

Make it better!

Total Assembly Solutions
ASSEMS



Introduction

Total assembly solutions provider, **ASSEMS**

Adhesives have a long history and are the core material for most production processes in recent industry.

ASSEMS was established in 2003 named Optim for the development of eco-friendly & human-friendly adhesives and has continuously grown in the field of adhesives.

Our environment-friendly film-adhesive is produced by eco-friendly methods without solvents and allows you to achieve low-cost and high-efficiency.

Our primary field was the shoe industry for the first time, we were registered with Nike as a supplier for hot-melt film adhesive and process of bonded fabric. Now we are extending our business field to bags, clothes, motorcars and electric products.

Our 3 major businesses are the production of hot-melt film, laminating & coating of fabrics with our film, and production of hot-melt laminating machine.

We can supply full package service to customers for bonding and laminating. We assure the environment will be one of the focusing points for quality standards. The world is trying to preserve environment of Earth through Kyoto protocol, Copenhagen climate change conference etc. but still too far to expect their real action.

With continuous efforts to save the Earth, ASSEMS is making it be possible now.



Ji Sang, Jang / President

History

- 2003.06 OPTIM Co., Ltd. established
- 2003.12 Selected to new technology company from Ministry of commerce, Industry and Energy
- 2004.09 Selected to brilliant company from the Small & Medium Industry Promotion Corporation
- 2005.01 Lamination facility approved by NIKE Korea
- 2005.07 Designated to Venture business company from the Small & medium Industry Promotion Corporation
- 2005.12 ISO 9001 & 2000 Certification
- 2006.01 Industrial technology innovation award
- 2006.06 Export blue chip medium and small enterprises choice
- 2007.03 Pusan appointment 1000 guidance corporation
- 2007.05 Certification NEP "Hot melt film adhesive for insole"
- 2007.07 Republic of Korea area reform contest prime minister Prize-winning
- 2008.03 Special permissions reform style smaller enterprise choice
- 2008.10 OPTIMA established in Guangzhou, China
- 2009.04 OPTIM VINA established in Hochiminh, Vietnam
- 2010.03 OPTIM JAYA established in Indonesia
- 2010.11 Green Certification
- 2011.01 Change Company name to ASSEMS Inc.



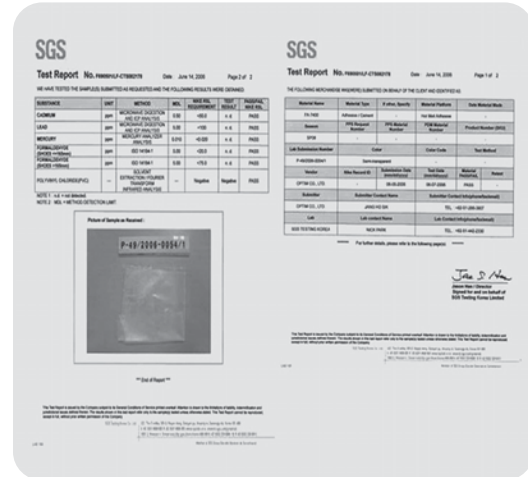


Table of Contents

Technology Innovation	04
Hot-melt Film Adhesives	07
Industrial Applications	09
FAM-1600 Lamination Machines	10
Coating process	12
Lamination Process	14
Practical application	15
FAM-450 Mini Laminator	18
Properties and Usage	19

▶ Form of ASSEMS Hot-melt Film

- Shape : melt adhesive by heat (Hot-melt type)
- Form : Dyed color, vinyl form of no-smell, No release paper
- Width : 44 inch(112cm)~60 inch(152cm)
- Thickness : 15µm~ 200µm (hair : 60µm)
- Characters : Environment friendly adhesives
 - No 2nd, 3rd pollution
 - SGS analysis (All products)
 - Pass in heavy metal test for Nike
 - Correct film possession in special quality
 - Able to recycle for scraps



▶ Characters of ASSEMS Hot-melt Film

Usage

- Various & specialized film adhesives for foam and material, material and material adhesion

Form

- No use release paper film adhesives

Skill

- Toxic solvent adhesive & Imported film adhesive change
- Obvious quality control

Performance

- Strong adhesion & breathing security
- Easy, convenient usage

Environment

- Non-using toxic solvent, Environment friendly process

▶ Advantages of ASSEMS Hot-melt Film

- No release paper and no toxic solvent for clean environment and no environmental pollution
- Various kinds of hot-melt film bases for various materials
- Consistent & strong bonding strength and breathability
- Environment-friendly process for workers
- Possible to make width 44" to 60"(112~152cm) & thickness 15~300µm
- Various application for shoes, garments, clothes, automobile, furniture, bags, album, printing etc.



▶ Adhesives Comparison


Original adhesive

- Use toxic solvent
- Liquid & block Type
- Apparent bad smell
- Direct spread working
- No constant spread
- Poor factory environment

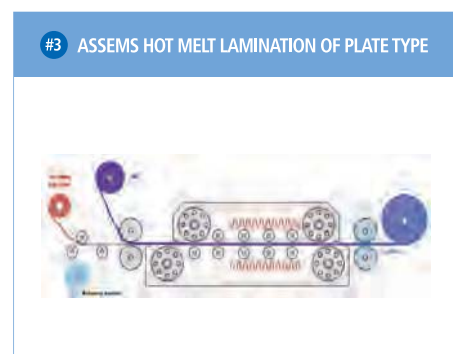
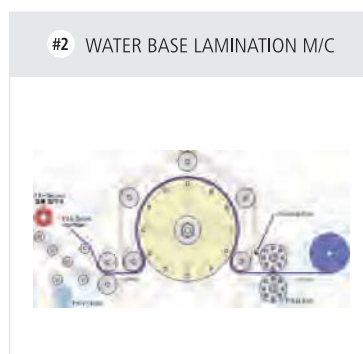
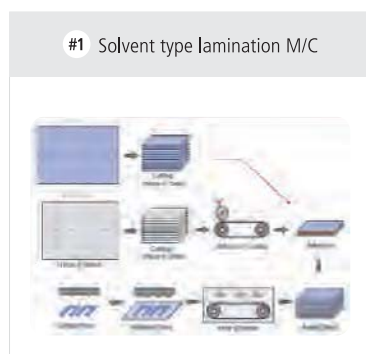


ASSEMS hot-melt Film

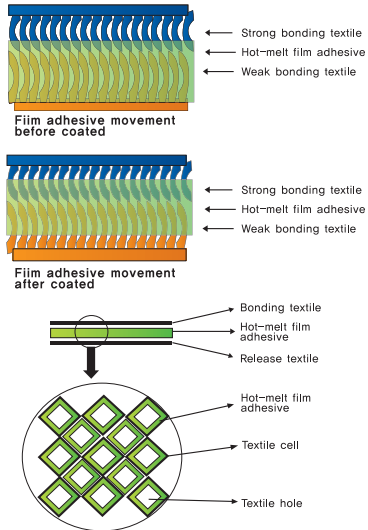
- Non solvent type
- Film type
- No smell
- Film from product constant spread
- Clean factory environment



	ADHESIVE TYPE	MAIN SYSTEM	POWER	LAMINATION STATUS	HEAT	QUALITY	LOSS	Shrinkage	Small Bonding Possibility	Spread
SOLVENT TYPE LAMINATION M/C #1	LIQUID	ROLL PRESS	ELECTRIC	ROUNDING	ONE SIDE	unequal	a Lot	Clear	Hard	unequal
WATER BASE LAMINATION M/C #2	LIQUID	ROLL HEAT PRESS	OIL PUMP	ROUNDING	ONE SIDE	unequal	a Lot	Frequent	Hard	unequal
ASSEMS HOT MELT LAMINATION OF PLATE TYPE #3	FILM/WEB	BELT HEAT PRESS	ELECTRIC	PLATE	ONE SIDE	equal	Few	Frequent	Easy	equal
HOT MELT LAMINATION OF ROLL TYPE	FILM/WEB	ROLL HEAT PRESS	OIL PUMP	ROUNDING	ONE SIDE	unequal	a Lot	Frequent	Hard	unequal
HOT MELT LAMINATION OF POWDER	POWDER	NET TYPE	ELECTRIC	PLATE	ONE SIDE	unequal	a Lot	Frequent	Hard	unequal



▶ Coating system that use release textile



	ASSEMS coating system	Using release paper Coating system
Work speed	Fast	Slow
Dry time	Same time with working	Need aging time
Coating quality	Consistant	Consistant
Coating tool	Release-textile (Recycle)	Release paper (Disposal)
Working method	One time	Three times
Environment	Harmless	Disposable release paper
Product cost	Low	High
Waste (44"/g/m)	0 g/m	75g/m

- Improve bonding strength
- Possible to control breathable rate

▶ Capacity of Hot-melt Film Adhesives

	FA-1000(40μm)	FA-2000(40μm)	FA-3000(35μm)	FA-4000(40μm)	FA-7000(150μm)
HMA line 1			2,000M/Hr		
HMA line 2		2,000M/Hr			
HMA line 3	2,000M/Hr			1,500M/Hr	120M/Hr
Total/Day	48,000M(2ton)/day	48,000M(2ton)/day	48,000M(2ton)/day	36,000M(1.8ton)/day	28,000M(1ton)/day
Taotal/Month	1,440,000M (60ton)/Month	1,440,000M (60ton)/Month	1,440,000M (60ton)/Month	1,080,000M (54ton)/Month	84,000M (30ton)/Month

- Maximum Capacity: 4,320,000M/month(180ton)
- HMA Line: Working for 24hours

▶ Capacity of Laminating & Coating

		Coating Process	Laminating Process
Head office & Korea Factory	Lamination Line 1	6,000M/8hr x 20days = 120,000M/Month	
	Lamination Line 2		3,000M/8hr x 20days = 60,000M/Month
	Lamination Line 3		3,000M/8hr x 20days = 60,000M/Month
China Factory			3,000M/8hr x 20days = 60,000M/Month
Vietnam Factory			3,000M/8hr x 20days = 60,000M/Month
Indonesia Factory			3,000M/8hr x 20days = 60,000M/Month
Total/Month		120,000M/Month	300,000M/Month

- Coating Capacity: 240,000M/Month (2shifts)

▶ ASSEMS Patent Right

Title	Name	Nationality	Application date
Laminating system & temp control way to adhere to Hot-melt film in textile	Jang J . S	South Korea	Mar, 05, 2007
Special coating release Textile & making method	Jang J . S	South Korea	Mar, 05, 2007

▶ **FA-1000 Series** (Acryl Base) : FA-1150

Application	PU foam, tricot lamination for shoes, automobile, furniture etc					
Density(g/cm ³)	M.P(°C)	S.P(°C)	M.I(g10min)	Width(inch)	Thickness(mm)	Working Temp(°C)
0.95~0.99	85~95	70~75	15	36~60	0.015~0.150	100~130

Current liquid base cement lamination

- Old machine & bad smell
- Inconsistent bonding strength
- Poor environment for workers

Hot-melt film lamination

- New machine and clean environment without bad smell
- Consistent bonding quality
- High productivity and environment-friendly process

▶ **FA-2000 Series** (EVA Base) : FA-2100N, FA-2010, FA-2150

Application	Coating of reinforcement mat'l(6oz Canvas, Non-woven), EVA, Neoprene, Lycra, Reflective mat'l with low working temp					
Density(g/cm ³)	M.P(°C)	S.P(°C)	M.I(g10min)	Width(inch)	Thickness(mm)	Working Temp(°C)
0.95~0.99	60~140	32~110	0.4~20	36~60	0.015~0.150	70~130

•Material : YL-ML-005 (Photo taken with Digital Camera)



Original



FA-2010
Low
Melting Point



FA-2150
High
Melting Point

- Lamination done with the low melting point HMA FA-2010 shows
- better glossiness than the high melting point FA-2150

▶ **FA-3000 Series** (Poly-olefin Base) : FA-3030, FA-3050

Application	Coating of reinforcement mat'l(6oz Canvas, Non-woven), hysock, sockliner for mold(inside), IP hybrid, butterfly system					
Density(g/cm ³)	M.P(°C)	S.P(°C)	M.I(g10min)	Width(inch)	Thickness(mm)	Working Temp(°C)
0.95~0.99	85~95	70~75	15	36~60	0.015~0.150	100~130

Coating nonwoven cutting

Pylon Mid-sole

Molding Press

Butterfly System Hysock Process IP Hybrid Sockliner

Hot-melt Film Adhesives

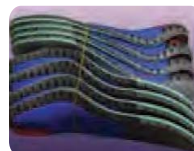
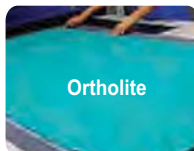
▶ FA-4000 Series (Poly-ester Base) : FA-4100

Application	TPU lamination with reinforcement without Non-yellowing, Satin lamination for sublimation					
Density(g/cm ²)	M.P(°C)	S.P(°C)	M.I(g/10min)	Width(inch)	Thickness(mm)	Working Temp(°C)
0.97~1.01	110~170	80~150	0.4~4	36~60	0.02~0.150	130~150

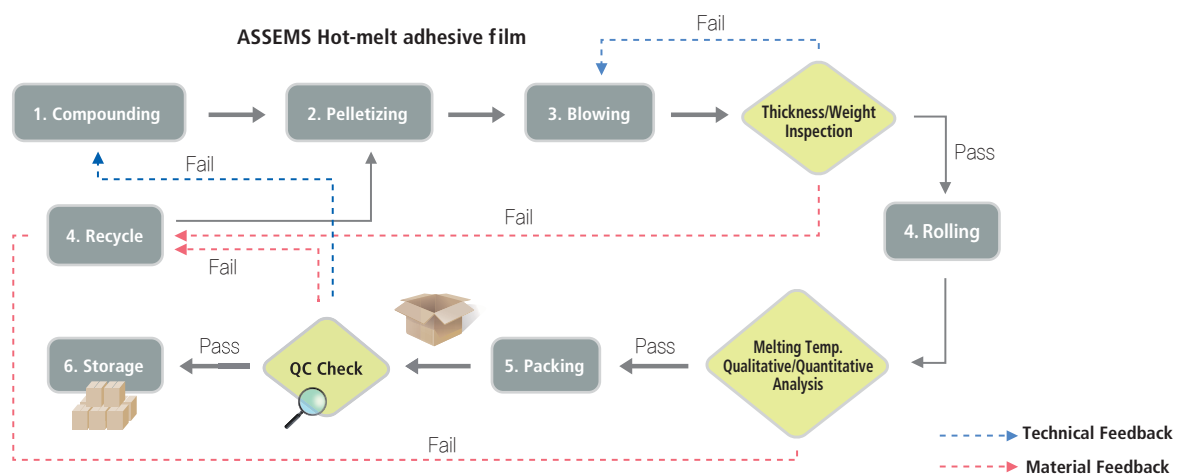


▶ FA-7000 Series (Poly-urethane Base) : FA-7300, FA-7400

Application	Coating of TPU, PU synthetic, PU skin layer for No-Sewing, Ortholite Foam(Virgin Foam)					
Density(g/cm ²)	M.P(°C)	S.P(°C)	M.I(g/10min)	Width(inch)	Thickness(mm)	Working Temp(°C)
0.95~0.99	60~140	32~110	0.4~20	36~60	0.015~0.150	70~130



▶ Film Production



• 1. Compounding



1. Mixing

2. Raw material

• 2. Pelletizing



Pelletizing Machine



1. Raw material input



2. Melting



3. Cooling by water



4. Drying



5. Mop up



6. Cutting to pellet

• 3. Blowing



• 4. Rolling



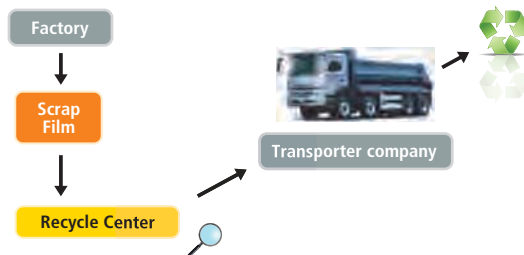
• 5. Packing



• 6. Storage Storage by film



• 7. Film Recycling Process



Input



Melting material



Output



Cooling by water



Mop up water and Cutting



Recycle pellet

▶ Industrial Applications

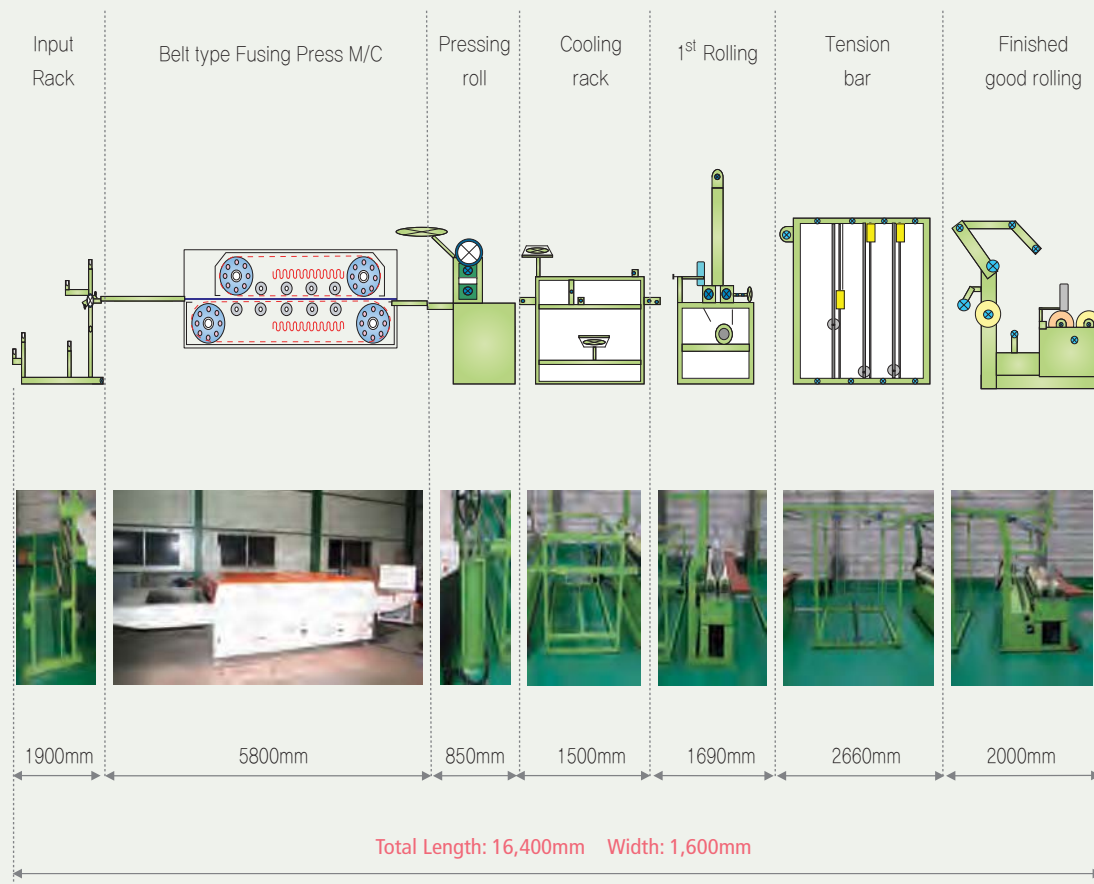


FAM-1600 Lamination Machines

▶ General Information



• Outline



•The length of each process line can be changed according to work place.

• Specification

Power Supply	380V/(4P)	
Motor	½ HP – 4P – 1/40	
Heater	62.0kw	
Temperature	0~300℃	
Speed control	5~25 Sec	
Air	0~6kg/cm²	
Belt Size (Width*Length)	Upper : 1,600 X 6,040	Lower : 1,600 X 7,640
Bearing No.	2204, F205	
Dimension	5,500 X 2,150 X 1,180	

▶ Characteristics

- Optimum bonding condition & exact temperature control system – **Within 5 temp.** deviation
- Multiple layers of materials can be laminated and coated process at one time.



- Handles adhesives & substrates up to 60"wide.
- FAM-1600 can also handle sheet feed applications.
- Constant and high pressure by air cylinder and silicon roller.



- Control Box
 - Easy to operate and visible process control.
- Unique technical skills
 - Laminating system & temp. control method.
 - The releasing textile coated by silicon manufacturing method.



➔ Protected by patent rights

FAM-1600 Lamination Machines

► Coating process



Input rack

Release textile rolling

Laminating & Coating M/C (FAM-1600)

Press rolling

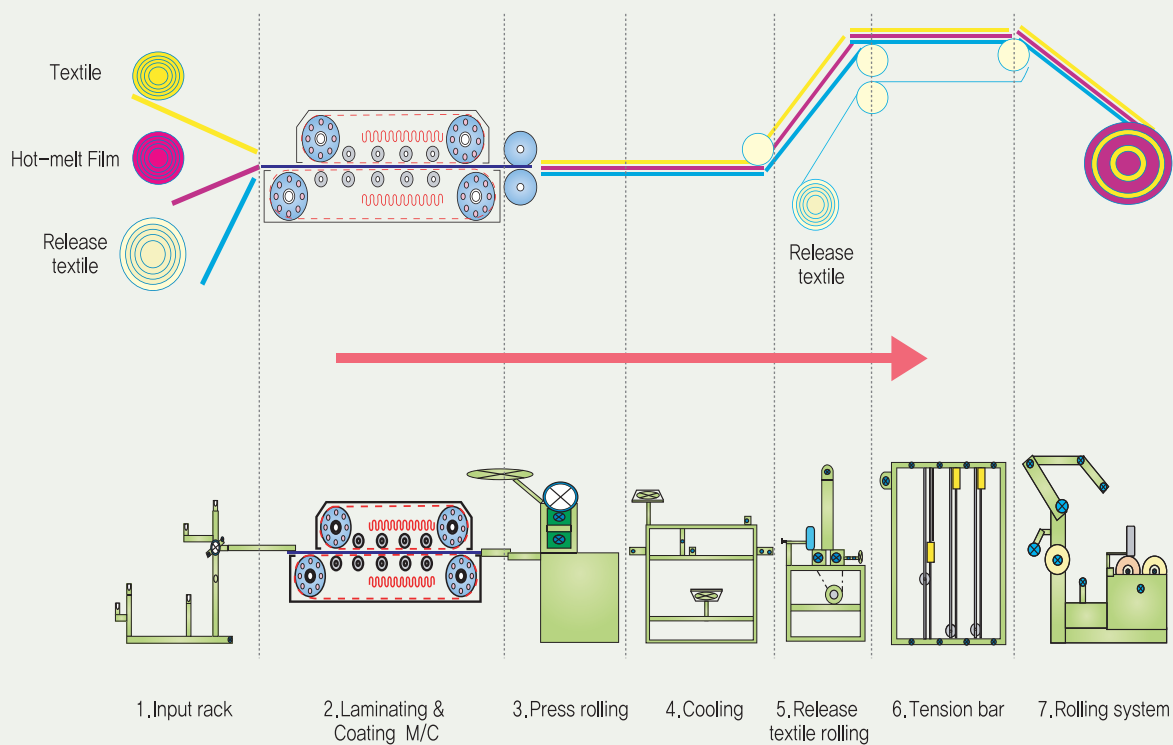
Cooling

Release textile

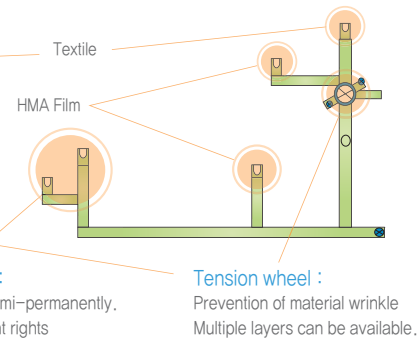
Tension bar

Rolling system

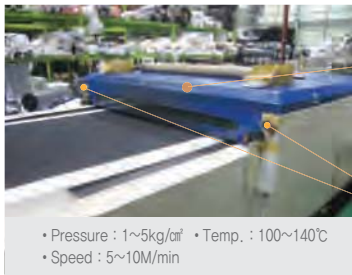
• Outline



• 1. Input rack

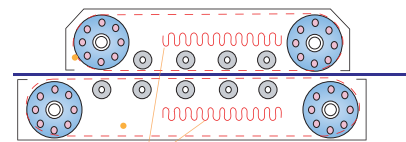


• 2. Laminating & Coating machine (FAM-1600)



Lid – Find the problem easily

Emergency Switch



Possible to measure the temp upper/
lower belt respectively.

• 3. Pressing



One more pressing for stable bonding & surface

• 4. Cooling



For fast binding to prevent wrinkle and curling

• 5. Tension Bar



To prevent shrinkage & help exact rolling

• 6. 1st Rolling



Release textile: Roll out to reuse releasing textile

• 7. Finished good rolling



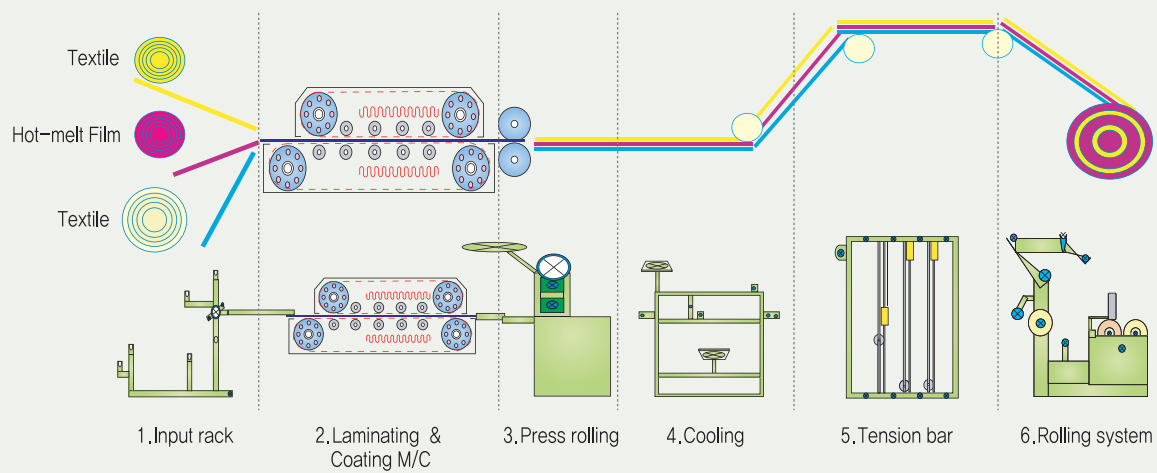
Coated material

FAM-1600 Lamination Machines

▶ Lamination Process



• Outline



• Heating Press & Cooling Press



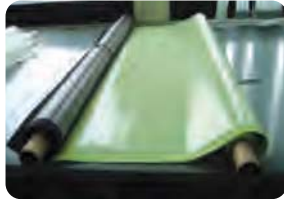
Cooling Fan

Pressing Roll :
To strengthen bonding power

Temperature sensor : Protected by patent rights

• Pressure : 1~20kg/cm² • Cooling Temp. : 110°C

▶ **No-sew Process** (FA-7300, 150~200um)



1. coating



2. cutting



Bonding strength: Above 2.5Kg/cm



3. Hot-press



4. Finished goods

▶ **Reinforcement Material Lamination process** (FA-3050 or 2150, 40um)

- This is general process for reinforcement materials hot-melt lamination used with FA-3050.
- It is very simple & fast lamination process and clean workplace can be maintained.



1. Material preparation



2. Laminating



3. Materials roll up

FAM1600 Machine Condition

- Pressure : 3~4kg/cm² • Temp. : 135~145°C • Time : 3~5 M/min

▶ **Normal Lamination process**

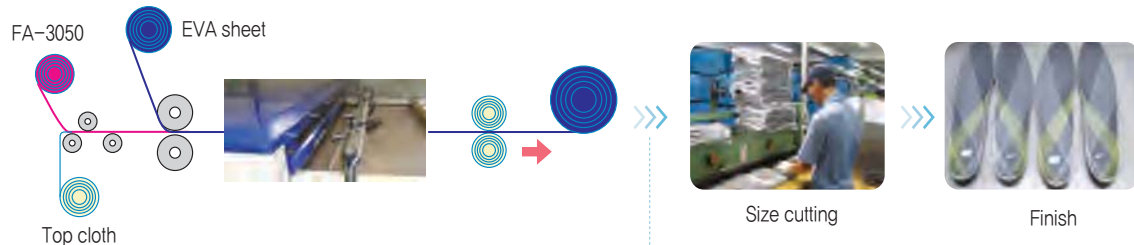
1. Textile to Textile
2. Textile to PU Synthetic leather
3. Tricot to PU Foam to Textile
4. Lycra to EVA to Lycra
5. Others, 4 layers of materials can be laminated at one time.



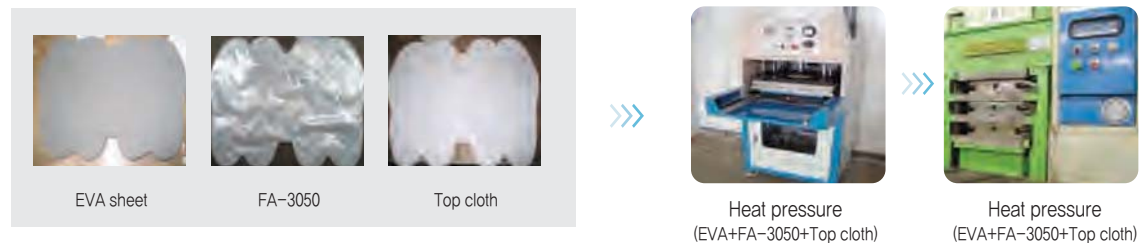
Practical application

► Sock-liner process (FA-3050, FA-2150)

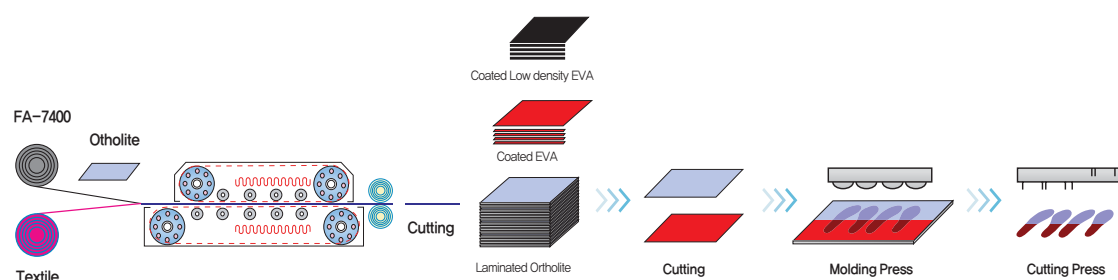
• I. Die cut sockliner process



• II. Molded sockliner process



► Ortholite Hotmelt coating process (FA-7400)



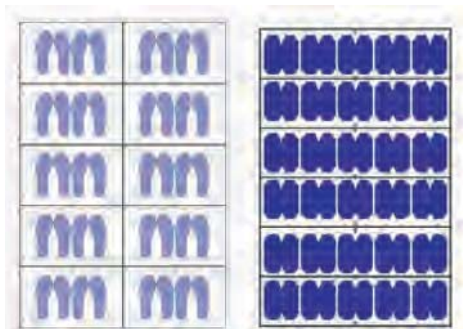
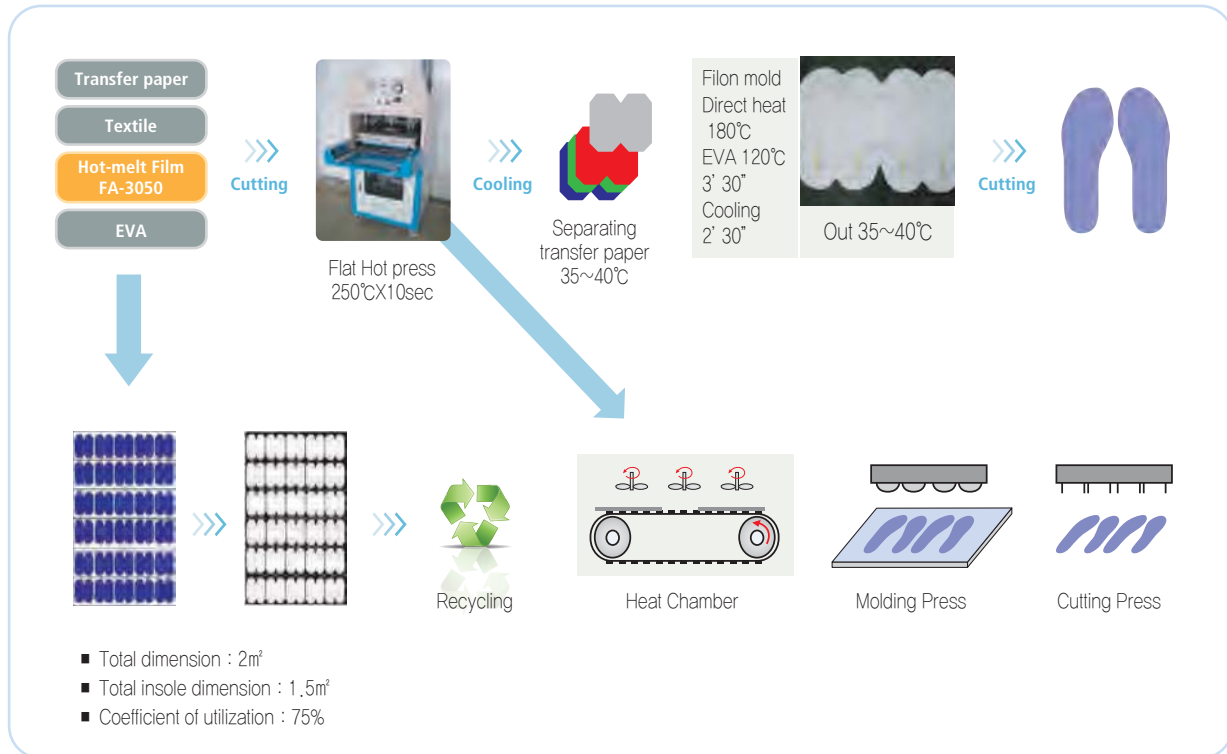
Laminated HMA film

Coated Low density EVA form FA-2100N 40μm
Coated EVA form FA-2150 40μm
Laminating Ortholite form with FA-7400 50μm

FA-7000 Series is PU Base copolymer

EVA sheet to PU foam(OrthoLite)
directed comolding sockliner process
Soft touch and very strong laminating strength.

▶ Butterfly System



Appropriated facade cutting after adhesives lamination at existing solvent adhesives use
As our company's film adhesives use after cut out all resources doing not stick each other, resources that is infected by adhesives application is incomprehensible refreshing but can utilize part that resources regeneration rate is much because rise and does priority cutting by this way

	Molded sock liner	Butterfly molded sock liner
Coefficient of utilization	50%	75%
Recycle EVA	Impossible	Possible
Occurrence wastes	much	A little

• Strong Point

1. Reduce production process decrease cost
2. Cut down Textile, Hot-melt Film and EVA
3. Environment friendly (no odor & noise)
4. Higher bonding score
5. Expected VOC improvement
6. Recycle for remaining EVA (after cut)

• Comments

Since FA-3050 is environment friendly and high productivities with higher bonding score, it needs to be applied to improve the sock liner bonding.

FAM-450 Mini Laminator



▶ General Information

- The machine is well-suited for sample laminating and coating.
- Handles adhesives & substrates up to 45cm wide.
- Very easy to process.



Cut and put together



Put in



Put out



Complete

• Specification

Description	1050 x 890W x 150H
Weight	140kg
Motor	2P, 220V (1/30), 0.1HP
Heater	220V x 3kw
Temp Range	0~250℃
Conveyor Speed	1~ 8m/sec
Belt size (mm)	upper : 500 x 1660
	lower : 500 x 2090

Properties and Usage of ASSEMS Hot-melt Film

Description		FA-1000 Series			FA-2000 Series			FA-3000 Series		FA-4000 Series		FA-7000 Series		
		1150	2100 N	2010	2150	3030	3050	4100	7100	7300	7400			
Base Polymer		Polyacryl												
Packing unit		Roll												
Spec.	Thickness (μm)	20~150												
	Width (inch)	36~60												
	Length (M)	500·1000												
Melting Point (°C)		90~95	90~95	70~75	85~90	90~95	105~110	105~110	110~115	115~120	135~140			
Process temperature (°C)		125~135	130~140	105~115	125~135	125~135	135~145	140~160	120~130	130~140	140~150			
Working Time ±5		20	20	20	20	20	20	20	25	25	25			
Ventilation		Normal												
Touch		Soft												
Applicable material														
Textile	Cotton	-	○	-	○	○	○	○	○	○	○	○		
	Span (Lycra)	-	○	-	○	-	-	-	○	○	○	○		
	Acetate	○	-	-	-	-	-	○	-	-	-	-		
	Polyester	○	○	-	○	○	○	◎	○	○	○	○		
	Glossy nylon	○	-	-	-	○	◎	-	-	○	○	-		
	Felt (Non Woven)	-	○	○	○	○	○	○	○	○	○	○		
Metal	Aluminum	○	-	-	-	◎	◎	-	-	-	-	-		
	Stainless	○	-	-	-	○	○	-	-	-	-	-		
	Copper	○	-	-	-	○	○	-	-	-	-	-		
	Copper plate	○	-	-	-	○	○	-	-	-	-	-		
	Polypropylene (PP)	-	-	-	-	-	-	-	-	-	-	-		
	PE, TPO (Thermo Plastic Olefin)	○	○	○	○	○	○	-	-	-	-	-		
Synthetic Resin	PVC	-	-	-	-	-	-	-	-	-	-	-		
	PC (Polycarbonate)	○	-	-	-	-	-	○	○	○	○	○		
	PU, PET (polyethylene terephthalate)	○	-	-	-	-	-	-	◎	◎	◎	◎		
	TPU (Thermo Plastic Urethan)	-	◎	◎	◎	-	○	○	○	○	○	-		
	EVA	-	◎	◎	◎	-	-	-	-	-	-	-		
	AS (Polystyrene, styrofoam)	◎	○	○	○	-	○	○	○	○	○	○		
An inorganic compound	ABS	-	-	-	-	-	-	-	-	-	-	-		
	FRP	-	-	-	-	○	○	-	-	-	-	-		
	Paper	○	◎	◎	◎	○	○	○	○	○	○	○		
	Rubber with sulfur	-	-	-	-	-	-	-	-	-	-	-		
	Rubber without sulfur	-	-	-	-	-	-	-	-	-	-	-		
	Ceramic	-	-	-	-	-	-	-	-	-	-	-		
Wood(furniture)	Synthetic leather	○	○	○	○	○	○	○	◎	◎	◎	◎		
	Natural Leather	○	◎	◎	◎	◎	◎	○	○	○	○	○		
	Hard wood	○	◎	◎	◎	◎	◎	-	-	-	-	-		
	Soft wood	○	◎	◎	◎	◎	◎	-	-	-	-	-		

◎ Red—Best ○ Black—Good



HEAD OFFICE

#542, JANGRIM-DONG, SAHA-GU, BUSAN, KOREA
TEL : 82-51-713-3900
FAX : 82-51-711-3900
mail : mail@assembles.com
www.assembles.com

NOK-SAN FACTORY

#1722-9, SONGJUNG-DONG, GANGSEO-GU,
BUSAN, KOREA
TEL/FAX : 82-51-831-1243

CHINA FACTORY

HUAISANXIAOZUPANG, LIANMAROAD, DASHA MANAGEMENT AREA,
DALINGSHAN TOWN, DONGGUAN CITY, CHINA
TEL : 86-769-81159265
FAX : 86-769-81159275

VEITNAM FACTORY

TAN PHUOC KHANH TOWN, TAN UYEN DSTRIC,
BINHDOUNG PROVINCE, VIETNAM
TEL : 84-932-263-598

INDONESIA FACTORY

KAW.MILLENNIUM INDUSTRI EATATE BLOA.22/3A, BUDI MULYA,
CIKUPA, TANGERANG, BANTEN 15710 INDONESIA
TEL : 62-21-5940-2265(M.P : 62-8128009812)

JAPAN BRANCH

1-9-23-201 KAWAGISI TODASI SAITAMAKEN 335-0015, JAPAN
TEL : 81-48-452-8075
FAX : 81-48-452-8075