Spesifikasi

Tajuk Templat: FIRE-RESISTANT SUIT FOR FIRE AND RESCUE DEPARTMENT OF MALAYSIA

Jenis Item: Produk

Jenis Barangan: Impot

Item	UOM	Jenis Harga	Kuantiti
	Spesifikasi		
FIRE-RESISTANT SUIT	pair	Biasa Standard	9000
	1.0 GENERAL 1.1 This specification sets out the technical requirements to be complied for supplying, delivering, testing and acceptance of Fire-Resistant Suit (herein after called The Suit) for Firefighters which comply with EN 469:2005 Standard (material properties test) and ISO 13506-1:2017 and ISO 13506-2:2017 (manikin test) or equivalent international standards for Fire And Rescue Department of Malaysia (FRDM). The tenderer shall specify the followings: 1.1.1 Make: 1.1.2 Model: 1.1.3 Type: 1.1.4 Year of Manufacture: 1.1.5 Country of Origin : 1.1.6 Made in :		
	1.2 The Suit shall consists of the followings garment: 1.2.1 Fire Fighting Jacket with removable lining; and 1.2.2 Over Trousers with removable lining.		
	1.3 The Suit shall be manufactured in a factory with an implemented Quality Control System according to Article 11B of the European PPE Directive 89/686/EEC or equivalent. A copy of CE certification shall be submitted and approved by Commissioner for Oaths.		
	1.4 Details designed drawing of The Suit shall be provided by the tenderer with reference to Appendix A (mandatory).		
	1.5 The Suit shall be loose fitting for ease and speed of dressing during emergency.		
	1.6 The Suit shall be designed to provide unrestricted movement and also to be compatible with other protective equipment.		
	1.7 The Suit shall have: 1.7.1 Protection against heat and flame;		
	1.7.2 Protection against chemicals;		
	1.7.3 Protection against water penetration;		
	1.7.4 Resistance against water vapour; and		
	1.7.5 Visibilty in accordance to EN469:2005.		
	1.8 It shall be no metal reinforcement in The Suit.		
	2.0 WEIGHT The Suit shall be lightweight and total dryweight of size L, shall not be more than 3.5 kg.		
	3.0 COLOUR AND SIZES 3.1 The Suit shall be provided in two (2) colours: (i) Red : Pantone 18 – 1444 TCX		

(ii) Navy blue : Pantone 19 – 4015 TCX
3.2 The sizes shall follow the BS EN ISO 13688:2013.
3.3 The successful tenderer shall be required to discuss with FRDM regarding breakdown of colours and sizes to be supplied.
4.0 THE CONSTRUCTIONS OF THE SUIT 4.1 The Suit shall have three (3) layers, consist of (Appendix B) : i. Outer shell ii. Moisture Barrier Membrane iii. Innermost Layer (consist thermal barrier innermost lining)
4.1.1 The tenderer shall submit the certificate of material for each layer as follows: 4.1.1.1 Material Compliance Certificate (MCC) – The tenderer shall submit the MCC issued by the fabric manufacturer to demonstrate the standard compliance of the fabric to the type of fabric stated in the following and approved by Commissioner for Oaths.
4.1.2 OUTER SHELL 4.1.2.1 The material for the outer shell of The Suit shall be constructed with a combination of flame and heat resistant and durable material. The tenderer shall specify the details of the material composition: i) Material: ii) Composition:
iii) Material Compliance Certificate (MCC)
4.1.2.2 The weave of the material shall be of a rip-stop type.
4.1.2.3 It shall be double needle felled stitched using heavy duty non-flammable fibre and heat resistant fibre thread suitable for firefighting.
4.1.2.4 Each seam type shall be thoroughly tested.
4.1.2.5 The colour of the outer materials shall be of non-fading type with additional sewn yellow/silver/yellow.
4.1.3 MOISTURE BARRIER MEMBRANE 4.1.3.1 The membrane shall be able to protect the body against intrusion of water, chemicals and viral agents but allow metabolic heat to escape and reduce overall heat stress during strenuous activities.
4.1.3.2 The membrane shall have material made of non-woven fabric which shall be fire and heat resistant. The tenderer is required to specify the details of the material composition used: i) Material: ii) Composition:
iii) Material Compliance Certificate (MCC)
4.1.4 INNERMOST LAYER 4.1.4.1 Thermal Barrier It shall be made of heat resistant fabrics. The tenderer shall be required to specify the details of the material used : i) Material: ii) Composition:
iii) Material Compliance Certificate (MCC)
4.1.4.2 Innermost lining It shall be made of heat resistant fabrics and anti-static. The tenderer shall be required to specify the details of the material used : i) Material : ii) Composition :
iii) Material Compliance Certificate (MCC)
5. DESCRIPTION OF JACKET 5.1 Jacket Zip 5.1.1 The Jacket shall be designed with a non-flammable and heavy duty moulded polyester fastened zip with quick release type.
5.1.2 The zip shall be overlaid with a protective flap (minimum 120mm)

	and this flap is to be secured with Velcro fasteners.
	5.2 Jacket Pocket 5.2.1 Two (2) external pockets with flap shall be patch type attached by twin row sewing and double sewn hole with lateral bellows.
	5.2.2 The pocket size: 5.2.2.1 Height: 20cm 5.2.2.2 Width: 20cm 5.2.2.3 Depth: 6 cm
	5.2.3 The pocket flap shall be of velcro flap zap-on, positioned at the upper center of the pocket.
	5.2.4 Below the both pocket flaps there should be a loop installed which can be closed with a press stud. A metal carabinner can be attached to the loop.
	5.2.5 Openings at the bottom shall allow liquids to run off.
	5.3 Jacket Collar 5.3.1 Depth shall be in range of 85mm - 125 mm.
	5.3.2 It shall have a closure strap with velcro to ensure complete protection to the neck.
	5.4 “BOMBA” sign 5.4.1 The word “BOMBA” (in capital letters and in Bold Arial Font) shall be written on at the left front and the centre back portion of the Jacket, both shall use a silver retro reflective color.
	5.4.2 Left front of the Jacket shall be 3 cm tall block stencil cut letters.
	5.4.3 The detail design and size of the word “BOMBA” for the back portion is specified in Appendix C.
	5.5 Epaulettes 5.5.1 The epaulettes of the Jacket shall be secured on a protective flap of the jacket. (Appendix C)
	5.5.2 The size shall be as follows: 5.5.2.1 Length: 16cm 5.5.2.2 Width: 4cm - 5cm
	5.6 Radio Pocket Patch pocket for a walkie-talkie shall be provided at the front left of the Jacket. The dimension shall be as follow: 5.6.1 Depth: 6cm 5.6.2 Height: 16cm 5.6.3 Width: 8cm
	5.7 Special Protection 5.7.1 The elbow of the Jacket shall be provided with a layer of heavily flame retardant reinforced pad.
	5.7.2 The knitted cuffs shall be made from heat and flame resistant knit with thumb loop attached.
	5.7.3 To the bottom of the Jacket lining shall be sewn of at least 95mm wide strip of anti-wicking strip as per stated in EN 469.
	5.7.4 A hanger loop to be sewn inside the suit at a jacket collar.
	5.8 Marking 5.8.1 The marking shall be sewn inside of the Jacket.
	5.8.2 It shall contain the following details/instructions: 5.8.2.1 Washing Instruction;
	5.8.2.2 ISO 7000 (2418 pictogram);
	5.8.2.3 Year of Production;
	5.8.2.4 Manufacturer;

	5.8.2.5 Country of Origin;
	5.8.2.6 Size;
	5.8.2.7 Standard compliance;
	5.8.2.8 CE marking;
	5.8.2.9 Structure integrity and contamination risk precaution;
	5.8.2.10 HAK KERAJAAN MALAYSIA wording;
	5.8.2.11 A blank space for wearer identification.
	6. DESCRIPTION OF OVER-TROUSERS 6.1 Over trouser shall be design as slip pant with drawn up lumbar area and a detachable inner layer.
	6.2 Waist adjustment Over-trousers shall have a width regulation in the hip area consisting of a take-up strap at each side.
	6.3 Knee Reinforcement Over-Trousers shall be lined with ergonomically-constructed a layer of heavily flame resistance reinforced pad on the knees. i. Material : ii. Composition:
	iii. Material Compliance Certificate (MCC)
	6.4 Thigh Pockets 6.4.1 The Over-Trousers shall have two thigh pockets with flap and bellows all around with openings at the bottom to allow liquids to run off.
	6.4.2 The pocket size: 6.4.2.1.1.1 Height: 20cm 6.4.2.1.1.2 Width: 20cm 6.4.2.1.1.3 Depth: 2 cm
	6.4.3 The pocket flap shall be of velcro flap zap-on, positioned at the upper center of the pocket.
	6.4.4 Below the both pocket flaps there should be installed a loop with a D-ring.
	6.5 Trouser Zip 6.5.1 Shall be designed with a non-flammable and heavy duty moulded polyester with two zip fasteners plus additional pull tab in the fly.
	6.5.2 The zip shall be overlaid with a protective flap (approx. 70mm) and this flap is to be secured with multilayered velcro fasteners.
	6.6 Braces 6.6.1 The Over-Trousers shall have a removable H-style suspenders of 40mm width are to be made of heavy duty type elastic band. They shall be adjustable in length via double loop safety buckles and draw-loop.
	6.6.2 The back divider shall be 15cm wide from black non-flammable material.
	7. REFLECTIVE STRIPE 7.1.1 Make : 7.1.2 Model :
	7.1.3 Width : 50mm.
	7.1.4 Yellow (12.5 - 15mm) / Silver (20 – 25 mm) / Yellow (12.5 - 15mm) in colour.
	7.1.5 The retro reflective stripe shall last for not less than five years (please provide a letter of confirmity from the manufacturer).

	7.7.6 The retro-reflective performance shall be bright, durable, high quality and comply to BS EN ISO 20471:2013 and flame retardant requirement shall comply to EN ISO 15025:2016. (please provide proof)
	8. PERFORMANCE TEST OF THE SUIT (Mandatory) 8.1 The Suit shall be tested using two (2) types of performance test (clause 9.0): 8.1.1 Property test of the material ; and 8.1.2 Manikin Test
	8.2 The test shall be conducted by a laboratory accredited by international bodies.
	8.3 The tenderer shall be required to submit an original or a certified true copy of the property test of the material reports by the Commissioner of Oath together with the tender submission.
	8.4 The validity of test reports shall be not more than five (5) years.
	9. TEST REPORT DETAILS NEED TO BE SUBMITTED 9.1 PROPERTY TEST OF THE MATERIAL Test Property a) General Clothing Design Test Method Standards BS EN 469:2005 or equivalent Performance Requirement (minimum) Third Party Assessment Test Report by Accredited laboratory.
	Test Property b) Flame Spread (Outer material) Test Method Standards BS EN 469:2005, EN ISO 14116, BS EN 1486, and EN ISO 15025, procedure A. Performance Requirement (minimum) No hole, burning, molten or flaming debis, after flame 2s after glow 2s, seams shall not open
	Test Property c) Flame Spread (Innermost lining) Test Method Standards BS EN 469:2005 EN ISO 14116, EN 1486, EN ISO 15025, procedure A. Performance Requirement (minimum) No hole, burning, molten or flaming debis, after flame 2s after glow 2s, seams shall not open
	Test Property d) Flame Spread (outer seams) Test Method Standards BS EN 469:2005 EN ISO 14116, EN 1486, EN ISO 15025, procedure A. Performance Requirement (minimum) No hole, burning, molten or flaming debis, after flame 2s after glow 2s, seams shall not open
	Test Property e) Heat Transfer (flame) Test Method Standards BS EN 469:2005, EN 367 Performance Requirement (minimum) Performance level 2 HTI : 13,0, (HTI - HTI) : 4,0
	Test Property f) Heat Transfer (radiation) Test Method Standards BS EN 469:2005, EN ISO 6942, method A, Heat flux at 40kW/m² Performance Requirement (minimum) Performance level 2 RHTI 24 : 18,0, RHTI 24 – RHTI 12 : 4,0
	Test Property g) Residual Tensile Strength of material when exposed to radiant heat Test Method Standards BS EN 469:2005 EN ISO 6942, method A, Heat flux at 10kW/m² ISO 13934-1 or ISO 1421, method 1 Performance Requirement (minimum) Strength 450 N
	Test Property h) Heat Resistance Materials Test Method Standards BS EN 469:2005 ISO 17493:2000 at (180 + 5)degree C Performance Requirement (minimum) No melt, drip or ignite, no shrink more than 5%
	Test Property i) Heat Resistance Hardware Test Method Standards BS EN 469:2005 ISO 17493 Performance Requirement (minimum) Shall

function after test at (180 ± 5) o C
Test Property j) Heat Resistance Threads Test Method Standards BS EN 469:2005 EN ISO 3146 Performance Requirement (minimum) Shall not melt at 260°C
Test Property k) Tensile Strength (Outer Material) Test Method Standards BS EN 469:2005 ISO 13934-1 or EN ISO 1421, method 1 Performance Requirement (minimum) Breaking load in machine and cross direction 450N
Test Property l) Tensile Strength Main Seams (Outer Material) Test Method Standards BS EN 469:2005 ISO 13934-2 Performance Requirement (minimum) Give a breaking load of 225 N
Test Property m) Tear Strength (Outer Material) Test Method Standards BS EN 469:2005 EN ISO 4674-1 Method B (coated fabric) EN ISO 13937-2 (non-coated fabric) Performance Requirement (minimum) 25N in both machine and cross direction
Test Property n) Surface Wetting (Outer Material) Test Method Standards BS EN 469:2005 EN 24920 Performance Requirement (minimum) Spray rating 4
Test Property o) Surface Resistance (Outer Material) Test Method Standards EN ISO 13688 EN 1149-1 Performance Requirement (minimum) Must less than 5 x 10^{10} Ohms().
Test Property p) Abrasion Resistance Test Method Standards BS EN ISO 12947-2 at 12kPa with crossbred worsted abrasion Performance Requirement (minimum) Outer 30,000 Liner 15,000
Test Property q) Dimensional change Test Method Standards BS EN 469:2005 EN ISO 5077 Performance Requirement (minimum) equal to or less than + 3% in both direction
Test Property r) Resistance to Penetration by liquid chemicals Test Method Standards BS EN 469:2005 EN ISO 6530 Performance Requirement (minimum) 80% repellency and no penetration to the innermost surface
Test Property s) Resistance to water penetration Test Method Standards BS EN 469:2005 EN 20811 Performance Requirement (minimum) 20 kPA = Level 2 for garment with moisture barrier
Test Property t) Water vapour resistancen Test Method Standards BS EN 469:2005 EN 31092 Performance Requirement (minimum) Level 2 = 30.0 m^2Pa/W
9.2 MANIKIN TEST 9.2.1 The tenderer shall submit the report of the Manikin Test of The Suit that comply with ISO 13506-1:2017 and ISO 13506-2:2017 and approved by Commissioner for Oaths.
10. INFORMATION AND DOCUMENTATION TO BE SUBMITTED 10.1 The tenderer shall submit the original or a copy of relevant pamphlets, brochures and catalogues.
10.2 The tenderer must submit a copy of the appointment letter from the Original Equipment Manufacturer (OEM) as a dealer or supplier and approved by Commissioner for Oaths.

	10.3 The tenderer shall submit a copy of the letter from the Original Equipment Manufacturer (OEM) confirming the Suit supplied is tested and complies with all clause and approved by the Commissioner for Oaths.
	11. SAMPLE (mandatory) 11.1 The tenderer shall be required to submit: (i) Two (2) sample (Size L) of the complete set of The Suit which is returnable for unsuccessful tenderer. a. One (1) RED sample
	b. One (1) Navy Blue sample and
	(ii) One (1) 10cm x 10cm cross-section sample of The Suit with tagging showing the layers of material used as at Clause 4.1.
	(iii) One (1) sample of reflective tape – 15 cm long together with the tender submission before the closing date of the tender.
	11.2 The samples will be used as a reference for evaluation of The Suit supplied by the tenderer.
	11.3 FRDM shall not be responsible for any wear and tear of the sample due to the testing and evaluation process.
	12.0 WARRANTY 12.1 A warranty of one (1) year on the part and labour shall be provided from the date of the acceptance by FRDM.
	12.2 There shall be no additional charge for repair services throughout the warranty period.
	12.3 A written warranty shall be provided by The successful tenderer for any manufacturer defect.
	12.4 Any manufacturing defect of The Suit within the warranty period of a minimum of one (1) year from the date of official acceptance, shall be replaced by the successful tenderer.
	13.0 FINAL ACCEPTANCE 13.1 The successful tenderer shall be required to carry out an acceptance test for The Suit and it shall be witnessed by FRDM representatives before all The Suit are officially accepted.
	13.2 Upon delivery of the suit, acceptance committee shall randomly choose three (3) samples of the suit for manikin testing purposes as stated in Clause 15.0 and Clause 16.0 and all cost incured shall be borne by the successful tenderer.
	13.3 Three (3) randomly samples must be replace by the successful tenderer.
	13.4 The successful tenderer shall be required to provide a complete inventory checklist and test protocol documents to describe the entire aspect of The Suit during the acceptance.
	13.5 The successful tenderer shall provide a proper testing ground and facilities for the acceptance.
	13.6 The acceptance shall cover the followings: 13.6.1 The physical and visual inspection of The Suit; and 13.6.2 Documentation Test Results verification;
	13.7 All cost incurred upon the acceptance test shall be borne by the successful tenderer.

	13.8 FRDM shall have the right to reject The Suit supplied by the successful tenderer, if it fails to comply with the technical specifications specified.		
	14.0 DELIVERY 14.1 All The Suits shall be delivered to Stor Pusat, Jabatan Bomba dan Penyelamat Malaysia, Bandar Baru Salak Tinggi, 43900 Sepang, Selangor or other places designated by FRDM.		
15.0 PRE-DELIVERY - MANIKIN TEST	PACKAGE	Biasa Standard	1
	15.1 The manikin test for three (3) random sampling shall be carried out by the successful tenderer at the Firelab that produced the report in Clause 9.2 above. 15.2 The arrangement of date, test and other facilities for the Manikin Test with the Firelab will be done by the Successful Tenderer.		
16.0 ASSESSMENT OF TESTING	PACKAGE	Biasa Standard	1
	16.1 The testing shall be witnessed by three (3) FRDM Fire Officers and all cost is to be borned by the successful tenderer.		