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Aschaffenburg, 12 May 2107

From: Za-mue
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REPORT

Order No.: 8217/1 **Page 1 of 5 pages**

Client: Mega Fortris Security Bags (Malaysia) Sdn. Bhd.
29, Jalan Anggerik Mokara 31/47
Kota Kemuning, Sekysen 31
40460 Shah Alam, Selangor / Malaysia

Date of order: 21 March 2017

Receipt of sample material: 27 March 2017

Origin of sample material: From the client

Purpose: Analysis of a Security Tamper-Evident Bag for security mechanisms



(Dr. Derra)
Managing Director



(Zahn)
Head of
Physical Material Testing

The present report refers exclusively to the samples as laid out therein. Information and statistical data on the results can be obtained on request.

Sample Material

For analysis the following sample material was in hand:

| Sample description |
|---|
| ICAO STEB BAG "Mega Void High Security Tape" Bag size: approx. 62.0 x 34.5 (outer dimensions with handles) approx. 48.0 x 31.0 (inner dimensions) |

Carrying out of the Tests

Examination period: 28 March 2017 to 4 May 2017

Examination according to AVS&C STEB/PROT-2008.V1 (April 2008)

1. Visual inspection and determination of Thickness

The bags were inspected for their compliance with the ICAO - specifications mentioned in section I of the AVS & C STEB/PROT-2008.V1. The determination of film thickness was performed according to ISO 4593.

Result:

| Visual inspection | | |
|--|--|--|
| Section of STEB-PROT - Parameter | Requirement | Measurement value |
| I - 1 - Film thickness: | > 50 µm | 69.7 µm |
| I - 2 - Tape width: | ≥ 30 mm | 30 mm ¹⁾ |
| I - 2 - Release liner width: | ≥ 40 mm | 40 mm ¹⁾ |
| I - 3 - Side border width: | ≥ 15 mm | 15 mm |
| I - 3 - Bottom border width: | ≥ 15 mm | 15 mm |
| I - 4 - Printed border width: | ≥ 5 mm | 5 mm |
| I - 4 - Continuous message: | e.g. "DO NOT OPEN" | "DO NOT OPEN / TAMPERVOID" |
| I - 5 - Security sign ("happy face", green) - position: | middle of the bag | middle of the bag |
| I - 6 - Red box at bottom - wording: | "Do not open until final destination - Contents may be confiscated if tampered with" | "Do not open until final destination - Contents may be confiscated if tampered with" |
| I - 7 - State three letter code: I - 7 - Manufacturer name: | Printed on the bag | "AUS / MEGAFORTRIS" |
| I - 8 - Inventory / security code: | Printed on the bag | "2 05007 930952" / "AVS&C TESTING" |

¹⁾: Release liner overlaps the security tape for 10 mm.

2. Temperature tests on the security tape

Two bags were closed and after a delay of one minute exposed to a certain temperature in a climate chamber or an oven. One bag was examined after 5 minutes and the other bag was examined after 6 hours storage. Attempts were taken to open and close the security tape of the bag without causing signs of manipulation.

The tests were performed at the following temperatures:

Room temperature, 60 °C, 80 °C, 100 °C, -5 °C, -10 °C and -20 °C.

Additionally a test was performed on the security tape of one closed bag with a cooling spray (immediate freezing at about -40°C) at an exposure time of 1 minute.

Another test was performed on the security tape of one closed bag with a hair dryer (at about 60°C) at an exposure time of 1 minute.

Results of the temperature tests:

| Temperature | Exposure time | Test result |
|------------------|---------------|---|
| approx.- 40 °C | 1 min | The security tape could not be removed without destructing it. During the manipulation attempt the words "OPEN / VOID" became repeatedly visible on the security tape and in the area of the security bag's opening and kept partly visible after the attempt to close the security tape again. |
| - 20 °C | 5 min | |
| | 6 h | |
| - 10 °C | 5 min | |
| | 6 h | |
| - 5 °C | 5 min | |
| | 6 h | |
| Room temperature | 5 min | |
| | 6 h | |
| 60 °C | 5 min | The security tape could not be removed without destructing it. As far as the opening of the bag was possible, the words "OPEN / VOID" became visible on the security tape and in the area of the security bag's opening and kept partly visible after the attempt to close the security tape again. |
| 60 °C | 6 h | |
| 100 °C | 5 min | |
| 100 °C | 6 h | |
| Hair dryer test | 1 - 2 min | |

Evaluation of the results of the temperature tests:

Attempts to open the security tape at the above mentioned temperatures lead to the appearance of a clearly visible security sign (the words "OPEN / VOID") and/or the irreversible breaking of the security tape.

3. Solvent tests on the security tape and the sealing

One bag was closed and after a delay of one minute three strips were cut out of the bag: one strip containing the security tape, one strip containing one side border and one strip containing the bottom border (including the sealing).

The strips were exposed to the solvent. After a storage time of 6 hours in the solvent, attempts were taken to open and close the security tape and the sealing of the bag without causing signs of manipulation. Furthermore the influence of the solvent on the print of the bag was visually examined.

The tests were performed with the following solvents:

Acetone, Ethanol, Ethyl acetate, Tetrahydrofuran, n-Hexane and Toluene.

Results of the solvent tests:

| Solvent | Test result |
|-----------------|---|
| Acetone | The security tape could be removed, the words "OPEN / VOID" did partly become visible on the security tape. The print of the bag's outer side was partly removed. The rest of the print which was not removed could be wiped off. The sealed borders of the bag could not be opened without destructing them. |
| Ethyl acetate | |
| Tetrahydrofuran | |
| n-Hexane | The security tape could be removed, the words "OPEN / VOID" became visible on the security tape. The print of the bag's outer side was not removed and could hardly be wiped off. The sealed borders of the bag could not be opened without destructing them. |
| Ethanol | The security tape could not be removed without destructing it. The words "OPEN / VOID" became visible on the security tape. The print of the bag's outer side was partly removed. The rest of the print which was not removed could be wiped off. The sealed borders of the bag could not be opened without destructing them. |
| Toluene | The security tape could be removed, the words "OPEN / VOID" became visible on the security tape. The print of the bag's outer side was not removed, but could be wiped off. The sealed borders of the bag could not be opened without destructing them. |

Evaluation of the results of the solvent tests:

Attempts to open the security tape of the bag after storage for 6 hours in the above mentioned solvents lead to the appearance of a security sign (the words "OPEN / VOID") and/or the disappearance of the print of the bag's outer side.

Attempts to open the sealed borders of the bag after storage for 6 hours in the above mentioned solvents lead to the irreversible breaking of the bag.

4. Resistance test

One bag was loaded with three filled bottles of 1,25 litres, then closed and suspended on a rack during 24 h.

The bag was examined visually after 6 hours and after 24 hours.

Result:

| Test duration | Test result |
|---------------|---|
| 6 h | The security tape and the bag showed no visible changes. |
| 24 h | The bag showed on one small place where the security tape has opened for approx.. 1 - 2 cm (not completely) and the words "OPEN / VOID" became visible. |

Comment: The sample passes the 6 hour test.

The accreditation (Register no. D-PL-14160-01-01 and D-PL-14160-01-02) applies to the methods marked with * in the test report.

End of report