

# Monnex Dry Powder performance test

Monnex BCE Dry Powder



## Executive Summary

Following the announcement from the CAA that UK Alt Moc 4 ADR.OPS.B.010 (a) (2) will be withdrawn commencing 1<sup>st</sup> January 2020. The Aviation Rescue & Firefighting industry raised questions and sought to seek answers.

AOA provided the forum for discussion with the CAA present, before AFOA (working with Angus) pushed to provide the evidence needed to demonstrate the performance of a 'High performing' powder against a standard ABC powder.

## Introduction

For several years, the CAA (CAP 168) have allowed Airport RFFS's to implement a 'Substitution rate' to their media requirements.

UKAltMoC4 ADR.OPS.B.010 (a) (2) Rescue and fire fighting services Extinguishing agents

(d) the amounts of water for foam production, and of the complementary agents provided on the rescue and firefighting vehicles are in accordance with the determined aerodrome category and Table 1, except that for media substitution a maximum of 50% of complementary media or water may be replaced according to the following rates when using performance level B foam:

1. 1 kg of gaseous agent or dry powder = 0.66 litres of water.
2. 2 kg of CO<sub>2</sub> = 0.66 litres of water.

Note 1: If a "high performance" dry powder is used the amount required may be reduced by 50%.

Note 2: High performance dry powders should be produced in accordance with the EN 615 standards. In tests 1.5 kg of powder should extinguish a 144B tray with a surface

area of 4.52 Esq.

## Test

Tests took place at Angus testing facility in Bentham, Lancashire.

### Attendees

Name	Organisation
Mr A Fraser	CAA RFFS Inspector
Mr N Gyllenship	Manchester Airport / AFOA
Mr A Hawkes	Hawkes Fire
Mr D Russell	Angus Fire
Mr J Payne	Angus Fire
Mr G Blackwell	Angus Fire – Test Personnel
Mr J Gardner	Angus Fire – Test Personnel

All tests were carried out using 9Kg Fire extinguishers with similar application discharge ability.



Standard ABC

Monnex Dry



The EN1568/3 tray was used for the test corresponding to the 144B (4.52m<sup>2</sup>) size according to EN3. This was initially filled with approx. 100 litres of water and 100 litres of Heptane and then topped up between tests with a further 20 litres of Heptane for each test.



The tray was cleaned thoroughly between the testing of the Monnex and BC powder and 100 litres of clean water and heptane applied.

Pre-burn, as per EN3 was 1 min before the powder applied from a 9kg extinguisher using 150psi CO2 gas cartridges for the Monnex and Stored Pressure for the ABC powder (EN3 - Minimum discharge time for a 9kg extinguisher is 15secs).

Fuel, Water & Air temperature, Wind speed, Extinguishment time and Weight of powder used were all recorded. The intent was to carry out five tests with each product (Monnex / ABC powder) and average out the results to give greater statistical significance.



Note: All tests were video recorded and this video is available for distribution (Available on request).

## Results

Table 1.1

Test	Weight Before (Kg)	Weight After (Kg)	Kg Used	% Used	Ext Time (sec)	Fuel Temp °C	Water Temp °C	Wind speed m/s
1	15.354	13.126	2.228	24.8	8	24	29	1.1
2	15.498	8.108	7.390	82.1	17	33	31	1.2
3	15.348	12.268	3.080	34.2	8	38	36	1.2
4	15.414	8.266	7.148	79.4	18	41	39	1.0
5	15.410	12.268	2.872	31.9	7	43	41	0.6
1	13.542 13.512	5.140 5,310	8.402 + 8.202  16.604	92.2	Did not extinguish after 35 seconds	22	23	0.5
2	13.496 13.512	5.478 5.610	8.018 + 7.902  15.920	88.4	Did not extinguish after 35 seconds	36	30	0.6

Monnex powder

ABC Standard

## Conclusions

As can be seen from table 1.1, all five heptane fires were successfully extinguished using the 9Kg Monnex powder extinguishers.

However, using the ABC powder, no extinguishment was achieved with the first extinguisher so a second ABC powder extinguisher was applied and again, no extinguishment.

The test was then repeated and no extinguishment achieved despite using three consecutive ABC powder extinguishers.

## Summary

The Monnex powder outperformed the ABC powder with very fast extinguishing times and with usage of 4.544 kg per test.

Table: 1.2

Powder type	Average Extinguishment time	Average usage (Kg)
Monnex Powder	11.6	4.544
ABC Powder	>35secs (Nil)	16.262 (2 x extinguishers)

The ABC powder did not extinguish the fires on either of the two tests despite using two consecutive extinguishers and an average weight of 16.262kg.

My conclusion based on the evidence demonstrated and observed is that, Monnex Dry powder, far out performed that of the standard ABC powder.

## Considerations

The 9kg Monnex extinguisher using 150psi CO2 gas cartridges may give an advantage over the standard ABC powder extinguisher stored pressure, due to the CO2 gas being present and potentially supporting the firefighting capability of the Monnex extinguisher.

My recommendation would be to test both powders under laboratory conditions, giving the scientific evidence to fully support an Alt Moc being presented.