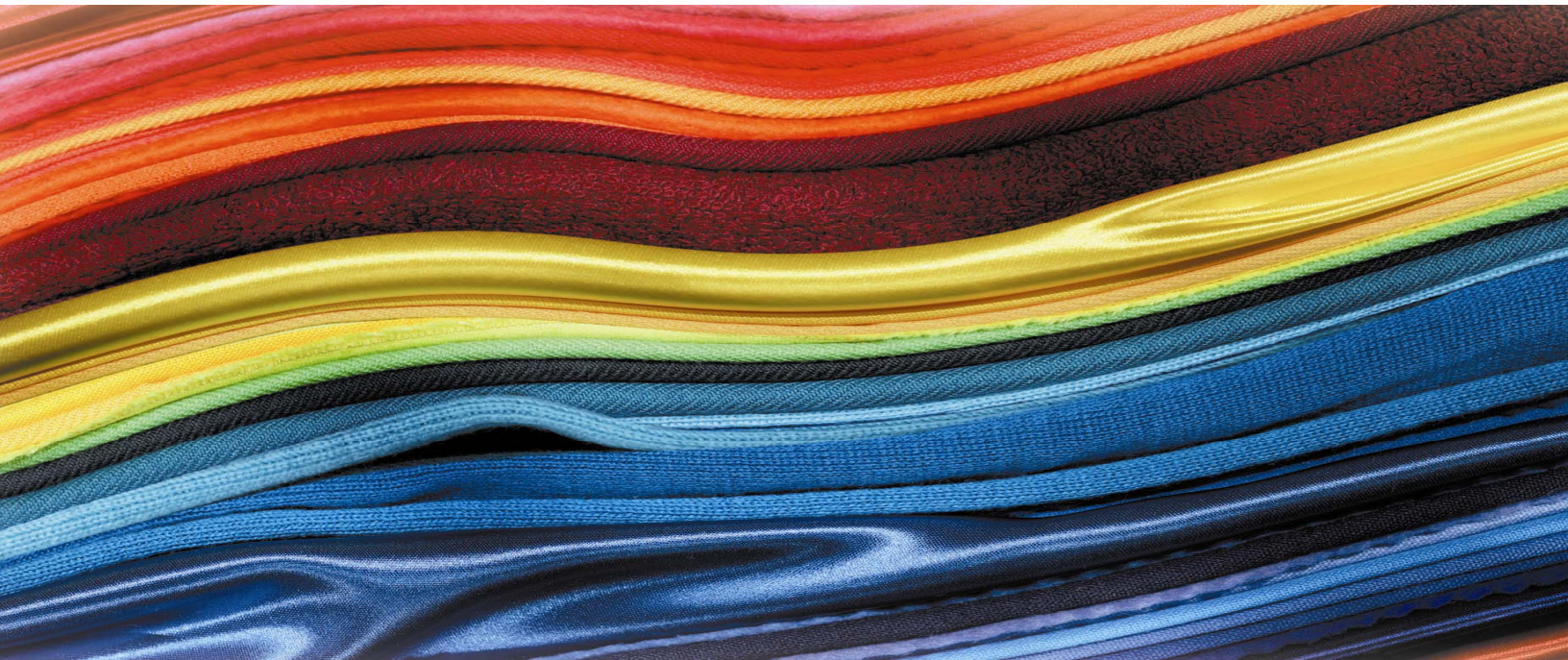


Textile Effects

**LANASET<sup>®</sup> dyes**

Dyeing system for wool and wool blends



# Contents

## Description

Main characteristics and benefits of the LANASET® dyeing system .....	4
General.....	5
Outlets .....	5
Pretreatment.....	6
Preliminary washing .....	6
Bleaching/fluorescent whitening .....	7
Dye selection .....	8
Dyeing .....	9
Dissolving the dyes.....	9
Dyeing chemicals.....	9
Dyebath pH.....	9
Procedure for loose stock and slubbing .....	10
Conventional LANASET® dyeing process .....	10
LANASET® TOP dyeing process .....	11
Procedure for yarn and piece dyeing .....	12
Procedure for chlorinated and shring resist treated wool.....	13
Shading.....	14
Correction of faulty dyeings .....	14
Mothproof and beetleproof finishing .....	14
Softening of wool by exhaust process .....	14
Vigoureux printing and continuous dyeing .....	15
Vigoureux printing.....	15
Continuous dyeing.....	15
Dye selection .....	15
Printing/dyeing recipes .....	16
Thickening .....	16
Steaming times .....	16
Dyeing of wool blends .....	17
Wool/polyester blends .....	17
Outlets .....	17
Dyeing system .....	17
Important parameters for dyeing polyester and wool blends .....	18
TERASIL® dye selection .....	19
Dyeing procedure for WO/PES blends with LANASET® and TERASIL® dyes.....	20
Wool/polyamide blends .....	21
Outlets .....	21
Dyeing system .....	21
Parameters influencing partition between wool and polyamide .....	21
LANASET® dye selection.....	22
Dyeing procedure for WO/PA blends with LANASET® dyes.....	24

Wool/acrylic blends .....	25
Outlets .....	25
Dyeing system .....	25
MAXILON <sup>®</sup> dye selection.....	25
Dyeing procedure for WO/PAN blends with LANASET <sup>®</sup> and MAXILON <sup>®</sup> dyes .....	26
Wool/silk blends .....	27
Outlets .....	27
Dyeing system .....	27
Parameters influencing partition between wool and silk .....	27
LANASET <sup>®</sup> dye selection.....	28
Dyeing procedure for WO/S blends with LANASET <sup>®</sup> dyes .....	28
Wool/cellulose blends.....	29
Outlets .....	29
Dyeing systems .....	29
LANASET <sup>®</sup> /SOLOPHENYL <sup>®</sup> dyeing method.....	29
Dyeing procedure for WO/CEL blends with LANASET <sup>®</sup> and SOLOPHENYL <sup>®</sup> dyes .....	30
LANASET <sup>®</sup> /NOVACRON <sup>®</sup> F/FN dyeing method .....	31
First bath: NOVACRON <sup>®</sup> F/FN dyeing procedure .....	31
Second bath: LANASET <sup>®</sup> dyeing procedure.....	32
Machine-washable finish for wool and its blends.....	33
<b>LANASET<sup>®</sup> dyes – patterns and properties</b> .....	34
LANASET <sup>®</sup> dyes – combination shades .....	38
LANASET <sup>®</sup> dyes – properties and fastness data .....	39
Notes on the pattern section .....	47
<b>Textile chemicals</b> .....	51
ALBEGAL <sup>®</sup> SET leveling agent.....	56
ERIONAL <sup>®</sup> PAS reserving agent for polyamide .....	57
ALBAFLOW <sup>®</sup> CIR penetration accelerant.....	58
ALBATEX <sup>®</sup> AB-45 acid buffer for PES and WO fibers .....	59
ERIOPON <sup>®</sup> OS afterclearing .....	60
MIRALAN <sup>®</sup> HTP wool care .....	61
MIRALAN <sup>®</sup> TOP wool care with LANASET <sup>®</sup> TOP short dyeing process .....	62
MIRALAN <sup>®</sup> Q wool care .....	63
MITTIN <sup>®</sup> FF HC or MITTIN <sup>®</sup> FF LIQ wool care .....	64
UNIVADINE <sup>®</sup> PB .....	65

## Main characteristics and benefits of the LANASET® dyeing system

Properties	Customer benefits
<b>Broad shade range</b>	brilliant and restrained combination shades at all depths brilliant shades with high wet and light fastness
<b>Compact range with similar dyeing behavior</b>	reduced inventory costs excellent compatibility easy dye selection
<b>High fastness properties</b>	high fastness to processing suitable for all end products suitable for carpets and upholstery suitable for Oeko-Tex Standard 100
<b>Dyeing at pH 4.5</b>	minimum damage to the fiber quality of the wool retained higher spinning yields
<b>Same dyeing method for all shade depths</b>	simple procedure more dependable results in production
<b>High exhaustion</b>	good laboratory-to-bulk transfer excellent reproducibility minimal effluent pollution
<b>Suitable for many blends</b>	flexibility for meeting changing market needs only one dye range for the wool portion of different blends

## General

The LANASET<sup>®</sup> dyeing system is a versatile and comprehensive system for dyeing and printing wool, polyamide and silk. This pattern card provides recommendations for dyeing wool and wool blends. For application of LANASET<sup>®</sup> dyes on polyamide and silk please refer to the corresponding publications.

The LANASET<sup>®</sup> range comprises modified, tinctorially strong 1:2 metal complex, acid and reactive dyes with high wet and light fastness. The dyes cover the shade spectrum systematically. Almost all fashion shades can be produced economically using simple combinations of these dyes. Nearly identical dyeing properties and high exhaustion result in excellent compatibility and reproducibility.

For all depths of shade LANASET<sup>®</sup> dyes are applied at pH 4.5 –the isoelectric region of wool–, leaving the fiber in excellent physical condition. The auxiliary ALBEGAL<sup>®</sup> SET, designed especially for the dye range, ensures safe and level dyeings. LANASET<sup>®</sup> dyes are suitable for dyeing wool in all forms, especially loose stock, slubbing and yarn. In addition the LANASET<sup>®</sup> range is highly suitable for blends of wool with numerous other fibers, including polyester, polyamide, silk, acrylics and cellulose.

The pattern card contains useful information on pretreatment, bleaching, fluorescent whitening, dye selection, dyeing procedures including blend dyeing, and textile auxiliaries. Dyeing parameters are also detailed.

All dyes are illustrated as self-shades at several depths and in combination dyeings. Fastness data and details of application properties complete the pattern section.

## Outlets

The LANASET<sup>®</sup> range is suitable for dyeing wool as loose stock, slubbing, yarn and piece for the following outlets:

- women's and men's outerwear, uniforms
- knitgoods, hand and machine knitting yarns
- household textiles, blankets and upholstery
- floor coverings
- textiles made from fine animal fibers, e.g. cashmere, mohair

## Pretreatment

### Preliminary washing

If the goods are soiled with grease, oil, spinning lubricants or dirt, it is advisable to wash them before dyeing. This can be done in the dyeing machine, using soft water.

Suggested recipe:            0.5–3 g/l    ULTRAVON® PRE or INVADINE® DA  
                                      0.5–2 g/l    INVATEX® CS  
                                            y g/l    ammonia or soda ash

Neutral washing:            pH 6.5–7.5  
                                      20–40 min at 50–65°C/122–149°F  
                                      rinse warm and cold

Alkaline washing:           pH 8–9.5  
                                      20–40 min at 40–50°C/104–122°F  
                                      rinse warm and cold

In some cases the addition of electrolyte, e.g. up to 5 g/l sodium sulfate, can assist the removal of mineral oil lubricants.

### Bleaching/fluorescent whitening

Wool can be bleached at all stages of processing using conventional dyeing equipment.

#### Oxidation bleaching

The most commonly used bleaching agent, hydrogen peroxide, is applied under alkaline conditions using pyrophosphate as pH stabilizer. To minimize wool damage, the specified pH and temperature conditions should be strictly observed.

Suggested recipe:            0.5–1 g/l    ULTRAVON® PRE or INVADINE® DA  
                                      1–2 g/l    tetrasodium pyrophosphate  
                                      15–30 ml/l    hydrogen peroxide 35%  
                                            y g/l    ammonia or soda ash  
  
                                      pH 9–9.5  
                                      2–4 h at 50°C/122°F or  
                                      start at 50°C/122°F and leave to cool down overnight  
                                      drain, rinse and sour off to pH 5.5

A phosphate-free alkaline bleaching method using stabilizer CLARITE® WO gives whites that are superior to those obtained by stabilizing with phosphate: Addition of INVATEX® CS complexing and dispersing agent improves the handling of the bleached wool.

                                      4 g/l    CLARITE® WO  
                                      0–2 g/l    INVATEX® CS  
                                      15–30 ml/l    hydrogen peroxide 35%  
  
                                      60 min at 45°C/113°F  
                                      drain, rinse and sour off to pH 5.5

## Reduction bleaching

Reduction bleaching using stabilized hydrosulfite can be performed as a single process where a full bleach is not required, or as a treatment to follow hydrogen peroxide bleaching. In the latter case, reduction bleaching will give an improved, neutral white, generally with better light fastness than that attained with peroxide bleaching alone.

Suggested recipe:

0.5–1 g/l	ULTRAVON® PRE or INVADINE® DA
2–5 g/l	stabilized sodium dithionite, e.g. CLARITE® PS
<u>        </u> x %	fluorescent whitening agent

1–2 h at 50–60°C/122–140°F

Rinse and add 0.5 ml/l hydrogen peroxide 35% to the final rinsing bath to remove residual sulfurous compounds.

If required, a fluorescent whitening agent (FWA) can be added to the reduction bleaching bath. The following FWAs can be used, depending on required shade.

FWA	Required amount	pH	Shade
UVITEX® NFW LIQ	0.5–2 %	5–6	violet
UVITEX® NFW-S LIQ	0.5–2 %	5	distinctly violet
UVITEX® BHT LIQ 115%	0.75–3 %	7	neutral blue
UVITEX® CF LIQ 200%	0.5–2 %	6–7	red

## Dye selection

LANASET® dyes possess similar dyeing properties and therefore have excellent compatibility. It is recommended to use the dye closest in color to that required and to shade as appropriate. The following LANASET® dyes are highly suitable for combinations in the more muted shade area, allowing a wide range to be covered:

LANASET® Yellow 2R

LANASET® Red G

LANASET® Brown B

LANASET® Grey G

### Recommendations for standard combination shades

Shade area	Yellow	Orange	Scarlet/ red	Bor- deaux	Violet	Blue	Blue- green/ turquoise	Green/ olive	Brown/ beige/ grey	Navy	Black
<b>LANASET®</b>											
Yellow 4GN	■	□	□				□	□			
Yellow 2R	■							□	△		□
Orange RN	□	■	□								
Brown G-01									■		
Brown B									■		
Red G	□		■	□					△	□	□
Red 2B		□	■		□	□					
Bordeaux B			□	■						□	□
Violet B			□	□	■	□					
Blue 2R					□	■				□	
Blue 5G	□					□	■	■		□	□
Green B							□	■			
Grey G				□		□			△		
Navy R										■	□
Black B											■

■ = basis, □ = shading component, △ = trichromatic component

# Dyeing

## Dissolving the dyes

Paste the dye cold with soft water

Add hot water (60–90°C/140–194°F) and boil up briefly with live steam if necessary

Stir thoroughly (with high-speed stirrer if necessary)

Auxiliaries and chemicals should not be added during dissolving. For further details on solubility of the individual dyes, please see the fastness tables in the pattern section. The temperature of dye solutions containing LANASET® Red 2B should not exceed 60°C/140°F.

## Dyeing chemicals

### Penetration accelerants

ALBAFLOW® CIR or ALBAFLOW® UNI is added to the dyebath to de-aerate and rapidly wet out the goods. These products also have a foam-suppressing effect.

### Leveling agent

ALBEGAL® SET is amphoteric and has affinity for both dye and fiber. For all shade depths 1% ALBEGAL® SET is used at liquor ratios from 8:1 to 25:1. Below 8:1 the amount should be reduced to 0.5%, above 25:1 it should be increased. ALBEGAL® SET improves the compatibility of the LANASET® dyes, promotes their migration and exhaustion, and greatly helps to ensure fiber and surface levelness. These effects can be improved still further by an addition of 5–10% Glauber's salt (particular recommended for dyeing yarn and piece goods).

### Wool care product

MIRALAN® Q improves the quality of the wool at all stages of processing. It reduces felting and setting during dyeing and has a lubricating effect. Carding and spinning properties of loose material are improved. In package dyeing, flattening on crossover points is reduced and bulk increased. In piece dyeing, running marks and felting are prevented.

### Dyeing accelerant

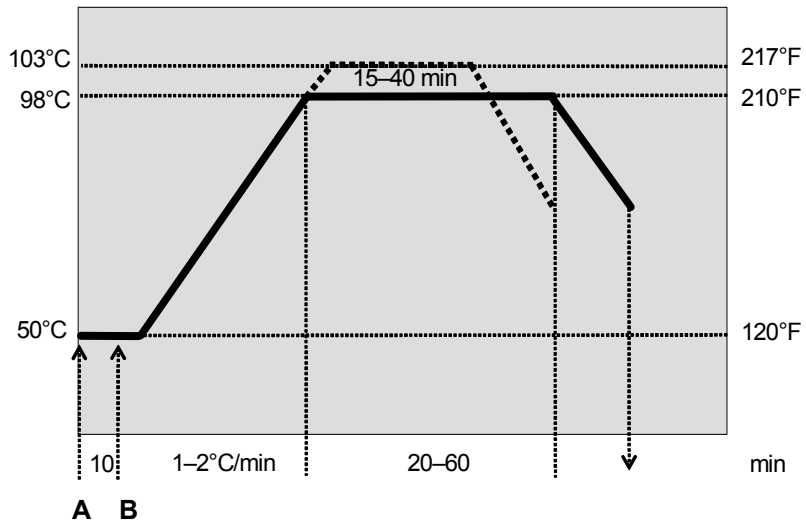
MIRALAN® TOP is a special dyeing accelerant for the LANASET® TOP process to accelerate diffusion of LANASET® dyes inside the wool fiber and shorten the dyeing time. The LANASET® TOP process is recommended only for dyeing loose wool and tops.

## Dyebath pH

Irrespective of shade depth and stage of processing LANASET® dyes are applied at pH 4.5, the ideal pH for wool as it minimizes fiber damage during dyeing. The pH is best set with a buffer of sodium acetate and acetic acid or with ALBATEX® AB-45, a pH controlling agent, which sets the pH at 4.5.

## Procedure for loose stock and slubbing

### Conventional LANASET® dyeing process

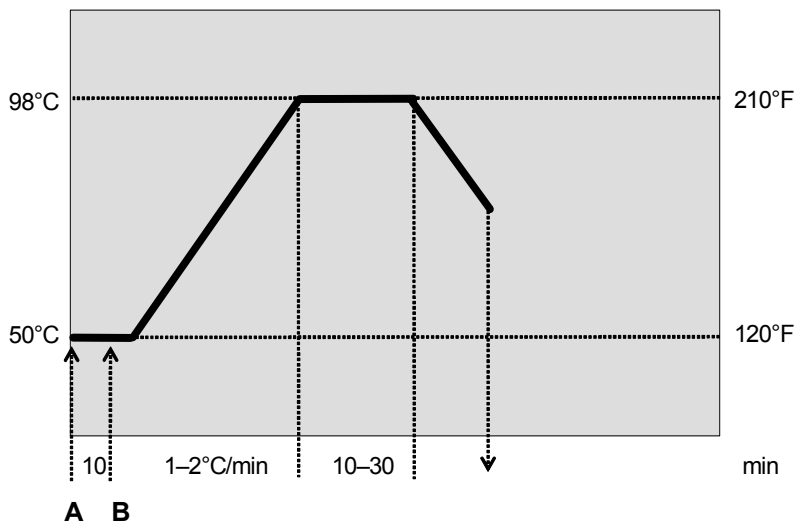


- A**
- |         |   |
|---------|---|
| 0.5 g/l | ALBAFLOW® CIR or ALBAFLOW® FFA                      |
| 1 g/l   | MIRALAN® Q  |
| 1 %     | ALBEGAL® SET  |
| x %     | ALBATEX AB-45 or acetic acid 80% or formic acid 85% |
- pH 4.5
- B**
- |     |               |
|-----|---------------|
| y % | LANASET® dyes |
|-----|---------------|

## LANASET® TOP dyeing process

The LANASET® TOP process for loose wool and tops shortens the dyeing process by means of the dyeing accelerant MIRALAN® TOP. The benefits of the process are as follows:

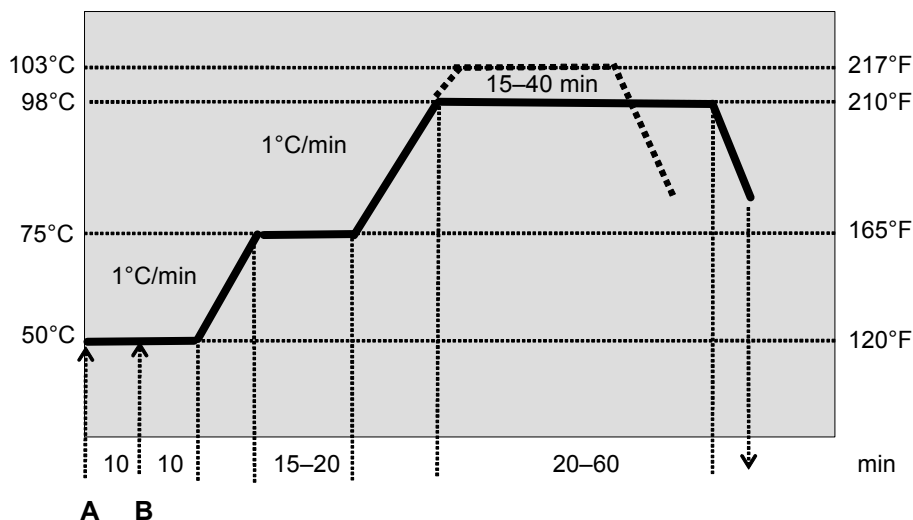
- reduces dyeing time at the boil to half, improving productivity
- improves exhaustion to almost 100%
  - reduced effluent load
  - shorter rinsing cycles
  - dyeings can be performed in standing baths
- saves time, water and energy.



A	0.5 g/l	ALBAFLOW® CIR or ALBAFLOW® UNI
	1 g/l	MIRALAN® Q
	1.5 %	MIRALAN® TOP
	x %	formic acid 85%
<hr/>		
	pH 4.0–4.5	
B	y %	LANASET® dyes

**Note:** For pale shades a combination of 1.0% MIRALAN® TOP with 0.5% ALBEGAL® SET is recommended to improve levelness. MIRALAN® TOP also improves dyeing rate at 85°C/185°F.

## Procedure for yarn and piece dyeing



A	0.5 g/l	ALBAFLOW <sup>®</sup> CIR or ALBAFLOW <sup>®</sup> UNI
	1 g/l	MIRALAN <sup>®</sup> Q
	1-1.5 %	ALBEGAL <sup>®</sup> SET
	5-10 %	Glauber's salt anhyd
	1 g/l	sodium acetate cryst.
	x %	acetic acid 80%
	<hr/>	
	pH 4.5-5.5	
B	y %	LANASET <sup>®</sup> dyes

The pH of the dye bath can be set with 3-5 g/l ALBATEX<sup>®</sup> AB-45 instead of using acetic acid and sodium acetate.

### Alternativ method with ALBATEX<sup>®</sup> PS-35 ph slider

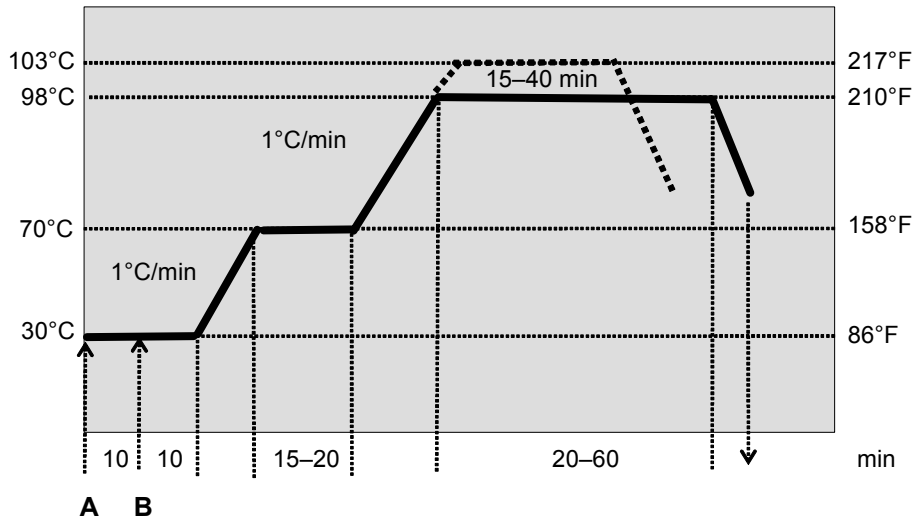
Instead of setting the pH at a constant value at 4.5-5.5 the dyeing is started under neutral condition. The pH slides down to the final pH during the heating phase, reducing a too quick uptake at the beginning of the dyeing.

A	0.5 g/l	ALBAFLOW <sup>®</sup> CIR or ALBAFLOW <sup>®</sup> UNI
	1 g/l	MIRALAN <sup>®</sup> Q
	1-1.5 %	ALBEGAL <sup>®</sup> SET
	5-10 %	Glauber's salt anhyd
B	y %	LANASET <sup>®</sup> dyes

## Procedure for chlorinated and shrink resist treated wool

A slightly alkaline prewash is recommended prior to dyeing in order to neutralize the chlorinated wool. Since the dye affinity to the fiber is generally increased by a shrink-resist process, the dyeing is started at lower temperature and higher pH (see table below) to get best leveling.

Note: Wetfastness is reduced due to the chlorination process. For highest fastness requirement LANASOL reactive dyes are recommended.



A	0.5 g/l	ALBAFLOW® CIR or ALBAFLOW® UNI
	1 g/l	MIRALAN® Q
	1–1.5 %	ALBEGAL® SET
	5–10 %	Glauber's salt anhyd
	4 %	ammonium sulfate
	x %	acetic acid 80%
	<hr/>	
	pH 7–5.5	(see table)
B	y %	LANASET® dyes

Amount of dye	pH
0–0.5 %	7–7.5
0.5–1 %	7–6.5
1–2 %	6–6.5
> 4 %	5

## Shading

LANASET<sup>®</sup> dyeings are highly reproducible. All LANASET<sup>®</sup> dyes can be used for shading. As a rule there is no need to top up with chemicals. Before the shading dye is added, the dyebath should be cooled to 75–80°C/167–176°F. For loose wool and slubbing, the additions can be made with steam off.

## Correction of faulty dyeings

Dyeings that have turned out too deep or slightly unlevel can be weakened by 10–15% or leveled by treating in a fresh bath for 30 min at the boil with

2 %	ALBEGAL <sup>®</sup> SET
10 %	Glauber's salt anhyd.
x %	acetic acid 80%

pH 6–7

Before re-dyeing cool dyebath to 60°C/140°F and adjust with acetic acid to pH 4.5.

Shade weakening by 30–40% can be achieved by treating in a fresh bath for 30 min at the boil with

4 %	TINEGAL <sup>®</sup> W
10 %	Glauber's salt anhyd.
x %	acetic acid 80%

pH 6–7

To remove TINEGAL<sup>®</sup> W residues and improve rubbing fastness before redyeing, the goods should be treated (after rinsing) with 2% INVALIDON<sup>®</sup> DAM for 10 min at 40°C/104°F and rinsed again. Redye in a fresh bath.

**Note:** LANASET<sup>®</sup> Violet B, Blue 2R and Blue 5G can only be weakened marginally.

## Mothproof and beetleproof finishing

MITIN<sup>®</sup> FF gives lasting protection against clothes moth, fur and carpet beetle larvae. The effects are fast to light and washing. The finish can be applied in the dyebath by adding 1–1.5% MITIN<sup>®</sup> FF HC or 2.5–4% MITIN<sup>®</sup> FF liq before all other chemicals.

## Softening of wool by exhaust process

After dyeing, softening agents are applied, usually in a separate bath, to achieve a soft and pleasant hand. Different softeners can be used, depending on the hand required of the specific end product, e. g. soft, elegant, surface smooth, cool, warm, luxurious, drapy, bulky etc.

SAPAMINE<sup>®</sup> CA NEW and ULTRATEX<sup>®</sup> EMJ achieve two of the most commonly requested effects. More options are available.

### Process:

pH	4.5–5.5 (adjusted with acetic acid)
time	15–20 min
temperature	30–40°C (86–104°F)
liquor ratio	3:1–20:1

The amount of softener ranges from 1 to 5%, depending on requirements.

The goods are hydro-extracted without subsequent rinsing and the fabric is dried at 110–130°C (230–266°F).

## Vigoureux printing and continuous dyeing

### Vigoureux printing

Vigoureux printing is a special technique in which slivers of raw, bleached or dyed wool are printed with stripes, steamed, run through a backwasher, and then dried.

Advantages of vigoureux printing :

- minimum fiber damage
- exceptionally regular melange effects
- virtually no discoloration of the wool
- low steam and water consumption
- low effluent pollution

### Continuous dyeing

Continuous dyeing is done in a single, non-stop pass, slivers of raw wool being padded with liquor, steamed, run through a backwasher, and then dried.

Advantages of continuous dyeing:

- minimum fiber damage
- uniform appearance of entire dyed batch
- good coverage of different qualities of wool
- almost no discoloration of the wool
- good reproducibility
- low steam and water consumption
- low effluent pollution

### Dye selection

LANASET® dyes are used in vigoureux printing and continuous dyeing to produce highly fast shades on untreated wool. All LANASET® dyes are suitable for this application.

## Printing/dyeing recipes

x	g	dye
y	g	cold water
z	g	boiling water
100–300	g	thickener (2% solution)
10–20	g	acetic acid 80%
2	g	LYOPRINT® AP
10–30	g	THERMACOL® PN
5–10	g	ALBEGAL® SET
<hr/>		
1000	g	

## Thickening

The amount of dye applied can largely be controlled by the viscosity of the print paste or padding liquor.

The right thickening is the key to good printing. In principle, only thickeners should be used which are easy to wash off and resistant to acid, e.g. guar based thickener. When present in the print paste or padding liquor, the thickener should be well dissolved, otherwise problems can arise, e.g. agglomeration of dye and thickener, sticking on the backwasher, wrapping round rollers, dusting during gilling or spinning. To be on the safe side, therefore, many mills prefer to use stock thickenings.

## Steaming times

The steaming times tabulated below are for guidance only. In each specific case the precise length of the treatment will depend on depth of shade, steaming temperature, density of material and type of steamer used.

	<b>semi-continuous</b>	<b>continuous</b>
pale shades	30–60 min	15–30 min
deep shades	about 60 min	20–45 min

Saturated (not superheated) steam should be used. If dry steam is used, it is good practice to add the necessary moisture by injecting water, to interrupt steaming after half the time has elapsed, and to allow the slubbing to cool down. The steaming temperature is 100–102°C (212–216°F), depending on the type of steamer.

## Dyeing of wool blends

The versatility of the LANASET<sup>®</sup> dyeing system is further reflected in its suitability for blends of wool with other fibers. The most important blends are:

- wool/polyester
- wool/polyamide
- wool/acrylic fibers
- wool/cellulose
- wool/silk

Blends of wool with other fibers require close attention by the dyer. The problem is, first, to achieve solid shades given the different dyeing behavior of the blended fibers and, second, the compatibility of the required dye classes. The LANASET<sup>®</sup> dyeing system is an excellent way to dye various fiber blends with the same dye range and achieve high reproducibility and good fastness properties.

## Wool/polyester blends

### Outlets

PES/wool blended fabrics are mainly used for apparel, i.e. suits. Blending wool with PES makes the fabric cheaper and increases durability and wrinkle-resistance. Main outlets are worsted fabrics. The most common blend ratio for PES/WO is 55:45 but a large variety of other blend ratios can also be found in the market. PES/WO blends are dyed in piece form (solid shades) or as yarn on packages (for pattern wovens).

### Dyeing system

All LANASET<sup>®</sup> dyes are ideal for PES/WO blends. They are applied at pH 4.5, which guarantees optimum wool preservation, and perfect conditions for the dispersion stability of TERASIL<sup>®</sup> disperse dyes. LANASET<sup>®</sup> dyes are stable at 120°C/248°F and have excellent migration at this temperature, therefore they can also be recommended for piece dyeing of PES/WO blends. All LANASET<sup>®</sup> dyes are noted for very good reservation of PES. The selection of dyes follows the same rules as for pure wool.

Excellent technical behavior during dyeing and good fastness properties make the LANASET<sup>®</sup> dyes the ideal range for dyeing PES/WO blends:

- coverage of a wide range of colors, including brilliant shades
- pale to deep shades attainable, including navy and black
- one-bath dyeing method
- shade stability at 120°C/248°F, no interference with wool protecting agents
- optimal wool protection
- good overall light and wet fastness

## Important parameters for dyeing polyester and wool blends

### Dyeing temperature and time

The most common dyeing temperature is 120°C/248°F. At this temperature the selected TERASIL<sup>®</sup> dyes show good build-up on PES and the wool quality is largely preserved if a wool-protecting agent is used (MIRALAN<sup>®</sup> HTP or MIRALAN<sup>®</sup> HTW). The normal dyeing time is 45 min, the maximum time limit at 120°C/248°F is 60 min. Alternatively PES/WO blends can be dyed at 106°C /223°F. But in this case a diffusion accelerant has to be used to achieve sufficient build up on PES and only low-energy disperse dyes can be used. For very fine weaving yarns, where even a small reduction of tensile strength is not acceptable, a maximum dyeing temperature of 115°C/239°F in presence of a wool protecting agent is recommended.

### Wool protecting agent

MIRALAN<sup>®</sup> HTW improves the heat resistance and preserves the mechanical and technological properties of the wool fiber at 120°C/248°F. The best effects are achieved by using 4% MIRALAN<sup>®</sup> HTW. MIRALAN<sup>®</sup> HTP is free of formaldehyde and achieves similar effects at the same usage level.

### Diffusion accelerants

At a dyeing temperature of 120°C/248°F for pale and medium shade depths no diffusion accelerant is required as a rule. For dark shades, especially black and navy, addition of the diffusion accelerant UNIVADINE<sup>®</sup> PB results in better exhaustion and higher reproducibility. At dyeing temperatures below 120°C/248°F UNIVADINE<sup>®</sup> PB is necessary for most types of PES to achieve sufficient build-up. Too much diffusion accelerant can cause blocking effects, depending on the PES type.

### TERASIL<sup>®</sup> dye selection

The right selection of TERASIL<sup>®</sup> disperse dyes is essential for good results. The main criteria for the selection of TERASIL<sup>®</sup> dyes are stability to reduction and low staining on wool. The recommended TERASIL<sup>®</sup> dyes are shown in the following table. For details see TERASIL<sup>®</sup> pattern card.

Shade area	Tri-chromy	Yellow and Orange	Brilliant Scarlet Red	Red	Bor-deaux	Violet	Blue	Green	Brown	Navy	Black
<b>TERASIL®</b>											
Yellow W-6GS	<input type="checkbox"/>	<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			
Golden Yellow W-3R		<input checked="" type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brown 2RFL	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red 4GN			<input checked="" type="checkbox"/>	<input type="checkbox"/>							
Red R			<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
Red G 150%	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>		
Red FBN CONC	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Red 3BL-01 150%					<input checked="" type="checkbox"/>	<input type="checkbox"/>					
Rubine 2GFL	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
Violet BL-01 150%					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Blue 3RL-02 150%	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Blue BGE-01 200%		<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Navy BRW / NFR										<input checked="" type="checkbox"/>	
Black MAW / BFR											<input checked="" type="checkbox"/>

basis                       shading element

### Trichromatic recommendation

TERASIL® Brown 2RFL or Yellow W-6GS

TERASIL® Red G 150% or Rubine 2GFL

TERASIL® Blue 3RL-02 150%.

### TERASIL® Yellow W-6GS

Basis for brilliant green shades together with TERASIL® Blue BGE-01 200%. Trichromatic element if Brown 2RFL is not suitable.

### TERASIL® Red R

Economical trichromatic red element, but poorer wool reservation than TERASIL® Red G 150%, our main recommendation.

### TERASIL® Red 4GN, Red FBN CONC, Rubine 2GFL and Red 3BL-01 150%

Recommended in cases when TERASIL® Red R or Red G 150% cannot achieve the required shade.

### TERASIL® Black BFR and Navy NFR

Both dyes are free of C.I. Disperse Orange 37/76. They need 60 min dyeing time at 120° C and UNIVADINE® PB to achieve adequate build up and reproducibility.

TERASIL® Black MAW is not suitable for Oeko-Tex Standard 100.

### Dyeing at 106°C

The build-up of most disperse dyes is insufficient at this temperature. Only low-energy dyes in presence of a diffusion accelerant like UNIVADIN® PB are suitable.

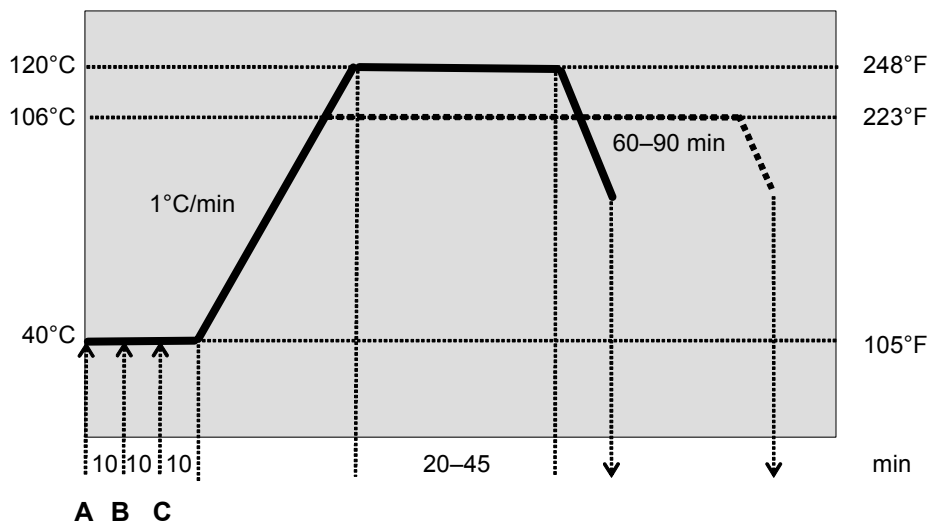
Recommendation for trichromatic dyeings:

TERASIL® Yellow 4G

TERASIL® Red G 150% or Red FBN CONC

TERASIL® Blue 3RL-02 150%.

## Dyeing procedure for WO/PES blends with LANASET® and TERASIL® dyes



- A**    0.5 g/l    ALBAFLOW® CIR or ALBAFLOW® UNI  
        1 g/l    MIRALAN® Q
- B**    0.5 %    ALBEGAL® SET  
        4 %    MIRALAN® HTW or MIRALAN® HTP  
        0-1 g/l    UNIVADINE® PB  
        3-4 %    ALBATEX® AB-45 (or 1 g/l sodium acetate cryst. + x% acetic acid 80%)  
        pH 4.5
- C**    y %    LANASET® dyes  
        z %    TERASIL® dyes

A hydrosulfite reduction clear after dyeing is not recommended owing to the sensitivity of wool to this process. A wash off with 2 g/l ERIOPON® OS at pH 4-5 at 70°C/158°F for 20 min is recommended for deep shades to remove disperse dye stains from the wool.

# Wool/polyamide blends

## Outlets

Polyamide fibers are often blended with wool to strengthen its mechanical properties without losing the typical wool character. Main outlets for this blend are woolen fabrics for coats, knitting yarns for socks and carpet yarns. The main WO/PA blend ratio is 80/20.

## Dyeing system

Polyamide is chemically related to wool because amino groups are integral components of both fibers. Therefore polyamide can be dyed with the same dyes as wool. The LANASET<sup>®</sup> dyeing system offers the following advantages:

- coverage of a wide range of colors, including brilliant shades
- one-bath dyeing method
- excellent tone-in-tone dyeing of both fibers
- trichromatic systems available
- good light fastness for carpet yarn dyeing
- ideal for deep shades due to high wet fastness

## Parameters influencing partition between wool and polyamide

### Polyamide fiber type

The most common polyamide types are PA 6 and PA 66. PA 6 has higher dye affinity than PA 66 and therefore needs more blocking agent to achieve solid shades on its blends with wool. Beside this difference based on chemical composition, the fiber fineness (dtex), fiber surface/cross section (round, trilobal, etc.), degree of delustering, texturing, and pretreatment (heat setting) influence the color depth on polyamide.

### Wool fiber

Quality and type, fiber diameter and pretreatment, all influence the uptake and shade depth on wool. If the wool has been treated by a shrink-resist-process its dye affinity is increased appreciably. In most of these cases wool then dyes to a darker shade than the polyamide blended with it.

### Blocking agent

Blocking agents like ERIONAL<sup>®</sup> RF or ERIONAL<sup>®</sup> PAS consist of colorless anionic compounds having high affinity for polyamide. They partially saturate the polyamide fiber and allow the dye to move onto the wool portion of the blend. The amount of blocking agent has to be adjusted so that an even distribution can be achieved between the fibers. The required amount of blocking agent depends on the dyes used, dye concentration, fiber type and blend ratio, and has to be determined in preliminary lab trials simulating bulk conditions as closely as possible.

## Dye concentration

The distribution of dyes between the two fibers depends strongly on the applied dye concentration. At pale to medium depths below the saturation limit of polyamide, this fiber is generally colored deeper than wool. Therefore dye uptake by polyamide must be retarded with a blocking agent, such as ERIONAL® RF. In medium to deep shades an even distribution between the fibers is often encountered. In deep shades many dye classes dye the wool darker. In such cases the polyamide has to be covered with dyes having high affinity for polyamide.

## Dye selection

Besides the dye selection based on end-use requirements such as wet and light fastness properties, each individual dye has different affinity for wool and polyamide. This means that some dyes dye wool darker and some dye polyamide darker. For dye combinations it is very important that the individual dyes distribute more or less evenly between wool and polyamide and that they react similarly to the same amount of blocking agent to give good solidity.

## LANASET® dye selection

The following table shows the affinity of the LANASET® dyes for polyamide. Dyes with low affinity for polyamide need less blocking agent than dyes with medium or high affinity. For combination shades dyes should be selected if possible only from the group with the same affinity in order to achieve best solidity.

The following LANASET® dyes are highly suitable for combinations in the more muted shade area, allowing a wide range to be covered:

LANASET® Yellow 2R  
LANASET® Red 2GA-01  
LANASET® Brown B  
LANASET® Grey G  
LANASET® Blue 2RA

Classification of LANASET® dyes according to their affinity for polyamide and the necessary amount of blocking agent for good solid shades.

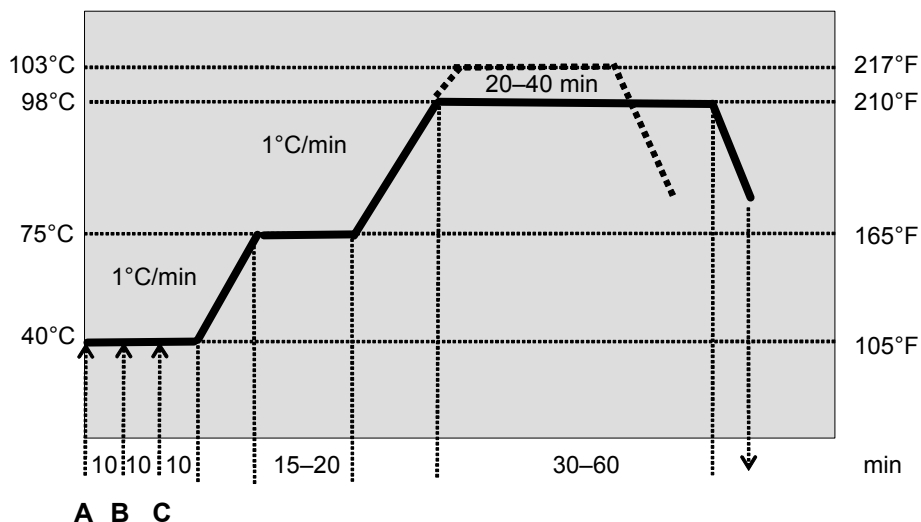
<b>low affinity low amount of ERIONAL® RF</b>	<b>medium affinity medium amount of ERIONAL® RF</b>	<b>high affinity high amount of ERIONAL® RF</b>
LANASET® Yellow 4GN LANASET® Orange RN LANASET® Violet B LANASET® Blue 2R LANASET® Green B	LANASET® Red G LANASET® Red 2B LANASET® Blue 5G	LANASET® Yellow 2R LANASET® Red 2GA-01 LANASET® Bordeaux B LANASET® Brown B LANASET® Blue 2RA LANASET® Navy R LANASET® Grey G LANASET® Black B

## Recommendations for combination shades

Shade area	Trichromatic system	Brilliant Yellow	Yellow Olive	Orange	Scarlet Brilliant Red	Red	Bordeaux	Violet	Blue	Green	Brown	Navy	Black
<b>LANASET®</b>													
Yellow 4GN		■		□						□			
Yellow 2R	■		■			□	□		(□)		□	□	□
Orange RN		□		■	□			□		(□)			
Brown B	□										■		
Red 2GA-01	■		□			■	□				□	□	□
Red G					□								
Red 2B				□	■								
Bordeaux B					□	□	■		□			□	□
Violet B								■					
Blue 2R								□					
Blue 2RA	□		(□)				□		■			□	□
Blue 5G		(□)		(□)	□			(□)	□	□			(□)
Green B		□		□						■			
Grey G	■		□			□	□		□		□	□	
Navy R												■	□
Black B													■
Amount of blocking agent	high	low	high	low	medium	high	high	low	high	low	high	medium - high	medium - high

■ = basis    □ = shading component    (□) = shading dye if necessary

## Dyeing procedure for WO/PA blends with LANASET® dyes



A    0.5 g/l    ALBAFLOW® CIR or ALBFLOW® UNI  
       1 g/l    MIRALAN® Q  
       0-4 %    ERIONAL® RF or ERIONAL® PAS \*  
       5 %    Glauber's salt anhyd.  
       1 g/l    sodium acetate cryst.  
       x %    acetic acid 80%

---

pH 4.5-5.5

B        1 %    ALBEGAL® SET  
 C        y %    LANASET® dyes

\* The necessary amount of blocking agent depends on the type of polyamide and the dye concentration used. It has to be determined in preliminary lab trials on the specific material and shade.

### Mothproofing of WO/PA blends

MITIN® FF is anionic, has affinity for PA and acts like a blocking agent. The blocking effect is very selective and can impair shade solidity. Therefore an aftertreatment at 60-80°C/140-176°F for 30 min is recommended.

## Wool/acrylic blends

### Outlets

The most important outlets for acrylic/wool blends are knitted textiles for sportswear, leisurewear and fashionable men's and women's outerwear, plus hand knitting yarns.

These blends are dyed primarily in yarn form as packages or muffs. Hand knitting yarns and high-quality machine knitting yarns are also hank-dyed for the best results.

### Dyeing system

A suitable dyeing system comprises LANASET<sup>®</sup>/MAXILON<sup>®</sup> dyes, the main benefits of which are:

- coverage of a wide range of colors, including brilliant shades
- trichromatic systems available
- pale to deep shades attainable, including navy and black
- good overall light and wet fastness
- one-bath, two-stage dyeing method except for black
- good stability of the dyebath containing LANASET<sup>®</sup> and MAXILON<sup>®</sup> dyes

### MAXILON<sup>®</sup> dye selection

The most important criteria for selecting cationic dyes are sensitivity to reduction and reservation of the wool.

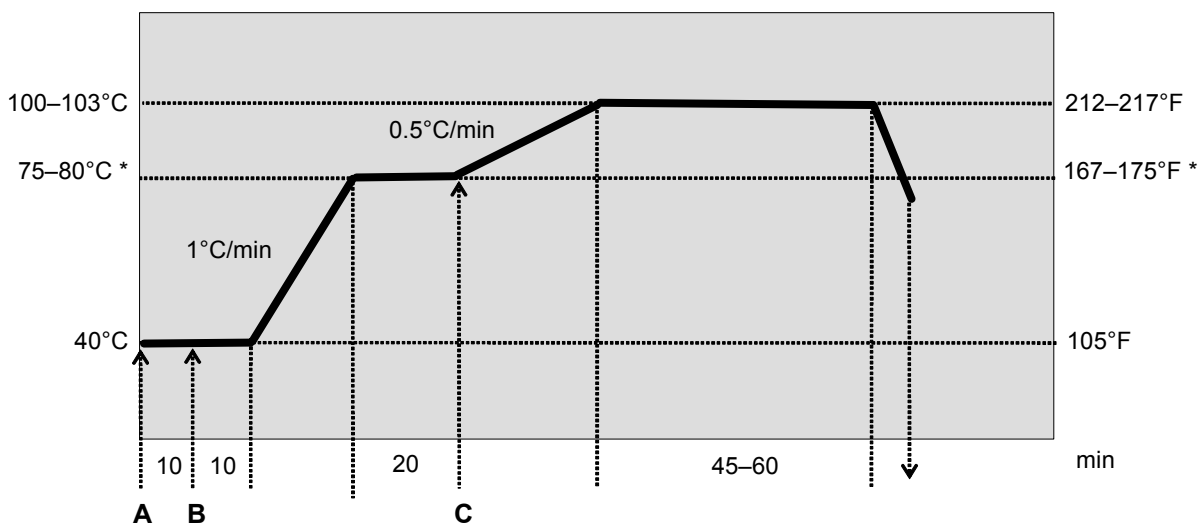
The trichromatic system for acrylic/wool comprises:

- MAXILON<sup>®</sup> Golden Yellow GL
- MAXILON<sup>®</sup> Red SL
- MAXILON<sup>®</sup> Blue SL

For green shades and flair control, MAXILON<sup>®</sup> Yellow GL and MAXILON<sup>®</sup> Blue 5G are very suitable.

For further details and suitability of other MAXILON<sup>®</sup> dyes see also pocket card 512003.

## Dyeing procedure for WO/PAN blends with LANASET® and MAXILON® dyes



\* below the glass transition point of the PAN fiber used

A     0.5 g/l    ALBAFLOW® UNI or ALBAFLOW® FFA-01  
       0.5-1 %    ALBEGAL® SET  
       0-3 %     Glauber's salt anhyd.  
       3-4 %     ALBATEX® AB-45 (or 1 g/l sodium acetate + x% acetic acid 80%)  
       pH 4.5

B        y %     LANASET® dyes

C        z %     MAXILON® dyes  
       0-1.5 %    TINEGAL® BDR

The wet fastness of deep shades can be improved by washing off with 1-2 g/l INVALON® DAM (pH 4) for 20 min at 60-65°C/140-149°F followed by thorough rinsing.

### Black shades

Blacks are dyed in a two-bath process, dyeing first the acrylic fiber and subsequently in a fresh bath the wool portion.

## Wool/silk blends

### Outlets

Wool/silk blends are mainly used for apparel in woven or knitted form to give them a luxury character. A large variety of blend ratios can be found ranging from 5 to 50% of silk. WO/S blends are dyed in piece form or as yarn on packages and hanks.

### Dyeing system

Silk is chemically related to wool because amino groups are integral components of both fibers. Therefore silk can be dyed with the same dyes as wool. The LANASET<sup>®</sup> dyeing system offers the following advantages:

- coverage of a wide range of colors, including brilliant shades
- one-bath dyeing method
- excellent solid shades
- trichromatic systems available
- pure silk, pure wool and blended goods can be dyed with the same dyes

### Parameters influencing partition between wool and silk

#### Silk fiber type

The quality and type of silk fibers e.g. mulberry silk, tussah silk, weighted silk, influence the distribution of dyes between silk and wool. The silk used in blends should be degummed before fiber blending to avoid negative influence of the silk gum on dyeing performance and fastness.

#### Wool fiber

Quality and type of wool, fiber diameter and pretreatment all influence uptake and shade depth on the fiber. If the wool has been treated by a shrink-resist process the dye affinity is increased appreciably. In most of these cases wool then dyes darker than the silk blended with it.

#### Amount of salt

Glauber's salt is the major reagent to control the distribution of dyes between wool and silk. Salt retards the dye uptake on wool in favor of silk.

#### Dyeing temperature

Dyeing at a low temperature favors a deeper dyeing on silk. However too low a dyeing temperature has a negative influence on the wet fastness on wool. The best temperature for LANASET<sup>®</sup> dyes for this blend is 90°C/194°F.

#### Dyeing pH

The distribution of dyes between the two fibers depends on the pH used. A lower pH favors a deeper dyeing of silk. In order to obtain reproducible results, the use of a buffer like sodium acetate is recommended.

## LANASET<sup>®</sup> dye selection

With most LANASET<sup>®</sup> dyes solid shades can be achieved on wool/silk blends. Therefore the normal recommendations including the trichromatic system LANASET<sup>®</sup> Yellow 2R, Red G and Grey G can be followed with the following exceptions:

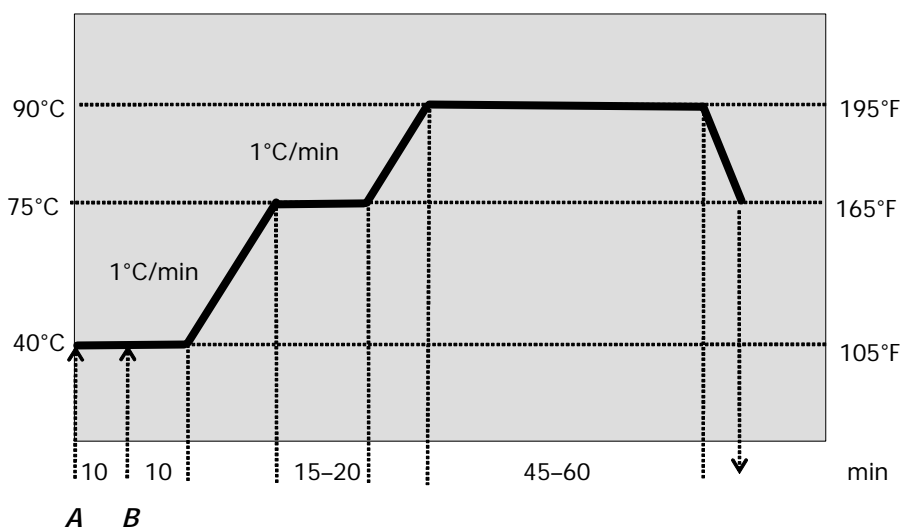
LANASET<sup>®</sup> Red 2B, Blue 2R, Blue 2RA and Navy R dye silk lighter than the other LANASET<sup>®</sup> dyes. Dyeing at pH 4.5 and using higher amounts of salt can improve the depth on silk.

**Blue shades:** Good partition is obtained by a combination of LANASET<sup>®</sup> Blue 5G and Violet B.

**Navies:** Solid shades can be achieved by a combination of LANASET<sup>®</sup> Navy R and Black B. Alternatively navies could be based on LANACRON<sup>®</sup> Navy S-G 150%.

**Blacks:** Dyeings with LANASET<sup>®</sup> Black B need less salt and only 0.5% ALBEGAL<sup>®</sup> SET.

## Dyeing procedure for WO/S blends with LANASET<sup>®</sup> dyes



- |            |           |  |
|------------|-----------|--|
| A          | 0.5 g/l   | ALBAFLOW <sup>®</sup> CIR or ALBAFLOW <sup>®</sup> FFA |
|            | 1 g/l     | MIRALAN <sup>®</sup> Q                                 |
|            | 1 %       | ALBEGAL <sup>®</sup> SET                               |
|            | 10-40 g/l | Glauber's salt anhyd.                                  |
|            | 1 g/l     | sodium acetate cryst.                                  |
|            | x %       | acetic acid 80%  |
| pH 4.5-5.5 |           |  |
| B          | y %       | LANASET <sup>®</sup> dyes                              |

### Note:

In order to establish the best dyeing conditions for solid shades, lab trials under identical conditions are recommended.

Wet fastness on silk is generally lower than on wool. If necessary an aftertreatment in a fresh bath with 2% ERIONAL<sup>®</sup> ECS at pH 5-6 for 20 min at 40°C/104°F can be given to improve wet fastness.

## Wool/cellulose blends

### Outlets

Wool/cellulose blends are mainly used for apparel in woven or knitted form. A large variety of blend ratios can be found ranging from 80/20 to 20/80. WO/CEL blends are dyed in piece form or as yarn on packages and hanks.

### Dyeing systems

LANASET dyes have excellent reservation of cellulosic fibers. Therefore they are ideal for this blend. There are no restrictions on LANASET<sup>®</sup> dye selection therefore the same rules as for pure wool can be followed. The two major methods to dye WO/CEL blends are a one-bath dyeing method using SOLOPHENYL<sup>®</sup> direct dyes and a two-bath method using NOVACRON<sup>®</sup> F/FN reactive dyes for the cellulose portion.

### LANASET<sup>®</sup>/SOLOPHENYL<sup>®</sup> dyeing method

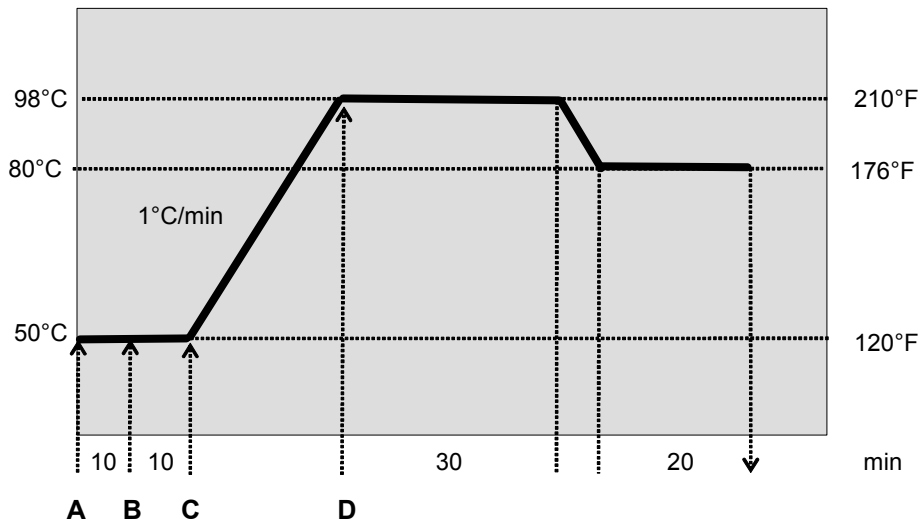
This economical one-bath dyeing method is recommended for pale to medium shade depths because of the typical wet fastness level of direct dyes. A dyeing pH of 5.5 is used to ensure good exhaustion of the LANASET<sup>®</sup> dyes on wool and minimize staining of the wool by the SOLOPHENYL<sup>®</sup> dyes. Blocking agent ERIONAL<sup>®</sup> RF or ERIONAL<sup>®</sup> PAS is mandatory, otherwise SOLOPHENYL<sup>®</sup> dyes will mainly dye the wool portion.

### SOLOPHENYL<sup>®</sup> dye selection

The selection of SOLOPHENYL<sup>®</sup> dyes is governed by minimum staining of wool under dyeing conditions and stability to reduction in presence of wool. The following SOLOPHENYL<sup>®</sup> dyes are recommended ( $\Delta$  = trichromatic dye):

SOLOPHENYL <sup>®</sup>	Recommended trichromatic systems	
	standard	pale shades
Flavine GFE 500%		
Yellow GLE	$\Delta$	
Yellow ARLE 154%	$\Delta$	
Orange ARLE 220%		$\Delta$
Orange TGL 182%		
Scarlet BNLE 200%	$\Delta$	$\Delta$
Red 4GE		
Red 3BL 140%		
Red 7BE		
Bordeaux 3BLE 140%		
Royal Blue RFE		
Blue GL 250%		
Blue FGLE 220%	$\Delta$	
Blue TLE		$\Delta$
Turquoise BRLE 400%		
Green BLE 155%		
Gray 4GLE 400%		
Navy BLE 250%		

## Dyeing procedure for WO/CEL blends with LANASET<sup>®</sup> and SOLOPHENYL<sup>®</sup> dyes



A    0.5 g/l    ALBAFLOW<sup>®</sup> CIR or ALBAFLOW<sup>®</sup> UNI  
       2–4 %    ERIONAL<sup>®</sup> RF or ERIONAL<sup>®</sup> PAS  
       0.5–1 %    ALBEGAL<sup>®</sup> SET  
       1 g/l    sodium acetate cryst.  
       x %    acetic acid 80%

---

pH 5.5

B        y %    LANASET<sup>®</sup> dyes  
       z %    SOLOPHENYL<sup>®</sup> dyes

C    1/5 part    Glauber's salt anhyd. (for amount see SOLOPHENYL<sup>®</sup> pattern card)

D    4/5 parts    Glauber's salt anhyd.

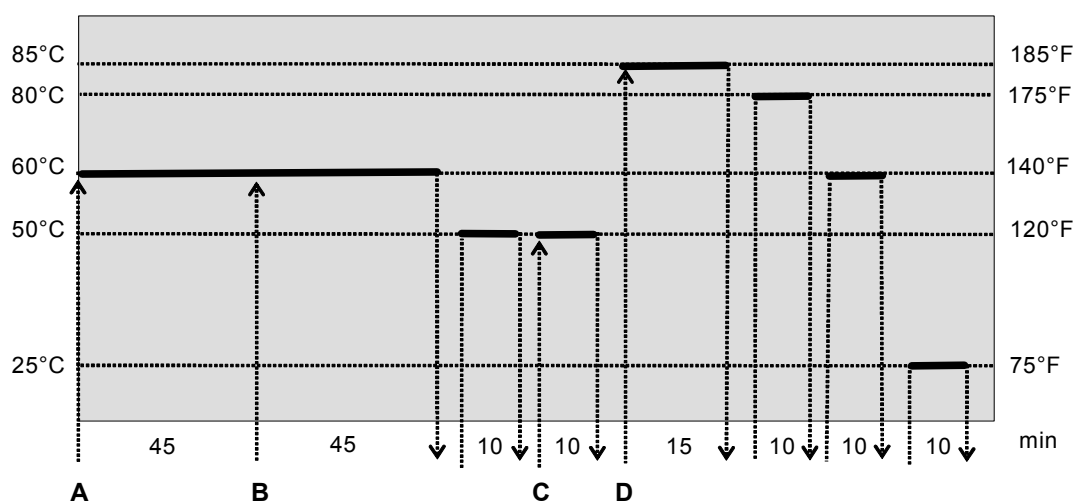
### Note:

If necessary an aftertreatment in a fresh bath with 2 % ERIONAL<sup>®</sup> ECS at pH 5–6 for 20 min at 40°C/104°F can be given to improve wet fastness.

## LANASET®/NOVACRON® F/FN dyeing method

For higher fastness requirements in medium to deep shades the cellulose portion of the blend is preferably dyed with NOVACRON® F/FN reactive dyes. The dyeing has to be done by a two-bath-procedure, dyeing first the cellulose and, after soaping and rinsing, the wool portion in a fresh bath. NOVACRON® F/FN dyes always stain the wool somewhat. This staining is fast and the wool recipe has to be adjusted accordingly. In order to minimize damage to the wool only soda ash should be used for fixation (see table below) and the temperature should not exceed 60°C. The amount of soda ash and salt should be calculated for the amount of NOVACRON® F/FN dye based on pure cellulose. For selection of NOVACRON® F/FN dyes, see corresponding pattern card.

### First bath: NOVACRON® F/FN dyeing procedure



<b>A:</b>	ALBAFLOW® FFC	g/l	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	LYOPRINT® RG	g/l	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	NOVACRON® (based on pure CEL)	%	<b>0–0.5</b>	<b>0.5–1</b>	<b>1–2</b>	<b>2–3</b>	<b>3–4</b>	<b>4–5</b>	<b>&gt; 5</b>
	Glauber's salt	g/l	20–30	30–40	40–50	50–60	60–70	70–80	90
<b>B:</b>	soda ash	g/l	2	3	4	5	5	6	7
<b>C:</b>	acetic acid 80% pH 7		x	x	x	x	x	x	x
<b>D:</b>	ERIOPON® R LIQ	g/l	1	1	1	1.5	1.5	2	2

#### Note:

Soaping should be done at a neutral pH. Too high a pH has a negative influence on the wool quality and at a low pH the hydrolyzed dye exhausts onto the wool.

### Second bath: LANASET® dyeing procedure

For the wool component the normal dyeing procedure on page 13 can be followed.

## Machine-washable finish for wool and its blends

Durable machine-washable, wash and wear, non-felting, crease-resistant finishes on wool and its blends can be easily achieved with DICRYLAN<sup>®</sup> WSR-01.

### DICRYLAN<sup>®</sup> WSR-01

DICRYLAN<sup>®</sup> WSR-01 is an aqueous solution of a modified polyurethane and a polydimethyl siloxane. It forms a durable film around the wool fiber, protecting it from shrinkage, and provides outstanding machine-washability whilst maintaining the natural wool character.

#### DICRYLAN<sup>®</sup> WSR-01:

- retains the natural soft handle, the “hallmark” of pure new wool.
- imparts excellent antifelting properties to wool and wool blends
- gives wool garments good shape retention properties and improves springback in wash and wear
- can be combined with stain protection agents to meet TEFLON specifications
- has virtually no influence on color fastness, fiber strength and wear properties
- enhances wool’s natural attributes
- requires no chlorine pretreatment

#### DICRYLAN<sup>®</sup> WSR-01:

- meets the high requirements of the consumer:
- good wash and wear behavior, easy-care and shape retention properties
- soft, natural handle and comfort next to the skin
- prolonged attractive appearance of finished textiles
- enhanced anti-pilling properties
- ease of care, practicality and convenience in wool garments
- domestic machine washing rather than dry cleaning

## Application of DICRYLAN® WSR-01

DICRYLAN® WSR-01 is generally applied by padding. The required amount is 30–60 g/l DICRYLAN® WSR depending on fabric, method and requirements.

The padding liquor has to be prepared with soft water.

Pick-up about 60–90%, bath temperature about 20°C/68°F.

Drying at 110–130°C/230–266°F, subsequent curing for 4–5 min at 150°C/302°F (hotflue) or drying and curing on a stenter (total treatment time 40–70 s)

zone 1	110°C/230°F
zone 2	130°C/266°F
zones 3, etc.	150–160°C/302–320°F

## Suggested recipes with DICRYLAN® WSR-01

### 1. *Non-felting finish on woven or knitted wool fabric*

2–5	g/l	sodium bicarbonate
30–60	g/l	DICRYLAN® WSR-01
0–5	g/l	INVADINE® PBN

### 2. *Non-felting finish on woven or knitted wool fabric with softer handle*

2–5	g/l	sodium bicarbonate
30–60	g/l	DICRYLAN® WSR-01
20–40	g/l	ULTRATEX® AF Base
0–5	g/l	INVADINE® PBN

### 3. *Non-felting finish on wool woven or knitted fabric with water and oil repellent effects*

30–60	g/l	DICRYLAN® WSR-01
30–60	g/l	OLEOPHOBOL® L SL
0–10	g/l	PHOBOL® XAN
0–5	g/l	INVADINE® PBN

When DICRYLAN® WSR-01 is applied in combination with OLEOPHOBOL® SL the best effects are achieved with a neutral to weakly alkaline fabric. Here the liquor should be prepared without sodium bicarbonate.
















































Textile Effects

# LANASET<sup>®</sup> dyes

Patterns and properties

## Patterns and properties

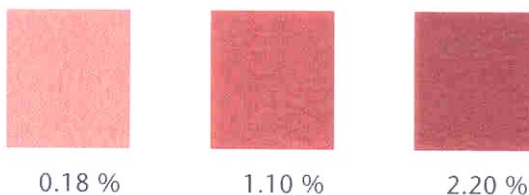
<b>LANASET®</b>	
<b>Yellow 4GN</b>	Brilliant lemon yellow for self-shades or brilliant greens in combination with LANASET® Blue 5G.
<b>Yellow 2R</b>	Cost effective basis for restrained yellow shades and combination shades. Excellent compatibility especially with LANASET® Red G and Grey G.
<b>Orange RN</b>	Basis for brilliant orange shades with very good build up.
<b>Brown G-01</b>	Reddish brown as basis for light to medium beige and brown shades.
<b>Brown B</b>	Cost effective basis for medium and dark brown shades.
<b>Red G</b>	Basis for restrained red shades and combination shades. Excellent compatibility especially with LANASET® Yellow 2R and Grey G.
<b>Red 2B</b>	For brilliant red shades with high light and wet fastness properties.
<b>Bordeaux B</b>	Basis for bordeaux shades.
<b>Violet B</b>	Brilliant violet with high light and wet fastness properties. Can be shaded with LANASET® Red 2B and Blue 2R.
<b>Blue 2R</b>	Brilliant blue for royal blue self-shades with high fastness properties. Can be shaded with LANASET® Violet B and Blue 5G.
<b>Blue 5G</b>	Greenish blue with high fastness properties. Basis for brilliant greens with LANASET® Yellow 4GN. To correct shade shifts in artificial light towards green.
<b>Green B</b>	Basis for green and olive shades with a high fastness level.
<b>Grey G</b>	Bluish grey with high light fastness for greys and combination shades. Excellent compatibility with LANASET® Yellow 2R and Red G.
<b>Navy R</b>	Brilliant navy blue. Basis for medium to dark navy shades with high fastness properties.
<b>Black B</b>	Neutral black with good build up and levelling properties at a high fastness level.

LANASET Yellow 4GN				LANASET Violet B			
	0.23 %	1.4 %	2.8 %		0.27 %	1.6 %	3.2 %
LANASET Yellow 2R				LANASET Blue 2R			
	0.23 %	1.4 %	2.8 %		0.33 %	2.0 %	4.0 %
LANASET Orange RN				LANASET Blue 5G			
	0.28 %	1.7 %	3.4 %		0.37 %	2.2 %	4.4 %
LANASET Brown G-01				LANASET Green B			
	0.22 %	1.3 %	2.6 %		0.32 %	1.9 %	3.8 %
LANASET Brown B				LANASET Gray G			
	0.2 %	1.2 %	2.4 %		0.17 %	1.0 %	2.0 %
LANASET Red G				LANASET Navy R			
	0.17 %	1.0 %	2.0 %		1.3 %	2.6 %	3.9 %
LANASET Red 2B				LANASET Black B			
	0.28 %	1.7 %	3.4 %		1.1 %	2.3 %	3.5 %
LANASET Bordeaux B							
	0.15 %	0.9 %	1.8 %				

## LANASET supplementary dyes

These dyes have been especially developed to achieve best shade solidity on wool/polyamide blends (see page 21).

LANASET Red 2GA-01



Trichromatic red component for WO/PA blend dyeing in combination with LANASET Yellow 2R and Grey G.

LANASET Blue 2RA



Brilliant royal blue with higher migration than LANASET<sup>®</sup> Blue 2R.

Especially suitable as basis for blue shades on WO/PA blends in combination with LANASET<sup>®</sup> Red 2GA-01, Bordeaux B and Grey G.

# LANASET® combination shades



1.8 % Yellow 4GN  
0.06 % Orange RN



0.16 % Orange RN  
2.0 % Violet B  
0.14 % Blue 2R



0.02 % Yellow 4GN  
0.6 % Blue 5G  
1.1 % Green B



0.19 % Yellow 2R  
0.012 % Red G  
0.085 % Brown B



2.9 % Yellow 4GN  
0.18 % Orange RN



0.2 % Red G  
1.0 % Violet B  
1.5 % Blue 2R



0.7 % Yellow 4GN  
0.07 % Red G  
2.5 % Green B



1.3 % Yellow 2R  
0.33 % Red G  
0.15 % Gray G



1.1 % Yellow 2R  
0.37 % Orange RN  
0.008% Brown G-01



0.7 % Violet B  
1.5 % Blue 2R



1.2 % Yellow 4GN  
1.4 % Green B



0.73 % Yellow 2R  
0.97 % Brown B  
0.02 % Gray G



0.91 % Orange RN  
0.8 % Red 2B



1.7 % Blue 2R  
0.9 % Blue 5G  
0.03 % Gray G



2.0 % Yellow 4GN  
0.5 % Blue 5G



0.7 % Yellow 2R  
0.7 % Red G  
0.23 % Gray G



0.36 % Yellow 2R  
2.3 % Red 2B  
0.04 % Gray G



0.1 % Yellow 2R  
0.95 % Blue 2R  
1.1 % Blue 5G



0.6 % Yellow 4GN  
0.09 % Yellow 2R  
0.2 % Green B



0.07 % Yellow 2R  
0.04 % Red G  
0.16 % Gray G



3.0 % Red 2B  
0.1 % Bordeaux B



0.13 % Yellow 2R  
1.0 % Blue 2R  
1.3 % Navy R



2.0 % Yellow 4GN  
0.1 % Blue 5G



0.04 % Yellow 2R  
0.1 % Red G  
0.7 % Gray G



0.02 % Yellow 2R  
0.7 % Red G  
1.5 % Bordeaux B



0.5 % Red G  
2.5 % Navy R



2.0 % Yellow 2R  
0.35 % Green B  
0.08 % Gray G



1.0 % Yellow 2R  
2.5 % Black B

## LANASET® properties and fastness data

LANASET®	Xenon lamp SD				Solubility g/l		Solution stability g/l		Change in artificial light	
	1/12	1/3	1/1	2/1	90°C	60°C	60°C	30°C	A	TL 84
Yellow 4GN	5	5-6	6	6-7	80	80	80	80	RR	R
Yellow 2R	5	5	5-6	6	80	80	80	80	RR	R
Orange RN	5	5-6	6	6-7	65	30	65	65	RR	R
Brown G-01	5	5-6	6	6-7	65	65	65	65	R	R
Brown B	5-6	6	6-7	6-7	80	50	80	100	R	R
Red G	4	5	5-6	6	100	100	100	100	YY	Y
Red 2GA-01	4	5	5-6	6	80	80	80	80	YY	Y
Red 2B	4	5	5-6	6	30	20	20	15	YY	Y
Bordeaux B	3-4	4	5	5-6	65	10	20	20	YY	Y
Violet B	4	4-5	5	5-6	80	40	60	60	RR	R
Blue 2R	5	5	5-6	6	80	80	80	80	RD	R
Blue 2RA	4-5	5	5-6	6	80	60	80	80	RD	R
Blue 5G	4-5	5	5-6	6	80	80	80	80	YY	Y
Green B	5	5-6	6	6-7	65	65	65	65	Y	D
Grey G	5	5-6	6	6	80	80	80	80	YY	Br
Navy R	—	—	N/L 5-6	N/Dk 6-7	80	80	80	80	RR	R
Black B	—	—	B/L 7	B/Dk 8	65	65	65	65	RR	Y

LANASET®	%	Washing IWS TM 250, 40°C				Washing C06 B2, 50°C				Perspiration, alk. IWS TM 174				Rubbing	
		Ch	WO	PA	CO	Ch	WO	PA	CO	Ch	WO	PA	CO	dry	wet
Yellow 4GN	1.4	4-5	5	5	5	5	5	4-5	5	4-5	4-5	4	4-5	5	4-5
	2.8	4	5	5	5	5	5	4	5	4-5	4-5	4	4-5	5	4-5
Yellow 2R	1.4	4	5	5	5	5	5	4-5	5	4-5	5	3-4	4	5	4-5
	2.8	4	5	4-5	5	5	5	4-5	5	4-5	3-4	3	3-4	5	4
Orange RN	1.7	4-5	5	5	5	5	4-5	4-5	5	5	5	4-5	4-5	5	4
	3.4	4-5	5	5	5	5	4-5	4-5	5	5	4-5	4	4-5	5	4
Brown G-01	1.3	5	5	5	5	4-5	5	5	5	5	5	5	5	5	4-5
	2.6	4-5	5	5	5	4	5	5	5	5	5	4-5	4-5	5	4
Brown B	1.2	4-5	5	5	5	5	5	4-5	5	4-5	4-5	4-5	4-5	5	4-5
	2.4	4-5	5	4-5	5	5	4-5	4-5	5	4-5	4-5	3-4	4	5	4
Red G	1.0	4-5	5	5	5	4-5	4-5	4	3-4	4-5	4-5	4	4-5	5	4
	2.0	4	5	4-5	5	4-5	4-5	3-4	3-4	4-5	4	3-4	4-5	4-5	3-4
Red 2GA-01	1.1	4-5	4-5	4-5	5	5	4-5	3-4	4-5	4-5	4-5	4-5	4	4-5	3-4
	2.2	4	5	4-5	4-5	4-5	4-5	3-4	4-5	4-5	4-5	4-5	4	4-5	3-4
Red 2B	1.7	4-5	5	4-5	5	5	4-5	4	5	4-5	4	3-4	4	5	4
	3.4	4-5	5	4	4-5	5	4-5	3-4	5	4-5	3-4	2-3	3-4	4-5	3-4
Bordeaux B	0.9	4	5	4-5	5	4-5	5	4	5	4-5	4	3-4	4	5	4
	1.8	4	5	4-5	5	4-5	5	4	5	5	4	3	3-4	5	3-4
Violet B	1.6	4	5	5	5	4-5	5	5	5	4-5	5	4	4-5	5	4
	3.2	4	5	5	5	4	5	5	5	4-5	4-5	3-4	4	4-5	3-4
Blue 2R	2.0	4-5	5	5	5	4-5	4-5	5	5	5	4-5	4	5	4-5	4
	4.0	4-5	5	4-5	5	4-5	4-5	4-5	5	5	4	3-4	4-5	4	4
Blue 2RA	1.8	4-5	4-5	4-5	5	4	4	3-4	5	4-5	4-5	4	4-5	5	3-4
	3.6	4	4-5	4-5	4-5	4	4	3	5	4-5	4	3-4	4-5	4-5	3-4
Blue 5G	2.2	4	5	5	5	4-5	4-5	5	5	4-5	4-5	4	4-5	4-5	4
	4.4	4	5	5	5	4-5	4-5	5	5	4-5	4	3-4	4-5	4	3-4
Green B	1.9	4	5	5	5	4	4-5	5	5	4	5	4-5	5	5	4-5
	3.8	4	5	5	5	4-5	4-5	5	5	4	4-5	4	4-5	5	4-5
Grey G	1.0	4-5	5	4-5	5	4-5	4-5	3-4	5	4-5	5	4-5	5	5	4-5
	2.0	4-5	5	4	5	4-5	4-5	3	5	4-5	4-5	4-5	5	5	4
Navy R	2.6	4-5	5	5	5	4	4-5	3-4	5	4-5	5	4-5	5	5	4
	3.9	4-5	5	4-5	5	4-5	4-5	3-4	5	4-5	4	4	4-5	5	4
Black B	2.3	4-5	5	4-5	5	4-5	4-5	3	5	4	5	4-5	5	5	3-4
	3.5	4-5	5	4	5	4-5	4-5	2-3	5	4-5	5	4-5	4-5	5	3

LANASET®	%	Water, IWS TM 6				Hot water, 70°C			Perspiration, acid			Perspiration, alkaline		
		Ch	WO	PA	CO	Ch	WO	CO	Ch	WO	CO	Ch	WO	CO
Yellow 4GN	1.4	4-5	5	5	5	5	4-5	5	5	4-5	5	4-5	4-5	4
	2.8	4-5	5	4-5	5	5	4	5	5	4	5	4-5	4	3-4
Yellow 2R	1.4	4	5	4-5	5	5	4-5	5	5	4-5	4-5	5	4-5	4-5
	2.8	4-5	4-5	4	4-5	5	4	4-5	5	4-5	4-5	5	4	4
Orange RN	1.7	5	5	4-5	5	5	5	5	5	5	5	5	5	5
	3.4	5	5	4-5	5	5	4-5	4-5	5	5	5	5	5	4-5
Brown G-01	1.3	5	5	4-5	5	5	5	5	5	4-5	4-5	5	4-5	4-5
	2.6	5	5	4-5	5	5	5	5	5	4-5	4-5	5	4-5	4-5
Brown B	1.2	4-5	5	4-5	5	5	4-5	5	5	5	5	5	5	5
	2.4	5	5	4-5	5	5	4	4-5	5	5	5	5	5	5
Red G	1.0	5	5	5	5	5	4	4-5	5	5	5	5	5	4-5
	2.0	5	5	4-5	5	5	3-4	4	5	4-5	4-5	5	4-5	4
Red 2GA-01	1.1	5	4-5	4-5	4-5	4-5	4	4-5	4-5	5	5	4-5	5	5
	2.2	4-5	4	4-5	4	4-5	3-4	4	4-5	5	5	4-5	5	5
Red 2B	1.7	4-5	5	4-5	5	5	4-5	4-5	5	5	5	5	4-5	4-5
	3.4	4-5	5	4-5	5	5	4	4	5	4-5	4-5	5	4	4
Bordeaux B	0.9	4-5	5	4-5	5	5	4-5	4-5	5	5	5	5	5	4-5
	1.8	4-5	5	4-5	5	5	4	4-5	5	4-5	4-5	5	4-5	4
Violet B	1.6	4-5	5	5	5	5	4-5	5	5	5	5	5	5	5
	3.2	4-5	5	4-5	5	5	4	4-5	4-5	5	5	5	5	4-5
Blue 2R	2.0	5	5	5	5	5	4-5	5	5	4-5	4-5	5	4-5	4-5
	4.0	5	5	4-5	5	5	3-4	4-5	5	4	4-5	5	4	4
Blue 2RA	1.8	5	5	5	5	4-5	3-4	4-5	4-5	4-5	4-5	4-5	4-5	4-5
	3.6	5	5	4-5	5	4-5	3	4-5	4-5	4	4-5	4-5	4	4
Blue 5G	2.2	4-5	4-5	4-5	5	5	4-5	5	5	5	5	5	5	5
	4.4	4-5	4-5	4-5	5	5	4	4-5	5	5	5	5	5	5
Green B	1.9	4	5	4-5	5	4-5	5	5	4-5	5	5	4-5	5	5
	3.8	4	5	4-5	5	4-5	4	4-5	4-5	5	5	4-5	5	5
Grey G	1.0	4-5	5	5	5	5	5	5	5	5	5	5	5	5
	2.0	4-5	5	5	5	5	4-5	5	5	5	5	5	5	5
Navy R	2.6	4-5	5	5	5	5	4-5	5	5	5	5	5	5	5
	3.9	4-5	5	4-5	5	5	4	4-5	5	5	5	5	5	5
Black B	2.3	4-5	5	5	5	5	4	4-5	5	5	5	5	5	5
	3.5	4-5	5	4-5	5	5	3	3-4	5	5	5	5	5	5

LANASET®	%	Milling, alkaline			Carbonizing	Decatizing, severe	Dry cleaning	Stability 120°C IRGASOL HTW NEW	Wool chlorination
		Ch	WO	CO	Ch	Ch	Ch	Ch	Ch
Yellow 4GN	1.4	5	4	5	4-5	4-5	5	4-5	4-5
	2.8	4-5	3-4	5	5	4-5	5		
Yellow 2R	1.4	4-5	5	5	4-5	4-5	5	4	4-5
	2.8	4-5	4-5	5	4-5	4-5	5		
Orange RN	1.7	4-5	4-5	5	5	5	5	4	4-5
	3.4	4-5	4	4-5	5	5	5		
Brown G-01	1.3	5	4	5	5	5	5	4-5	4-5
	2.6	4-5	3-4	5	5	5	5		
Brown B	1.2	5	4-5	5	5	5	5	4-5	4
	2.4	5	4	5	5	5	5		
Red G	1.0	5	4-5	4-5	5	5	5	3-4T	4
	2.0	5	4	4	5	5	5		
Red 2GA-01	1.1	4-5	4	5	4-5	4-5	4-5	3-4	4
	2.2	4-5	4	5	4-5	4-5	4-5		
Red 2B	1.7	5	3-4	4-5	5	5	5	4-5	4-5
	3.4	5	3	4-5	5	5	5		
Bordeaux B	0.9	5	4-5	5	5	5	5	4	4
	1.8	5	3-4	4-5	5	5	5		
Violet B	1.6	4-5	4-5	5	5	5	5	4	2-3Y
	3.2	4-5	4	5	5	5	5		
Blue 2R	2.0	5	4-5	5	5	5	5	4-5	2-3Y
	4.0	5	4	5	5	5	5		
Blue 2RA	1.8	4-5	4	5	4-5	4-5	4-5	4-5	2-3YD
	3.6	4-5	3-4	5	4-5	4-5	4-5		
Blue 5G	2.2	5	5	5	5	5	5	4	3Y
	4.4	5	4-5	5	5	5	5		
Green B	1.9	4-5	5	5	4-5	5	5	4	4
	3.8	4-5	5	5	5	5	5		
Grey G	1.0	5	4-5	5	5	5	5	4-5	4
	2.0	5	3-4	5	5	5	5		
Navy R	2.6	4-5	4	5	5	5	5	4-5	4-5
	3.9	4-5	3-4	5	5	5	5		
Black B	2.3	5	3-4	4-5	5	5	5	4-5	4-5
	3.5	4-5	3	4-5	5	5	5		

LANASET®	%	Dimensional stability, aminosulfonic acid derivative			PMS treat- ment Ch	DICRYLAN® WSR Ch	Dis- charge- ability Ch	Reservation Staining of multifiber strip		
		Ch	WO	CO				PAN	PES	CO
Yellow 4GN	1.4	4-5	5	5	4-5	4	5	4-5	4-5	3-4
	2.8	4-5	5	5						
Yellow 2R	1.4	3-4	5	5	4-5	4	4-5	4	4	3
	2.8	3-4	5	5						
Orange RN	1.7	4-5	5	5	5	4	5	4	4	2-3
	3.4	4	5	5						
Brown G-01	1.3	3R	5	5	4-5	4	4	3	3	2-3
	2.6	3-4R	5	5						
Brown B	1.2	4	5	5	5	4-5	4	3-4	3-4	2-3
	2.4	3	5	5						
Red G	1.0	4	5	5	5	5	2-3	3-4	3-4	2
	2.0	4	5	5						
Red 2GA-01	1.1	4	5	5	4-5	4	3	4	4-5	3
	2.2	4	5	5						
Red 2B	1.7	3-4W	5	5	5	4-5	4	3-4	3-4	2
	3.4	3-4W	5	5						
Bordeaux B	0.9	3-4W	5	5	4-5	4-5	2-3	4	4	2
	1.8	3W	5	5						
Violet B	1.6	4	5	5	5	4-5	2	3-4	2-3	3
	3.2	4	5	5						
Blue 2R	2.0	3W	5	5	4-5	4-5	2	4	4	2-3
	4.0	3W	5	5						
Blue 2RA	1.8	4-5	5	5	4-5	5	2	4-5	3	3
	3.6	4-5	5	5						
Blue 5G	2.2	4	5	5	5	4-5	2	3	3	3
	4.4	3W	5	5						
Green B	1.9	4	5	5	4-5	4-5	2	5	4-5	3-4
	3.8	3W	5	5						
Grey G	1.0	3W	5	5	4-5	4	4-5	3-4	3-4	3
	2.0	3W	5	5						
Navy R	2.6	2	5	5	4-5	4-5	4-5	3-4	2-3	2-3
	3.9	3W	5	5						
Black B	2.3	3W	5	5	5	4	2	3-4	2	2-3
	3.5	3W	5	5						

## Wet fastness properties on chlorinated wool

LANASET®	%	Washing, 40°C IWS TM 250				Perspiration, alkaline IWS TM 174			
		Ch	WO	PA	CO	Ch	WO	PA	CO
Yellow 4GN	1.4	4-5	5	4-5	5	4-5	4-5	3-4	4
Yellow 2R	1.4	4-5	5	4-5	4-5	4-5	4-5	3	4
Orange RN	1.7	4-5	5	5	5	5	4-5	3-4	4
Brown G-01	1.3	5	5	5	5	5	4-5	3-4	4
Brown B	1.2	4-5	5	4	5	4-5	4	3	4
Red G	1.0	4-5	5	4-5	5	4-5	4-5	3	4
Red 2GA-01	1.1	4-5	5	4-5	5	4-5	4-5	3-4	4
Red 2B	1.7	4	5	3-4	4	4-5	4	2-3	3-4
Bordeaux B	0.9	4-5	5	3-4	4-5	4-5	4	2-3	3-4
Violet B	1.6	4	5	4-5	5	4	4-5	3	4
Blue 2R	2.0	4-5	5	5	5	4-5	4-5	3	4-5
Blue 2RA	1.8	4-5	5	4-5	5	4-5	4-5	3	4-5
Blue 5G	2.2	3-4Y	5	5	5	3-4	4	3	4
Green B	1.9	3-4Y	5	5	5	3-4Y	4-5	3-4	4-5
Grey G	1.0	4-5	4-5	3	5	4-5	4-5	3-4	4-5
Navy R	2.6	4-5	4-5	4	5	5	3-4	3	3-4
Black B	2.3	5	4-5	3-4	5	5	4	2-3	3-4

## USA light fastness properties on wool test fabric

LANASET®	%	AATCC, 16E USA 20 AFU				AATCC, 16E USA 40 AFU				AATCC, 16E USA 60 AFU			
		1/12	1/3	1/1	2/1	1/12	1/3	1/1	2/1	1/12	1/3	1/1	2/1
Yellow 4GN	1.4	4-5	4-5	4-5	5	4	4-5	4-5	4-5	3-4	4	4-5	5
Yellow 2R	1.4	4-5	4-5	4-5	4-5	4	4	4-5	4-5	4	4	4	4
Orange RN	1.7	4	4-5	4-5	4-5	3-4	4	4	4	3-4	3-4	4	4
Brown G-01	1.3	4	4-5	5	5	4	4	4-5	4-5	3-4	3-4	4	4
Brown B	1.2	4-5	4-5	4-5	5	4	4	4-5	4-5	3-4	4	4-5	4-5
Red G	1.0	4	4	4	4-5	3	3-4	4	4-5	3	3	3-4	4
Red 2GA-01	1.1	4	4	4	4-5	3	3-4	4	4-4	2-3	3	3-4	4
Red 2B	1.7	4	4	4-5	4-5	3-4	3-4	4	4-5	2-3	3	4	4
Bordeaux B	0.9	3-4	3-4	4	4-5	2-3	2-3	3	4	2	2	2-3	3
Violet B	1.6	3-4	4	4	4-5	3	3	3-4	4	2-3	3	3	3-4
Blue 2R	2.0	4-5	4-5	4-5	4-5	3-4	3-4	3-4	4	3	3	3-4	3-4
Blue 2RA	1.8	4	4	4-5	4-5	3-4	3-4	3-4	3-4	3	3	3-4	3-4
Blue 5G	2.2	4	4	4	4	3-4	3-4	4	4	3	3	3-4	3-4
Green B	1.9	4	4-5	4-5	5	3-4	4	4	4-5	3	3-4	4	4-5
Grey G	1.0	4-5	4-5	4-5	4-5	4	3-4	4-5	5	3	3-4	4	4-5
Navy R**	2.6		4	4-5	4-5		3-4	4	4-5		3	4	4-5
Black B**	2.3		4-5	5	5		4-5	4-5	5		4	4-5	5

All ratings against grey scale.

\*\*tested in 0.5, 1 and 1.5 times the concentration of N/L or Bk/L

## USA wet fastness properties on wool test fabric

LANASET®	%	Washing 40°C 1A				Washing 49°C 2A				Perspiration alk. USA				Water USA			
		AATCC 61				AATCC 61				AATCC 15-1997				AATCC 107-1997			
		Ch	WO	PA	CO	Ch	WO	PA	CO	Ch	WO	PA	CO	Ch	WO	PA	CO
Yellow 4GN	1.4	4-5	4-5	5	5	4-5	4-5	5	5	4-5	4-5	4-5	5	4-5	5	5	5
	2.8	4	4-5	5	5	4-5	4-5	5	4-5	4-5	4-5	4-5	5	4-5	5	5	5
Yellow 2R	1.4	5	4-5	5	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5
	2.8	4-5	4-5	5	4-5	4-5	4-5	4	4-5	4-5	4	3-4	4-5	4-5	4-5	4	4-5
Orange RN	1.7	4-5	4-5	5	5	4-5	4-5	5	5	4-5	5	5	5	4-5	4-5	4-5	5
	3.4	4-5	4-5	5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	5
Brown G-01	1.3	4-5	4-5	5	5	4-5	4-5	4-5	5	4-5	5	5	5	4-5	4-5	4-5	5
	2.6	4-5	4-5	5	5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	5
Brown B	1.2	4-5	5	5	5	4-5	4-5	4-5	5	4-5	5	5	5	4-5	4-5	4-5	5
	2.4	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	4-5
Red G	1.0	4-5	5	5	5	4-5	4-5	4-5	5	4-5	5	4-5	5	4-5	4-5	4-5	5
	2.0	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Red 2GA-01	1.1	4-5	5	5	5	4-5	4-5	4	4-5	4-5	5	4-5	5	4-5	4-5	4-5	4-5
	2.2	4-5	5	5	5	4-5	4-5	4	4-5	4-5	5	4-5	5	4-5	4-5	4-5	4-5
Red 2B	1.7	4-5	5	5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5
	3.4	4-5	5	4-5	5	4-5	4-5	3-4	4-5	4-5	4-5	3-4	4-5	4-5	4-5	4-5	4-5
Bordeaux B	0.9	4-5	5	5	5	4-5	4-5	4	4-5	4-5	5	5	5	4-5	5	5	5
	1.8	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	4-5	4-5	5	5	5
Violet B	1.6	4-5	5	5	5	4-5	4-5	5	5	4-5	4-5	5	5	4-5	4-5	5	5
	3.2	4-5	5	5	5	4-5	4-5	5	5	4-5	4-5	4-5	5	4-5	4-5	5	5
Blue 2R	2.0	4-5	5	5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5
	4.0	4-5	5	5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5	4-5	4-5	4-5	5
Blue 2RA	1.8	4-5	5	5	5	4-5	4-5	3-4	4-5	4-5	4-5	4	5	4-5	4-5	4-5	5
	3.6	4-5	4-5	4	5	4-5	4	3	4-5	4-5	4-5	4	5	4-5	4	4	5
Blue 5G	2.2	4-5	5	5	5	4-5	4-5	4-5	5	4-5	5	5	5	4-5	5	5	5
	4.4	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	5	4-5	4-5	5	5
Green B	1.9	4-5	5	5	5	4-5	4-5	5	4-5	4-5	5	5	5	4	5	5	5
	3.8	4-5	5	5	5	4-5	4-5	4-5	4-5	4-5	5	4-5	5	4-5	5	5	5
Grey G	1.0	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	5	4-5	5	5	5
	2.0	4-5	4-5	4-5	5	4-5	4-5	3	4-5	4-5	4-5	4-5	5	4-5	5	5	5
Navy R	2.6	4-5	5	5	5	4-5	4-5	4-5	4-5	4-5	5	5	5	4-5	4-5	4-5	5
	3.9	4-5	5	4-5	5	4-5	4-5	4	4-5	4-5	5	4-5	5	4-5	4-5	4-5	5
Black B	2.3	4-5	5	5	5	4-5	4-5	4	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	4-5
	3.5	4-5	5	4-5	5	4-5	4-5	3-4	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	4-5

## Notes on the pattern section

The illustrated self-shades were produced with LANASET<sup>®</sup> dyes on wool felt at liquor ratio 10:1 by the method described. Combination shades were dyed on wool serge by the method described at liquor ratio 20:1. All dyeings were performed with an addition of 1% MITIN<sup>®</sup> FF high conc. to the dyebath

### General properties

#### Solubility

The dye is dissolved by stirring into fully demineralized water at 90°C/194°F or 60°C/140°F using a magnetic stirrer. After 10 min, the solution is filtered through two prewetted S+S 1450 CV paper filters in a heated special steel suction filter under a given vacuum.

The residue on the filter and the filtration time are assessed.

#### Stability of stock solutions on cooling

After dissolving the dye at 90°C/194°F (see above) and leaving to stand for 2 h at 60/140°F or 30°C/86°F, the solution is swirled and filtered as described.

#### Shade change in artificial light

The difference in appearance of a shade under a MacBeth lamp in daylight (D65) and

(A) under an incandescent lamp or

(TL 84) under a Philips TL 84 tubular fluorescent lamp

is assessed.

### Fastness properties

Fastness properties were determined from dyeings on a plain woven wool test fabric and tested in accordance with SN-ISO 105 or international standards. Where multifiber strip is specified as adjacent fabric, such as in wash test C06 B2, adjacent fabric not mentioned in the table attained rating 5 for staining.

Light fastness was tested at the given depths, wet fastness at 1/1 and 2/1 standard depth (SD) or as light navy (N/L), dark navy (N/Dk), light black (B/L) or dark black (B/Dk). Standard depth 1/1 was determined colorimetrically in accordance with ISO 105-A06 (edition 1995, "Instrumental determination of standard depth 1/1").

Fastness results can differ, depending on fiber material, and for special requirements preliminary trials are recommended.

## Non-standard fastness tests

### Woolmark fastness tests

#### **Water, severe, IWS TM 6**

Procedure as described in the ISO standard, but with SDC multifiber adjacent fabric.

#### **Washing, 40°C/104°F, IWS TM 250 (hand wash)**

4 g/l detergent (SM 49)

30 min at 40°C/104°F, 150 ml, SDC multifiber adjacent fabric

#### **Perspiration, alkaline, IWS TM 174**

5.0 g/l sodium chloride

2.5 g/l disodium phosphate cryst.

0.5 g/l L-histidine monohydrochloride

adjusted to pH 8 with caustic soda, SDC multifiber adjacent fabric

The specimen is immersed in the test solution for 30 min at room temperature, liquor ratio 50:1, then placed under load between glass plates for 4 h at 37°C/99°F.

## Stability at 120°C/248°F to IRGASOL HTW NEW

All dyes are tested as 1/1 SD shades. Dyeings produced at liquor ratio 15:1 are compared with dyeings obtained after

- a) 60 min at 98°C/208°F without IRGASOL HTW NEW
- b) 30 min at 120°C/248°F with 4% IRGASOL HTW NEW

The shade change is assessed by comparison with the grey scale.

**Note:** Formaldehyde-free wool protectant MIRALAN HTP has no negative effect on shade.

## Dimensional stabilization

The dyed goods are padded at room temperature with an aqueous solution of 50g/l of an aminosulfonic acid derivative (Flovan ASN) and 0.5 g/l ULTRAVON® JUN HC (pick-up 60%). They are then sandwiched between undyed wool and cotton fabric and set with steam at 4–5 bars (pe) in the Hoffman press for 20 seconds. After a further 20 seconds with the steam off, the dyeing is suctioned off for 5 seconds at max. 60°C/140°F in the laboratory dryer. The shade change is assessed by comparison with the grey scale.

## Chlorination

The dyeings are treated with 4.5% Basolan DC (BASF) [or Fi-Clor Clearon (Chlor Chem. Ltd./UK) or Orced (Rhône-Poulenc/France)] and compared with an untreated dyeing.  
Shade change is assessed by comparison with the grey scale.

## PMS treatment

The dyed goods are treated at room temperature with an aqueous solution containing

0.5 g/l ALBAFLOW CIR

0.2 % soda ash

for 20 min

then 5% Basolan 2448 (BASF) is added to the same bath and the goods are treated for another 60 min at room temperature

6% sodium bisulfite is then added

the pH is adjusted to 7–8

and the goods are treated for

10 min at 50°C/122°F

The treated goods are rinsed warm and cold and dried.

Shade change is assessed by comparison with the grey scale.

## DICRYLAN<sup>®</sup> WSR finish

The dyed goods are padded at room temperature with an aqueous solution of

50 g/l DICRYLAN<sup>®</sup> WSR

4 g/l sodium bicarbonate

The padded fabric is dried at 110°C/230°F for 2 min and baked at 150°C/302°F for 5 min.

The shade change is assessed by comparison with the grey scale.

## Dischargeability

Dyeings at 1/1 SD, light navy or light black on wool test fabric.

### Recipe:

500	g	thickener (e.g. guar derivative)
10	g	glycerin
5	g	THERMACOL <sup>®</sup> AS
150	g	Decrolin solution conc. (BASF)
335	g	water
<hr/>		
1000	g	

The dyed goods are printed, dried, steamed for 20 min at 0.1 bar, rinsed cold, washed with 1 g/l TINEGAL<sup>®</sup> W at 30–40°C/86–104°F, then rinsed and dried.

Shade change is assessed by comparison with a special scale.:

5 = white dischargeable, 1 = not dischargeable

### Key to fastness tables

Ch	=	shade change	Br	=	brighter
CO	=	staining of cotton	De	=	deeper
CV	=	staining of viscose	D	=	duller, flatter
PA	=	staining of polyamide 66 textured tricot	W	=	weaker
PAN	=	staining of acrylics			
PES	=	staining of polyester			
WO	=	staining of wool			
Bl	=	bluer	BB	=	appreciably bluer
Bn	=	browner	GG	=	appreciably greener
G	=	greener	RR	=	appreciably redder
R	=	redder	YY	=	appreciably yellower
Y	=	yellower			
N/L	=	standard depth "light navy"			
N/Dk	=	standard depth "dark navy"			
B/L	=	standard depth "light black"			
B/Dk	=	standard depth "dark black"			

## Textile chemicals

Products	Effects	Benefits
<b>ALBAFLOW® CIR</b>	penetration accelerant <i>anionic</i>	<ul style="list-style-type: none"> <li>– instant penetration of dye liquor into the textile material</li> <li>– especially recommended for circulating liquor dyeing machines</li> <li>– APEO- and solvent free</li> </ul>
<b>ALBAFLOW® FFC-01</b>	penetration accelerant <i>slightly anionic</i>	<ul style="list-style-type: none"> <li>– fast penetration of dye liquor into the textile material</li> <li>– very stable to high alkali and electrolyte concentrations</li> <li>– durable anti-foaming action</li> <li>– suitable particularly for jet dyeing machines</li> <li>– APEO- and solvent free</li> </ul>
<b>ALBAFLOW® UNI</b>	penetration accelerant <i>anionic</i>	<ul style="list-style-type: none"> <li>– Permanent foam prevention and immediate, total air removal, High wetting action</li> <li>– Stable in acid and alkaline treatment baths</li> <li>– High stability to shear, even in HT conditions</li> <li>– Can be additionally used in the pretreatment</li> <li>– Good compatibility with all dye classes and textile chemicals</li> <li>– Contains no APEO, solvent, silicone or mineral oil</li> </ul>
<b>ALBATEX® AB-45</b>	acid buffer for pH 4.5 <i>anionic</i>	<ul style="list-style-type: none"> <li>– keeps the dye bath pH constant throughout the entire dyeing cycle</li> <li>– no addition of acid necessary</li> <li>– increases reproducibility</li> </ul>
<b>ALBATEX® PS-35</b>	pH slider <i>nonionic</i>	<ul style="list-style-type: none"> <li>– Uniform build up and leveling of dyes hence reproducible excellent surface and fiber levelness</li> <li>– Better coverage of physical barriness</li> <li>– Easy and safe handling</li> </ul>
<b>ALBEGAL® SET</b>	leveling agent for LANASET® dyes <i>amphoteric</i>	<ul style="list-style-type: none"> <li>– improved fiber levelness</li> <li>– prevents dye agglomeration</li> <li>– promotes migration and diffusion</li> <li>– promotes on-tone build-up with dye combinations</li> </ul>

<b>Products</b>	<b>Effects</b>	<b>Benefits</b>
<b>CLARITE® PS</b>	stabilized reduction bleaching agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– improves whiteness on polyamide and in combination with a peroxide bleach gives a higher and more stable white on wool, cellulose and silk</li> <li>– bleach baths containing CLARITE® PS are active longer than those containing a non-stabilized reduction agent</li> <li>– high complexing power for heavy metals (e.g. iron) and alkaline earth ions</li> <li>– high cleaning action with booster effect on surfactants</li> <li>– high stability in hard water</li> </ul>
<b>CLARITE® WO</b>	single pack bleaching auxiliary <i>anionic</i>	<ul style="list-style-type: none"> <li>– single pack bleaching auxiliary for hydrogen peroxide bleaching of wool</li> <li>– suitable for non-phosphate bleaching of wool</li> <li>– contains all components for bleaching, including alkali</li> <li>– requires only the addition of hydrogen peroxide</li> </ul>
<b>DICRYLAN® WSR</b>	machine-washable finish for wool <i>anionic</i>	<ul style="list-style-type: none"> <li>– gives outstanding machine washability while maintaining the natural character of wool</li> <li>– easy-care and shape retention properties</li> <li>– no chlorine pretreatment required</li> <li>– simple process (pad application)</li> </ul>
<b>ERIONAL® ECS</b>	wet fastness improver <i>cationic</i>	<ul style="list-style-type: none"> <li>– improves wet fastness of acid and MCDs on wool, polyamide and silk</li> <li>– improves wet fastness of direct and reactive dyes</li> <li>– contains no formaldehyde and zinc</li> </ul>
<b>ERIONAL® RF</b>	reserving and fixing agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– controls solid dyeing of wool/ polyamide blends</li> <li>– prevents staining of wool and polyamide by direct dyes in wool/cellulose and polyamide/cellulose blend dyeing</li> <li>– improves wet fastness of polyamide dyeings</li> </ul>
<b>ERIONAL® PAS</b>	fixing and reserving agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– maximum wet fastness improvement</li> <li>– maximum reservation effects</li> <li>– controls solid dyeing of wool/ polyamide blends</li> <li>– improved dye bath stability in presence of acid</li> </ul>
<b>ERiopon® OS</b>	washing agent for disperse dyes <i>nonionic</i>	<ul style="list-style-type: none"> <li>– for afterclearing of PES dyeings</li> <li>– improves wet and rubbing fastness</li> <li>– reduces cross-staining with PES/WO</li> <li>– low foaming</li> </ul>

<b>Products</b>	<b>Effects</b>	<b>Benefits</b>
<b>ERIOPON® R LIQ</b>	washing agent for washing off reactive dyeings <i>anionic</i>	<ul style="list-style-type: none"> <li>– speeds up release and outward diffusion of dye hydrolysates</li> <li>– prevents renewed uptake of dye hydrolysate.</li> <li>– ensures maximum fastness properties</li> <li>– low foaming</li> </ul>
<b>INVADINE® DA</b>	wetting agent and detergent <i>anion/nonionic</i>	<ul style="list-style-type: none"> <li>– low foaming</li> <li>– for batchwise pretreatment</li> <li>– good detergency and emulsifying properties</li> <li>– APEO-free</li> </ul>
<b>INVADINE® PBN</b>	wetting agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– special wetting agent for oil and water repellent finishes with no influence on oil and water repellent effects</li> <li>– improves wetting of the goods and penetration of the liquor into the yarn</li> </ul>
<b>INVALON® DAM</b>	dispersing agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– improves afterclearing of deep shades on Hercosett-treated wool, wool/acrylic and acrylic/cellulose blends</li> </ul>
<b>INVATEX® CS</b>	dispersing and complexing agent <i>anionic</i>	<ul style="list-style-type: none"> <li>– prevents precipitation of metal hydroxides, carbonates and silicates on goods and machinery</li> <li>– crystallization-inhibiting properties (threshold effect)</li> <li>– enhances the effect of simultaneously applied detergents and dispersants</li> <li>– high stability to alkali, oxidation and hydrolysis</li> </ul>
<b>LYOPRINT® AP</b>	anti-foam and de-aerating agent for prints <i>nonionic</i>	<ul style="list-style-type: none"> <li>– instantaneously removes air from print pastes in preparation and use</li> <li>– highly effective antifoam</li> <li>– improved penetration of fiber assembly</li> <li>– improved fiber and surface levelness</li> </ul>
<b>LYOPRINT® RG</b>	reduction inhibitor <i>anionic</i>	<ul style="list-style-type: none"> <li>– prevents reduction of reactive dyes</li> </ul>
<b>MIRALAN® HTP</b>	wool protectant <i>anionic</i>	<ul style="list-style-type: none"> <li>– preserves physical properties of wool in dyeing at temperatures above the boil</li> <li>– allows dyeing of wool/polyester at 120°C/248°F</li> <li>– low yellowing of wool</li> <li>– prevents setting of wool</li> <li>– formaldehyde-free</li> </ul>
<b>MIRALAN® HTW</b>	wool protection <i>anionic</i>	<ul style="list-style-type: none"> <li>– preserves physical properties of wool in dyeing at temperatures above the boil</li> <li>– allows dyeing of wool/polyester at 120°C/248°F</li> <li>– low yellowing of wool</li> </ul>

<b>Products</b>	<b>Effects</b>	<b>Benefits</b>
<b>MIRALAN® Q</b>	wool care <i>anionic</i>	<ul style="list-style-type: none"> <li>– improves quality of wool at all stages of processing</li> <li>– lubricating effect</li> <li>– anti-felting effect</li> <li>– anti-setting effect</li> </ul>
<b>MIRALAN® TOP</b>	diffusion accelerant for LANASET® TOP dyeing system <i>anionic</i>	<ul style="list-style-type: none"> <li>– reduces dyeing times at the boil to half</li> <li>– improves productivity and wool quality</li> <li>– outstanding exhaustion even in deep shades</li> <li>– enables dyeing in standing baths</li> </ul>
<b>MITIN® FF HC</b> <b>MITIN® FF LIQ</b>	protection against moths and beetles <i>anionic</i>	<ul style="list-style-type: none"> <li>– durable protection of wool fiber against keratin-eating insects</li> <li>– high light and wet fastness</li> <li>– permethrin-free</li> </ul>
<b>OLEOPHOBOL® S</b> <b>OLEOPHOBOL® SL</b>	Oil- and water repellent <i>mainly nonionic/ weakly cationic</i>	<ul style="list-style-type: none"> <li>– excellent protection against oil-based stains</li> <li>– excellent protection against rain and water-based stains</li> <li>– marked dry soiling resistance</li> </ul>
<b>PHOBOL® XAN</b>	extender/booster for oil and water repellent effects <i>cationic/nonionic</i>	<ul style="list-style-type: none"> <li>– optimizes the oil and water repellent effects of OLEOPHOBOL® products on delicate articles</li> <li>– outstanding effect improvement in combination with fluorochemicals</li> <li>– marked improvement of fastness to washing and dry cleaning</li> </ul>
<b>SAPAMINE® CA NEW</b>	softening <i>cationic</i>	<ul style="list-style-type: none"> <li>– softener for wool and synthetic fibers requiring a bulky, soft hand</li> <li>– increases fiber lubrication and facilitates further mechanical processing of wool, e. g. spinning, raising</li> <li>– has negligible influence on thermomigration in blends with polyester</li> </ul>
<b>THERMACOL® PN</b>	penetration accelerant for continuous applications <i>anionic</i>	<ul style="list-style-type: none"> <li>– instantaneous and even penetration</li> <li>– prevents frosting in continuous applications</li> <li>– outstanding push-through and sharpness in vigoureux printing</li> </ul>
<b>TINEGAL® BDR</b>	retardant for basic dyes <i>cationic</i>	<ul style="list-style-type: none"> <li>– excellent retarding and leveling action</li> <li>– improves migration without blocking</li> <li>– for regular and rapid dyeing of acrylics</li> <li>– especially suitable for acrylic fiber blends</li> </ul>
<b>TINEGAL® W</b>	leveling and stripping <i>cationic</i>	<ul style="list-style-type: none"> <li>– high leveling promoting properties</li> <li>– especially helpful for shade weakening and correction of unlevelness</li> </ul>
<b>ULTRATEX® AF Base</b>	polysiloxane <i>nonionic</i>	<ul style="list-style-type: none"> <li>– improves stretch and shape recovery with an extremely soft hand</li> </ul>

Products	Effects	Benefits
<b>ULTRATEX® EMJ</b>	<i>nonionic/cationic</i>	<ul style="list-style-type: none"> <li>– silicon micro emulsion imparting an extremely soft, fluid and full hand with a warm luxurious feel</li> <li>– increases the elasticity of knitted fabrics and helps garments to keep their shape during washing, drying and wear</li> <li>– improves sewability</li> </ul>
<b>ULTRAVON® JUN HC</b>	wetting, dispersing and scouring agent <i>nonionic</i>	<ul style="list-style-type: none"> <li>– emulsifies greases, oils and solvents</li> <li>– prevents lime soap deposits</li> <li>– outstanding chemical stability and compatibility, also compatible with enzymes</li> <li>– APEO-free</li> </ul>
<b>ULTRAVON® PRE</b>	washing and wetting agent <i>nonionic</i>	<ul style="list-style-type: none"> <li>– extremely low foaming and highly effective rewetting agent and detergent with outstanding emulsifying and degreasing power to remove thoroughly greasy and oily impurities</li> <li>– good wetting power</li> <li>– APEO-free, contains no anti-foam</li> </ul>
<b>UNIVADINE® PB</b>	diffusion accelerant <i>anionic</i>	<ul style="list-style-type: none"> <li>– accelerates uptake of disperse dyes on PES</li> <li>– higher reproducibility for WO/PES blends</li> <li>– negligible impact on elastane fibers</li> </ul>
<b>UVITEX® BHT LIQ 115%</b>	fluorescent whitening agent <i>anionic stilbene derivative</i>	<ul style="list-style-type: none"> <li>– neutral to blue white shade</li> <li>– for cellulose, polyamide, wool and silk</li> <li>– particularly recommended for exhaust application in reduction bleaches</li> <li>– very good wash fastness</li> </ul>
<b>UVITEX® CF LIQ 200%</b>	fluorescent whitening agent <i>anionic stilbene derivative</i>	<ul style="list-style-type: none"> <li>– reddish white shade</li> <li>– for cellulose, polyamide, wool and silk</li> <li>– particularly recommended for exhaust application in reduction bleaches</li> <li>– very good wash fastness</li> </ul>
<b>UVITEX® NFW LIQ</b>	fluorescent whitening agent <i>anionic distyryldiphenyl derivative</i>	<ul style="list-style-type: none"> <li>– violet white shade</li> <li>– for polyamide, wool, silk and cellulose</li> <li>– suitable for exhaust and pad application</li> <li>– very good stability to reducing agents and acids</li> <li>– outstanding fastness properties</li> </ul>
<b>UVITEX® NFW-S LIQ</b>	fluorescent whitening agent <i>anionic distyryldiphenyl derivative</i>	<ul style="list-style-type: none"> <li>– distinct violet white shade</li> <li>– for polyamide, wool, silk and cellulose</li> <li>– suitable for exhaust and pad application</li> <li>– very good stability to reducing agents and acids</li> <li>– outstanding fastness properties</li> </ul>

## ALBEGAL® SET leveling agent

- Leveling agent for the LANASET® dyeing system on wool
- Affinity for the fiber and the dye
- Promotes migration, shade build up, leveling power and penetration
- Breaks down dye aggregations and speeds up dye diffusion
- Enhances bath exhaustion
- Low foaming

### Coverage of wool affinity differences/leveling

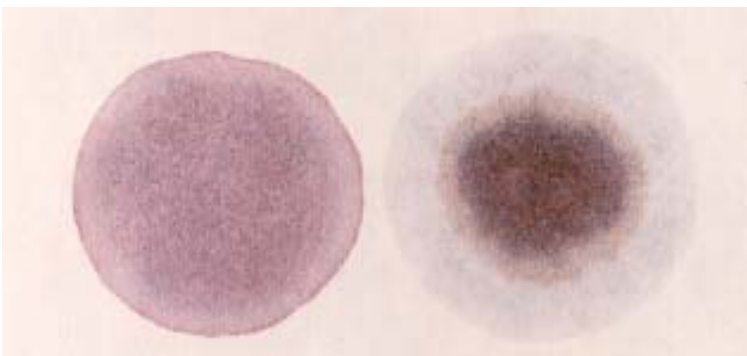


without



1% ALBEGAL® SET

### Breaking down dye aggregations



1% ALBEGAL® SET

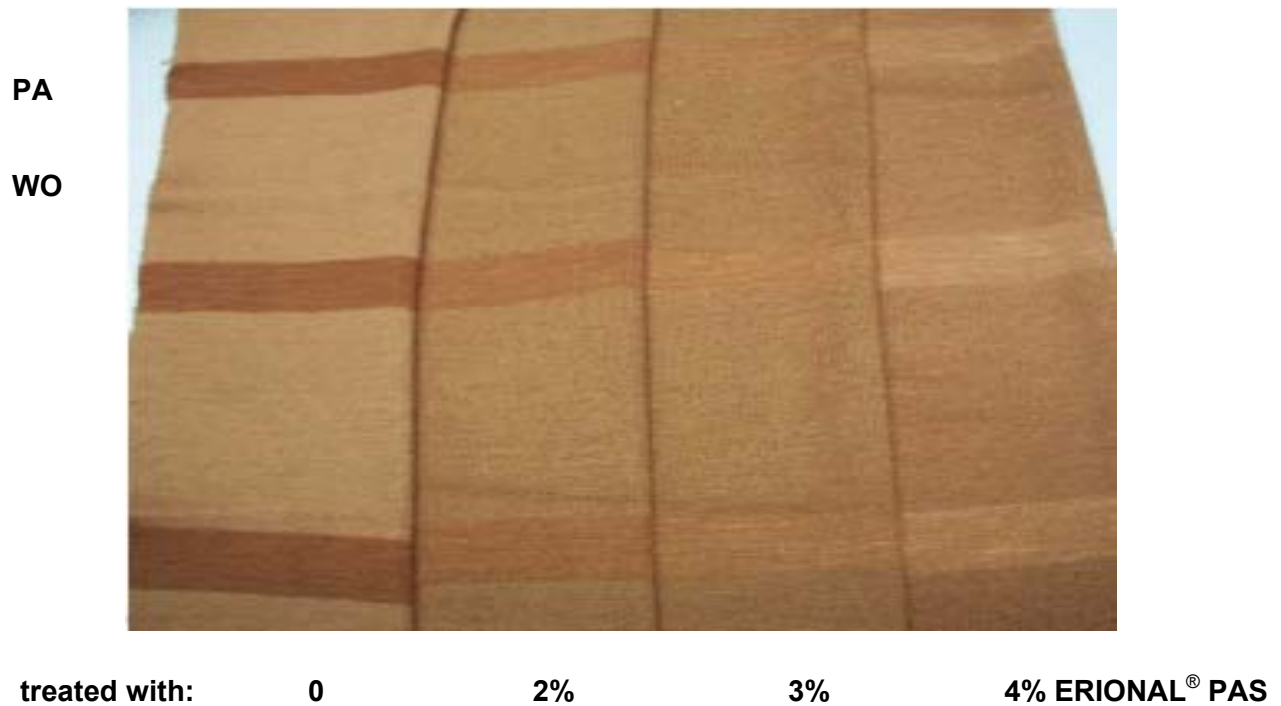
without

## ERIONAL<sup>®</sup> PAS reserving agent for polyamide

- Reserving WO dyes in dyeing polyamide/wool blends
- Reserving direct dyes in dyeing wool/cotton blends
- Reserving direct dyes in dyeing polyamide/cellulose blends
- Much improved stability to concentrated acids – less danger of spotting in application
- High exhaustion rate

### Reserving PA portion during dyeing of WO/PA

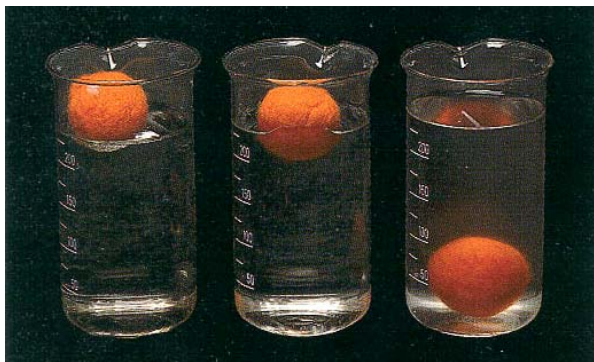
(80:20/LANASET<sup>®</sup> dyes)



## ALBAFLOW® CIR penetration accelerant

- APEO- and solvent-free de-aerating agent with wetting properties and durable antifoam properties
- Instant penetration of goods, especially recommended for circulation dyeing machines
- Appropriate stability to shear forces
- Stable in acid and alkaline media
- Promotes constant liquor flow, hence inside-outside levelness and reduced risk of channeling
- Free from mineral oil and organic solvent

### Wetting/de-aerating/defoaming



Water

wetting  
agent

penetration  
accelerant

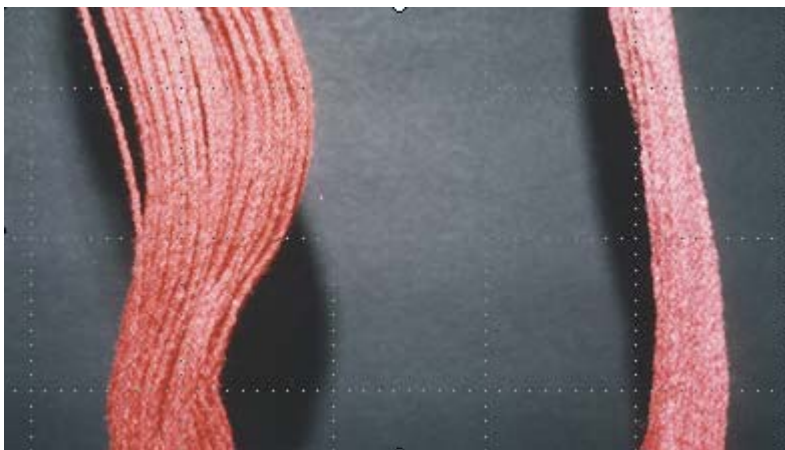


wetting  
agent

defoaming  
agent

penetration  
accelerant

### Dyeing of wool yarn as hank



1 g/l ALBAFLOW® CIR

0

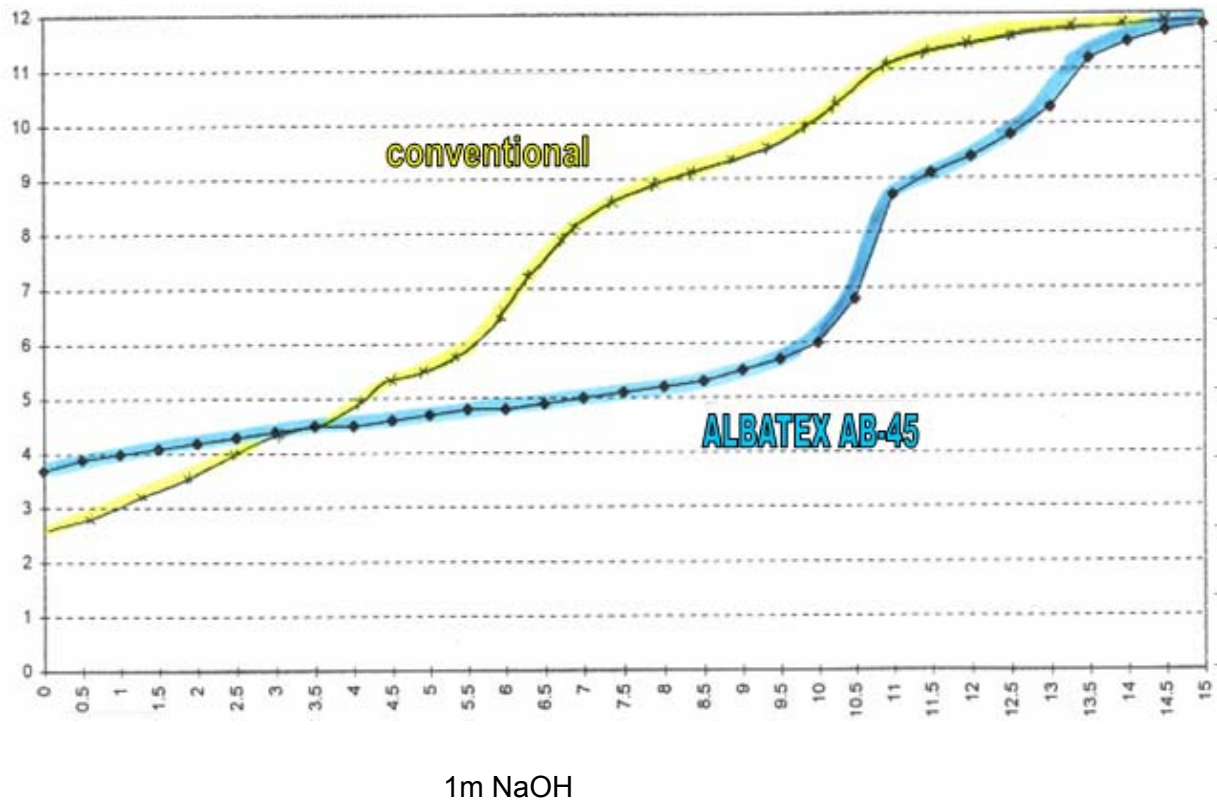
## ALBATEX<sup>®</sup> AB-45 acid buffer for PES and WO fibers

- Excellent buffer capacity for dyeing WO (LANASET<sup>®</sup> dyes) and PES (TERASIL<sup>®</sup> W dyes)
- No impact on pH through impurities in the fiber or water
- No problems with correct pH measurement
- No extra addition of acid required
- Non-foaming

### Effect of buffer capacity/titration

2 g/l of tested products

pH



## ERIOPON® OS afterclearing

- Provides better wet and rubbing fastness
- Prevents renewed uptake of unfixed dye
- Very high emulsifying power on mineral oils and paraffins
- Low foaming

### Washing-off effect on PES/WO (50/50)

1.4% TERASIL® Red G 150%

PES

WO

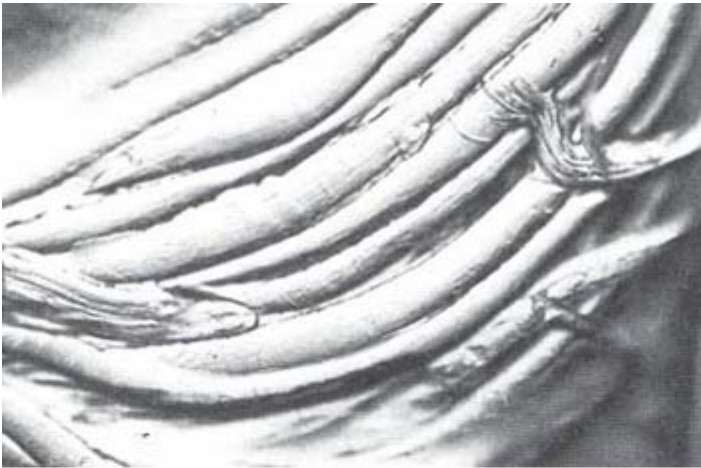


Without wash-off

1 g/l ERIOPON OS  
20 min at 70°C/158°F

## MIRALAN<sup>®</sup> HTP wool care

- Formaldehyde-free wool protectant
- Allows dyeing of PES/WO at 120°C/248°F and of other wool blends at above the boil
- Preserves physical properties of wool
- Anti-setting effects for all wool goods
- Anti-felting effect for all wool goods



dyed without wool protecting agent  
40 min at 120°C/248°F

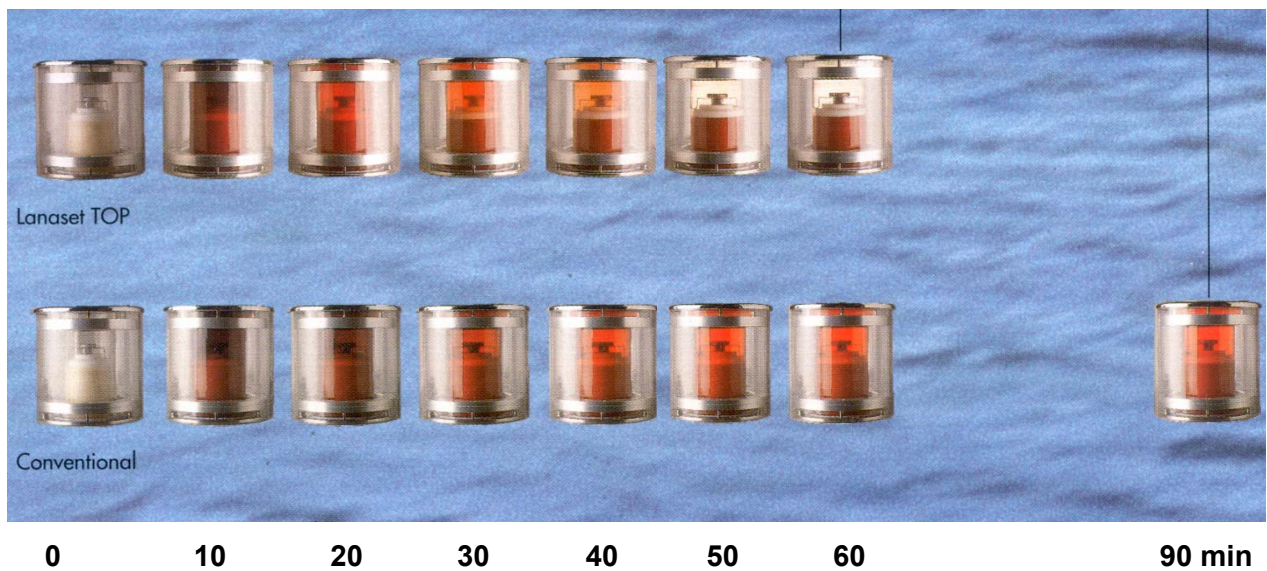


dyed with 4% MIRALAN<sup>®</sup> HTP  
40 min at 120°C/248°F

## MIRALAN<sup>®</sup> TOP wool care with LANASET<sup>®</sup> TOP short dyeing process

- Improves quality of wool for tops and loose stock
- Saves dyeing time (max. 20 min at the boil)
- Cuts water consumption (possibility to dye from standing baths)
- Promotes complete exhaustion and instant shade development
- Ensures same fastness level as ALBEGAL<sup>®</sup> SET

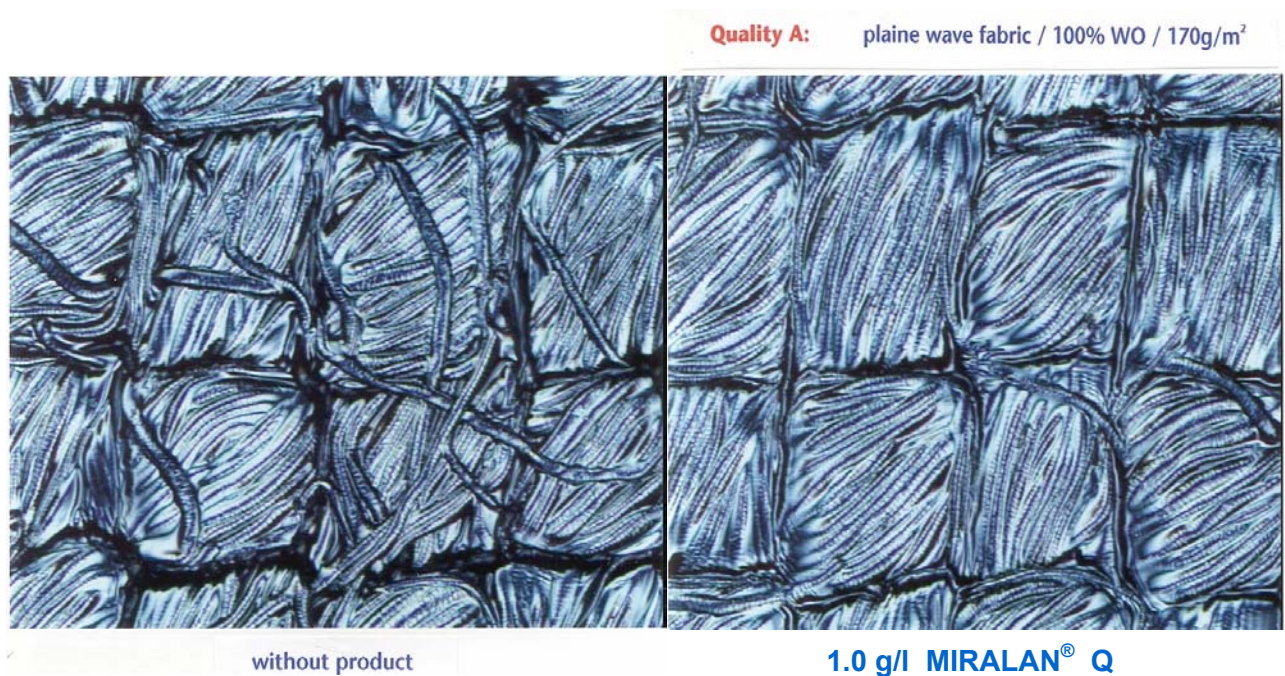
### Short dyeing process



## MIRALAN<sup>®</sup> Q wool care

- Improves quality of wool at all stages of processing
- Lubricating effect especially for piece goods
- Anti-setting effect for all wool goods
- Anti-felting effect for all wool goods
- Promotes dimensional stability of wool goods
- Promotes abrasion resistance of wool goods (especially pieces)

### Effect of MIRALAN<sup>®</sup> Q



## MITTIN® FF HC or MITTIN® FF LIQ wool care

- Protects animal fibers against attack by clothes moth, fur moth and carpet beetle larvae
- Durable light- and washfast protection of wool and other keratinous material
- Very good exhaustion and leveling properties when applied from an aqueous bath
- No effect on handle, appearance or odor of wool

### Protection of animal fibers



## UNIVADINE® PB diffusion accelerant

- Allows PES and its blends to be dyed at lower temperatures or in shortened dye cycles
- Ensures good dye yield
- Promotes excellent build up to solid shades
- Negligible impact on elastane fibers
- No or minimum effect on Xenon light fastness

### Diffusion test

(DPA 45.08A at 120°C/248°F for 120 min)

### TERASIL® Red W-4BS

No auxiliary



2 g/l UNIVADINE® PB



## *Region Europe*

Huntsman Textile Effects (Germany) GmbH  
Rehlinger Str. 1  
86462 Langweid a. Lech, Germany  
infotexteurope@huntsman.com  
Tel: +49 8230 41-0  
Fax: +49 8230 41-370

## *Region Americas*

Huntsman International LLC  
Textile Effects  
4050 Premier Drive  
USA-High Point, North Carolina 27265  
infotexamericas@huntsman.com  
Tel: +1 800 822 1736  
Fax: +1 336 801 2808

## *Region Asia*

Huntsman (Guangdong) Ltd.  
Textile Effects  
Flying Geese Mountain Industrial Park  
Shilou Town, Panyu District, Guangzhou  
511447, PR China  
infotexasia@huntsman.com  
Tel: +86 20 8484 5100  
Fax: +86 20 8484 5222

Copyright © 2007 Huntsman. All rights reserved.

All trademarks mentioned are either property of or licensed to Huntsman Corporation or an affiliate thereof in one or more, but not all countries.

**IMPORTANT:** The following supersedes Buyer's documents. Sales of the product described herein ("Product") are subject to the general terms and conditions of sale of either Huntsman Advanced Materials LLC, or its appropriate affiliate. Huntsman warrants that at the time and place of delivery all Products sold to Buyer shall conform to the specifications provided to Buyer by Huntsman.

While the information and recommendations included in this publication are, to the best of Huntsman's knowledge, accurate as of the date of publication, NOTHING CONTAINED HEREIN (EXCEPT AS SET FORTH ABOVE REGARDING CONFORMANCE WITH SPECIFICATIONS PROVIDED TO BUYER BY HUNTSMAN) IS TO BE CONSTRUED AS A REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS, OR WARRANTIES AS TO QUALITY OR CORRESPONDENCE WITH PRIOR DESCRIPTION OR SAMPLE, AND THE BUYER ASSUMES ALL RISK AND LIABILITY WHATSOEVER RESULTING FROM THE USE OF SUCH PRODUCT, WHETHER USED SINGLY OR IN COMBINATION WITH OTHER SUBSTANCES.

No statements or recommendations made herein are to be construed as a representation about the suitability of any Product for the particular application of Buyer or user or as an inducement to infringe any patent or other intellectual property right. Buyer is responsible to determine the applicability of such information and recommendations and the suitability of any Product for its own particular purpose, and to ensure that its intended use of the Product does not infringe any intellectual property rights.

The Product may be or become hazardous. The Buyer should obtain Material Safety Data Sheets and Technical Data Sheets from Huntsman containing detailed information on Product hazards and toxicity, together with proper shipping, handling and storage procedures for the Product, and should comply with all applicable governmental laws, regulations and standards relating to the handling, use, storage, distribution and disposal of, and exposure to the Product. Buyer shall also take all steps necessary to adequately inform, warn and familiarize its employees, agents, direct and indirect customers and contractors who may handle or be exposed to the Product of all hazards pertaining to and proper procedures for safe handling, use, storage, transportation and disposal of and exposure to the Product, and the containers or equipment in which the Product may be handled, shipped or stored.

Please note that products may differ from country to country. If you have any queries, kindly contact your local Huntsman representative.  
320002e—July-07, Printed in Switzerland.