

THE ROLE OF STANDARDS AND TESTING RECYCLED RUBBER PRODUCTS

INTERNATIONAL TIRE CONFERENCE
BORDER-TIRE MANAGEMENT PARTNERSHIP
San Diego, California | May 3-9, 2008

from **SCRAP TO PROFIT**

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DK ENTERPRISES



THE RECYCLERS CONNECTION



OVERVIEW

- ❑ Need for standards and product testing
- ❑ Development of product testing protocol
- ❑ Examples of established testing standards for tire-derived products
- ❑ Working with testing organizations – stories from the trenches

WHAT DO WE WANT TO ACCOMPLISH?

- Safer environment for ourselves and our children
- Knowledge
- Consistency in material
- Quality material
- Sustainable products
- Sustainable markets

WHAT IS THE WINNING STRATEGY?

- Identify long term plan of action to achieve goal
- Premeditated planning
- Reduce the variables
- Couple resources, structure, and the environment
- Create opportunity

WHO IS RESPONSIBLE?

- Designers
- Architects
- Builders
- Contractors
- Consultants
- Manufacturers
- Material Suppliers
- Installers
- Inspectors
- Laboratories
- Regulators
- Owners / Operators

WHO WILL BENEFIT?

- Everyone
- The environment
- Our world



WILL THE RESULTS MEET THE GOALS?

YES

SAFER ENVIRONMENT

**SUCCESS IN CREATING SUSTAINABLE
PRODUCTS AND MARKETS**

**STRENGTHENED INFRASTRUCTURE IN
THE TIRE RECYCLING INDUSTRY**

PRODUCT TESTING PROTOCOL

- ❑ Develop a test plan prior to testing
- ❑ Formal documents
 - ◇ Requirements
 - ◇ Activities
 - ◇ Resources
 - ◇ Documentation
 - ◇ Schedule

DEVELOP A TEST PLAN

- Device or product description
- Test strategy
- Important terminology and key words
- References
- Sampling techniques
- Sample sizes

CONSIDER VARIABLES IF CONSIDERING TESTING

- Market or ultimate use
- Equipment resources
- Quality and supply of material
- Personnel
- Time
- Money
- Short and long-term impact

MOVING AHEAD TO TEST MATERIAL

- Select the testing organization, inspector, and possible certification requirements
- Know the definition of a successful test and pass/fail criteria
- Understand the certification process if required in the short and long term
- Discern what is required to produce procedural /certification manuals

TESTING LABS



E-TECH Testing Services, Inc.



BIO MECHANICA



WESTERN ELECTRO-ACOUSTIC LABORATORY
A Division of Test Resources Associates, Inc.



Testing Services incorporated



Detroit Testing Laboratory, Inc.



SELECTION OF INSPECTOR, TESTING FACILITY, AND CERTIFICATION ORGANIZATION

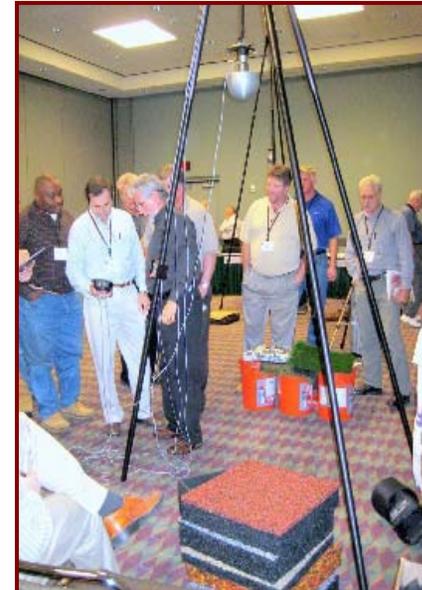
- Follow product testing protocol guidelines
- Type of tire derived product
- Client – agent relationship
- Willingness to work with a State agency due to proprietary nature of testing
- Capability to test new or more complex tests

SELECTION OF INSPECTOR, TESTING FACILITY, AND CERTIFICATION ORGANIZATION

- Time schedule required to test product material and provide test reports
- Testing facilities sometimes sub contract tests to outside testing labs, delaying results
- Your company's readiness to meet timeline
- Costs associated with location of performance of tests
- Onsite and infield associated testing requirements

PRODUCT TESTING RATES

- ❑ Same rate for private and public sector
- ❑ Established rates if ASTM based
- ❑ Non ASTM, majority are case by case
- ❑ Testing facilities sub to outside labs
- ❑ Field tests
- ❑ Discounted rates for multiple tests



TESTING TIRE-DERIVED PRODUCTS

- Playground Safety Surfacing
- Highway safety products
- Acoustical flooring
- Molded rubber products
- Roofing accessories
- Engineered rubber products

TIRE - DERIVED PRODUCTS



MOLDED AND EXTRUDED RUBBER PRODUCTS



Impact Sound Insulation



Tiles and Mats



Rubber Drains



Erosion Control Blok



EXAMPLES OF TESTING TIRE-DERIVED PRODUCTS

□ Playground Surfacing

◇ Poured-in-place

◇ Synthetic

◇ Bonded

◇ Wet pour

◇ Cast in place



STANDARD TESTING FOR PLAYGROUND SURFACING

- ❑ **ASTM F1292 – 04: Compliance to $G_{max} < 200$ & HIC < 1000**
- ❑ **ASTM F1487 – 07 ae1: Installation and maintenance of surfacing to ASTM F1292-04**
- ❑ **ASTM F1951 - 08: Access of surface systems under and around playground equipment**
- ❑ **ASTM F2479 – 07: Standard guide for specification, purchase, installation, and maintenance of poured-in-place playground surfacing**

DEVELOPING NEW STANDARD

ASTM F08

- ❑ Use in playgrounds and athletic surfaces
- ❑ Sub-committee published Standard Guide for Poured-In-Place under ASTM F2157 – 02; standard specification for Synthetic Surfaced Running Tracks
- ❑ Will provide performance based tests that can be used in the laboratory and field.



PLAYGROUND SURFACE TEST



- ASTM F 1292 - 04
- Headform missile dropped from whole foot increments
- Values not more than 200 G-max nor 1000 HIC
- Upper/Lower Height and Temperature Limits

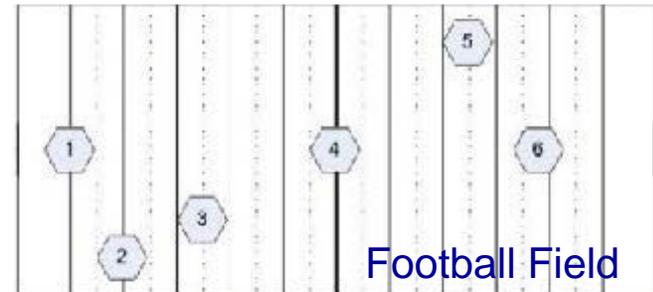
PLAYGROUND ACCESSIBILITY TEST



- ASTM F1951 - 99
- ADA Wheelchair
- Both Straight and Turning Propulsion
- Compared to a baseline of a 7.1% grade ramp

STANDARD TESTING FOR SYNTHETIC TURF PLAYING SURFACES

- ❑ ASTM F1551-03: Comprehensive Characterization of Synthetic Turf Playing Surfaces
- ❑ ASTM F1015-03: Relative abrasiveness of synthetic turf playing surfaces
- ❑ ASTM F355-95: Shock attenuation of sports surfaces
- ❑ ASTM F1936-07e1: Incorporate equipment requirements of F355-95 for North American Football



Three Gmax readings at one minute intervals

HIGHWAY SAFETY PRODUCT TESTING



HIGHWAY SAFETY PRODUCT TEST

- ❑ Test if work zone devices are designed to be anchored to roadway surfaces and will change in deceleration and velocity
- ❑ Freestanding and unanchored products having a mass in excess of 45 kg or below excess of 45 kg
- ❑ Freestanding and unanchored products intended to evaluate, fracture or yielding mechanism of the device

CONSTRUCTION OF ACOUSTICAL FLOORING TESTS



COMMERCIAL FLOORING TESTS

- ❑ Housing and building structures are moving upwards not outwards; requiring product testing
- ❑ Rubber underlayment under engineered hardwood
- ❑ Impact Sound Transmission Test using tapping machine, Impact Insulation IIC testing, ASTM E492-04 / ASTM E989-06
- ❑ Laboratory Measurement of effectiveness of floor coverings in reducing impact sound transmission through concrete floors, ASTM E2179



ENGINEERED RUBBER POWDER TESTS

- ❑ Particle size
- ❑ Foreign material
- ❑ Contaminants
- ❑ Chemical changes
- ❑ ISO Controlled procedures
- ❑ Quality control measurements



Testing of Rubber & Plastics

ENGINEERED RUBBER PRODUCT USES

- Automobile industry
- Plastics
- Paint
- New tires
- Developing markets
- Untapped uses



EXTEND YOUR PRODUCTS LIFE CYCLE

**STANDARDS AND PRODUCT TESTING
ARE KEY FACTORS IN MANUFACTURING
SUSTAINABLE PRODUCTS AND
DEVELOPING SUSTAINABLE MARKETS**

**CONSUMERS ARE SPECIFYING
SUSTAINABLE CRITERIA**

**DESIGN PRODUCTS WITH ENVIRONMENTAL
PARAMETERS IN MIND**

WORKING WITH TESTING ORGANIZATIONS

SHORT STORIES IN THE TRENCHES

- Priorities change
- Delivery of material
- Labs outsourcing material
- Creative approaches
- Building relationships for the long term approach

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