Federal Aviation Administration

International Aircraft Materials Fire Test Working Group

Lab-Scale Testing of Seat Cushions Used in Full-Scale Test

Presented to: IAMFT WG, Naples, FL

By: Tim Marker, FAA Technical Center

Date: March 4, 2009

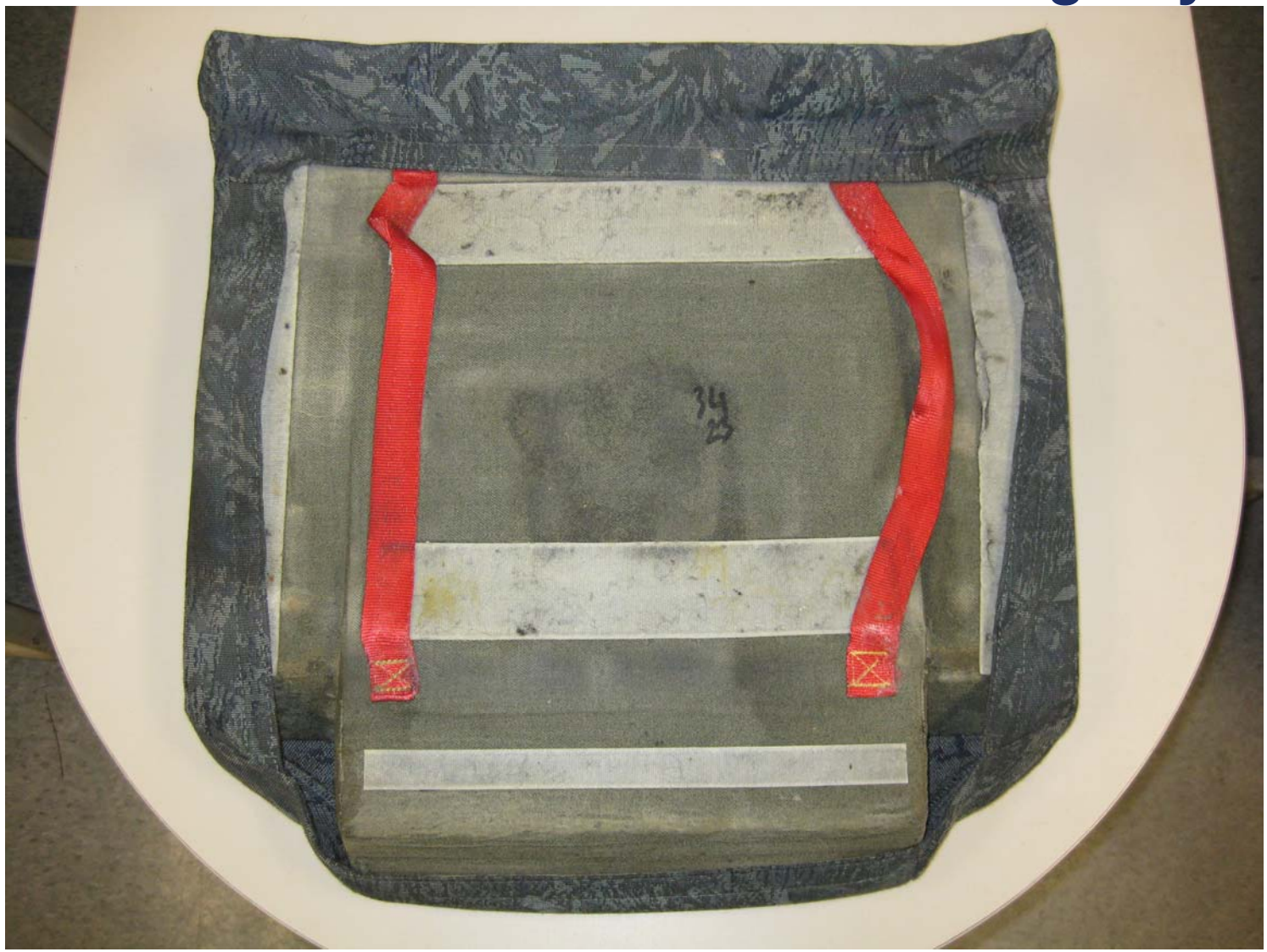
Testing of Seat Cushions Used in Full-Scale Mag-Alloy Study

Background

- Heightened interest in determining performance of seat cushions materials used in two full-scale baseline tests
- Observed poor performance of seat cushion materials may mask any additional hazard associated with magnesium alloys during subsequent testing
- Any changes in cushion materials will severely impact test schedule

Various AirCanada Cushions Used in Baseline 1

AirCanada Cushion with no Blocking Layer

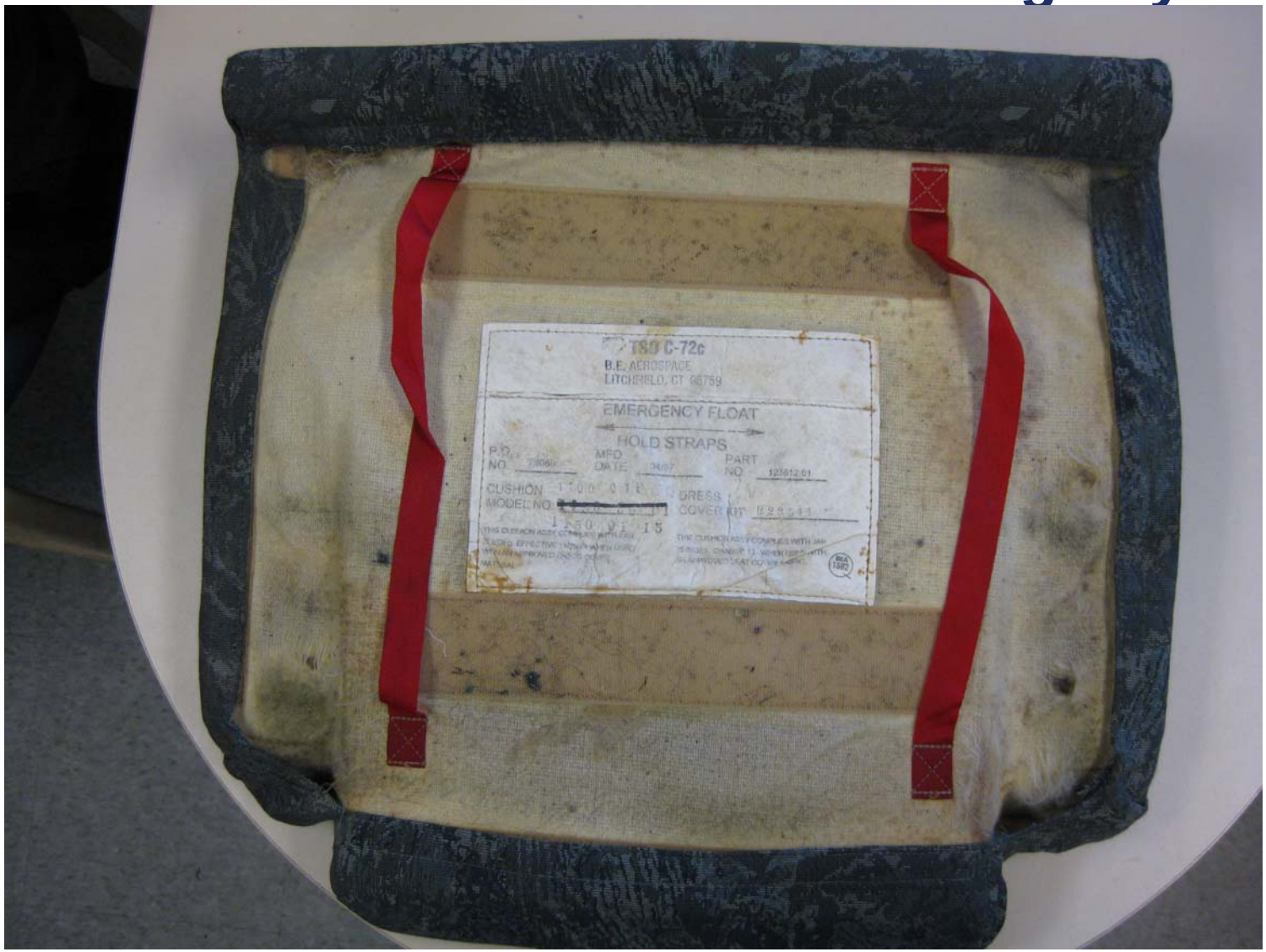


AirCanada Cushion with no Blocking Layer

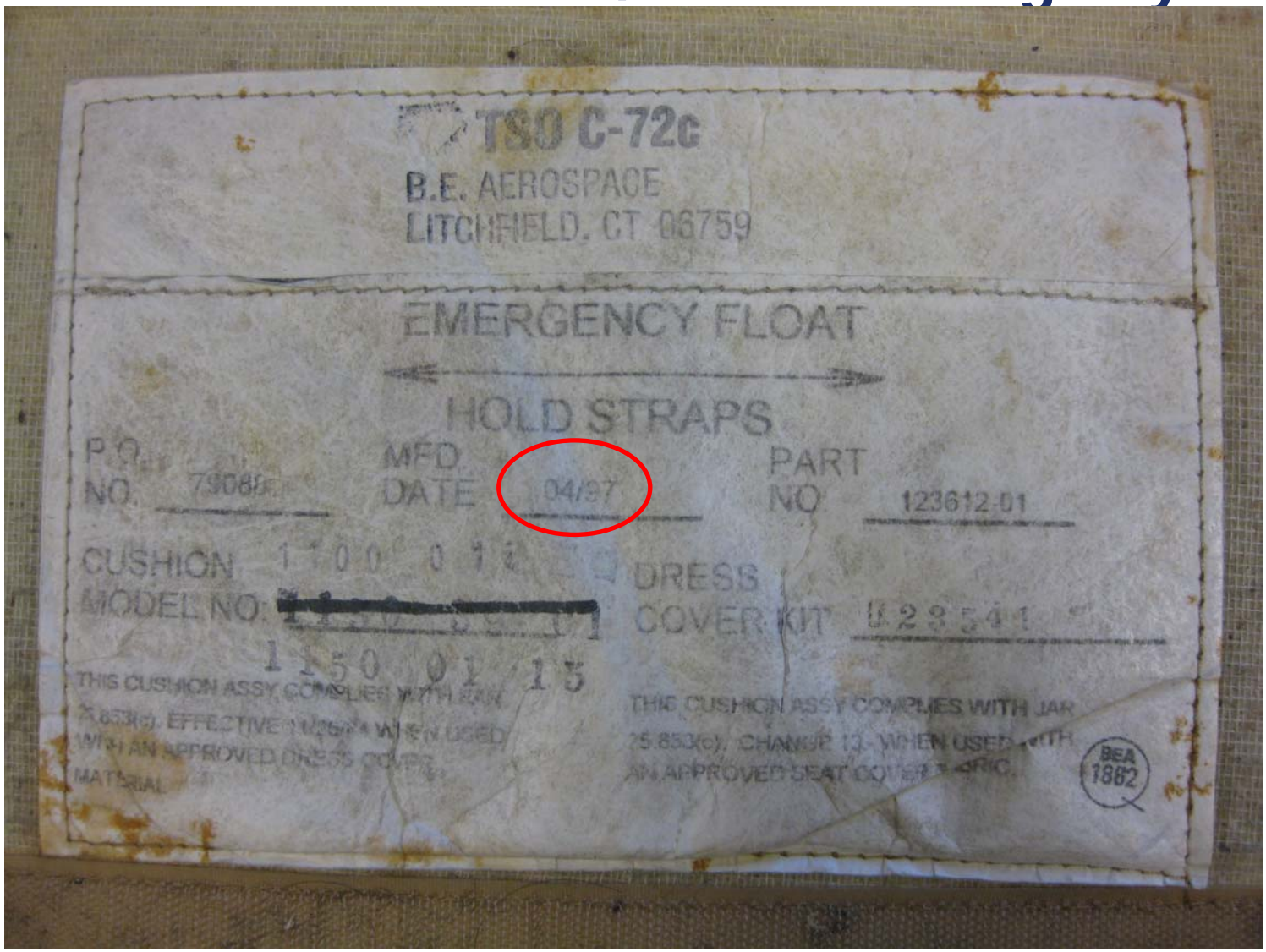
AirCanada Cushion with no Blocking Layer

AirCanada Cushion with no Blocking Layer

AirCanada Cushion w/ Fire-Blocking Layer #1

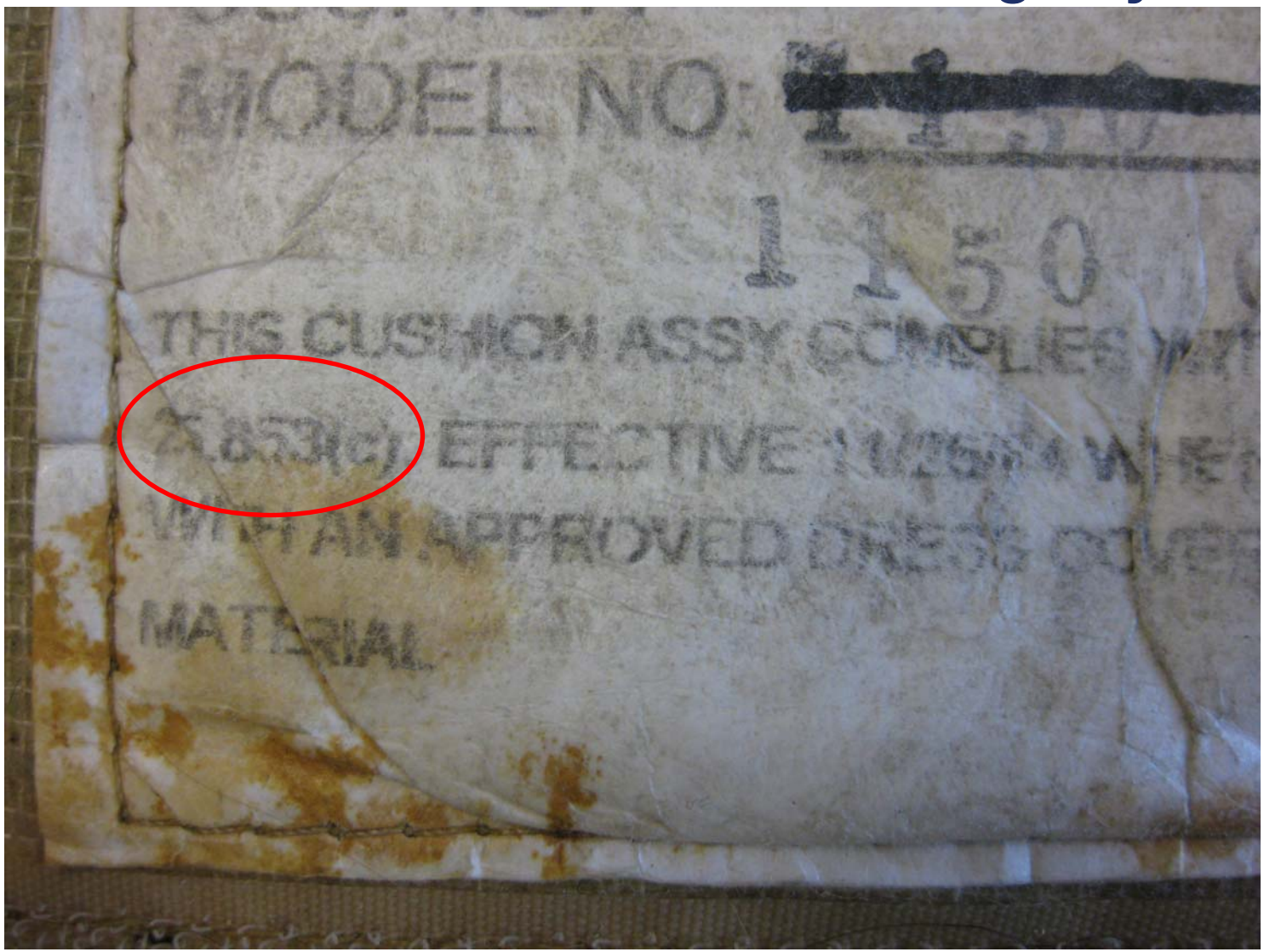


AirCanada Cushion w/ Fire-Blocking Layer #1



AirCanada Cushion w/ Fire-Blocking Layer #1

AirCanada Cushion w/ Fire-Blocking Layer #1

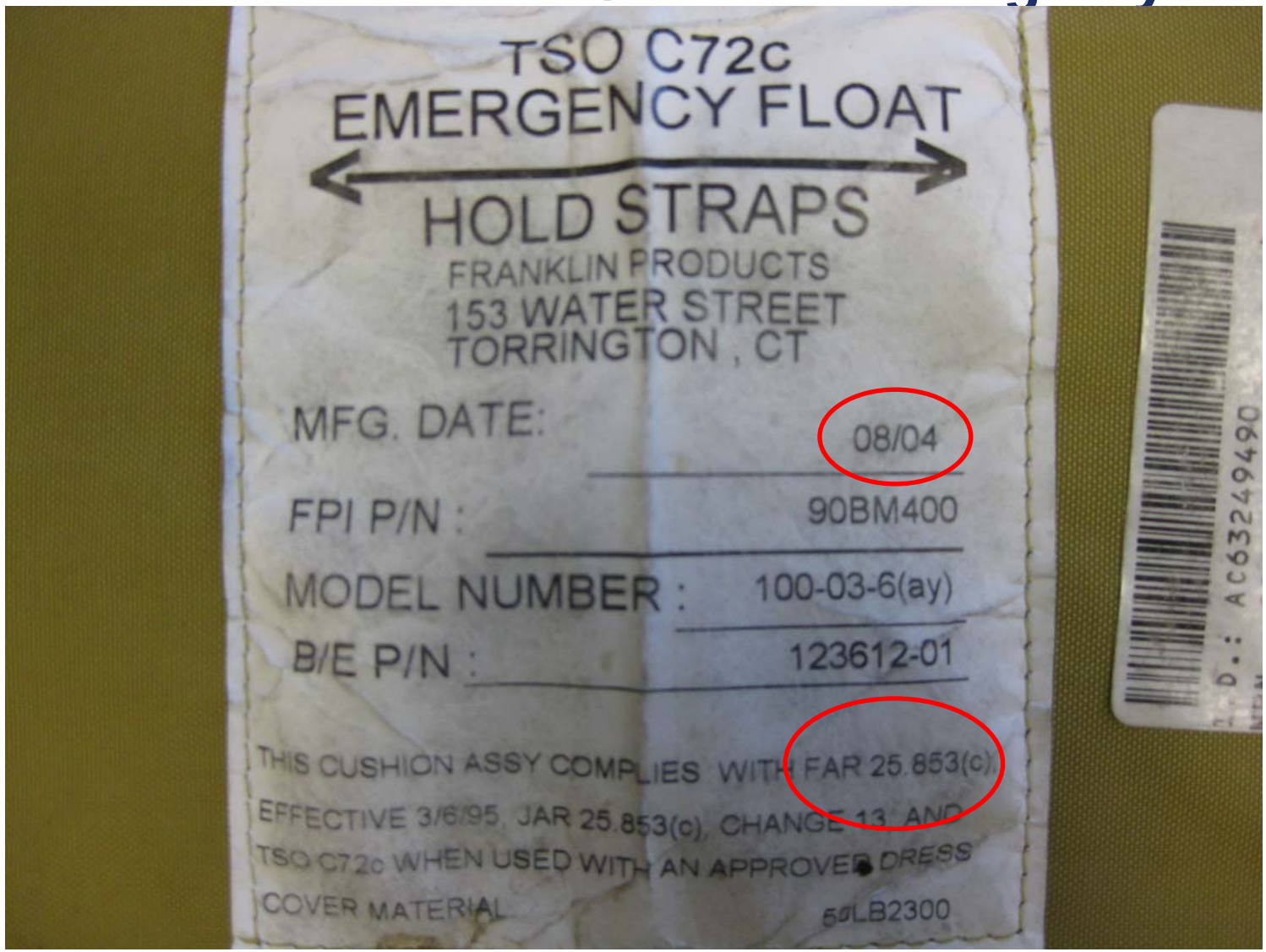


AirCanada Cushion w/ Fire-Blocking Layer #1

AirCanada Cushion w/ Fire-Blocking Layer #1

AirCanada Cushion w/ Fire-Blocking Layer #2

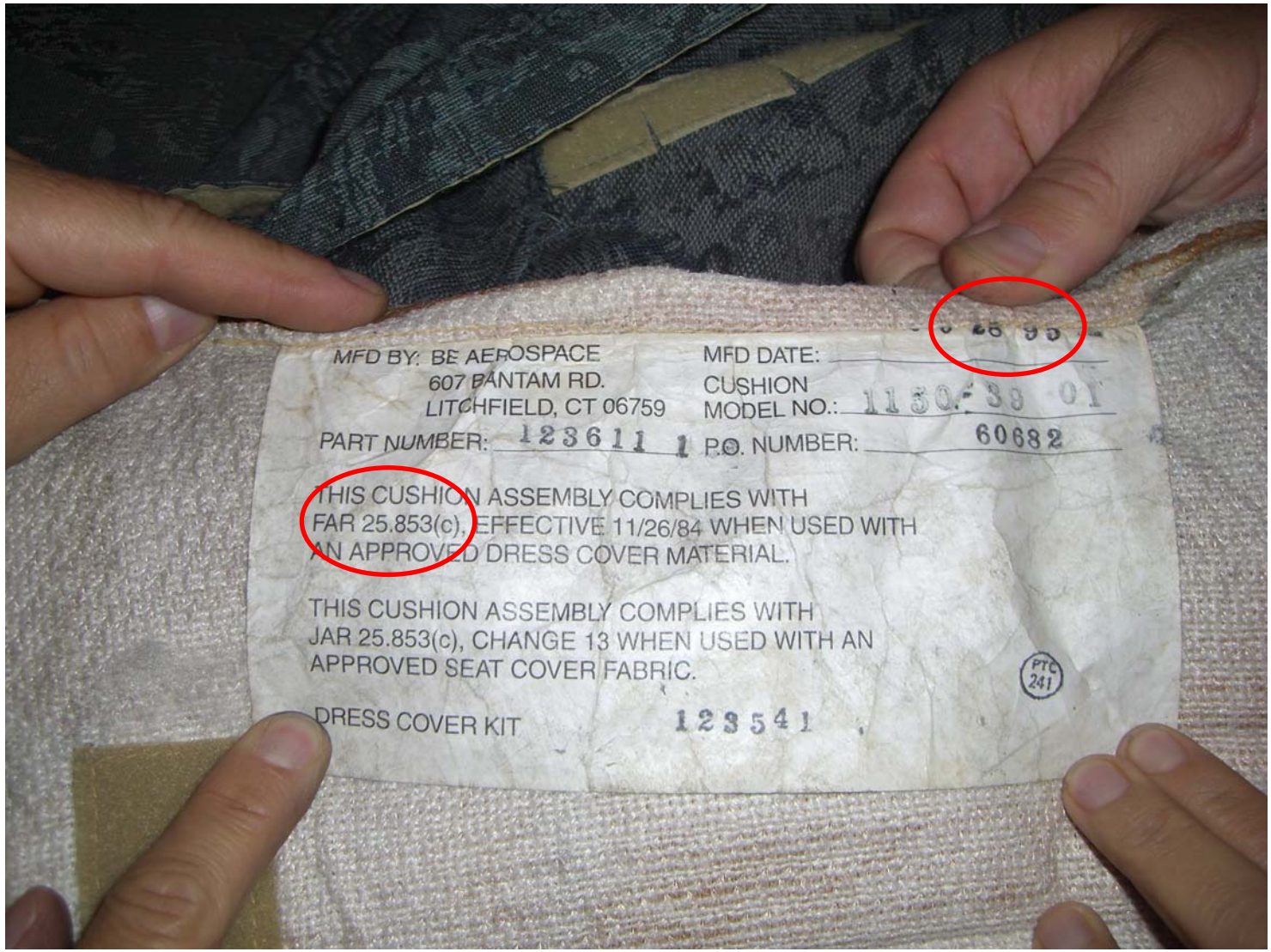
AirCanada Cushion w/ Fire-Blocking Layer #2



AirCanada Cushion w/ Fire-Blocking Layer #2

AirCanada Seat Back Cushion-Fiber Fill

AirCanada Seat Back Cushion-Fiber Fill



Lab-Scale Configuration Using AirCanada Cushion

Lab-Scale Configuration Using AirCanada Cushion

Lab-Scale Configuration Using AirCanada Cushion

Lab-Scale Configuration Using AirCanada Cushion

Posttest Results Bottom Cushion (Non-blocked)

Posttest Results Bottom Cushion (Fireblocked)

Oil Burner Test Results of AirCanada Cushion

	Pre-Test Weight			Post-Test Weight			% Weight Loss		
	Bottom cushion	Back cushion	Total	Bottom cushion	Back cushion	Total	Bottom	Back	total
AirCanada (un-blocked)	1320	1420	2740	1040	480	1520	21.21	66.20	44.53
AirCanada (un-blocked)	1260	1420	2680	840	560	1400	33.33	60.56	47.76
AirCanada (blocking #1)	1220	1340	2560	960	560	1520	21.31	58.21	40.63
AirCanada (blocking #1)	1260	1360	2620	1040	600	1640	17.46	55.88	37.40
AirCanada (blocking #2)	1300	1400	2700	1140	560	1700	12.31	60.00	37.04
AirCanada (blocking #2)	1320	1420	2740	1180	580	1760	10.61	59.15	35.77

Vertical Bunsen Burner Testing of Seatback Material

Contribution from Non-Cushion Seat Back?

Contribution from Non-Cushion Seat Back?

Contribution from Non-Cushion Seat Back?

Contribution from Non-Cushion Seat Back?

Next Steps

Conduct Oil Burner Test on OEM Continental Samples

Compare Results to AirCanada Results

Determine if either material suitable for full-scale evaluation

If neither material is deemed “suitable”, it will be necessary to acquire more 990 seat frames and re-run baseline test again with alternate cushion material

Consider “home-made” FB seat back cushions for full-scale evaluation