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Technical Information

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January 2000

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# Pretreatment of fabrics that contain spandex



# Spandex fabrics

## General information on spandex fibers

Spandex fibers are made from a high-molar-mass polymer. They consist of at least 85 % w/w segmented polyurethane. The international abbreviation is PUE.

The most important feature of fabrics made from spandex fibers and blends of spandex with cotton or synthetic fibers is their elasticity.

They should always be treated at temperatures below 100 °C if possible, because otherwise their elasticity will be impaired. The reduction in elasticity depends on length of time that the fabric is exposed to high temperatures.

Spandex fibers also lose their elasticity if they are exposed to heat under tension. Fabrics that contain spandex fibers should therefore not be stretched unnecessarily in processes in which they are exposed to heat, and we would recommend using low-tension equipment.

Spandex fibers are mainly treated with silicone preparations, which are applied in substantially higher quantities than the preparations applied to other types of fiber.

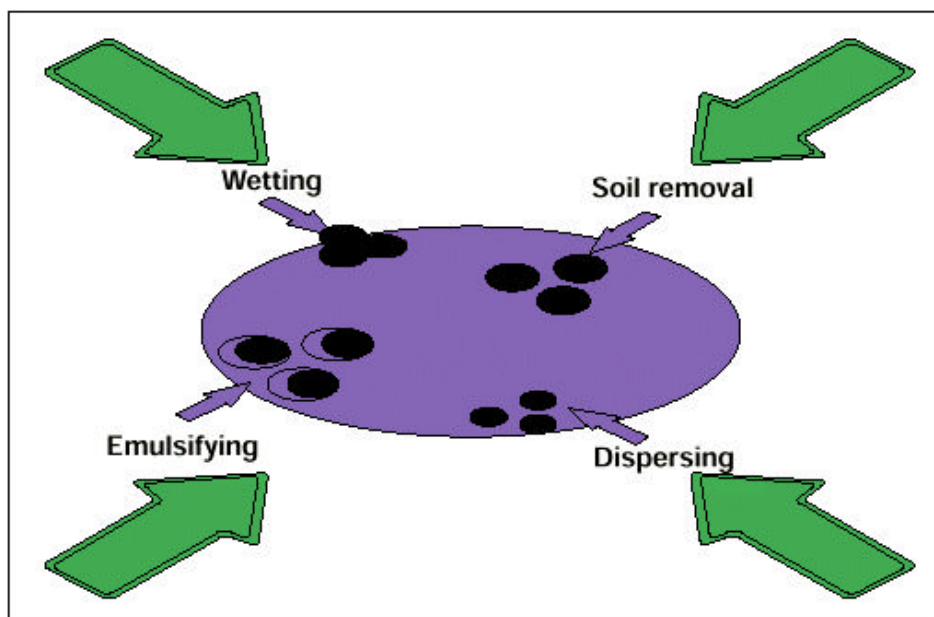
## Removing silicone preparations

These silicone preparations have to be removed from fabrics in order to prevent problems from occurring in finishing processes.

- Fumes can be given off when the fabric is stentered
- Deposits can form on the stenter
- Streaks and stains can form on the fabric when it is dyed or printed

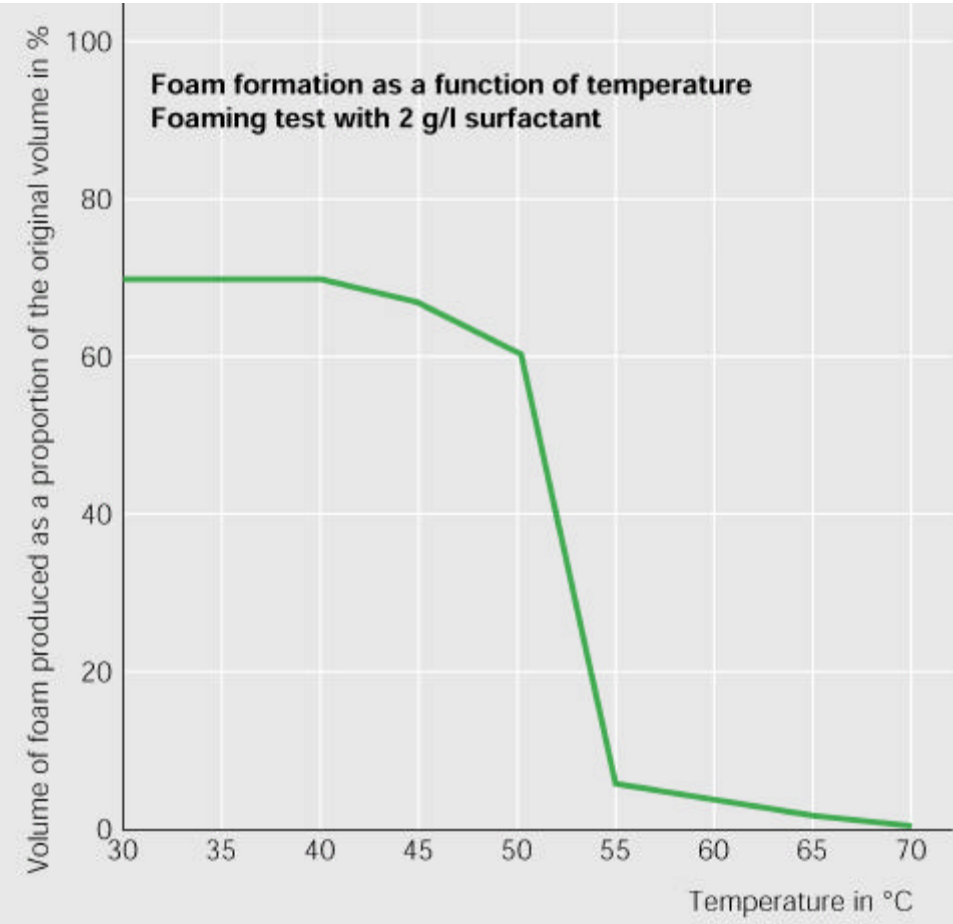
It is often difficult to remove silicone preparations properly with the pre-treatments normally applied to cotton and polyester-cotton. This means that it is advisable to wash the fabric in the acidic pH range and to use surfactants with a pronounced emulsifying and dispersing action.

**Kieralon MFB** is a multifunctional surfactant with wetting, emulsifying, dispersing and detergent properties. It is very effective for removing silicone preparations from textiles.



# Spandex fabrics

Kieralon MFB is low foaming at temperatures above ca. 50 °C, and it is suitable for use in continuous and discontinuous equipment



## Spandex fabrics

Additional effects, such as the removal of mineral deposits and hard-water salts from the cotton blended with spandex fibers, can be obtained by using a product with a complexing and dispersing action such as Dekol® N-SN.

Applying Kieralon MFB and Dekol N-SN in combination ensures that that silicone preparations can be removed from the spandex fibers very efficiently, and the natural pigments contained in the cotton can be extracted very effectively. This has the following advantages.

- Reproducible effects can be achieved.
- The fabric is more absorbent.
- There is less incrustation with hard water salts.
- The fabric is whiter.
- No smoke is formed when the fabric is stentered
- The fabric can be dyed to level shades and no streaks and stains form when it is printed.
- The fabric has an optically settled appearance.
- Safety is ensured during the production process.

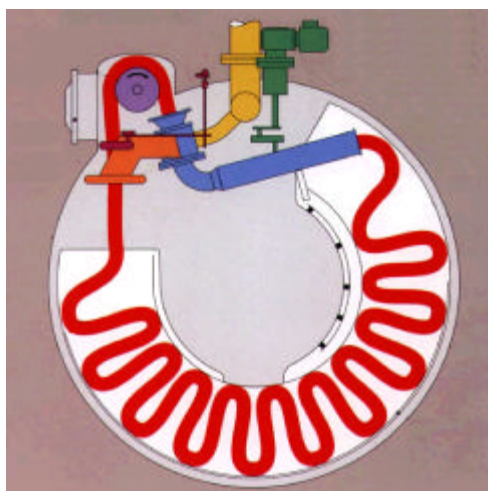
### **Common blends of spandex with other fibers are:**

Polyester/PUE  
Cotton/PUE  
Cotton/Nylon/PUE  
Cotton/Polyester/PUE  
Nylon/PUE  
Wool/PUE  
Wool/Polyester/PUE  
Rayon/PUE

# Spandex fabrics

## Suggested recipes

### Scouring in a jet dyeing machine



## Scouring in Jets

- I. For substrates containing spandex, use:
  - A. Pre-rinse with water alone at less than 50°C (120°F), allowing water to “overflow” if possible. This procedure will remove a large portion of the silicone oils from the fabric and “float them away with the overflowing action.” This process should allow at least 10 minutes.

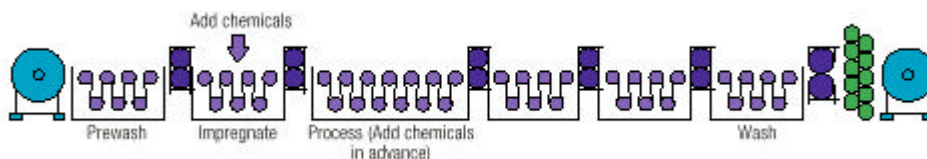
### B. Scour

	Fabric containing less than 10% spandex	Fabric containing greater than 10% spandex
with		
	1.0% Kieralon MFB or Kieralon N-DB	2.0% Kieralon MFB or Kieralon N-DB
	0.5- 1.0 % Dekol N-SN	1.0- 2.0 % Dekol N-SN

bath pH;	4-5
Liquor ratio:	10/1
Reaction time:	15-30 minutes
Reaction Temperature	90°C (190°F)

## Spandex fabrics

Washing in a continuous open-width washing machine



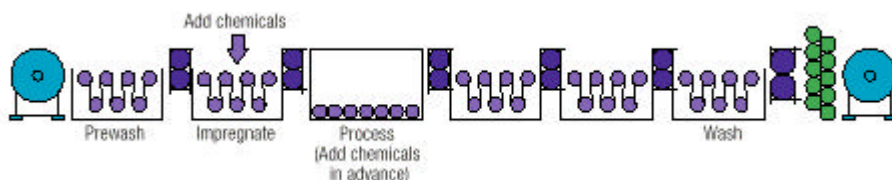
1. Pre-rinse with water only at  $< 50\text{ }^{\circ}\text{C}$ , allowing water to overflow if possible
2. Then apply:
  - 3 g/kg Kieralon MFB
  - 1 g/kg Dekol N-SN
  - pH 4 – 5 (not less than pH 6 if acrylic size is present)

Impregnating temperature:  $60\text{ }^{\circ}\text{C}$

Residence time: ca. 1 – 2 min. at  $70\text{ }^{\circ}\text{C}$  –  $90\text{ }^{\circ}\text{C}$

Washing temperature:  $90\text{ }^{\circ}\text{C}$

Equipment incorporating a submersion bath



1. Pre-rinse with water only at  $< 50\text{ }^{\circ}\text{C}$ , allowing water to overflow if possible
2. Then apply:
  - 3 g/kg Kieralon MFB
  - 1 g/kg Dekol N-SN
  - pH 4 – 5 (not less than pH 6 if acrylic size is present)

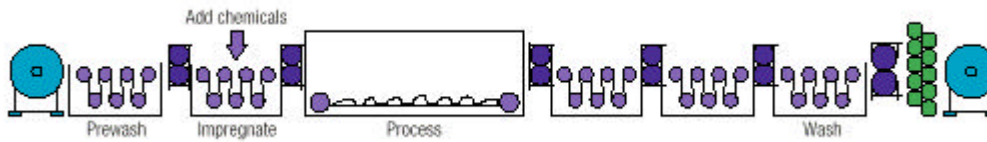
Impregnating temperature:  $60\text{ }^{\circ}\text{C}$

Residence time: ca. 3 – 5 min. at  $70\text{ }^{\circ}\text{C}$  –  $90\text{ }^{\circ}\text{C}$

Washing temperature:  $90\text{ }^{\circ}\text{C}$

# Spandex fabrics

Equipment incorporating a steamer



1. Prewash with water only at  $< 50\text{ }^{\circ}\text{C}$ , allowing water to overflow if possible

2. Then apply:

3 g/kg Kieralon MFB

1 g/kg Dekol N-SN

pH 4 – 5 (not less than pH 6 if acrylic size is present)

Impregnating temperature:  $60\text{ }^{\circ}\text{C}$

Residence time: 5 – 10 min at  $70\text{ }^{\circ}\text{C}$  –  $90\text{ }^{\circ}\text{C}$

Washing temperature:  $90\text{ }^{\circ}\text{C}$

## Note

The information submitted in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suit-ability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

## Spandex fabrics

### Safety

When using this product, the information and advice given in our Safety Data Sheet should be observed. Due attention should also be given to the precautions necessary for handling chemicals.

We know of no ill effects that could have resulted from using *Kieralon<sup>0</sup> MFB* for the purpose for which it is intended and from processing it in accordance with current practice.

According to the experience that we have gained over many years and other information at our disposal, *Kieralon<sup>0</sup> MFB* does not exert any harmful effects on health, provided that it is used properly, due attention is given to the precautions necessary for handling chemicals, and the information and advice given in our Material Safety Data Sheet are observed.

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*Note: Material Safety Data Sheet is available upon request.*

BASF Corporation, 2000  
Colorants and Textile / Leather Chemicals

**BASF Canada Inc.**  
345 Carlingview Drive.  
Toronto ON  
M9W 6N9  
Canada  
(416) 675-3611

**BASF Corporation**  
4330 Chesapeake Drive  
Charlotte, NC 28266  
USA  
  
(704) 392-4313  
800-545-4931

**BASF Mexicana, S.A de C.V.**  
Insurgentes Sur 975  
Col. Cd. de los Deportes  
03710 México, D. F.  
México  
(5) 325 2709

**BASF**