

# FOCUS GROUP A Homologation and Harmonisation

Fire Safety Workshop 17<sup>th</sup> – 18<sup>th</sup> March 2004 Cologne - Germany



# 1. What are the critical passive safety issues relating to the topic?

- a) Needs to be accepted by all countries
- b) All test facilities available from start of legislation/standard
- c) Understanding the text
- d) Clear Interpretation
- e) Systematic approach for whole industry
- f) Refurbishment & renewal application?
- g) Balance between Active and Passive Safety
- h) Differential between Loco and passenger stock
- i) Short term cost issues
- j) Balance between High Speed and Conventional
- k) Suppliers unable to make compliant product



## 2. What are the issues relating to standards?

- Needs to be practical to reduce costs
- Legislation is dictated by larger countries
- Opportunity for all countries to comment on the draft
- Amount of documentation



- 3. What are the overall recommendations for addressing the critical passive safety issues identified in question 1?
- a) Communication of ideas between different countries
  - Workshops for overview of documentation and clarification of text
  - Make documentation available generally to the Rail Community
- b) Investment in test house
- c) CIRCA forum web site
- d) Common legislation
- e) Safety management and RAMS
- f) Sub group for NoBos to define documentation

4. What are the business benefits in addressing the critical passive safety issues identified in question 1?

- Practical approach reduces cost
- Honest competition
- One common legislation leading to reduced cost



# 5. What are the priorities for future research activity?

- Who measures the improvements KPIs
- Analyse possible incidents
- Publicise findings
- Feedback from real life scenarios
- More input from operator to address the misbalance between operator and supplier



# FOCUS GROUP B FIRE SAFETY

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- 1. What are the critical passive safety issues relating to the topic?
- Assignment of vehicle category
- Toxicity requirements for cables and materials
- Compatibility between TSIs
- Consistency in certification of materials test bodies quality systems



### 2. What are the issues relating to standards?

- Transition process between existing and new standards

   impact on product build runs
- Toxicity requirements for cables and materials
- Clarity and unambiguity in the standard
- Consistency in interpretation Test house accreditation
- Reliance on small scale test



- 3. What are the overall recommendations for addressing the critical passive safety issues identified in question 1?
- Informative annex to standard giving guidance on vehicle categories
- Accreditation scheme for Test Houses
- Consistency of Notified Bodies

4. What are the business benefits in addressing the critical passive safety issues identified in question 1?

- Simplified, more certain outcome
- Control of costs and value for money
- Eliminate duplication of effort and resources



# 5. What are the priorities for future research activity?

- Tests for Toxicity
- Extensive use of films inside and outside of vehicle
- Change management:
  - New materials
  - New processes
- Risk Balance and Compensation
- Small versus large scale tests



### FOCUS GROUP C

### **Seats and Test Methods**

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# 1) What are the critical passive safty issues relating to seats and test methods?

a. \*1 More information about the test
Suboptimization – not testing thr whole seat

total CO generation HCL HCN

- b. We need to involve the industry (components sheets etc.)
- c. Notified body to conduct the test



#### 2) What are the issues relating to the standards?

- a. Armrest headrest
- b. A basic foam test is required
- c. 4000 € for test (3seats)
- d. No ,ageing' element to the standard



#### 3) Recommendations

- a. Change the duct to analyse the exhaust flow
- b. Time to (self) extinguishment



#### 4) Ability to sell products throughout europe

- a. Standardised testing regime
- b. Higher level of safty
- c. More competition



#### 5) More research to adress \*1

- a. real sample smoke and toxicity test
- b. research into ageing and delay of seat mattress etc.

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# Discussion



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# **Discussion- Focus Group D**

- 1) What are the critical passive safety issues relating to the topic?
- 2) What are the issues relating to standards?
- 3) What are the overall recommendations (solutions) for addressing the critical passive safety issues identified in #1 ?
- 4) What are the business benefits in addressing the critical safety issues identified in #1?
- 5) What are the priorities for future research activity?





#### 1) What are the critical passive safety issues relating to the topic?

- > Inner Lining, thermo plastic material, can it be used?
- Cables: thermal overload mechanical problems abrasion function control
- > Connectors: what can happen to a connector (dirt, aging,...)
- > work (replacement): safety & health issues
- > Meet the requirements for smoke and toxicity





#### 2) What are the issues relating to standards?

- > Why are cable diameters regulated?
- No monopoly in testing; can the producer test himself? Validity of the certificate 3 -> 5 years?
- > High testing costs for the producers e.g test complete systems

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3) What are the overall recommendations (solutions) for addressing the critical passive safety issues identified in #1 ?

- Inner Lining, thermo plastic material, can it be used?
  NO?!
- Cables: thermal overload one important point close corporation with the cable supplier mechanical problems abrasion function control
- Connectors: what can happen to a connector (dirt, )
  Design, price versus life time
- > work (replacement): safety & health issues when replacing parts
- Meet the requirements for smoke and toxicity Are solutions in the market available, Design, price versus life time ?





4) What are the business benefits in addressing the critical safety issues identified in #1?

>TCO (Total cost of ownership)?

> Interchangeability for the EU market and overseas, broader markets?!





#### 5) What are the priorities for future research activity?

- Research on occupational (Arbeitsschutz) health and safety
- Easy disposal of the materials (end of life)
- > Research into new composite materials & multi layer thermoplastics



#### **TRAINSAFE:** Fire Safety of Rail Vehicle Structures

## **Focus Group E: Materials and Test Methods**

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- 1. What are the critical passive safety issues relating to the topic?
- Fire and smoke are both critical
- FRP parts have to resist fire as long as possible
- FRP parts should not create toxic smoke in the case of heat from fire situation or fire itself
- Smoke should not contain burnable fractions





## 2. What are the issues relating to standards?

- FRP thermosets can be easily adopted to each level of the standard
- For region that was using DIN 5510 in the past the parts become much more demanding regarding the base material, weight and price
- Highly flame retardant parts from FRP thermosets are used already in France, Spain and United Kingdom



### ... What are the issues relating to standards?

### • Results of thermoste materials re part 2 of EN45545

Test standard	Unit	Results of BÜFA	Results of	Results of
		Firestopp S 490	menzolit <sup>®</sup> SMC 2400	Bakelite PHL 2503
ISO 5658 - 2 (spread of flame)	CFE [kW/m <sup>2</sup> ]	45,2	> 49,7	
ISO 5659 - 2 (smoke density)	Ds (4 min)	88,4	2,6	0,363
	VOF4	108,56	33,4	0,735
ISO 5659 – 2 (smoke toxicity)	CIT	0,135	0,75 at 600s (only CO and CO <sub>2</sub> detected)	0,0912
ISO 5660 – 1 (heat release rate)	MAHRE [kW/m <sup>2</sup> ]	80,5	35	21,9



- 3. What are the overall recommendations (solutions) for addressing the critical passive safety issues identified in slide 1?
- Best fire and smoke retardancy fo parts
- Easy deboarding of vehicle
- Smaller units to prevent gases to penetrade to fast
- Additional fire safety devices (fire estinguishers etc.)



# 4. What are the business benefits in addressing the critical passive safety issues identified in slide 1?

- → A harmonisation of all European fire standards is essential as more trains run international.
- → It also helps the industry to develop only according to one standard instead of many different ones.
- → The national standards vary not only in the test method but also in the demand of the level of performance of the materials used and the demand also varies regarding if the materials are used as interior or exterior parts.
- → This smoke and fire focus supports the use of passenger friendly flame retardant materials and bans all toxic and easy combustible materials.
- → The new standard uses tests at a radiant heat of 50 kW/m<sup>2</sup> which is close to a real fire scenario.
- → Using halogen-free flame retardant glass fibre reinforced plastics passenger safety in trains can be enhanced drastically in Europe and with the right means of fire fighting and good designs to minimize the risk of fire will minimize the danger of killed people in future rail vehicles.



# 5. What are the priorities for future research activity?

- Meeting all demands of the the new standard
- Meeting all other requiremnts for interior parts
- Develop materials for fire barriers



#### **TRAINSAFE:** Fire Safety of Rail Vehicle Structures

## **Focus Group E: Materials and Test Methods**

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- 1. What are the critical passive safety issues relating to the topic?
- Test methods
- Criteria
- Performance of materials



## 2. What are the issues relating to standards?

- Link between old standards and new standard
- Test of materials or products ?
- Correlation to design (of parts, compartment, train)?
- Responsibility for approval



- 3. What are the overall recommendations (solutions) for addressing the critical passive safety issues identified in slide 1?
- To get in coantact with the mirror committee
- Database of materials
- List of contacts



4. What are the business benefits in addressing the critical passive safety issues identified in slide 1?

→More efficiency by
 →Databases
 →Contacts
 →Only one approval for a certain material (harmonization)
 →Reduction of number of formulations



# 5. What are the priorities for future research activity?

- Usage of mathemathical models to facilitate product development
- Processability of materials



### **Working Group F**

#### **Materials and Test Methods Feedback**

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#### QUESTION #1 What are the critical passive safety issues relating to the topic?

- Direction of fire attack on sandwich structures.
- Problem of reproduction of end use conditions by small scale testing e.g jointed sandwich panels/mouldings
- Load carrying properties of sandwich structures in the effects of fire.
   E.g. if a joint fails new material is exposed = more fuel
- Failure of joints. Adhesive bonding failure.



#### QUESTION #2 What are the issues relating to standards?

- No standards for medium scale tests.
- Insufficient consideration of effects of fire on structural behaviour.
- No consideration of structural loading on fire reaction performance
- No relation between the conventional criteria 15 min performance requirement with regard to toxicity and visibility.
- Difficulty in certification due to lack of standards/guidelines.



QUESTION #3 What are the overall recommendations (solutions) for addressing the critical passive safety issues identified in #1?

- Creation of an engineering tool to predict visibility and toxicity
- Clarification of standards to remove ambiguity
- Establish applicability of testing. If small scale test is deemed inappropriate allow certified use of medium scale testing.
- Research/investigation required to understand the load carrying properties of sandwich structures in case of the effects of fire.
- Clarification and guidance of standards considering structural loading on fire reaction performance. Possibly requiring further research.
- Clarity and guidance in relation between 15 min with regard to toxicity and visibility.
- Improve process of certification



QUESTION #4 What are the business benefits in addressing the critical passive safety issues identified in #1?

- Wider use of composite materials, and their material advantages.
- Testing is accepted in all European countries. Requires one test for multiple target markets.
- Reduced certification/approval costings and reduced time to market.



#### QUESTION #5 #5 What are the priorities for future research activity?

- Railway acceptance criteria for medium scale tests.
- Creation of an engineering tool to predict visibility and toxicity

## **THANK YOU!**