auburn Hills, MI 48326
Phone: (616) 546-4600

# SURFACING MATERIAL REPORT – ASTM F1292-13

Client: **Owen Tree Service, Inc.**
Manufacturer: **Owen Tree Service, Inc.**
Manufacturing Location: **Attica, MI**

Phone: **(810) 724-6651**
Commercial Name of product: **Engineered Wood Fiber**
Date of Manufacture: **Unknown**
No. of samples submitted: **Approx. 50 Cubic Feet**

Project No.: **72118964-3**
Report Date: **8/12/2016**
Test Date: **8/11/16 and 8/12/16**
Initial Test ☑
Follow up Test ☐ **Ref Job:**
Sample Receipt Date: **7/27/2016**
Ambient Air Temperature: **25.5°C**
Humidity: **41.0%**

## Test Equipment:

| | | | |
|---|---|---|---|
| Triax System 5: | ☑ | Environmental Chamber No.: | **PLYP00069** |
| Triax System 4: | ☐ | Calibration Due Date: | **9/29/2016** |
| Accelerometer ID: | **PLYP00144** | Environmental Chamber No.: | **PLYP00101** |
| Accelerometer Calibration Date: | **2/16/2016** | Calibration Due Date: | **9/29/2016** |

## Loose fill Material Sample Description:

Engineered Wood Fiber: ☑
Loose Fill Wood ☐
Rubber: ☐
Sand: ☐
Gravel: ☐
Other: ☐

Un-compacted Depth: **14** Inches

Compacted Depth: **12** Inches

## Unitary Sample Description:

Tiles ☐
Poured in Place ☐
Other ☐

**Total Thickness:** _____
Top Layer: _____
Base Layer: _____

**Comments:**

**The maximum critical fall height of the above described material was determined to exceed TÜV SÜD America's maximum test parameters of:** **15** **Ft.**

The results reported herein reflect the performance of the above described samples at the time of testing and at the temperature(s) reported. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently. The following data sheet provides an accurate representation of the test results. Compliance with this Standard does not constitute product certification.

**Sample in compliance with ASTM F1292-13 at the temperature and rating specified?** **Yes** ☑ **No** ☐

Signature: Timothy Fonchia Project Coordinator Date: 8/12/2016

Reviewed by: Joseph McDonough Title: Project Coordinator Date: 8/12/2016

Client: **Owen Tree Service, Inc.**

Project No.: **72118964-3**

Manufacturer: **Owen Tree Service, Inc.**

Test Date: **8/11/16 and 8/12/16**

| Drop | Maximum Test Parameters (Ft.) | Reference Temperature -6°C, (21.2°F) | | | | Reference Temperature 23°C, (73.4°F) | | | | Reference Temperature 49°C, (120.2°F) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) |
| 1 | 15 | 99 | 633 | 31.1 | 15.036 | 98 | 543 | 31.2 | 15.133 | 89 | 456 | 31.1 | 15.036 |
| 2 | 15 | 107 | 594 | 31.2 | 15.133 | 115 | 674 | 31.3 | 15.230 | 116 | 696 | 31.3 | 15.230 |
| 3 | 15 | 114 | 634 | 31.2 | 15.133 | 122 | 748 | 31.4 | 15.328 | 126 | 805 | 31.3 | 15.230 |
| Average | | 110.5 | 614 | | | 118.5 | 711 | | | 121 | 750.5 | | |
| Measured Surface Temperature | | (-6°C) | Max. Change from reference + 5°C, (5°F) | | | 23°C | Max. Change from reference ± 3°C, (5°F) | | | 49°C | Max. Change from reference -3°C, (-5°F) | | |
| Sample Condition: | | DRY | | | | DRY | | | | DRY | | | |

| Drop | One foot under (Ft.) | Reference Temperature -6°C, (21.2°F) | | | | Reference Temperature 23°C, (73.4°F) | | | | Reference Temperature 49°C, (120.2°F) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) |
| 1 | 14 | 72 | 345 | 29.9 | 13.898 | 73 | 398 | 30.1 | 14.085 | 85 | 387 | 30.0 | 13.991 |
| 2 | 14 | 93 | 436 | 30.1 | 14.085 | 89 | 420 | 30.2 | 14.178 | 99 | 498 | 30.2 | 14.178 |
| 3 | 14 | 99 | 473 | 30.2 | 14.178 | 106 | 586 | 30.3 | 14.272 | 116 | 653 | 30.2 | 14.178 |
| Average | | 96 | 454.5 | | | 97.5 | 503 | | | 107.5 | 575.5 | | |
| Measured Surface Temperature | | (-6°C) | Max. Change from reference + 5°C, (5°F) | | | 23°C | Max. Change from reference ± 3°C, (5°F) | | | 49°C | Max. Change from reference -3°C, (-5°F) | | |
| Sample Condition: | | DRY | | | | DRY | | | | DRY | | | |

| Drop | Two feet under (Ft.) | Reference Temperature -6°C, (21.2°F) | | | | Reference Temperature 23°C, (73.4°F) | | | | Reference Temperature 49°C, (120.2°F) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) | G-Max | HIC | Velocity (ft/s) | Theoretical Drop Height (ft.) |
| 1 | 13 | 68 | 303 | 28.9 | 12.984 | 73 | 374 | 29.0 | 13.074 | 86 | 463 | 29.0 | 13.074 |
| 2 | 13 | 84 | 374 | 29.0 | 13.074 | 80 | 355 | 29.1 | 13.164 | 98 | 523 | 29.1 | 13.164 |
| 3 | 13 | 93 | 450 | 29.1 | 13.164 | 96 | 483 | 29.2 | 13.255 | 114 | 664 | 29.1 | 13.164 |
| Average | | 88.5 | 412 | | | 88 | 419 | | | 106 | 593.5 | | |
| Measured Surface Temperature | | (-6°C) | Max. Change from reference + 5°C, (5°F) | | | 23°C | Max. Change from reference ± 3°C, (5°F) | | | 49°C | Max. Change from reference -3°C, (-5°F) | | |
| Sample Condition: | | DRY | | | | DRY | | | | DRY | | | |

TÜV SÜD America

# Sieve Analysis Data Collection Form
## ASTM F 2075-15 per Section 4.4 and Section 7

TUV SUD America, Inc
1755 Atlantic Blvd.
Auburn Hills, MI 48326
Ph: (616) 546-4600

Customer/Participant: **Owen Tree Service, Inc**
Main Office Address: **225 N. Lake George Rd.**
(City, State, Zip) **Attica, MI 48412**
Location ID: **Attica, MI**
Product Brand Name: **Engineered Wood Fiber**

Test Date: **8/3/2016**
Project No.: **72118964-2**
Ambient Air Temp.: **26°C**
Relative Humidity: **38%**

## Test Equipment Used

| TUV Asset No.: | Equipment Type | Manufacturer | Model |
|---|---|---|---|
| PLYP00100 | Enviromental Chamber | Russels | RB-8-1-1, (QE496) |
| PLYP00163 | Data Logger | Omega | OM-CP-RHTEMP101A |
| PLYP00055 | Test Sieve | W.S. Tyler | No. 16 (1.19 mm) |
| PLYP00056 | Test Sieve | W.S. Tyler | 3/8" (9.53 mm) |
| PLYP00057 | Test Sieve | W.S. Tyler | 3/4" (19.05 mm) |
| PLYP00059 | Sieve Shaker | W.S. Tyler | RX 812 |
| PLYP00083 | Balance | Denver Instruments | 18453642 |

## Data

| | |
|---|---|
| Initial Sample and Container Weight | 803.0 |
| Tare weight of Container | 211.2 |
| Initial Sample Dry Weight (g) | 591.8 |
| Sample and Container Weight for 3/4" Sieve | 179.5 |
| Tare weight of Container | 179.5 |
| Sample Remaining on 3/4" Sieve (g) | 0.0 |
| Sample and Container Weight for 3/8" Sieve | 219.6 |
| Tare weight of Container | 179.5 |
| Sample Remaining on 3/8" Sieve (g) | 40.1 |
| Sample and Container Weight for #16 Sieve | 650.7 |
| Tare weight of Container | 179.5 |
| Material Remaining on # 16 Sieve (g) | 471.2 |

| Sieve Size | Min / Max Requirements | % Passing |
|---|---|---|
| 3/4" (19.05 mm) | 99 - 100% | **100.0** |
| 3/8" (9.53 mm) | 75 - 100% | **93.2** |
| No. 16 (0.0469 in.) | 0 -15% | **13.6** |

**Sample in compliance with ASTM F2075-15 for Sieve Analysis Section 4.4 per 7.4** Yes [X] No [ ]

**Note: Testing performed at TÜV SÜD America in Auburn Hills, MI.**

Performed By: _____ Title: Project Coordinator Date: 8/3/2016

Reviewed By: Timothy Fourchia Title: Project Coordinator Date: 8/12/2016

The results reported herein reflect the performance of the above described samples at the time of testing and at the temperature(s) reported. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently. The following data sheet provides an accurate representation of the test results.

TÜV America Inc.
1755 Atlantic Blvd.
Auburn Hills, MI 48326

Phone: (616) 546-4600
E-mail: info@tuvam.com
www.TUVamerica.com

# Hazardous Metals Test
## ASTM F2075-15, Section 4.5.2 per 8.0

| | |
|---|---|
| Manufacturer | Owen Tree Service, Inc. |
| Main Office Address | 225 N. Lake George Road, Attica, MI 48412 |
| Manufacturing Location ID | Attica, MI |
| Product Brand Name | Engineered Wood Fiber |

PURCHASE ORDER: # 2000019974 PROJECT NO.: 72118964-4

The following ISO 17025-accredited Laboratory performed testing:

St. Louis Testing Laboratories, Incorporated
2810 Clark Avenue
St. Louis, MO 63103
**St. Louis Testing Laboratory report attached, (1 page).**

**Test Result:** **Pass** **X** **Fail**_____

**Prepared By:**

Timothy Fouchia

**Timothy Fouchia** **8/12/16**
**Date**

**Project Coordinator**
**Title**

**Reviewed and Approved By:**

**8/12/16**

**Date**

**Project Coordinator**
**Title**

The results reported herein reflect the performance of the above described samples at the time of testing. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently. This data sheet provides an accurate representation of the test results.

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

*Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.*

**TUV SUD AMERICA, INC**
1755 Atlantic Blvd.
Auburn Hills, MI 48326

**Attention: Janice Gudenau**

August 8, 2016
Lab No. 16C-1266
Invoice No. 217774
P.O. No. 2000019974


## REPORT OF ANALYSIS

**MATERIAL:** 72118964-4

**SUBJECT:** Soluble Heavy Metals Analysis

**STANDARD:** ASTM F2075-15

**TEST METHOD:** ASTM F2075-15

**UNITS:** Soluble Heavy Metals - Parts per Million (ppm)

**RESULTS:**

| Substance | 72118964-4 | Maximum Allowable Limit | Method Detection Limit |
|---|---|---|---|
| Soluble Antimony | <5 | 60 | 5 |
| Soluble Arsenic | <5 | 25 | 5 |
| Soluble Barium | 153 | 1000 | 5 |
| Soluble Cadmium | 40 | 75 | 5 |
| Soluble Chromium | <5 | 60 | 5 |
| Soluble Lead | <5 | 90 | 5 |
| Soluble Mercury | <5 | 60 | 5 |
| Soluble Selenium | <5 | 500 | 5 |

The soluble heavy metal content of the tested product is in compliance with the requirements of the above-indicated standard.

Identification of tested specimen provided by the client.

Robin E. Sinn
Laboratory Director

RES/amw

**TÜV SÜD America Inc. Product Safety Services**
1755 Atlantic Blvd., Auburn Hills, MI 48326
Phone: (616) 546-4600

# Tramp Metals Test Results - ASTM F 2075

## ASTM F 2075-15
## Standard Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment, Section 4.6 and Section 9

| | | | |
|---|---|---|---|
| Customer/Participant: | Owen Tree Service, Inc. | Report Date: | 8/10/2016 |
| Main Office Address: | 225 N. Lake George Road | Test Date: | 8/9/2016 |
| All testing performed at location ID: | Attica, MI 48412 | Project No.: | 72118964-1 |
| Product Brand Name/Number: | Engineered Wood Fiber | | |

### 4.6.1 Per 9.4 Tramp Metals

Level – 0" – 15"

| Quadrant 1 | | Quadrant 2 | | Quadrant 3 | | Quadrant 4 | |
|---|---|---|---|---|---|---|---|
| Pass | Fail | Pass | Fail | Pass | Fail | Pass | Fail |
| ☒ | ☐ | ☒ | ☐ | ☒ | ☐ | ☒ | ☐ |

Level – 15" – 30"

| Quadrant 1 | | Quadrant 2 | | Quadrant 3 | | Quadrant 4 | |
|---|---|---|---|---|---|---|---|
| Pass | Fail | Pass | Fail | Pass | Fail | Pass | Fail |
| ☒ | ☐ | ☒ | ☐ | ☒ | ☐ | ☒ | ☐ |

Level – 30" – 45"

| Quadrant 1 | | Quadrant 2 | | Quadrant 3 | | Quadrant 4 | |
|---|---|---|---|---|---|---|---|
| Pass | Fail | Pass | Fail | Pass | Fail | Pass | Fail |
| ☒ | ☐ | ☒ | ☐ | ☒ | ☐ | ☒ | ☐ |

Level – 45" – 60"

| Quadrant 1 | | Quadrant 2 | | Quadrant 3 | | Quadrant 4 | |
|---|---|---|---|---|---|---|---|
| Pass | Fail | Pass | Fail | Pass | Fail | Pass | Fail |
| ☒ | ☐ | ☒ | ☐ | ☒ | ☐ | ☒ | ☐ |

Pass ☒ Fail ☐

The results reported herein reflect the performance of the above described samples at the time of testing. The results are specific to the described samples. Samples of surfacing materials that do not closely match the described samples will perform differently. This data sheet provides an accurate representation of the test results.

| | | | |
|---|---|---|---|
| Signature: | | Signature: | Timothy Forschia |
| Title: | Regional Manager | Title: | Project Coordinator |
| Date: | 8/10/16 | Date: | 8/12/16 |