



DANGEROUS GOODS PANEL (DGP) MEETING OF THE WORKING GROUP OF THE WHOLE

Memphis, 30 April to 4 May 2007

Agenda Item 6: Discussion of miscellaneous dangerous goods issues

USE OF NEW MATERIALS FOR AIRFREIGHT CONTAINERS AND FOR PACKAGING FOR THE CARRIAGE OF DANGEROUS GOODS

(Presented by D. Raadgers)

SUMMARY

The DG panel is invited to discuss the use of new materials for airfreight containers and for packaging for the carriage of dangerous goods and are requested to consider support to this initiative by The Netherlands.

1. INTRODUCTION

1.1 The development of new materials with specific features on fire, explosive and corrosive resistance might be a possibility to benefit the safety of transport of dangerous goods by air.

1.2 The Netherlands Ministry of Transport (MOT) in cooperation with the USA/TSA is at present investigating the possibility of developing an explosive resistant air freight container (ULD) designed by using Glare material for in-flight security reasons. The new designed container will be economically more attractive for air transport in terms of weight and costs than the existing FAA certified explosive resistant ULD which was too heavy and too expensive for the airlines.

1.3 In view of the specific features of Glare grade materials, the Netherlands MOT intends to carry out a feasibility study on the possibilities to use the strengthened container for the transport of dangerous goods and investigate the possible use of the Glare material for packaging of dangerous goods.

2. **DEVELOPMENT OF THE USE OF GLARE GRADE MATERIALS AIR FREIGHT CONTAINERS**

2.1 Over the last three years the Netherlands Ministry of Transport has supported the design of an explosive resistance air freight container for use to security risky destinations. The initiative has also raised the question whether:

- a) such a container could be of benefit for transport of certain dangerous goods i.e. as over-packaging;
- b) Glare grade materials could also be used to develop new packaging requirements to benefit the safe transport of certain dangerous goods.

2.2 To that regard the Netherlands Ministry of Transport would like to investigate in close cooperation with specialized research institutes and the aviation industry the possibility of using Glare grade materials for the safe transport of dangerous goods. The results of this study could form a basis for further development of transport requirements aiming at international acceptance by the UN Committee of Experts for the Transport of Dangerous Goods and inclusion of these new requirements in the ICAO Technical Instructions.

2.3 As a first step the Netherlands would like to initiate a feasibility study on the advantages of Glare grade materials, the possibility of using this material to design air freight containers for transport of dangerous goods and of identifying those classes of dangerous goods for which the design of enhanced packaging with glare material would be of benefit.

2.4 Based on the outcome of this study, consideration should be given to investigating the interests of the packaging industry and of the airlines on the potential use of the glare container and new packaging requirements and perform a safety analysis and a cost benefit study.

3. **FEATURES OF THE GLARE MATERIAL**

3.1 The following contains some information on the basic features and benefits of the GLARE material.

- Due to the layered configuration of GLARE (alternating layers of thin aluminium alloys and high strength glass prepregs), the material shows some remarkable good properties for safety and security applications.
- The applied glass layers enhance the static performance of the aluminium alloys. Consequently the structure can be lower in weight compared to standard aluminium structures
- Due to the right combination of aluminium alloys and glass layers, GLARE showed excellent blast resistant capabilities
- Compared to all aluminium structures a GLARE structure shows extremely good fire resistant properties. Fire tests on 1100+ 0C show no penetration through the material

(even after 15 minutes), while aluminium structures are already burned away in less than a minute.

- GLARE shows extremely good resistance to aggressive chemicals. The outer aluminium layers dissolve in minutes, but the chemical attack stops at the glass layer.
- GLARE shows also extremely good lightning strike resistance. Only the outer aluminium layer of GLARE (usual 0.4 mm) will have a burned spot and the underlying first glass layer is damaged. An aluminium structure needs about 4 mm for the same resistance.

4. FOLLOW-UP

4.1 The DGP and the appropriate industrial stakeholders as potential users are invited to discuss this paper and are requested to consider support to this initiative by the Netherlands. They are also invited in due time to take into considerations the results of the study with the objective of achieving international acceptance by the UN Committee of Experts for the Transport of Dangerous Goods and to include new packaging and transport requirements in the Technical Instructions.

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