

SINCE 1993



Your Bonding Expert

H&H Asia Group Ltd.



# Role of H&H

in making PPE-Suite  
**COVID-19.**

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## Be on the safe side when processing protective suits!

### PPE Selection

Use of right material and following right process are most important for processing any Personal Protective Equipment (PPE). Considering the common routes of contamination from Coronavirus 2019-nCoV, the PPE for front line medical workers should have blood and viral penetration resistance equivalent to AAMI Level 4.

As the common method of joining fabrics is sewing, which creates needle penetration holes along seam, it is paramount that both fabric and seam are compliant to ISO 16603 / ASTM F1670 (resistance to synthetic blood and body fluid penetration) and ISO 16604 /ASTM F1671 (resistance to viral penetration) standards. Of these the ISO 16604 test is commonly considered the most important because it uses a synthetic blood infected with a “bacteriophage” to assess penetration. Critically for this analysis, the bacteriophage used is a much smaller size (0.027 microns) in comparison to Coronavirus 2019-nCoV (0.125 microns) . Thus passing the ISO 16604 test at a high class is a good indicator that a fabric and seam are unlikely to allow the virus to penetrate, regardless of the medium.

### PPE Processing

The medical PPE are of two types; gowns and coveralls. In this document we will explain processing of medical coveralls (also commonly called Hazmat suits), which is basically hooded top joined with trouser at waistband. There are two ways of making coverall AAMI 4 level compliant. First of all choose fabric which are already compliant to above two tests; the fabric can be either joined by either classical method (traditional stitching and then seams are sealed by tapes) or modern method (ultrasonic welding). While stitching can be done by either single needle lockstitch or 4/5 thread overlock, seam sealing can be done by hot air seam sealing machine. In this document we will elaborate making of coverall by classical method.

The hot air seam sealing machine uses adhesive tape as consumable. The machine produces hot air with precisely controlled temperature to directly heat up the adhesive of seam tape. The heated tape and the fabric are feeding into two oppositely rotating rollers under pressure called nip rollers. The seam sealing tapes are multi-layered adhesive films and are applied to the sewn seams to prevent water from leaking through those seams.

For a medical PPE a 2 layer seam sealing tape can be appropriate, which are designed to seal seams on light to medium weight, vinyl or polyurethane coated fabrics. According to fabric type we can use tape made out of either Fabric + Ethylene Vinyl Acetate Copolymer (EVA) or Poly Ethylene (PE) + EVA. Application of tape should be outside surface of seam depending on fabric characteristics (usually on the coated side of fabric which could be outside ). A typical two layer seam sealing tape should have total thickness of 0.15 mm, weight of approximately 0.95 gm/square cm and inner layer melt index (ASTM D1238) of 200 gm/10 min.

<https://www.cdc.gov/>

<https://www.iso.org/obp/ui/#iso:std:iso:16604:ed-1:v1:en>

<https://www.britannica.com/science/coronavirus-virus-group>



## H&H Asia Group Ltd.

The company was established in 1993, and hence we have over two decades of experience for thermoplastic technology on seam sealing and adhesive film applications. We are specialized in thermoplastic technology for sew-free production. Use of adhesive and Waterproof technology for manufacturing of clothing specially sports wear, bags, shoes, material for medicals, tents and gloves etc. are priority in our mind... that include waterproof seam sealing, sew-free pocket adhesive, zipper bonding, front zip sealing, fabric joining, line bonding, overlay taping, and also adhesive backing for woven label and embroidery.

We can offer consultant support depends on the situation of customers. Now, we have several hundred customers and installation sites all over the world. You can visit our website to find more detail at [www.hh.com.hk](http://www.hh.com.hk) also you can subscribe us in YouTube by searching H&H ASIA GROUP LTD and watch our M/c videos.

## Manufacturing Process

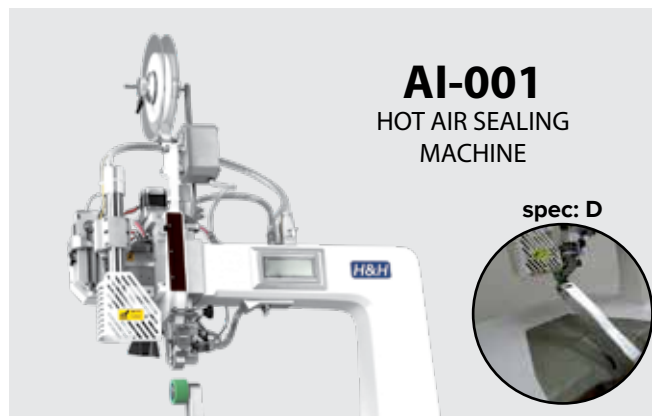
Classical Method (The stitched seams are additionally sealed)

- Elaborate production because two operations.
- The sealed seam conforms standards of EN 14126 and gives protection against.

Coverall which features standard stitched and an un-sealed seam or zip has holes through which penetration can easily occur especially as a result of bellows effect, which can actively draw airborne particles or droplets through seam holes. Thus we would always recommend the seam-sealed coverall which features sealed seams and a sealed zip cover.

SL. No.	Description	Classical Method (Sewing + Seam Sealing)	Machine Description
1	Hood Seam - Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
2	Sleeve Hem	Any 4T O/L + Elastic / Spandex	
3	Sleeve Inseam Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
4	Front And Back Yoke Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
5	Center Back Seam + Back Rise -Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
6	Neck Line - Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
7	Hood Hem Facing	Any 4T O/L + Elastic / Spandex	
8	Seam Sealing On Right Front Placket	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
9	Seam Sealing On Left Front Placket + Front Rise	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
10	Bottom Hem	Any 4T O/L + Elastic / Spandex	
11	Join Inseam	Any 4T O/L	
12	Inseam - Seam Sealing	AI-118 -SPEC- I-NNN	Hot Air Sealing Machine
13	Testing Parameters	HT-309	Hydrostatic Tester



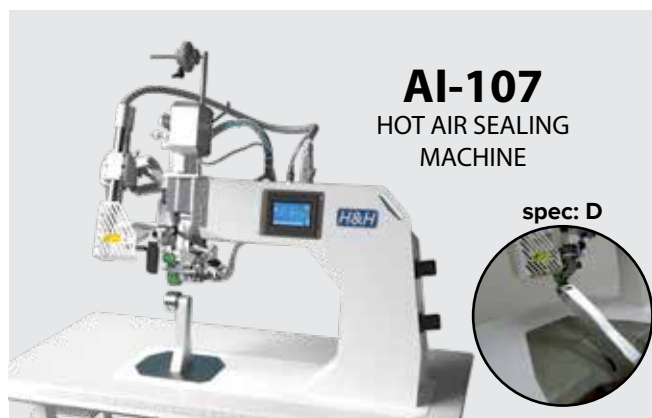


#### AI-001 spec A-NNN optional spec: D

- 3D Electronic Nozzle positioning system with step motor control
- Differential speed top and bottom roller
- Unique Instant variable seam sealing speed
- Digital tape tensioning device
- Data memory bank
- Fixed tape length seal option

#### Specifications:

- Power supply : AC 220V 50/60Hz 1Φ
- Heater power : 3600W
- Compressed air : >0.4 Mpa
- Max temp and speed : 800 deg & 60ft/min
- Tape width : 4-25mm



#### AI-107 spec A-NNN optional spec: D

- 2 Axis nozzle movements with cylinder control
- Differential speed top and bottom roller
- Program for tape start/middle/end control function
- Digital tape tensioning device
- Fixed tape length seal option

#### Specifications:

- Power supply : AC 220V 50/60Hz 1Φ
- Heater power : 3600W
- Compressed air : >0.4 Mpa
- Max temp and speed : 800 deg & 60ft/min
- Tape width : 4-25mm



#### AI-118 spec I-NNN

- 1 axis nozzle movements with cylinder control
- Differential speed top and bottom roller
- Digital tape tensioning device
- Fixed tape length seal option
- Memory data option\*

#### Specifications:

- Power supply : AC 220V 50/60Hz 1Φ
- Heater power : 3600W
- Compressed air : >0.4 Mpa
- Max temp and speed : 800 deg & 60ft/min
- Tape width : 4-25mm



### AI-127 spec A-NNN

- 2 Axis nozzle movements with cylinder control
- Differential speed top and bottom roller
- Program for tape start/middle/end control function
- Digital tape tensioning device
- Fixed tape length seal option

### Specifications:

- Power supply : AC 220V 50/60Hz 1Φ
- Heater power : 3600W
- Compressed air : >0.4 Mpa
- Max temp and speed : 800 deg & 60ft/min
- Tape width : 4-25mm



### HT-309 HYDROSTATIC TESTER

- Hand Free Testing
- Automatic Timer Option

### Specifications:

- Power supply : AC 220V 50/60Hz 1Φ
- Heater power : 370W
- Maximum Pressure : 6PSI

#### Disclaimer:

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