



DGP-WG/09-IP/10
20/5/09

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

Auckland, New Zealand, 4 to 8 May 2009

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2011/2012 Edition

Agenda Item 2.4: Part 4 — Packing Instructions

TEST REQUIREMENTS PI 602 AND PI 650

(Presented by K. Vermeersch)

INFORMATION PAPER

APPENDIX



*Federale Overheidsdienst Mobiliteit en Vervoer
Service public fédéral Mobilité et Transports*

Test Requirements PI 602 and PI 650

ICAO DGP-WG/09

Internal Pressure (Hydraulic) Test

- Test pressure to be applied in accordance with PI 602 and PI 650: 95 kPa

- How to perform testing:
 - No indication in PI 602 or PI 650
 - Only description of testing: ICAO Part 6; 4.5
 - Metal packagings must be subjected to test pressure: 5 min
 - Plastic packagings must be subjected to test pressure: 30 min

Test Results

- Number of tested packagings: 61
- Number of positive test results: 38
- Number of negative test results: 23
- Number of primary receptacles tested: 14
 - 10 positive test results
 - 4 negative test results**28% failed**
- Number of secondary receptacles tested: 47
 - 28 positive test results
 - 19 negative test results**40% failed**

40 kPA
Roomtemp

negative



20 kPA
Roomtemp

negative



20 kPA
Roomtemp

negative



50 kPA
Roomtemp

negative



95 kPA
10 minutes
Roomtemp

positive



Approved packages



Alternative testing method: external vacuum test

**! In accordance with the note of PI 602 and PI 650
not an acceptable method for flexible packagings.**

Testing of bags with hydraulic pressure

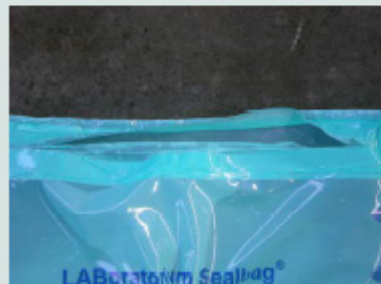
- Internal pressure : 95 kPa
- Temperature : room temperature
- 3 bags were tested (samples nr 1, 2 and 3).



Start 95 kPa



After 3 min. 95 kPa right
before breaking



Bag nr. 1 broke after 2 min.



Bag nr. 2 broke after 3 min.

Testing of bags in vacuum room

- Bags laying flat without air inside.
- Temperature : room temperature



Bag nr. 4 before test



Bag nr. 4 after 10 min.



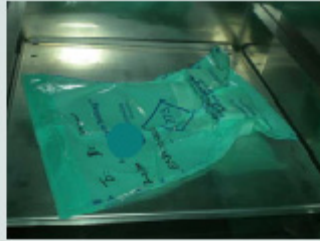
Bag nr. 4 after 30 min.

Testing of bags filled with small box with inner tubes in vacuum room.

- Temperature : room temperature.
- 2 bags were tested (samples nr. 5 and 6)
 - Bag nr. 5 : 2 small boxes containing primary receptacles and absorption material placed in the bag and the air was pushed out before closing.
 - Bag nr. 6 : 2 small boxes containing primary receptacles and absorption material placed in the bag and closed immediately.



2 small boxes containing primary receptacles



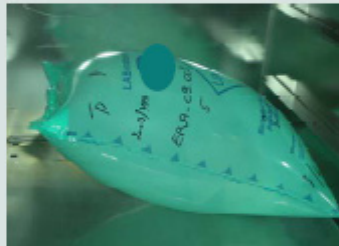
Bag nr. 5 after test



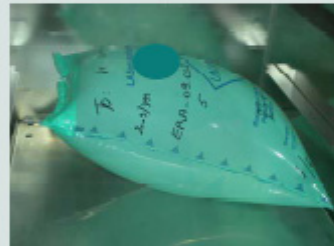
Bag nr. 6 after test



Bag nr. 5 before test



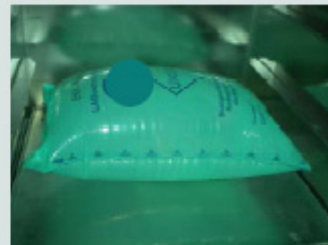
Bag nr. 5 after 5 min.



Bag nr. 5 after 30 min.



Bag nr. 6 before test



Bag nr. 6 after 5 min.



Bag nr. 6 after 30 min.

Alternative testing method: external vacuum test

- In order to verify if small leakages could be detected via the vacuum test, 2 small holes were made in the bags

⇒ Result: the bag blew still up !

⇒ Conclusion: Not an adequate method to be used

Additional Problem: Use of Dry Ice

- A lot of shipments of Infectious Substances Category B are shipped in Dry Ice

⇒ The adhesives used for plastic bags are not capable to withstand the temperature (tested for 72 hours).

⇒ Bags are completely opened !



— END —