

# ALM® 700

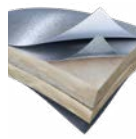


Triple layer aluminised suit with moisture barrier and additional fibreglass thermal barrier for superior heat protection

- Outer surface of superior Gentex® Dual Mirror® 100% aluminium, inner neoprene moisture barrier.
- Additional middle layer of thick fibreglass padding for higher level heat protection.
- Surface reflects up to 95% of radiant heat energy so less heat penetrates through to the wearer, extending effective work periods.
- Hood includes gold reflective heat shield.
- Class 4 (highest class) protection against radiant heat. Note: the actual result is >600s. The threshold for class 4 is 95s, so the ALM® 700 is well above this.
- Class 3 protection for convective and contact 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

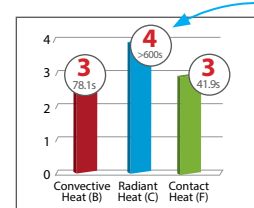
\* For full EN 11612 protection the full suit including hood, gloves and boots should be worn as an ensemble

### Fabric



Outer layer of Gentex Dual Mirror® aluminised fibreglass, inner neoprene moisture barrier with fibreglass aluminium thermal barrier between.

### Heat Performance Classes and Results



NB. Radiant heat result is >600s - well beyond the Class 4 threshold of 95s.

See overleaf for heat test and classification explanations

## ALM® 700 Styles

<b>700BAE</b>	<b>700E</b>	<b>20BA</b>	<b>20</b>	<b>22BA</b>	<b>22</b>	<b>30</b>	
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	
<b>36</b>	<b>25</b>	<b>26</b>	<b>10BA</b>	<b>10</b>	<b>44</b>	<b>55</b>	<b>ARBAG</b>
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.

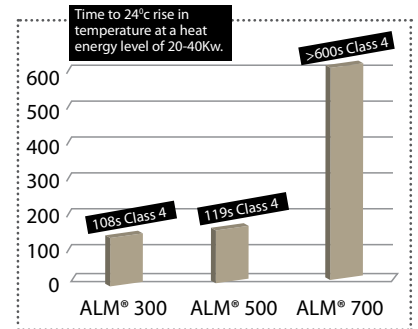
The ISO 6942 radiant heat test measures the time until a temperature rise of 24°C occurs behind the fabric given a heat source of 20 to 40Kw of radiant heat energy.

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.