



Home Office

Home Office Body Armour Standard 2017 – ILM Certification: Test House SOP Guidance

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Introduction

This document is to act as a guidance in the Body Armour testing process to the Home Office Body Armour Standard 2017 (Pub. 012/17) for accredited test houses. It is to be used in conjunction with the Standard and covers the processes outside of those listed in that document.

Process maps are located in the Annex to this SOP.

Process for In life Monitoring (ILM) Armour Testing

1. Manufacturer will notify test house of intention to perform ILM and agree Test Date.
2. Manufacturer sends Test House the technical file, proforma (Ref: BAS17#01) and technical file review document (Ref: BAS17#02). Technical file will include:
 - a. Photographs of armour construction and stitching to aid in test house construction checks.
 - b. A copy of the Initial Certificate
3. Test House will check:
 - a. technical file proforma (BAS17#01) details are present and correct, including that the most recent certificate has been included with the technical file.
 - b. Technical file details are present and correct as per the guidance in the technical file review document (Ref: BAS17#02) (Including that the Initial certificate has been included with the technical file) and complete review document to confirm data present.
 - c. Test House may test ILM irrespective of location of previous PQT test.
4. Lab manager will review technical file and technical file review document to check no issues have been missed.
 - a. Any issues or missing information must be reported back to the manufacturer. Await correction before proceeding with testing
5. Once all details are present and correct proceed with testing.
6. Testing completed as per the requirements of the standard including the approved BAS17 amendments noted on the PED. If unfair strikes are performed, additional panels should be tested. (See BAS17 Section 6.1.2, 6.1.3, 7.1.2 and 7.1.3).
7. Results obtained are checked to ensure all meets requirements in the standard (Appendix 2).
 - a. CPA results calculated using CPA tool following the CPA tool guidance document.
 - b. Areal Density calculated using:

$$\text{Areal Density (kg.m}^{-2}\text{)} = \left(\frac{\text{mass of armour (kg)}}{\text{mass of paper (kg)}} \right) \times \text{areal density of paper (kg.m}^{-2}\text{)}$$

- c. Construction checks will be completed only by staff signed off as competent to do so and carried out on all test panels including CPA panels. If the Construction does not match the Declaration then the manufacturer and Home Office should be notified immediately.
8. CPA V₅₀ results will be checked against Initial CoA CPA V₅₀ results (found on the PED and Initial Certificate) according to section 10.5.1.
- a. Calculation for CPA comparison is:
$$(V_{50} \text{ Initial} / V_{50} \text{ PQT} \times 100) - 100 = \% \text{ difference}$$
9. Assessment of the results will be made following the requirements laid out in Section 10.5.1 and Table 20 of the standard.
- a. If required, additional armour panels should be requested for a retest.
10. Lab manager reviews and checks all results to ensure all thresholds of the standard have been met.
11. If the armour fails to meet the requirements of the standard section 10.9 of the standard must be followed.
- a. The batch must be held for a thorough investigation.
 - b. The manufacturer and HO **must be notified**.
 - c. A model can have **no more than 3 attempts to pass ILM** without Home Office approval to do so.
 - d. The ILM non-conformance form (BAS17#10) will be generated for any failures using the template and sent to the Home Office with a copy of Test Results (BAS17#05) and TFR document (BAS17#02) (e-mail: PEDwebsite@homeoffice.gov.uk)
12. If all results correct and meet the requirements of the Standard, a CoA can be drafted using the CoA template (BAS17#06).
- a. A unique CoA number will be generated using the naming convention below the test house identifier is dictated in appendix 1, the unique test number is selected by the test house:

Test house Identifier/ILM/unique test number/date of testing.
 - b. If testing is carried out over multiple dates the first day of testing should be used.
13. Lab manager reviews and checks CoA.
14. CoA summary sheet (BAS17#07) is signed off by lab manager confirming all testing is completed and met the requirements.

15. If armour meets the requirements with no issues, CoA (BAS17#06), CoA summary (BAS17#07), TFR document (BAS17#02) and full Test Results (BAS17#05) including photographs of construction provided to Home Office (e-mail: PEDwebsite@homeoffice.gov.uk)
 - a. The CoA and CoA summary **must not** be sent to the manufacturer.
16. All results will be stored in accordance with agreed documents retention timelines.

Abbreviations

Abbreviation	Full Description
BAS17	Body Armour Standard 2017
BFS	Back Face Signature
CoA	Confirmation Of Accreditation
CPA	Critical Perforation Analysis
DoP	Depth of Penetration
HO	Home Office
ILM	In Life Monitoring
PED	Police Equipment Database
PQT	Production Quality Test
TFR	Technical File Review
SOP	Standard Operating Procedure

Appendix 1

Test House	Unique Test House Identifier
Cranfield University	CRA
Elements Belcamp	BEL
Elements Wichita	WIT
TNO	TNO

Appendix 2

Results recorded for BAS17 testing.

Required for all:
Manufacturer
Model
Threat Level
Lot Number
Batch Number
Date of Manufacture
Test Date
Test Technicians
Test House reference (Test house Identifier/(INIT/PQT/ ILM)/unique test number/date of testing)
Test Type (Initial, PQT etc.)

Stab/Spike

Formed	Unformed
Humidity	Humidity
Temperature	Temperature
Plastiline 40 calibration drops x2	Composite Back drop rebound height x3
Energy	Energy
Mean Energy	Mean Energy
Velocity	Velocity
Mean Velocity	Mean Velocity
Orientation of strike	Orientation of strike
Held/Penetrated	Held/Penetrated
Depth of Penetration	Depth of Penetration
Mean Depth of Penetration	Mean Depth of Penetration
Areal Density	Areal Density
Construction Check	Construction Check

Ballistic

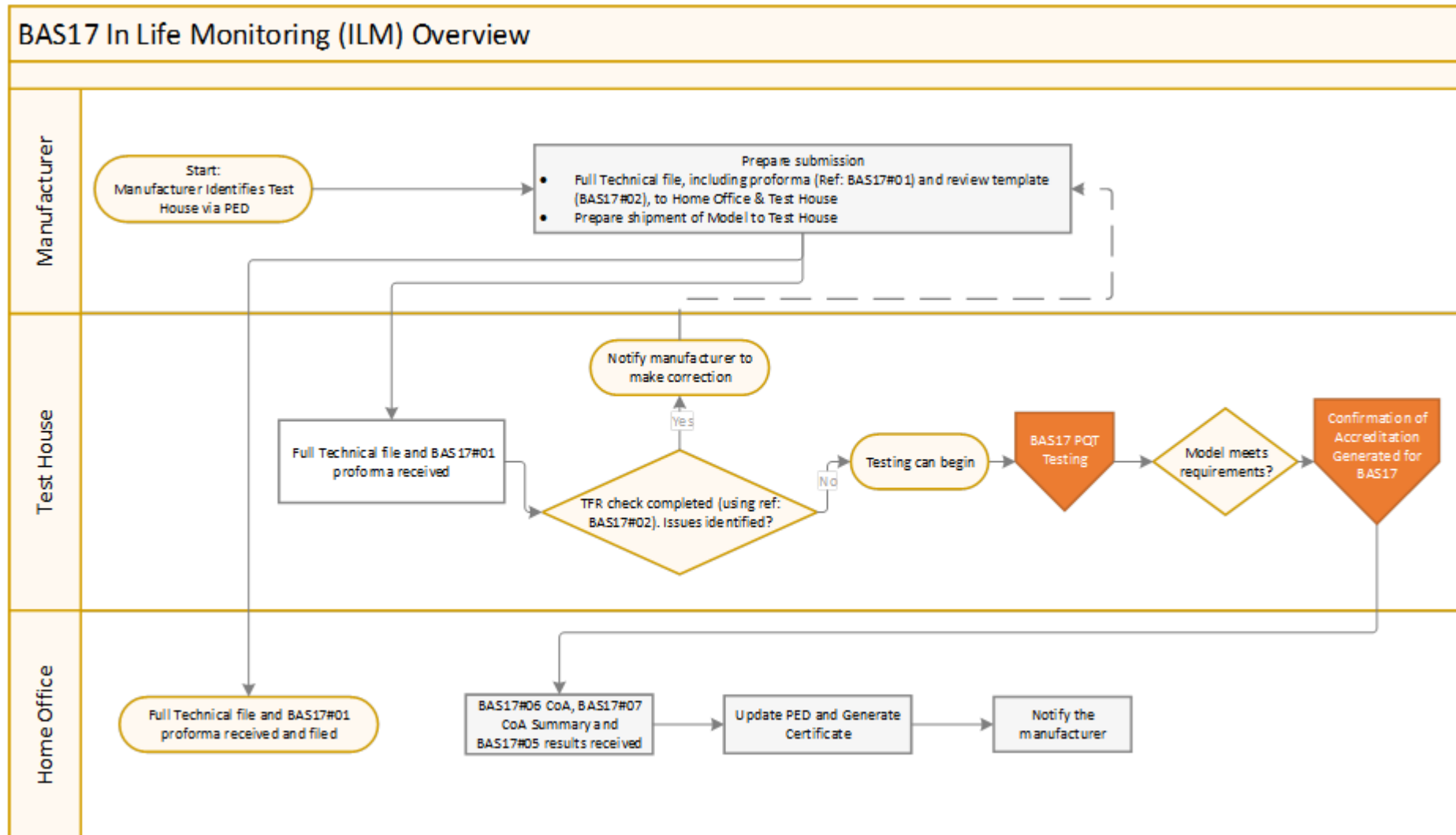
Formed	Unformed	Plate
Humidity	Humidity	Humidity
Temperature	Temperature	Temperature
Plastiline 40 calibration drops x2	Roma Plastilina No 1 Drops x3	Roma Plastilina No 1 Drops x3
Range/Distance (m)	Range/Distance (m)	Range/Distance (m)
Velocity	Velocity	Velocity
Mean Velocity	Mean Velocity	Mean Velocity
BFS	BFS	BFS
Mean BFS	Mean BFS	Mean BFS
Angle of strike	Angle of strike	Held/Perforated
Held/Perforated	Held/Perforated	Areal Density
Areal Density	Areal Density	CPA
Construction Check	Construction Check	
CPA	CPA	

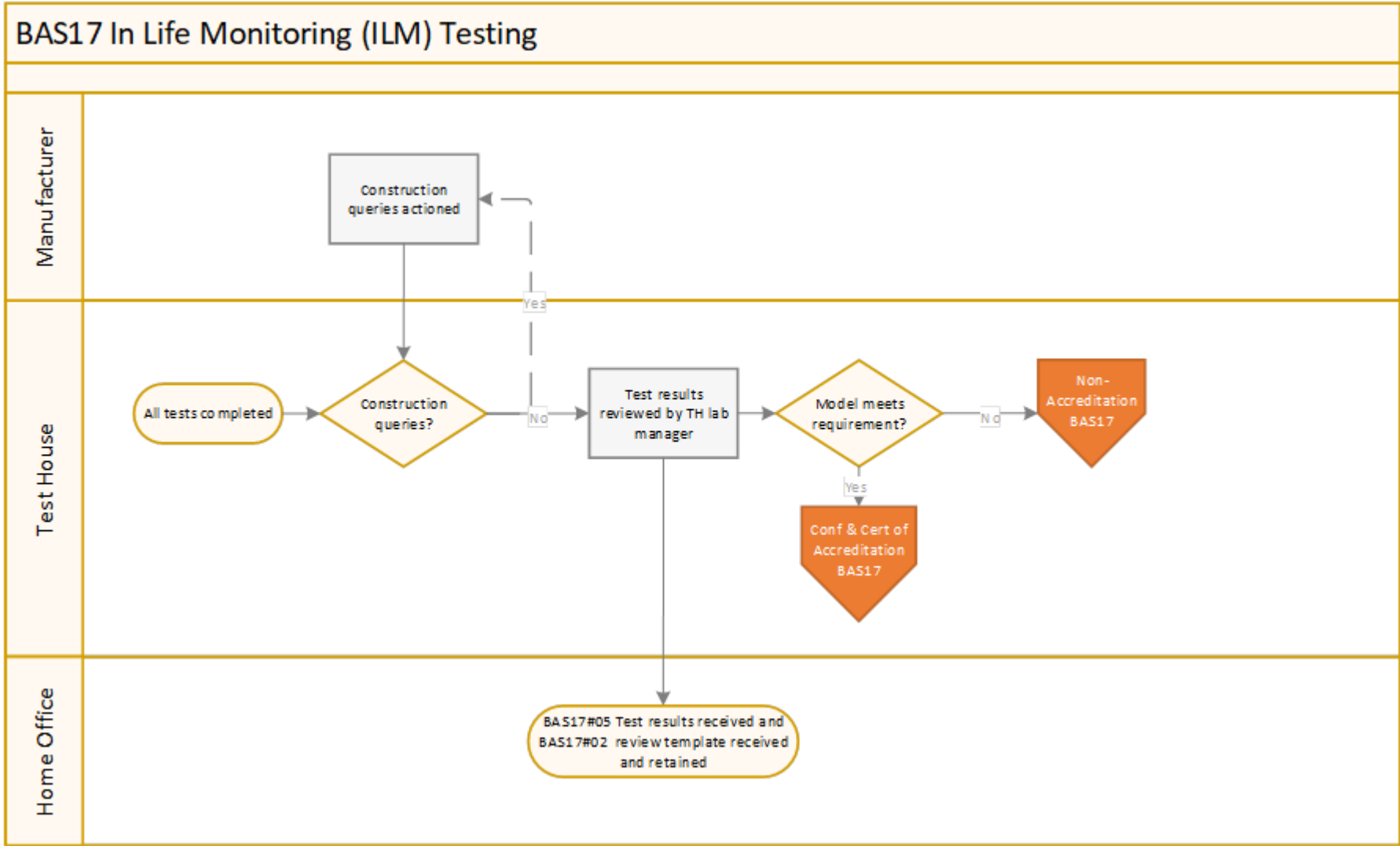
Annex 1

BAS17 ILM Process maps

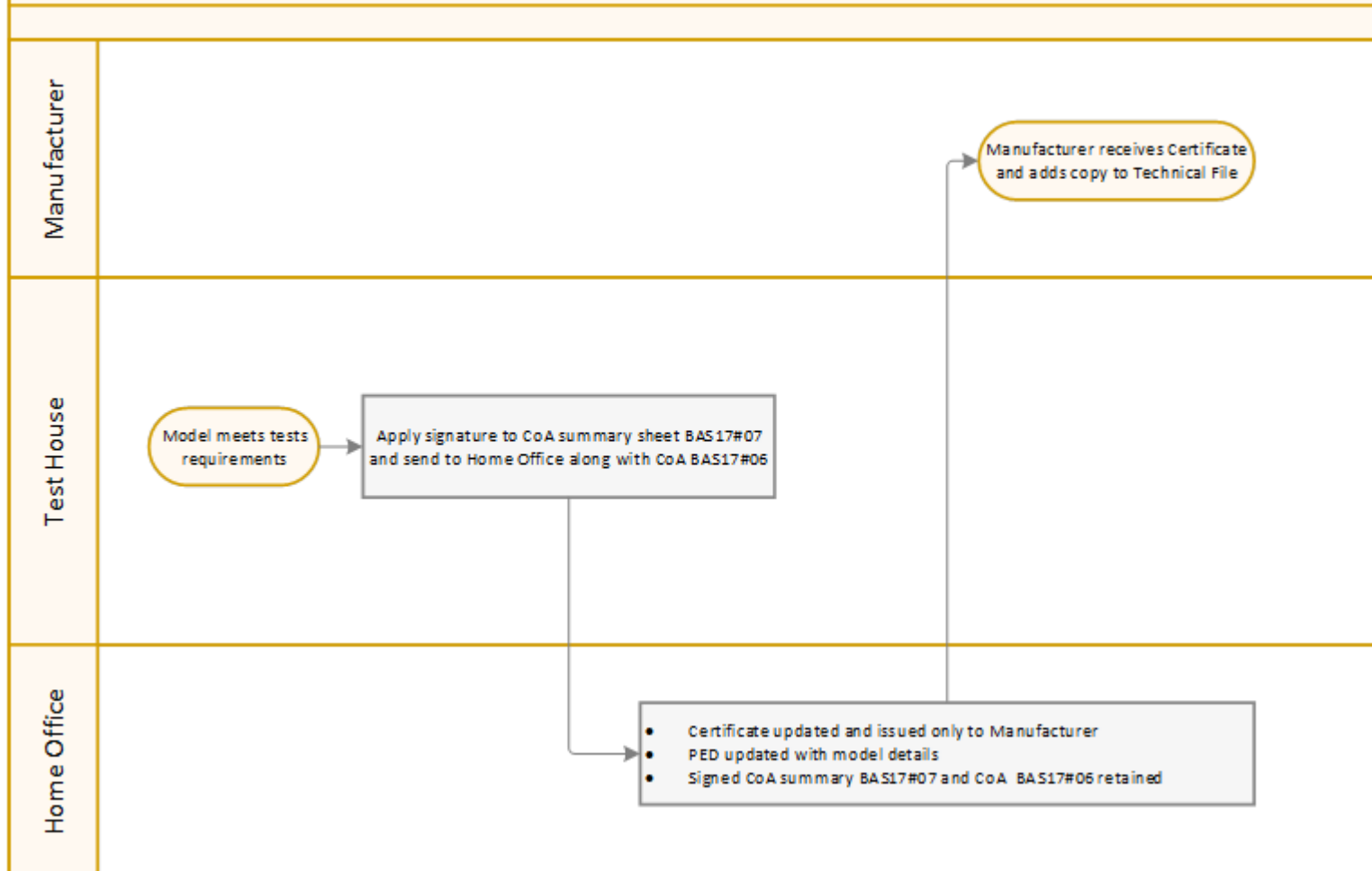
Process Maps: Pages 10-14

BAS17 In Life Monitoring (ILM) Overview





BAS17 Confirmation of Accreditation and Certification In Life Monitoring (ILM)



BAS17 Non-Accreditation In Life Monitoring (ILM)

