

ALM® 500



Aluminised suit with moisture barrier for use in approach areas with moisture or steam

- Outer surface of superior Gentex® Dual Mirror®, 100% aluminium.
- Reflects up to 95% of radiant heat energy so less heat penetrates through to the wearer, extending effective work periods
- Inner neoprene moisture barrier for moisture and steam protection
- Hood includes gold reflective heat shield
- Class 4 (highest class) protection against radiant heat
- Available as full suit with jacket & pants or full coverall with hood, boots, glove and carry bag
- Also available as individual items when required*
- Jacket and coverall include rear pouch for BA set
- Range of accessory styles available such as sleeves, aprons and smocks

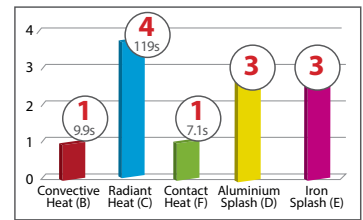
* For full EN 11612 protection the full suit including hood, gloves and boots should be worn as an ensemble

Fabric



Outer layer of Gentex Dual Mirror® aluminised fibreglass with inner neoprene moisture barrier

Heat Performance Classes and Results



See overleaf for heat test and classification explanations

ALM® 500 Styles

500BAE	500E	20BA	20	22BA	22	30	
Jacket and pants or coverall with BA accommodation, hood, gloves, boots and carry case Size: S - XXXL	Jacket and pants or coverall without BA accommodation, hood, gloves, boots and carry case Size: S - XXXL	Jacket with collar with BA accommodation Size: S - XXXL	Jacket with collar without BA accommodation Size: S - XXXL	Coverall with collar with BA accommodation Size: S - XXXL	Coverall with collar without BA accommodation Size: S - XXXL	Pants with braces. Size: S - XXXL	
36	25	26	10BA	10	44	55	ARBAG
Sleeves with elastic ends Size: One size	Long apron/smock with rear entry Size: One size	Long jacket Size: One size	Hood with gold plated visor with BA accommodation Size: S - XXXL	Hood with gold plated visor without BA accommodation Size: S - XXXL	Gloves with leather palms Size: M - XL	Boots with leather soles Size: One size	Storage / carry bag for ALM suits.

Warning: ALM® garments will only provide full body protection to EN 11612 and the radiant heat levels tested when worn with all the items to provide full body protection.

Understanding EN 11612 And Radiant Heat Protection



- What is the purpose of the standard?
- What are the different heat tests it contains and how are they tested?
- How is this useful in assessment of aluminium suits?

EN 11612
What is the purpose of the standard?

The EN 11612 introduction states it contains **MINIMUM PERFORMANCE LEVELS** for garments for protection against heat and flames and is not intended as a 'benchmark' - many applications will require higher levels of protection than the minimum.

What are the different heat tests it contains and how are they tested?

Fabric Flammability Tests	
Test method	EN 15025 : Procedure A (Code letter A1)
Status	Required: applies to fabric and seams
Description	Flame applied to centre of vertical fabric sample for 10 seconds
Requirements	- No flame shall reach the sample edge - No flaming or molten debris - No hole formation > 5mm - Afterglow should be ≤ 2s - Afterflame should be ≤ 2s

Test method	EN 15025 : Procedure B (Code Letter A2)
Status	Optional - applies to fabric and seams
Description	Flame applied to bottom edge of vertical fabric sample
Requirements	- No flame shall reach top or vertical edges - No Flaming or molten debris - Afterglow should be ≤ 2s - Afterflame should be ≤ 2s

How is this useful in assessment of aluminised suits?



Aluminised suits are primarily designed to protect against **RADIANT HEAT**.

This is assessed as the temperature rise likely to cause pain from a 2nd degree burn at this heat energy level.

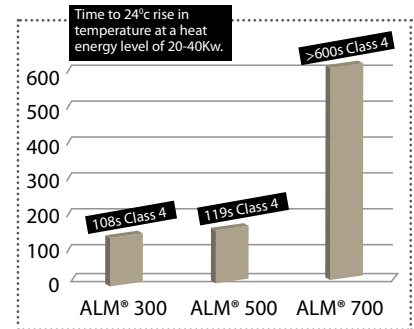
The ISO 6942 radiant heat test measures the time until a temperature rise of 24°C occurs behind the fabric given a heat source of 20 to 40Kw of radiant heat energy.

Class C1	Class C2	Class C3	Class C4
7.0s to 20.0s	20.0s to 50.0s	50.0s to 95.0s	95.0s or more

- Comparing the performance results of different products will indicate the relative effectiveness of protection.
- By calculating the likely heat energy level in Kw given the distance from the heat source, an approximate indication of how long wearer will be protected for can be determined.
- Where available, considering the actual result of the test as well the product classification can give more detail. Actual Results for Lakeland ALM® garments are indicated by the graph.

Note: Such an analysis can only provide approximate indications as other factors may effect the results - such as ambient temperature and the physiology of the wearer. It is always the users responsibility to determine suitability of a garment for an application

Fabric Heat Resistance Tests				
Note: any ONE of the heat protection performance tests with a Class 1 result is required				
Test Standard	Code Letter	Heat Type	Description	Classes
ISO 9151	B	Convective Heat	- Small flame applied to lower surface of horizontal fabric sample - Heat calorimeter records the time until a rise of 24°C on the other side of the fabric	B1: 4.0s to <10s B2: 10.0s to <20.0s B3: 20.0 or more
Lowest class is B1, highest class is B3: the longer time taken for temperature rise the longer a garment will protect				
ISO 6942	C	Radiant Heat	- Fabric sample exposed to radiant heat source of 20-40Kw - Heat calorimeter records the time until a rise of 24°C on the other side of the fabric	C1: 7.0s to <20.0s C2: 20.0s to <50.0s C3: 50.0s to <95.0s C4: 95.0s or more
Lowest class is C1, highest class is C4: the longer time taken for temperature rise the longer a garment will protect				
ISO 12127-1	F	Contact Heat	- Fabric sample placed over heated cylinder at 250°C - Calorimeter behind fabric measure time to a rise in temperature of 10°C	F1: 5s <10s F2: 10s <15s F3: 15s
F1 is the lowest. F3 is the highest. the longer time taken for temperature rise the longer a garment will protect				
Molten Metal Splash Tests				
Objective is to indicate the mass of molten metal required to damage a layer of PVC (simulating human skin) held behind the test fabric. The greater the mass required, the better the protection.				
ISO 9185	D	Molten Aluminium Splash	- Molten aluminium at 780°C dripped onto fabric sample at 60° angle	D1: 100g <200g D2: 200g <350g D3: 350g
ISO 9185	E	Molten Iron Splash	- Molten iron at 1400°C dripped onto fabric sample at 75° angle	E1: 60g <120g E2: 120g <200g E3: 200g
D1/E1 are the lowest. D3/E3 are the highest. The fabric will protect against a greater mass of the molten metal				



Although all 3 ALM® garments are measured as Class 4. ALM® 700 provides a much higher level of protection - and therefore facilitates greater working times and more protection, than 300/500.