

Handled by, department
Rauno Pyykkö
Chemistry and Materials Technology
+46 33 16 52 80, rauno.pyykko@sp.se

DEF-TEC Defence Technology GmbH
Ralph Zissel
Eschborner Landstrasse 42-50
DE-60489 FRANKFURT am MAIN
Tyskland

Test of OC-spray

Test object

Thirty pieces of "First Defense Red Pepper Spray MK-3" live version in yellow 50 ml containers, batch. nr. 802174 and two pieces of "First Defense Inert Spray MK-3" training version in light blue 50 ml containers, batch. nr. 803224.

Arrived at SP: 18/11/2004

Test date: 22/11/2004—15/12/2004

Assignment

Test of OC-spray.

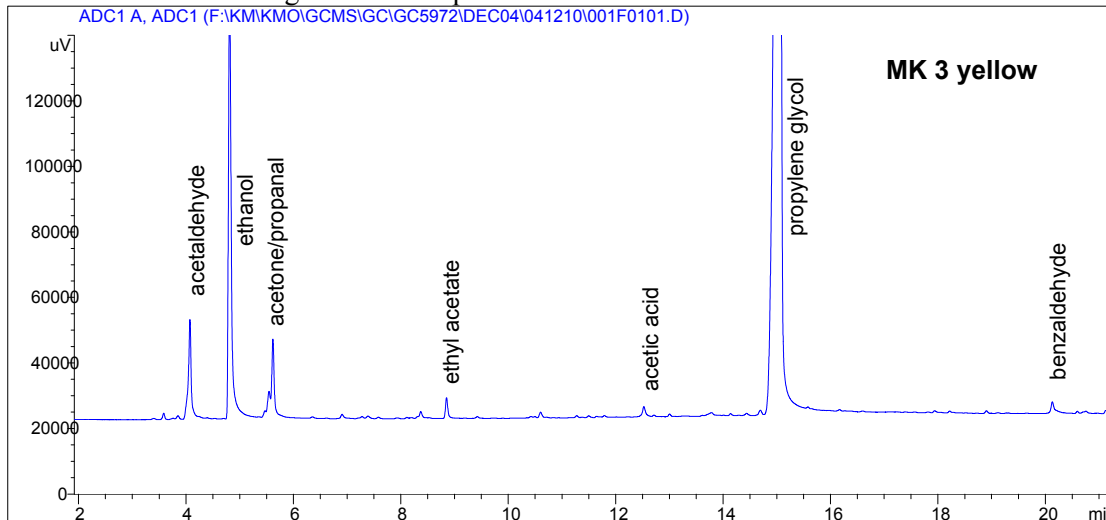
Results

1. GC-MS identification of solvents, propellants and other volatile components.

The propellant is introduced in a gastight bag. The gas is then analysed by gas chromatography (GC) with a thermal conductivity detector (TCD) and a Molecular Sieve as column for oxygen and nitrogen and with a Hayesep column for carbon dioxide.

Results: The propellant is Nitrogen (N₂).

Solvents and dominating volatile compounds.



SP Swedish National Testing and Research Institute

Postal address
SP
Box 857
SE-501 15 Borås
SWEDEN

Office location
Västeråsen
Brinellgatan 4
Borås

Phone / Fax / E-mail
+46 (0)33 16 52 80
+46 (0)33 12 37 49
info@sp.se

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2. Spray pattern

Results: The spray pattern is a stream and the spray is clear and yellowish.

3. Capacity and function

Face dose test, the bursts from three meters.

Sample	Face dose, Capsaicinoids (mg/dm ² /sec)	Comments at spraying
3:1:1	9,6	Good hit in the funnel.
3:1:2	11,7	Good hit in the funnel.
3:1:3	9,7	Good hit in the funnel.
3:2:1	9,2	Good hit in the funnel.
3:2:2	11,5	Good hit in the funnel.
3:2:3	13,5	Good hit in the funnel.
3:3:1	10,1	Good hit in the funnel.
3:3:2	11,4	Good hit in the funnel.
3:3:3	13,4	Good hit in the funnel.
Average	11,1	

Results: Average is **11,1 mg/dm²/sec.**

4. Temperature considerations

4.1.1 Store at -40°C for 24 h and immediately after that at +20°C for 2 h. Test function, i.e. that capsaicinoids are emitted at the same rate as for a “new” container. Using the face dose test method.

Face dose test, the bursts from three meters.

Sample	Face dose, Capsaicinoids (mg/dm ² /sec)	Comments at spraying
4:1:1:1	7,6	Good hit in the funnel.
4:1:1:2	11,0	Good hit in the funnel.
4:1:1:3	10,8	Good hit in the funnel.
4:1:2:1	12,0	Good hit in the funnel.
4:1:2:2	11,2	Good hit in the funnel.
4:1:2:3	10,8	Good hit in the funnel.
4:1:3:1	12,0	Good hit in the funnel.
4:1:3:2	9,5	Good hit in the funnel.
4:1:3:3	10,3	Good hit in the funnel.
Average	10,6	

Note: The stream is more “wet” i.e. bigger drops hits the funnel than at tests in paragraph 3.

Results: Average is **10,6 mg/dm²/sec.** The relative change compared to Paragraph 3 Capacity and Function test is insignificant (-4,5%).

4.1.2 Store at +50°C for 24 h cool to +20°C, wait for 5 h and detect change in weight of the containers.

Results: The relative change in weight was insignificant (0,07 %) for all three containers.

4.2.1 Cold conditions: cool to -25°C for 6 h and after 2 minutes at room temperature test the system by determining the face dose. The result is calculated as the average of three containers.

Face dose test, the bursts from three meters.

Sample	Face dose, Capsaicinoids ($\text{mg}/\text{dm}^2/\text{sec}$)	Comments at spraying
4:2:1:1	9,6	Good hit in the funnel.
4:2:1:2	13,2	Good hit in the funnel.
4:2:1:3	12,6	Good hit in the funnel.
4:2:2:1	8,9	Good hit in the funnel.
4:2:2:2	15,9	Good hit in the funnel.
4:2:2:3	10,9	Acceptable hit in the funnel.
4:2:3:1	10,7	Acceptable hit in the funnel.
4:2:3:2	11,3	Good hit in the funnel.
4:2:3:3	13,6	Good hit in the funnel.
Average	11,9	

Note: The stream is more “wet” and “narrow” i.e. bigger drops hits the funnel than at tests in paragraph 3.

Results: Average is **11,9 $\text{mg}/\text{dm}^2/\text{sec}$** .

The relative change compared to Paragraph 3 Capacity and Function test is insignificant 7,2 %.

4.2.2 Hot conditions: Condition at $+50^{\circ}\text{C}$ for 6h and after 2 minutes at room temperature, test the system. The system must be capable to give three one seconds bursts with “normal” characteristics of the bursts. Tested by visual inspection. Three units was tested.

Results: All three units fulfills the requirements.

4.3 The units should not leak after the temperature has been rapidly changed from -25°C to $+50^{\circ}\text{C}$. Three units was tested.

Results: No leakage was observed during the test.

5. Mechanical stability

The device is dropped from 2.5 m on a concrete surface after being cooled to -25°C for 6h. Three units was tested.

Results: All three containers showed a slight deformation at the bottom down drop test. No leakage was observed after the test. The tested units showed normal operation characteristics.

6. Fire hazard

6.1 No ignition should occur when OC-spray is sprayed against an open fire.

A full container from three meters was sprayed: No ignition occurred.

A full container from two meters was sprayed: No ignition occurred.

A full container from one meter was sprayed: No ignition occurred.

6.2 No fire hazard should occur when OC and Taser equipment is used simultaneously.

Three seconds spray from three meters and 5s Taser burst: No ignition occurred.

Three seconds spray from one meter and 5s Taser burst: No ignition occurred.

7. Holster

The manufacturer of the OC-spray should be able to provide a suitable holster fitting to duty belts up to 57 mm.

Results: Not tested. The test units arrived without holster.

9. Training version

Spray pattern and markings was visually inspected.

Results: No difference in spray pattern could be observed between the live and training version. The live version is a yellow container and the training version is a blue container with the text "Inert Spray".

10. Safety

Requirement: Visual inspection of that the devices should be designed to avoid accidental firing, making *firing* in the wrong direction impossible. If a safety catch is included it must be easily operated by both right and left hand.

Results: The unit fulfills the requirement.

12. Marking

The unit have a serial number and date of expiry on the bottom of the container.

Durability of marking was not tested.

**SP Swedish National Testing and Research Institute
Chemistry and Materials Technology - Organic Analytical Chemistry**

Conny Haraldsson
Technical Manager

Rauno Pyykkö
Technical Officer