

1.

. 가 가 가 ,
 . (Felt)
 , .
 가
 ,
 가 .
 “ ”
 .
 .
 .
 , , ,
 가 .
 ,
 가 가 ,
 , .
 ASTM 가 . “

, tuft wool felting
 .” .
 , .
 .
 Disposables : 가 가
 (0.5~1.5 oz/yd²), 가 .
 Semi-durables : , 가 .
 Durables : ,
 . 가 .
 , Disposables
 , Disposables ,
 . Semi-durables durables가 .
 100 . , 1853
 가 . 1930
 . 1940 lbs ,
 .
 2 ,
 가 , 1950 Pellon .
 ,
 . 1958~1959susrud
 .
 6 . 가
 . 1966 Scott Paper Dura-

, Scott Paper

가

가

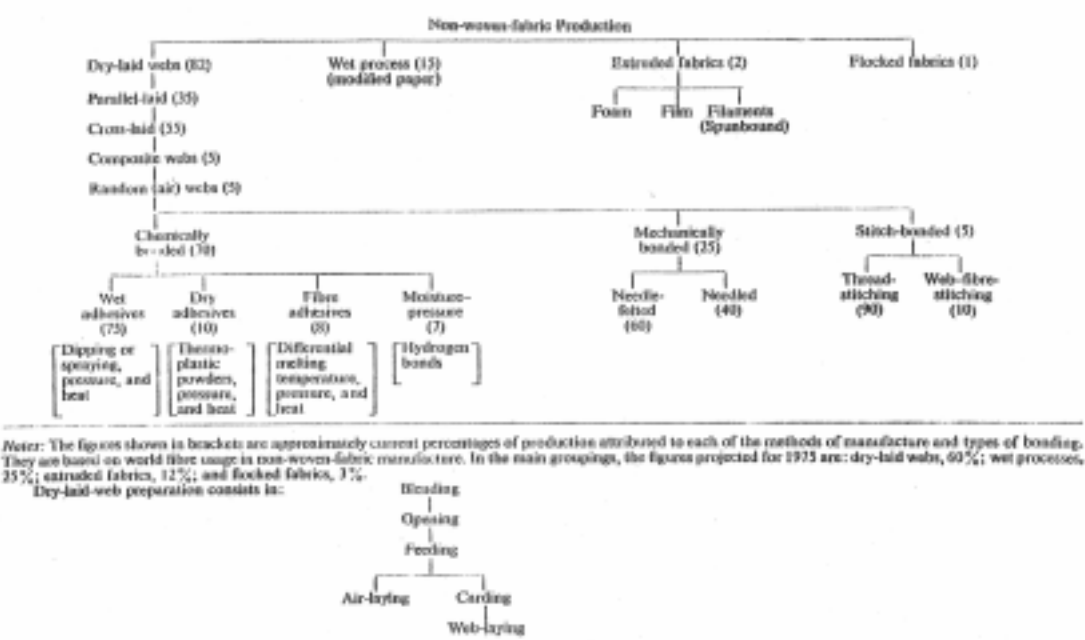
가

가

가 ,

가

< 1> Non-woven-fabric Production



•

,

•

1. Dry-Laid Webs

가

•

가 .

3

J. P.

,

FMC Corp.

•

,

•

가

가 .

2. Wet Process

,

Dry-laid

10m/min

100~200m/min가

,

Disposables

.

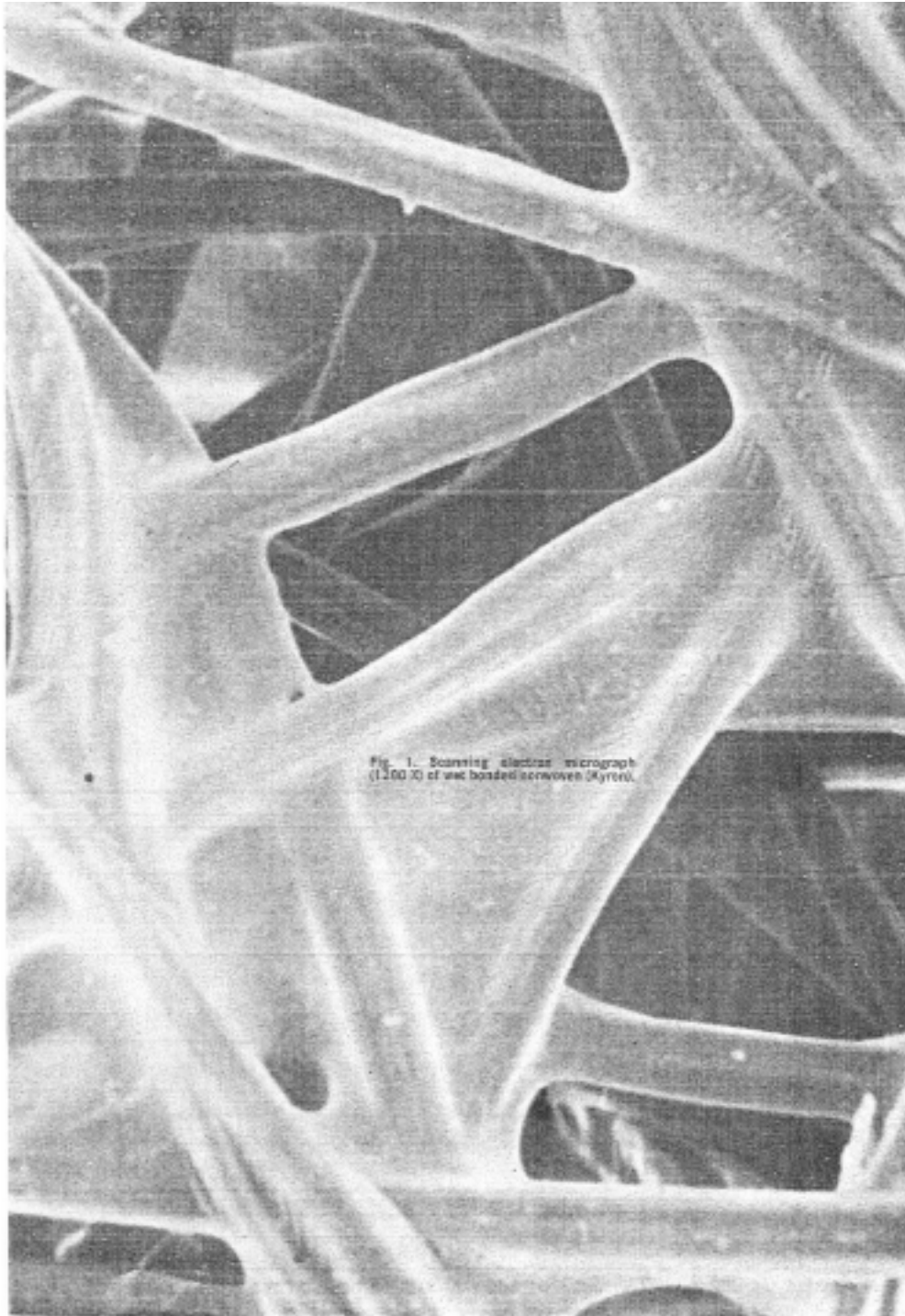


Fig. 1. Scanning electron micrograph (1200 X) of wet bonded nonwoven (Kyrin).

< 1> Scanning electron micrograph(1200X) of wet bonded nonwoven(Kyron)

3. Extruded Fabrics

Dry-Laid Webs

70

2%

,

.

Spun bonded

.

Filament

Balloon

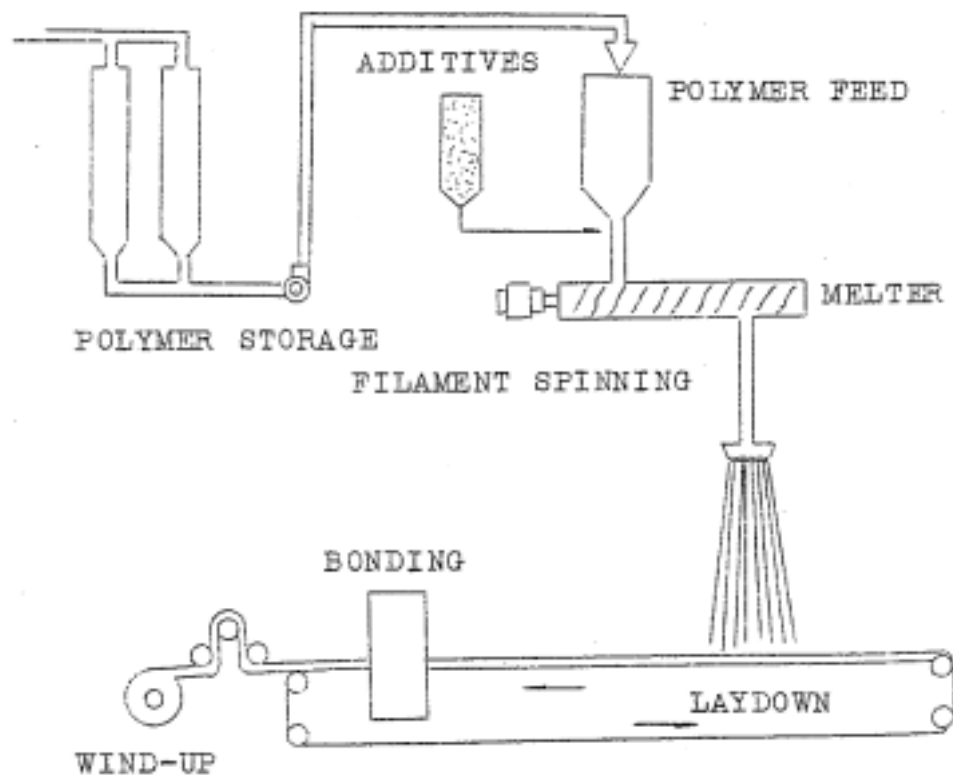
가

.

<

2>

.



< 2> Schematic of Spunbonded

1965

DuPont

Reemay, Tyvek, Typar

Monsanto

1970

Cerex가

.

,

가 . < 3>

. Cerex .

Cerex < 4> .

Heterofil 2 , ICI

.

Filament Conveyor

. ICI

“Melded” . Melt Welded .

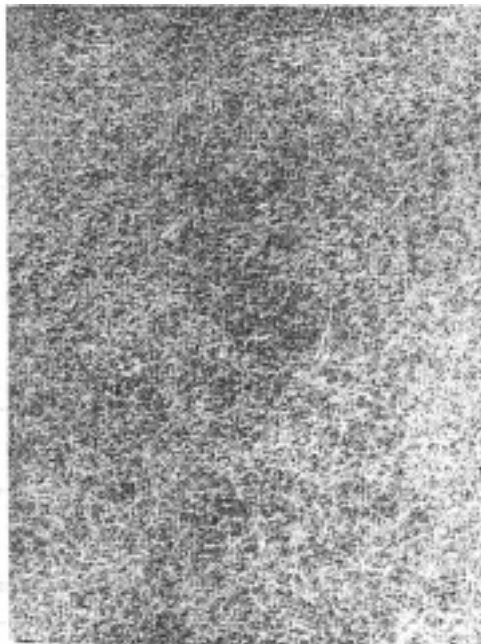
Spunbonded Fiber Plastic .

film web

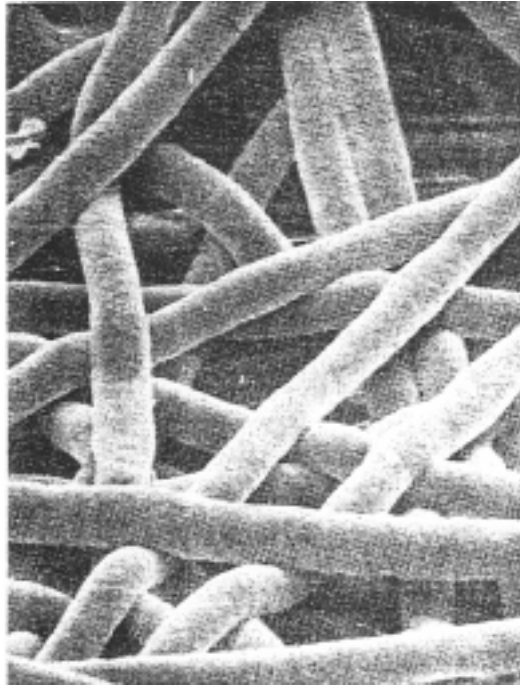
. Resmussen

. film , web

.



< 3> Reemay spunbonded product(5 ×).
Fabric weight approximately 1.5oz/sq yd.



< 4> Scanning electron micrograph of Cerex spunbonded fabric(1200 ×)

Hercules Delnet
Polyethylene Polypropylene Plastic sheet emvossing
가 . ,
1968 BASF Krauch .
가
.

4. Flocked Fabrics

Flock가 70
1% .

가 . < 2>

< 2> Estimated Factory Sales of Nonwoven Products-By Major Market
(in millions of dollars)

	1 9 6 6	1 9 7 5
The Consumer Market	\$ 225	\$ 675
The Industrial-Commercial Market	135	375
The Hospital Market	35	225
The Military and Other Markets	5-10	50-70
Totals	\$ 400	\$ 1,335

1. Consumer Market

market 가 ,
가 .

< 3>

1966 2 2 5 1975 6 5 7 5
가 , 13% .

Poromerice

10% . 1975 Poromerics 2 2
5 가 , 1966 11 가

가

가

< 3 >

\$50-\$60 million worth of sanitary napkin covers and tampon materials			
\$45-\$50	"	"	punched or needled felt broadloom linings and cushions
\$ 5-\$10	"	"	other punched or needled felt products such as pennants and table pads
\$20-\$25	"	"	nonwoven carpet and rug face and backing
\$ 20	"	"	poromeric shoe uppers
\$10-\$20	"	"	interlinings and interfacing for apparel and handbags, etc.
\$10-\$15	"	"	disposable diapers
\$10-\$15	"	"	blankets
\$ 3-\$ 5	"	"	nonwoven apparel
\$25-\$30	"	"	tapes and ribbons, aprons, bibs, dishcloths, wiping cloths, draperies, napkins, towels, vacuum cleaner bags, wall and book coverings, window shades, and miscellaneous products including tea bags
\$198-\$250 million		Total	

가

1966

, 1966

3~5

1967

2 5 , 1975 6~7

가

가 , Beach robe, Sports jackets

Carpet face backing 가

needle punched carpet

가

1975 4~5 가 ,

punched felt needled felt 1966 2 ,

8%

,

,

,

,

가

가 가 . 70 가

2. Industrial-Commercial market

disposables durables ,

, , . , 1966

1 2 1 5 . <

4> . Market 15% ,

11~13%가 . 1966 1 3 5

가 , 1975

3 5

4

< 4>

\$25-\$30 million worth of punched or needled felt broadloom			
linings and cushions			
\$ 5-\$10	"	"	" other punched or needled felt products
\$20-\$25	"	"	" filters - milk, air, oil, chemical
\$15-\$20	"	"	" wiping cloths
\$15-\$20	"	"	" tapes and ribbons
\$10-\$15	"	"	" nonwoven carpet and rug face and backing
\$ 5-\$10	"	"	" abrasives
\$20-\$25	"	"	" electrical insulators, automobile head and arm rests, wall coverings, book coverings, work uniforms, other service apparel, and miscellaneous products
\$115-\$155 million		Total	

가가 , carpet face
backing filter 가
Carpet face backing , ,
 , 가
 , filter ,

가 ,
 .
 Market
 가 Market
 , disposables
 . Sheet , , towel,
 (), , Napkin, Place-mat(Place setting
), , drapery 가 .
 , ,
 가 , drive-in, ,
 . , , , ,
 가 .
 , , , ,
 , tape , ,
 .
 가 .

3. Hospital Market

Market

.
 , .

market

Market disposables 1966 2~3

Consumer Market Industrial-Commercial Market

semi-durables durables 1

가 1966 3~4 . 1975

2 , 2 5 가

20%

Market disposables 가 sheet가

drape , , , , ,

alcohol 가 .

가 2/3

market ,

Market .

4. Military & Other Markets

Military Market ,

disposables 가 .

1963

disposables .

disposables ,

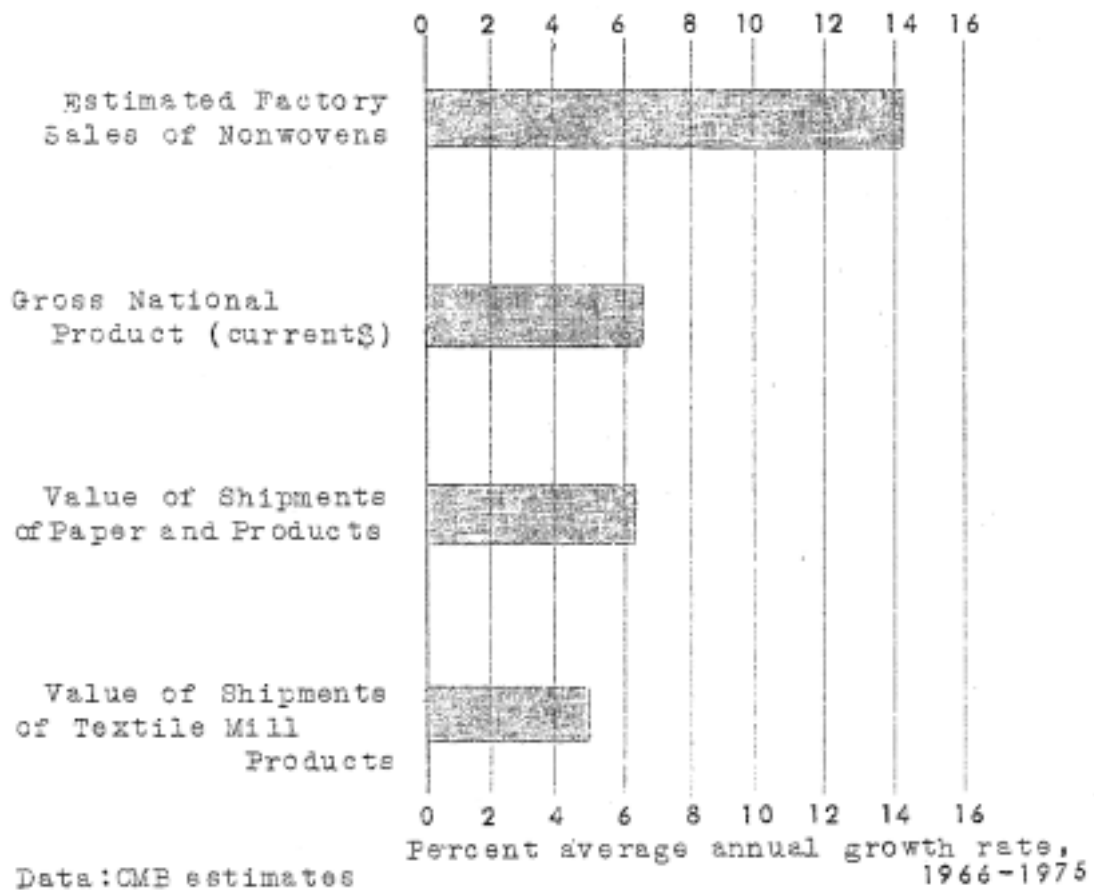
. 가 가
 . ,
 가 . sheet, ,
 , , .
 . , ,
 .
 . , Military Market
 가 , 1975 2 5
 .
 , , Market ,
 , 1975 Military Market 가
 . 12
 . 가 .
 가
 carpet . , ,
 carpet face가 backing .
 가
 . 5 가 .
 가 .
 .
 1966 4 , 1975

13

14%가

가 GNP

.< 5>



< 5> Expected Growth Rates for Nonwovens, Gross National Product, and two Related Industries

10

가

가 ,

가

. 1975

·
·
·
Disposables Association Market

·
가

·
Disposable
disposables 가

·
disposables PP SR가
“Easy-of -Care” 가

·
disposables
disposables

·
가 ,