

Safe Excursion? – Custom Made Seats in Transport

Summary

There are growing numbers of custom seating solutions available to prescribers which are likely to be utilised in a transport setting. The group aim to share their developing knowledge and expertise with practical examples of how to utilise the PMG Best Practice Guidelines on Wheelchair and Seating in Transport

Aims & Objectives

To aim is to highlight the issues of custom seating prescription, wheelchair 'hosting', effective occupant restraint and regulatory compliance where custom seating is used within a transport setting. The objective is to share the knowledge of the presenters from research and test work undertaken in the past 12 months that have the potential to improve the safety of custom seating occupants in transport

Background, Technique, Standards, Clinical Detail, Results and Testing

Two / Three NHS custom seating manufacturers have undertaken dynamic testing to following the ISO 16840 Part 4 standard as part of the design / validation process for their custom made seat units, in collaboration with Unwin Safety Systems.

The first set of these series of tests acted as part of a dissertation project on the effects of occupant restraint path in custom seating, aiming to identify the effects on poor occupant restraint path routing and how changes in the seat design might facilitate improved outcomes for the seated occupant in a vehicle related incident

The second dissertation project builds on the work detailed above and investigates and tests the using of occupant restraint systems integrated within custom made seating and host wheelchair. This approach would enable reduction of variables in application of the occupant restraint in real life situations on transport.

The final series of test were to further validate the design of the interfaces used in custom seating for use in transport, following a real life incident.

The Results

The results of the occupant restraint path tests have both demonstrated that it is possible to produce a custom made seat unit that include elements which improves and maintaining the geometry of the occupant restraint over the correct anatomy of the occupant during a crash event. This will in turn reduce the excursion of the occupant within the custom made seat during a crash event as well as reducing the likelihood of intrusion of the pelvic strap in to the abdominal cavity, injurious even in low speed low G vehicle incidents.

The validation tests on the interface design and construction have demonstrated the value of testing and the creation of a robust technical file for support when challenged by real life events that have involved the judicial processes

References

- Transportation of People Seated in Wheelchairs - International Best Practices Guidelines (BPG1) - 4th International Interdisciplinary Conference on Posture and Wheeled Mobility
- ISO 7176-19:2008 - Wheelchairs -- Part 19: Wheeled mobility devices for use as seats in motor vehicles
- ISO 16840-4:2009 - Wheelchair seating -- Part 4: Seating systems for use in motor vehicles
- ISO 10542-1:2012 - Technical systems and aids for disabled or handicapped persons -- Wheelchair tiedown and occupant-restraint systems -- Part 1: Requirements and test methods for all systems
- MHRA DB2001(03) Guidance on the Safe Transportation of Wheelchairs
- BSI PAS900-2010 Code of Practice for Wheelchair Passport Schemes

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