MOLCEM NANO CHEMICALS

INFO 2020

"Chemical Guide To Your Processes"

PRETREATMENT, DYEING AND FINISHING PROCESSES IN COTTON FABRICS

Coming together is a beginning; keeping together is progress; working together is success.

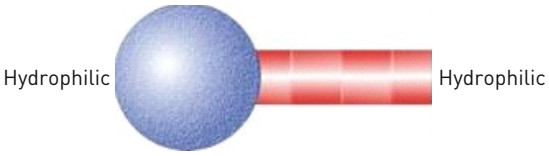
Henry Ford

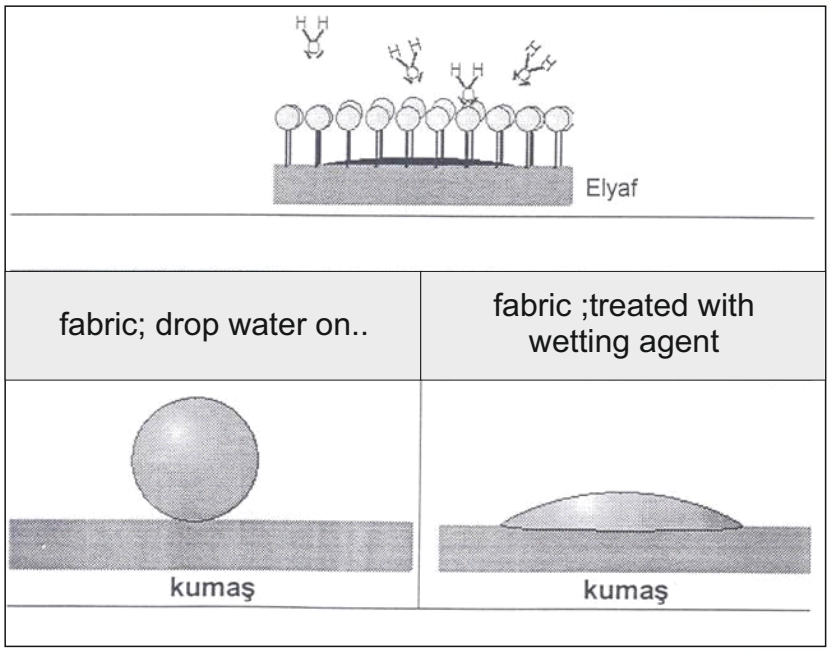
Each cotton fibre is composed of ;

Cellulose	85-95%
Oil and paraffin	0.4-1%
Protein and pectin	0.5-2%
Soil alkali salts	500-2700 mg / kg
Heavy metals	5-600 mg / kg

WHAT IS THE PURPOSE OF WETTING AGENTS

- It reduces the tension between the liquid and the solid surface and thus the liquid is spread on the surface of the fabric.
- By allowing the liquid to penetrate into the fibre, it is ensured that the air remaining in the fibre is thrown out.





WHAT IS THE PURPOSE OF PEROXIDE BLEACHING

- High whiteness grade
- Removal of fibre seeds (NEPS)
- Getting good hydrophilicity
- Removing impurities from the nature of the fabric
- Ensuring a homogeneous appearance

HOW DOES HYDROGEN PEROXIDE BLEACHING WORK?

- Hydrogen peroxide = H202 = H - O O - H (slightly acidic)
- If the pH falls below 10.5 the bleaching activity is decreased.
  Hydrogen peroxide bleaching occurs by the addition of caustic soda.
- Effective reactions in peroxide bleaching:
- 1. H2O2 + HO-H2O + HOO- (Per hydroxyl anion)
- 2. HOO-HO - + O

WHAT IS THE PURPOSE OF STABILIZERS AND COMPLEX CONSTRUCTIVE MATERIALS?

Stabilizers:

- It keeps oxygen formation under control and thus reduces the fragmentation rate.
- It increases the degree of whiteness.
- It prevents chemical damage to the fabric.

For which situations sequestering agents are used?

- Prevents calcium / magnesium-silicate precipitations
- Prevents decrease of washing and dispersing effects
- Prevents hardening of textile product due to shell binding
- Prevents uneven dyeing due to precipitation of dyes
- Prevents deposit formation on machine parts
- Prevents odors originating from shells containing odoriferous substances

Cotton and generally cellulose fibres can be dyed with following dyes;

- Reactive,
- Direct (substantive)
- Cube,
- Sulphur,
- Indigo,
- Naftol,
- They are also coloured with pigments.

The most commonly used dyestuffs are **reactive dyestuffs.**

REACTIVE DYESTUFF

Under appropriate conditions, it is the only class of dyes that can enter into a chemical reaction with the fibre in order to occur a bond in between.

It is the most widely used type of dyestuff in the dyeing of cotton products in sufficient fastness.

These dyes are indispensable prescription in the cotton sector for its Fastness, versatile possibilities, bright vibrant colours.

In order to achieve a uniform and proper dyeing the following points should be taken into account.

1 - Type of fibre to be dyed,
2 - Dyestuff type,
3 - Chemical substances and auxiliary substances,
4 - pH value must be kept constant during the dyeing process,
5 - Flotte ratio,
6 - Dyeing temperature,
7 - Dyeing time,

PURPOSE OF WASHING AFTER DYEING

- Removal of hydrolysed and un-bonded dyes.
- Removing the chemicals used during the dyeing process from the fabric
- If the dyestuff used is a vinyl sulphonyl type; we have to rinse and neutralize first in order to decrease the pH and salt concentration in the batch before starting the hot washing. Otherwise, the hydrolysed dyestuff can behave like direct dye in high salt and alkaline medium and therefore it may cause the fastness values to fall.
- Dispersing property the washing agent is considered as advantage
- In order to avoid problems at further finishing stages (softener, silicone finishing, Resin applications) the pH value must be increased to its proper level again.

POINTS TO BE CONSIDERED IN THE USE OF FIXING AGENTS

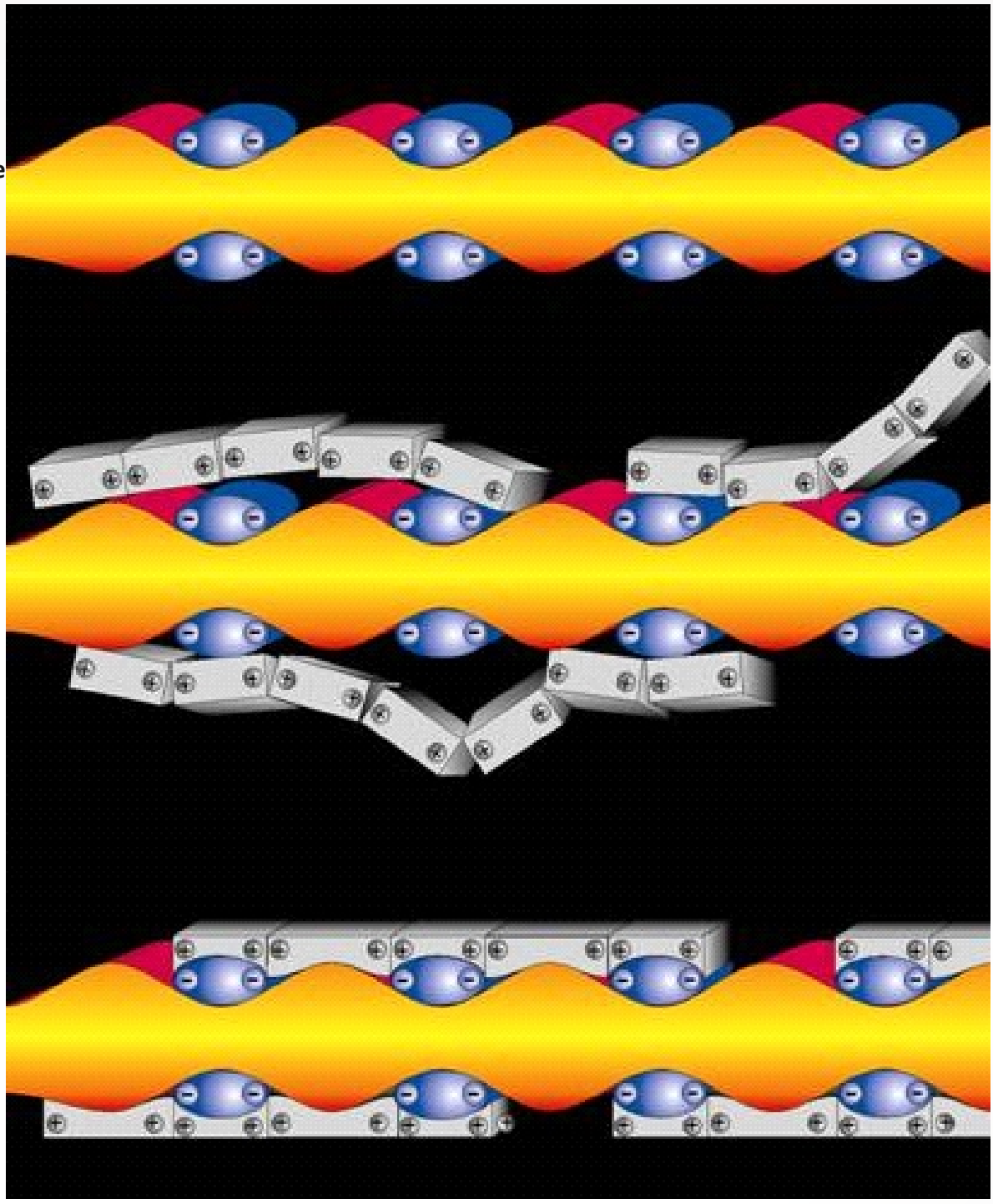
- The excess dyestuff on the fabric must be removed very well before application of fixing agent.
- If there is a (negative charged) dyestuff in the bath environment, the (positive charged) fixing agent will be combined with the excess dyes and therefore it will cause collapse on the fabric or to stick the dyes again on the fabric unevenly.
- We have to pay attention to the ionic structure of the buffers used.
- If the fastness is more important than touch of the fabric; the fixing agent should be applied before the softener.

FIXING AGENT APPLICATION

Surface of fibre containing dyestuff molecules

Classical fixing agents

Excellent bonding



PRETREATMENT

Nano Wet Y82
Nanostsb STC
Nano Quest WR 48
Nanopol CRK
Nanozyme APX
Nanozyme TDE

Bleaching 95 °C – 45 min

Bleaching 95 °C – 45 min	
0,5 g/l	Nano Quest WR 48
0,5 g/l	Nanostab STC
1 g/l	Nano Wet Y82
0,5 g/l	Nanopol CRK
3 g/l	NaOH (48 Be°)
2 g/l	Peroxide %50

Antiper & Antipilling 55 °C – 45 min : pH 4,5-5	
0,5 g/l	Nanozyme APX
1 %	Nanozyme TDE

REACTIVE DYEING

Nanogal PNM
Nanopol CRK
Nanoalkali ALC

Reactive Dyeing (bifunctinal) 60 °C – 60 min	
1 g/l	Nanogal PNM
0,5 g/l	Nanopol CRK
X %	Reactive dye
y g/l	Salt
z g/l	Nanoalkali ALC (10% of Soda Ash)

AFTER WASHING

Nanowash AYS Conc
Nanowash PC 3010
Nanofix RMC

Washing 95 °C – 15 min	
0,1 g/l	Nanowash AYS Conc.

Washing 80 °C – 15 min	
0,1 g/l	Nanowash PC 3010

Fixing 50 °C – 20 min	
2%	Nanofix RMC
1 g/l	Acetic Acid (pH 5-5,5)

FINISHING

Nanosoft CC Conc. (Pseudo Cat)
Nanosil MLC New (Hydrophilic Macro Silicone)
Nanosil SBL New (Micro Silicone)
Nanosil MAC 70 (Macro Silicone)

Classic Softening (Exh) 50 °C – 20 min	
4%	Nanosoft CC Conc.
1 g/l	Acetic Acid (pH 5-5,5)

Hydrophilic Softening (Exh) 50 °C – 20 min	
2%	Nanosil MLC New
1 g/l	Acetic Acid (pH 5-5,5)

Softening (Pad) (Wet on wet)	
30 g/l	Nanosil SBL New
30 g/l	Nanosil MAC 70
1 g/l	Acetic Acid (pH 5-5,5)

Hydrophilic Softening (Pad) (Wet on wet)	
30 g/l	Nanosil MLC New
1 g/l	Acetic Acid (pH 5-5,5)

RESOURCE SAVING CONCEPT

PRETREATMENT

Nanowet DGP

Washing 80 °C – 20 min	
1 g/l	Nanowet DGP

ANTIPILLING &REACTIVE DYEING

Nanozyme TDS
Nanogal PNM
Nanoalkali ALC

Process;
Add Nanozyme TDS at 55ºC
Add Nanogal PNM run 20 min
Add Salt and dyes rise to 60 ºC
Add Nanoalkali ALC (Progressive dosing) run 60 min

Reactive Dyeing (bifunctinal) 60 °C – 60 min	
1,5 %	Nanozyme TDS *
1 g/l	Nanogal PNM
X %	Reactive dye
y g/l %	Salt
z g/l %	Nanoalkali ALC (10% of Soda Ash)

AFTER WASHING

Nanowash PC 3010
Nanofix RMC

Washing 80 °C – 15 min	
1 g/l	Nanowash PC 3010

Fixing 50 °C – 20 min	
2 %	Nanofix RMC
1 g/l	Acetic Acid (pH 5-5,5)

FINISHING

Nanosoft CC Conc. (Pseudo Cat)
Nanosil MLC New (Hydrophilic Macro Silicone)
Nanosil SBL New (Micro Silicone)
Nanosil MAC 70 (Macro Silicone)

Classic Softening (Exh) 50 °C – 20 min	
%4	Nanosoft CC Conc.
1 g/l	Acetic Acid (pH 5-5,5)

Hydrophilic Softening (Exh) 50 °C – 20 min	
%2	Nanosil MLC New
1 g/l	Acetic Acid (pH 5-5,5)

Softening (Pad) (Wet on wet)	
30 /gl	Nanosil SBL New
30 /gl	Nanosil MAC 70
1 g/l	Acetic Acid (pH 5-5,5)

Hydrophilic Softening (Pad) (Wet on wet)	
30 /gl	Nanosil MLC New
1 g/l	Acetic Acid (pH 5-5,5)

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Belge No	:	TR-QC-3749
Tescil Tarihi	:	13.06.2014
Düzenleme Tarihi	:	13.06.2014
Bitiş Tarihi	:	13.06.2015
Geçerlilik Periyodu	:	3 Yıl
Baskı No	:	0

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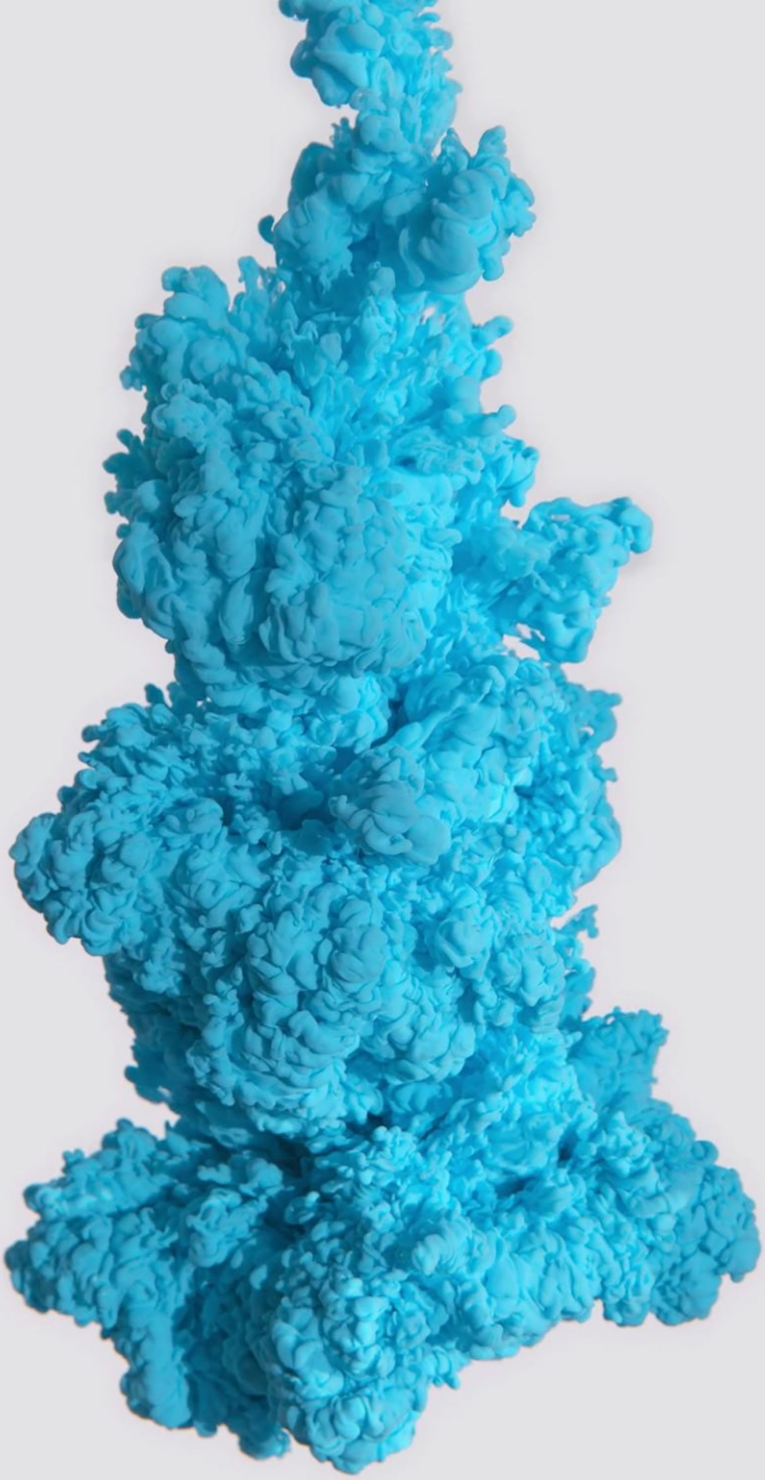

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