

## ISWP Standards Working Group

### March 17, 2015 Meeting Recap

The ISWP Standards Working Group met by conference call on Tuesday, March 17, 2015 from 12:00 p.m. to 1:00 p.m. U.S. Eastern Time. This provides a recap.

#### Action Items

1. Everyone in the group to review the spreadsheet of testing/evaluation standards uploaded on Google drive and recommend suggestions on the tests. Additionally, following action items were suggested:
  - a) Integrate the tests from earlier spreadsheet (maintained by Mark) into the new spreadsheet by Norman/Don.
  - b) Include an 'observation' column in the new spreadsheet to list failure modes as witnessed in the field.
  - c) Classify tests – dependent vs independent (eg. Floatation dependence on rollability) and system level vs component level. Add columns for the same.
  - d) Recognize the value of the test to the wheelchair (WC) user and insert that into a new column in the same spreadsheet.
  - e) Research available ISO/ASTM standards for each test and add to the spreadsheet.
2. Karen to provide pictures of casters along with information on years of use and activity in WC.
3. Check for ASTM specs for corrosion/rusting.

4. JP/Anand to check for surface tests from Peter Axelson and post.
5. Pitt to take over functional/usability testing part.

## **Discussion**

1. Categorization of WC - Matt and Eric provided classification criteria for WCs with intended usage for WCs in a particular category. Everybody in the group agreed on the classification. We shall proceed on listing tests for each category as follows:
  - a) 1st category – indoor WCs with ISO 7176 tests
  - b) 2nd category –
    - I. Chairs for LREs with minimum ratings – include additional ISO tests geared towards LREs (increased cycles on DDT + wear, corrosion, environment)
    - II. Chairs for LREs with enhanced ratings (tests similar to chairs with min. ratings + higher standards and aggressive testing).
2. Discussion - Reporting standards for wheel performance on broken pavements should be considered.
3. Discussion - Testing on hard and smooth surface should be a criterion to understand rollability and floatation. Testing width of casters vs durability should be considered.
4. Discussion on surface characterization –

Don – How to define an unpaved surface on a 12-inch diameter cylinder.

JP – Recommended looking at Peter Axelson’s study with different WC users going through various terrains, focused on performance on trails.
5. Discussion on enhanced tests for casters and rear wheels -

UV light exposure testing is suggested (used by P&O – JP)

Test track of 300 mile circle – bumpy road to see wear in tires, accelerated lifecycle tests for wheels and frames. Need to cater to aging of surface for the test track as pointed by Chris.

Short stop and turn tests conducted in Kenya - Karen.

Aging test or Durability test comes first? Try with a one threshold impact as per durability standard test and then proceed with aging test – JP

Free WC mission and Whirlwind chairs have chipping issue in casters. We need to test for that.

Polyurethane casters came out as good performers from the DDT.

6. Discussion on bearings –

Corrosion in bearings and rolling resistance should be tested. Need to look at both axial and radial loads of bearings.

Buy ISO 1281 for bearing testing standards and develop tests at HERL.

**Participants**

- ✓ Nancy Augustine, University of Pittsburgh
- ✓ Matt McCambridge: DEKA (formerly with Whirlwind)
- ✓ Anand Mhatre, University of Pittsburgh
- ✓ Dr. Jonathan Pearlman, University of Pittsburgh
- ✓ Norman Reese, LeTourneau University
- ✓ Karen Rispin, LeTourneau University
- ✓ Mark Sullivan, Convoid, Ride Designs and Polus Center (WG Chair)
- ✓ Don Schoendorfer, Free Wheelchair Mission
- ✓ Karl-Erik Westman, Handicap International
- ✓ Eric Wunderlich: LDS
- ✓ Chris Rushman, Motivation
- ✓ Dr. Rory Cooper, University of Pittsburgh

Prepared by: Anand Mhatre, University of Pittsburgh