

## **ISWP Standards Working Group**

### **April 29, 2015 Meeting Recap**

The ISWP Standards Working Group met by conference call on Wednesday, April 29, 2015 from 12:00 p.m. to 2:00 p.m. U.S. Eastern Time. This document provides objectives, action items and a recap.

#### **Objectives**

1. To discuss issues seen in the field with and testing related to wheelchair (WC) components – frames & crossbraces, fasteners, armpads and other miscellaneous parts.
2. Prioritize finalizing metrics for tests for WC components in the ISWP Standards WG matrix.

#### **Action Items**

1. Divide the working group into subgroups to work on specific areas in the Standards matrix as follows:
  - a. Rolling Resistance
  - b. Caster Durability
  - c. Corrosion
  - d. "Whole Chair" accelerated life testing and usability testing
  - e. Design Guidelines/Reporting
2. Group members to nominate for leading or participating for working on a particular subgroup.
3. Subgroups to work towards finalizing areas/metrics in WG matrix and working towards development of test methods.
4. Jon Pearlman to contact Lee Kirby for EBP group for work on comparing chairs for stability and terrain handling.

#### **Discussion**

1. Frames & Crossbraces
  - a. Frames and Crossbraces can be considered under system level test in a large drop test.

- b. Wheel alignment measurements – toe-in toe-out measure (camber), spoke-to-spoke.
2. Fasteners
  - a. Corrosion is a concern for fasteners: They do not come off once corroded, aesthetics are affected.
  - b. Stainless steel fasteners work well and add cost
  - c. Need to specify the hardness specification for fasteners
  - d. Fasteners standards can be in design guideline or best practices
  - e. Corrosion group could decide whether fasteners should be tested as part of ASTM b117 test.
3. Armpads
  - a. Armpads wear down, upholstered armpads breakdown easily and can be included in upholstery
  - b. Specify permeability for the armpads cover
  - c. Armpads should be easily replaceable. Once the plastic or cover of arm pad wears out, it should be replaced which should be a design guideline.
  - d. It can be included as reporting standards whether it is safe as it deteriorates (failsafe metric)
  - e. Accelerated aging test with UV and abrasion testing could be considered.
3. Harness/belt buckle, harness/belt material, calf strap, toe-straps, trays (used for active kids and kids who need more postural supports) can be placed under design guidelines.
4. Anti-tippers
  - a. Anti tippers have an issue on soft ground, may turn if detent pins are not good.
  - b. Put under design guidelines
5. System & Functional testing

Jon Pearlman Notes: Motivation has considered performance tests to compare and contrast wheelchairs. Motivation encourages service providers to do local user trials to compare/contrast. Motivation could get more feedback from service providers. Perhaps this is collaborating with CLASP to gather feedback and link into ISWP product catalog. Human subject trials may be good and could be possibly taken on by another working group.
6. Front Stability and Terrain Handling

- i. Falling forward, not able to maneuver, getting stuck are some issues that fall under this category
  - ii. Research how static stability predicts dynamic stability in MWCs.
  - iii. Develop a design guideline about foot-support location relative to caster axle. Report the foot support distance from caster centre. Max curb height could be reported.
7. Tracking Issue – Wheelchair not travelling straight.
  - a. Usually seen as a manufacturing issue.
  - b. Conducting a standard roll-down test at local facility of the manufacturer.
  - c. Motivation puts this at point of service for a roll-test also to ensure it does not go out of the service misaligned.
  - d. Kit-type WCs cannot be tested at manufacturer location.
  - e. Since, third-party assembles the chair, a design guideline should be provided.
8. Folding – R
  - a. Jon Perlman notes: reporting standard could include folding (yes/no), size of folded device, weight of heaviest component, number of steps to fold.
9. User propulsion versus attendant propulsion is a topic of discussion with EBP working group.
10. Turning force for casters
  - a. Need to identify torque to overcoming inertia/turning resistance.
  - b. Jon Pearlman notes: Dynamics may be different between 3 & 4 wheeled chair. 3-wheelchair 'steers' whereas the 4-wheelchairs scrub. Needs to be a system level test.
  - c. Refer to tests developed by Peter Axelson for surface softness.
11. Contact safety
  - a. We need to look at ISO for standards regarding pinch points and sharp corners. Chris suggested refining the standards for wheelchairs.
12. Dimensions of Overall Width, Overall Length, Wheelbase and Seat height should be reported per ISO 7176 section 5. Horizontal distance between user's arm and axle should be reported.

## **Participants**

- ✓ Matt McCambridge: DEKA (formerly with Whirlwind)
- ✓ 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 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

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