

## ISWP Standards Working Group

### November 9, 2016 Standards Working Group (SWG) Meeting Recap

The ISWP Standards Working Group met by conference call on Wednesday, November 9, 2016 from 12:00 p.m. to 1:30 p.m. U.S. Eastern Time. This document provides objectives and a recap.

#### Objectives

1. Discuss progress updates from the subgroups and related future work.

#### Discussion

1. Rolling resistance (RR) testing:
  - a. The team is comparing the resistance with wheels and casters on different flat surfaces and the drum surface.
    - i. This experiment will assist in evaluating the correction factor for testing resistance on the drum and
    - ii. Simulating surfaces like grass, concrete and soil on the RR drum.
  - b. This experiment will be conducted for different diameters with different weights.
  - c. Evaluating different wheels designs for conditions like toe-in toe-out, camber, tire types, changes in pressure levels and different surfaces was suggested. This data could potentially be beneficial to designers, providers and ISWP partners.
  - d. The team is building arms for caster testing.
  - e. Validating the load cells is in progress.
  - f. The team plans to test 5 wheels by December and submit report to ISWP.





2. Caster Testing
  - a. Update: <https://drive.google.com/open?id=0B3o-KpFV8x-8eTBHZzBCd2YySnc>
  - b. Norman suggested including more slats for quicker damage.
  - c. Don and Dave has seen issues (brittle stem bolt material) with assembly of stem and fork.
  - d. Checking for rolling resistance of caster exposed to corrosion can be one of the rolling resistance test as bearing balls can get rusted and cause drag.
  - e. Run a Rockwell hardness test on the stem bolt (40 is usual, 20-25 s softer material).
  - f. Loose assembly of stem bearings and bolt can be another issue for fracture.
  - g. Checking the durometer of the tire before and after caster and UV test was recommended.
  - h. Caster failure checklist results: <https://drive.google.com/open?id=0B3o-KpFV8x-8TF93ZjRHdTRHMVk>. Items with yellow background in this document will be included in the checklist.
  
3. Corrosion testing
  - a. Update: <https://drive.google.com/open?id=0B3o-KpFV8x-8eTBHZzBCd2YySnc>
  - b. The team performed a scribe test as can be seen in the pictures. The scribe widened from <1mm to 1.5-2.5mm.
  - c. Compare different finishes to see at what rate different materials rust.
  - d. Matt – evaluate abrasion and corrosion for wheelchairs.
  
4. UV testing
  - a. Check durometer readings and evaluate discoloration of the rubber and polymers.
  - b. Results from the test can inform design guidelines – Matt.
  
5. Whole Chair Testing (WCT):
  - a. Bonnie and Don to fly out to South Dakota for meeting with a manufacturer for the conveyer for WCT.
  - b. JP-ISO dummy model than crash test model, Don expressed concern with proper cushioning between the dummy and upholstery.
  - c. Develop a dataset of WCT vs ISO – to improve ISO.



## 6. Design Guidelines:

- a. UCP is going to host the meeting.
- b. DG sent to the review committee.
- c. Advocate for employing cushions during provision - Dan
- d. Group members (not attending) are encouraged to review and add comments to google doc.
- e. Dr Pearlman will communicate the final date for comments.
- f. Refer to WHO guidelines regarding policy related activities – Chris
- g. Guidelines should not supersede clinician’s input.

## 7. Implementation of standards

- a. The group should focus on integrating the standards as tech specs into ISO beginning with RR and caster tests.

### **Subgroups** (for reference)

- Design Guidelines: Mark Sullivan (lead), Daniel Martin, Jon Pearlman, Norman Reese, Chris Rushman, Eric Wunderlich
- Casters: Anand Mhatre (lead), Matt McCambridge, Jon Pearlman, Norman Reese, Don Schoendorfer, Joseph Ott, Stephanie Lachell
- Corrosion: Matt McCambridge, Don Schoendorfer, Anand Mhatre, Jon Pearlman
- Rolling Resistance: Norman Reese (lead), Matt McCambridge, Jon Pearlman
- Whole Chair Testing: Don Schoendorfer, Matt McCambridge, Josiah Auer, Mark Sullivan, Daniel Martin, Jon Pearlman, Norman Reese, Anand Mhatre, Dave Mahilo, Joseph Ott



## Participants

- ✓ Daniel Martin, Shonaquip
- ✓ Matt McCambridge: DEKA (formerly with Whirlwind)
- ✓ Norman Reese, LeTourneau University
- ✓ Rachel, LeTourneau University
- ✓ Don Schoendorfer, Free Wheelchair Mission
- ✓ Karl-Erik Westman, Handicap International
- ✓ Eric Wunderlich, LDS Church
- ✓ Chris Rushman, Motivation
- ✓ Dave Mahilo, Invacare
- ✓ Dr. Rory Cooper, University of Pittsburgh
- ✓ Anand Mhatre, University of Pittsburgh
- ✓ Dr. Jonathan Pearlman, University of Pittsburgh
- ✓ Nancy Augustine, University of Pittsburgh
- ✓ Ben Gebrosky, University of Pittsburgh
- ✓ Josiah Auer, Free Wheelchair Mission
- ✓ Joseph Ott, University of Pittsburgh
- ✓ Stephanie Lachell, University of Pittsburgh
- ✓ Krithika Kandavel, ISWP

Prepared by: Anand Mhatre, University of Pittsburgh