



## ISWP Standards Working Group

### September 13, 2016 Standards Working Group (SWG) Meeting Recap

The ISWP Standards Working Group met by conference call on Tuesday, September 13, 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.
2. Funding Request discussion.

#### Discussion

1. Inclusion of ISWP tests into ISO.
  - a. Dr Pearlman attended ISO meetings in Brazil.
  - b. He informed the group that it is favorable to establish the caster and rolling resistance tests as ISO technical specifications. Technical data can be published with these tests and they can be moved into an independent standard or 7176 as needed.
  - c. Don – specs should be based on intended use and should motivate manufacturers to conduct testing. Not hurt access to wheelchairs.
  - d. JP – ISWP testing may not be relevant or important according to some countries, manufacturers should be aware of new testing for LREs.
  - e. Discussion -Local manufacturer's products may appeal to governments or distribution from cost point but may not be appropriate and not useful for health complications.
  - f. Shonaquip uses ISO 7176 in south Africa
    - thinks it is expensive to accommodate the entire wheelchair test, cost is a factor
    - export cost, lead times are considerable since they don't have the test in-house
  - g. Make policy for country-specific standards.
2. Rolling resistance testing:
  - a. Testing for change in rolling resistance with rear wheels and casters will resume in the fall at LeTourneau University.



- b. 10 senior engineering students will be working on the RR test and some design improvements are to be done prior to resuming testing.
    - c. Tests can be conducted for rolling resistance forces at the weights of 15kg, 30kg, and 45kg for the wheels and 5kg, 10kg and 15kg for the casters on a smooth surface and several rough surfaces.
  3. Caster Testing
    - a. The Chakra is testing casters against oblique shocks with 6 casters models from different manufacturers.
    - b. 4 casters tested at same time.
    - c. Test conditions:
      - i. Casters run at 1m/s and slats are at 0, 15 and 30 degrees. 2/6 of each model test against each angle.
      - ii. Weights on casters are 31lbs
      - iii. The height of the arms above the turntable is maintained constant.
      - iv. 200,000 cycles for each caster.
    - d. Video: <https://www.youtube.com/watch?v=-HVditpyv5E&list=PLzfgFQjmOpvMTT-8xRjeBi-kqRzKRuhGh&index=14>
    - e. Test logs is maintained.
    - f. Upgrades:
      - i. Pie-piece markings with angles.
      - ii. Made one more arm of new design.
      - iii. Polycarbonate shields to avoid broken casters from ejecting out of the test equipment.
    - g. The group is developing a caster failure checklist for evaluating failures and a survey will be distributed soon to the members for evaluating which failures are to be included in the checklist.
    - h. Group working on developing UV testing and corrosion testing protocol for testing casters.
  4. Corrosion Testing:
    - a. Installation of salt fog chamber is in progress.
  5. Whole Chair Testing:
    - a. The group is working with manufacturers in Minneapolis to design the mary-go-round system for the test.
    - b. They are extending a job offer to a graduate from UCI who has worked effectively on designing instrumentation for data acquisition from chairs.



- c. They are estimating a year to build the whole system.
  - d. 3 months are required tentatively to get preliminary data.
  - e. The group will work with LDS charities to do some comparative testing of chairs and with Invacare for design of the equipment.
  - f. The group requested for assistance from the ISWP standards working members on development of the test.
    - i. Mark recommended collaborating with manufacturers to get their inputs on the development.
    - ii. Dan would like to be involved in the design for tethering chairs.
    - iii. Joe Ott (graduate student @ Pitt), our new working group member, will be working with Don and Josiah and assist in developing the test equipment design.
  - g. Don will send out some documents to review to the group on the tethering design.
6. Funding for the in-person meeting in December (week of 12<sup>th</sup>) was approved by the Advisory Board.

### **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  
Caleb Elder, LeTourneau University  
Karen Rispin, LeTourneau University
- ✓ Mark Sullivan, Convaid and Polus Center (WG Chair)
- ✓ 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  
Kirthika Kandavel, ISWP

Prepared by: Anand Mhatre, University of Pittsburgh