

Sunfix[®] HP

New Quality Standard for Cotton dyeing



Version. 3.1



Sunfix® HP

Features / Advantages

The global textile industry is working overtime to achieve a balance between economic development and environmental protection. As conservation of water resources and the environment becomes key issues of concern in textile manufacturing, Sunfix HP dyes help Textile Mills increase production outputs with shorter processing time.

Sunfix HP (High Productivity) is a New Quality Standard for deep shades in cotton dyeings, which has intense color strength and high wet fastness after three to four rinses at 60°C washing process. This innovative technology helps Textile Mills to reduce water and energy consumption as well as effluent discharge.



✓ Warm Washing System

Sunfix HP dyes ensure rapid and very high exhaustion for cotton and other cellulosic fibers, and their blends. Hydrolysed dye is also easier to remove at low temperatures.

- Reduce water consumption by up to 35%
- Reduce cycle time by 25%
- Achieve the best wet and overall fastness



✓ Easy application & Suitable for extreme low liquor ratio dyeing

Sunfix HP dyes easily replace existing recipes and process because it has similar shades and dyeing behaviors to dyestuffs widely used.



✓ Long lasting color

Sunfix HP dyes help address key sustainability challenges in the fashion and apparel industry, including high color stability in multiple home-laundrying. Ohyoung's new technology allows for a new color quality that is exceptionally stable for oxidation condition in water chlorine and detergent included.



✓ Environment-friendly products

Sunfix HP dyes meet the ZDHC Roadmap to Zero Programme standards as Level 3 quality and are bluesign® approved.

The shade of Sunfix HP dyes and Fastness properties

Sunfix

Yellow HP
2.8 %o.w.f.



Yellow Brown HP
1.2 %o.w.f.



Orange HP
1.2 %o.w.f.



Cardinal HP
0.9 %o.w.f.



Red HP
2.0 %o.w.f.



Red HP-2B
1.3 %o.w.f.



Sunfix

Blue HP
2.4 %o.w.f.



Space HP
2.8 %o.w.f.



Navy Blue HP
2.4 %o.w.f.



Forest HP
2.0 %o.w.f.



Black HP
5.0 %o.w.f.



Fastness properties

Sunfix	1/1 SD (% o.w.f.)	Light	Water	Perspiration	Washing						M&S C10A (Color retention)	Chlorinated water	Rubbing	Dischargeability
					CA	CO	PA	PES	PAN	WO				
Yellow HP	2.8	4-5 4-5	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 3-4	B A
Yellow Brown HP	1.2	4-5 4	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	3-4	4-5 3	W A
Orange HP	1.2	4 3-4	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4	4	4-5 3-4	W A
Cardinal HP	0.9	4-5 4	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4	4 3-4	W A
Red HP	2.0	4 3-4	4-5 4	4 4	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 3	B B
Red HP-2B	1.3	4 3	4-5 4	3-4 3-4	4-5	4-5	4-5	4-5	4-5	4-5	3	3-4	4-5 3	B B
Blue HP	2.4	4 3-4	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 3-4	W A
Space HP	2.8	4 3	4-5 4	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4 3	W A
Navy Blue HP	2.4	3-4 3	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 2-3	W A
Forest HP	2.0	4 3	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 3	W A
Black HP	5.0	4-5 4	4-5 4-5	4-5 4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5 2-3	W A

* All fastness were tested after soaping process with dyed fabric on CM 40's Interlock.

Fastness Test Methods

* Light (AATCC 16.3(20AFU))
- Upper : 1/1 SD
- Lower : 1/6 SD (BK 1/2 SD)

* Perspiration (ISO 105-E04, 37°C x 4hrs.)
- Upper : Acid
- Lower : Alkali

* M&S C10A (Oxidative Bleach Damage)
- 60°C x 30min., L/R = 1:100
- ISO 105-C09

* Rubbing (ISO 105-X12)
- Upper : Dry
- Lower : Wet

* Water (ISO 105-E01, 37°C x 4hrs.)
- Upper : Color change
- Lower : Staining

* Washing (ISO 105-C06, C25)
- 60°C x 30min.
- Staining

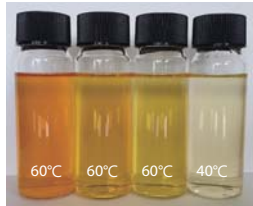
* Chlorinated water (ISO 105-E03)
- 27°C x 1hr.
- Active chlorine : 20ppm

* Dischargeability
- Upper : Rongalite C
- Lower : Decrolin

Sunfix HP dyes Wash-off & Fastness from Warm Washing System

Sunfix Yellow HP 1.4% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



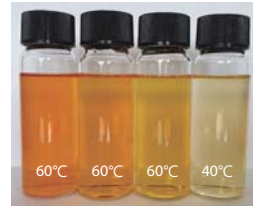
✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4	4-5	4-5	4-5	4-5

Chlorinated water
4-5

Sunfix Yellow Brown HP 1.2% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



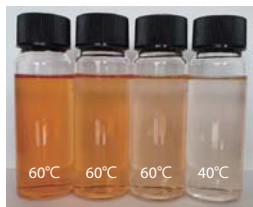
✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water
3-4

Sunfix Orange HP 1.2% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



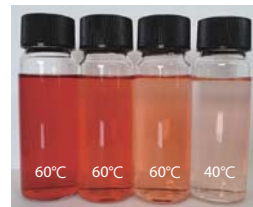
✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water
4

Sunfix Cardinal HP 0.9% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water
4

Sunfix Red HP 1.0% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4	4-5	4-5	4-5	4-5

Chlorinated water
4-5

Sunfix Red HP-2B 0.65% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

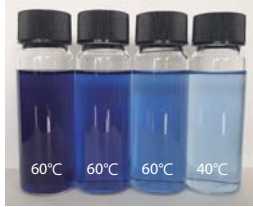
CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25 : 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4	4-5	4-5	4-5	4-5

Chlorinated water
3-4

Sunfix HP dyes Wash-off & Fastness from Warm Washing System

Sunfix Blue HP 1.2% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

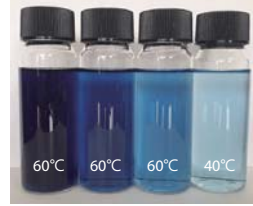
CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25: 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water

4-5

Sunfix Space HP 1.4% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

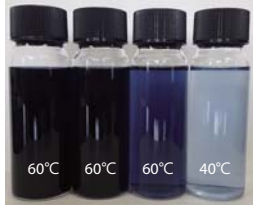
CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25: 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4	4-5	4-5	4-5	4-5

Chlorinated water

4-5

Sunfix Navy Blue HP 2.4% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

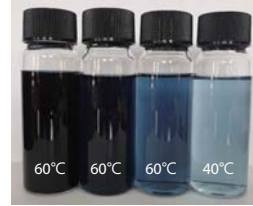
CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25: 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water

4-5

Sunfix Forest HP 2.0% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25: 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water

4-5

Sunfix Black HP 5.0% o.w.f.

✓ Wash-off residue (Liquor ratio = 1:10)



✓ Fastness

CA	CO	PA	PET	PAN	WO
Washing (ISO 105-C06, C25: 2010, 60°C x 30min.)					
4-5	4-5	4-5	4-5	4-5	4-5
Water (ISO 105-E01 : 2013, 37°C x 4 hrs.)					
4-5	4-5	4-5	4-5	4-5	4-5

Chlorinated water

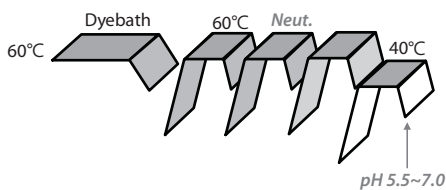
4-5



Recommendable Wash-off processes

Depend on the purposes, various Wash-off processes are applicable.

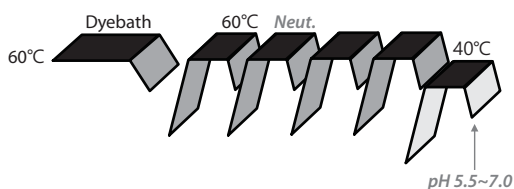
✓ Warm Washing System (Liquor ratio = 1:10)



<4 times wash-off>

- ✓ Sunfix Yellow HP
- ✓ Sunfix Yellow Brown HP
- ✓ Sunfix Orange HP
- ✓ Sunfix Cardinal HP
- ✓ Sunfix Red HP
- ✓ Sunfix Red HP-2B
- ✓ Sunfix Blue HP
- ✓ Sunfix Space HP
- ✓ Sunfix Navy Blue HP
- ✓ Sunfix Forest HP

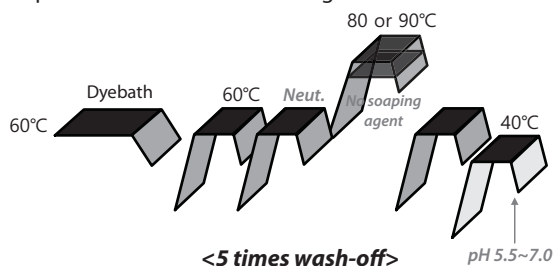
✓ Extended Warm Washing System for Sunfix Black HP, low liquor washing (less than 1:8) or ultra deep ternary shades.



<5 times wash-off>

- ✓ Sunfix Black HP
- ✓ Low liquor ratio (less than 1:8)
- ✓ Ultra deep ternary shades

✓ Specific method - Hot washing

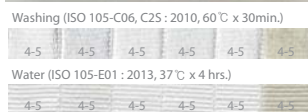


<5 times wash-off>

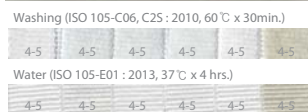
- ✓ Critical Black and deep shades
- ✓ To improve water fastness

✓ The results from different Wash-off liquor ratio (Sunfix Black HP)

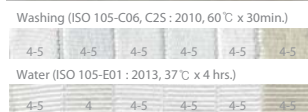
5.0%o.w.f.
Liquor ratio = 1:10



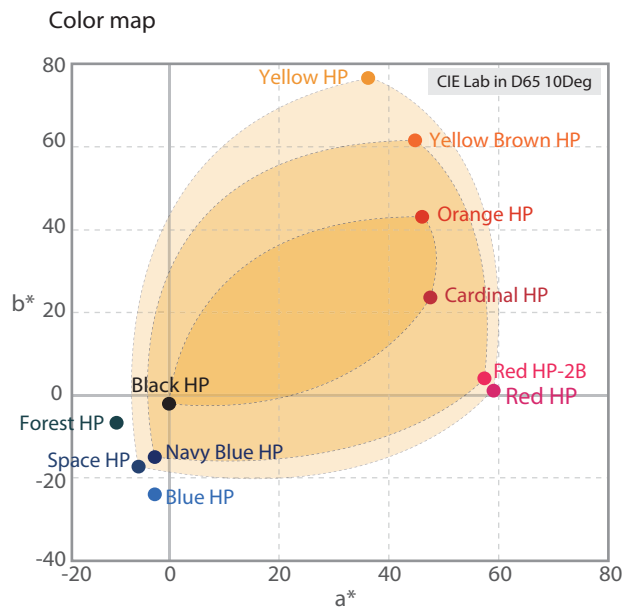
5.0%o.w.f.
Liquor ratio = 1:8



5.0%o.w.f.
Liquor ratio = 1:6



The profiles of Sunfix HP



Medium	Dark	Ultra deep	Black
Sunfix Yellow HP Sunfix Cardinal HP Sunfix Red HP Sunfix Space HP Sunfix Blue HP	Sunfix Yellow Brown HP Sunfix Orange HP Sunfix Cardinal HP Sunfix Red HP Sunfix Red HP-2B Sunfix Navy Blue HP Sunfix Forest HP	Sunfix Orange HP Sunfix Cardinal HP Sunfix Navy Blue HP Sunfix Forest HP	Sunfix Orange HP Sunfix Cardinal HP Sunfix Black HP

Medium shades

- Bright Golden Yellow and Red shades with high speed wash-off in low temperature.
- Long-lasting brilliance in multiple laundry.
- Good light fastness with Cardinal HP
- Less staining on synthetic fibers in blended fabric
- Very good leveling & reproducibility

Dark shades

- Cost-competitive recipes
- Very good wet fastness
- Highly reduced water consumption & processing time

Ultra deep shades


- Significant processing cost saving
- Very good wet fastness
- Easy to make intense shades with high build-up
- Outstanding wash off
- Less flare in various light sources with Forest HP

Black shades

- New quality Black to meet stringent environmental standards (incl. bluesign, ZDHC)
- Designed for very short dyeing liquor ratios (1:5 or less)
- Dramatically reducing processing time to boost production
- Long-lasting black shades in multiple laundry with new chemistries


Long Lasting colors

Commodity







20times home laundering

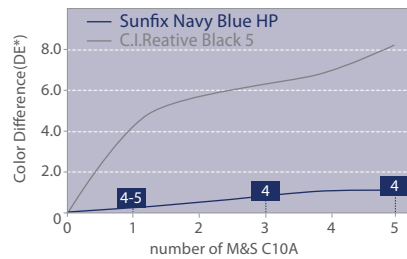
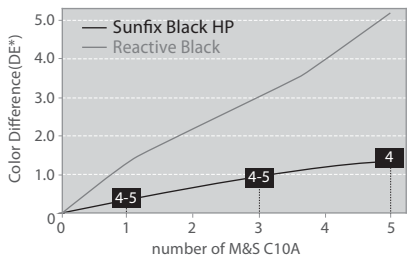
Sunfix HP



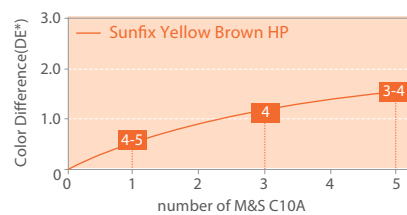
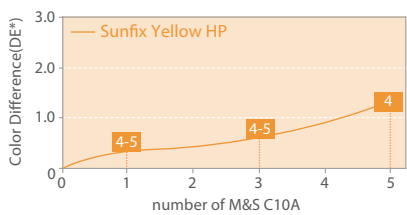
M&S C10A(ISO 105-C09) method is to assess any color change which may occur during repeat washing with an oxidative bleach detergent.



1time test has a similar effect to 20times home laundering.

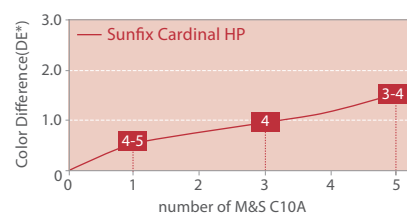
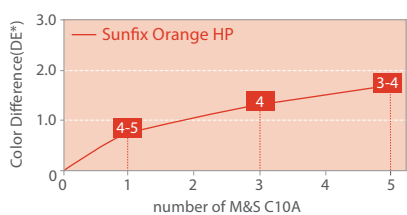
	STD	1time	3times	5times		STD	1time	3times	5times
Black HP 5.0% o.w.f. Grade		4-5	4-5	4	Navy Blue HP 2.4% o.w.f. Grade		4-5	4	4
Reactive Black 5.0% o.w.f. Grade		4	3-4	2-3	C.I.Reactive Black 5 2.0% o.w.f. Grade		2-3	2	1-2



	STD	1time	3times	5times		STD	1time	3times	5times
Yellow HP 2.8% o.w.f. Grade		4-5	4-5	4	Yellow Brown HP 1.2% o.w.f. Grade		4-5	4	3-4



	STD	1time	3times	5times		STD	1time	3times	5times
Orange HP 1.2% o.w.f. Grade		4-5	4	3-4	Cardinal HP 0.9% o.w.f. Grade		4-5	4	3-4



Long Lasting colors

Test Method

* M&S C10A (COLOUR FASTNESS TO OXIDATIVE BLEACH DAMAGE)

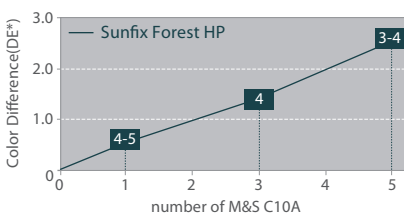
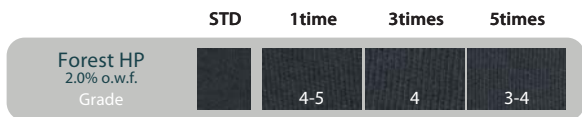
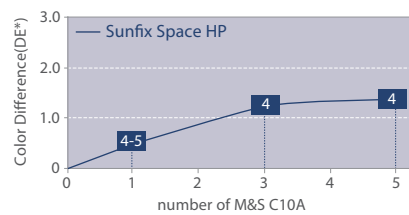
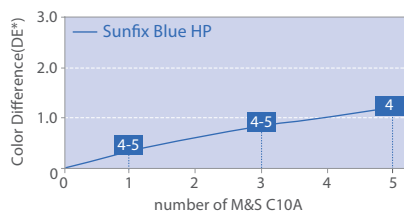
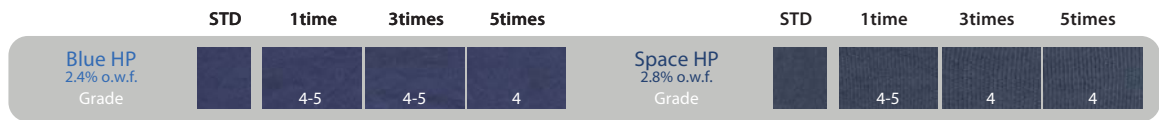
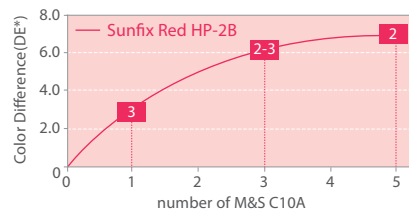
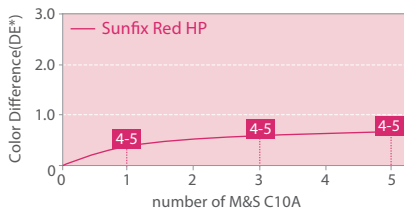
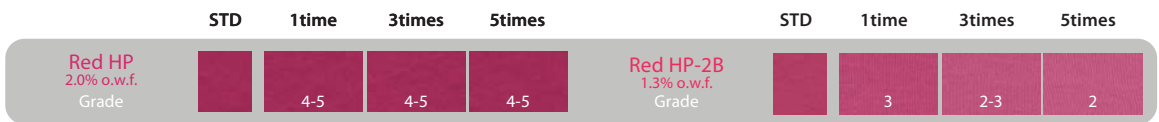
- Reagent :

ECE Reference Detergent (A) (without optical brightened) : 10.0g/L

Sodium Perborate Tetrahydrate (NaBO₃•4H₂O) : 12.0g/L

TAED (Tetra-Acetyl Ethylene Diamine) at 100% activity : 1.8g/L

- Method : Reagent 100mL, Fabric 1.0g, Liquor Ratio = 1:100, 60 °C x 30min.



Fastness to chlorinated water

Highest chlorinated water fastness ensures long-lasting color quality required by current technical trends. These days, the consumer preference in all fields of textiles use is both for wash-and-wear and high wash fastness. To achieve high color stability and high washable quality as well, the stability to chlorine becomes much important factor because chlorine is widely used in purification of tap water, washing machine and water pipe. Especially Activewear and swimming cotton wear are used to be washed more frequently.

	STD	20ppm	50ppm		STD	20ppm	50ppm
Reactive Black 5.0% o.w.f. Grade		 3-4	 2-3	C.I.Reactive Black 5 2.0% o.w.f. Grade		 3	 2
Black HP 5.0% o.w.f. Grade		 4-5	 4	Navy Blue HP 2.4% o.w.f. Grade		 4-5	 4
Yellow HP 2.8% o.w.f. Grade		 4-5	 4	Yellow Brown HP 1.2% o.w.f. Grade		 3-4	 2-3
Orange HP 1.2% o.w.f. Grade		 4	 3-4	Cardinal HP 0.9% o.w.f. Grade		 4	 3-4
Red HP 2.0% o.w.f. Grade		 4-5	 4	Red HP-2B 1.3% o.w.f. Grade		 3-4	 2-3
Blue HP 2.4% o.w.f. Grade		 4-5	 3-4	Space HP 2.8% o.w.f. Grade		 4-5	 3
Forest HP 2.0% o.w.f. Grade		 4-5	 4	* Test method - ISO 105-E03 : 2010 - Active chlorine 20, 50ppm, 27°C x 1hr.			

Dischargeability

Selected HP dyes are suitable for dyeing of yarns, fabrics and garments which to be applied to discharge printing of fabrics and faded-out effects of garments with "Tone on Tone" and "White" dischargeability



* Test Method : Rongalite C & Decrolin

The discharge test was made on cotton fabrics dyed at the standard depth by the following recipes.

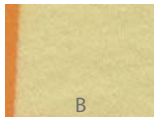
		Rongalite C	Decrolin
Thickener	Algin 5.0%	80	-
	Pigment	-	90
Rongalite C		15	-
Soda ash		5	-
Decrolin		-	10
Total		100	100

Rongalite C

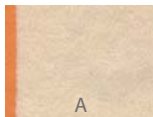
Decrolin

Yellow HP
2.8% o.w.f.

Grade



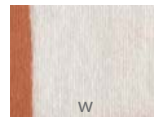
B



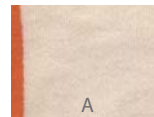
A

Yellow Brown HP
1.2% o.w.f.

Grade



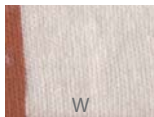
W



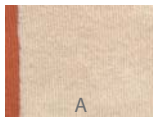
A

Orange HP
1.2% o.w.f.

Grade



W



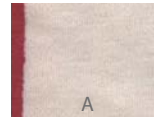
A

Cardinal HP
0.9% o.w.f.

Grade



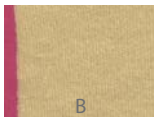
W



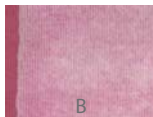
A

Red HP
2.0% o.w.f.

Grade



B



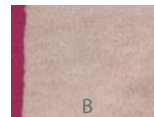
B

Red HP-2B
1.3% o.w.f.

Grade



B



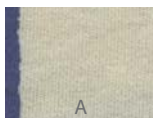
B

Blue HP
2.4% o.w.f.

Grade



W



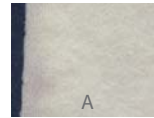
A

Space HP
2.8% o.w.f.

Grade



W



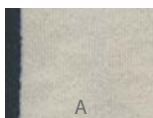
A

Forest HP
2.0% o.w.f.

Grade



W



A

Navy Blue HP
2.4% o.w.f.

Grade



W



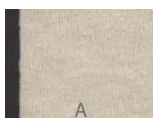
A

Black HP
5.0% o.w.f.

Grade



W



A

* Assessment

W : White dischargeable

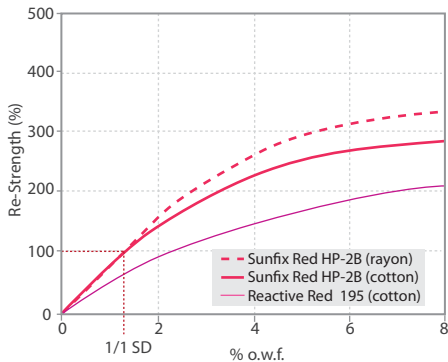
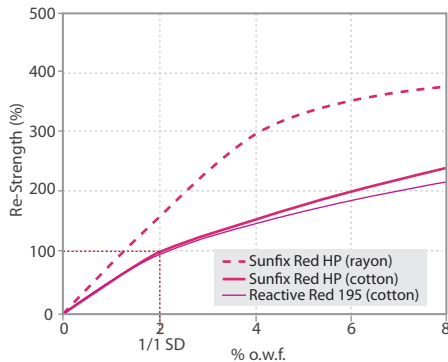
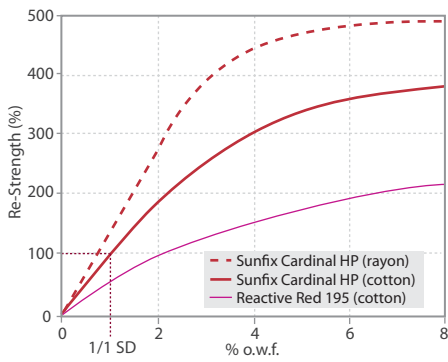
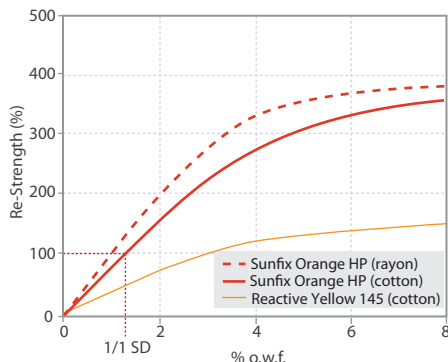
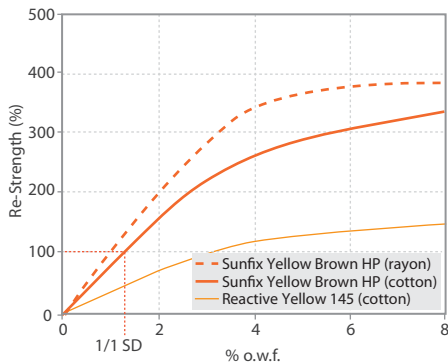
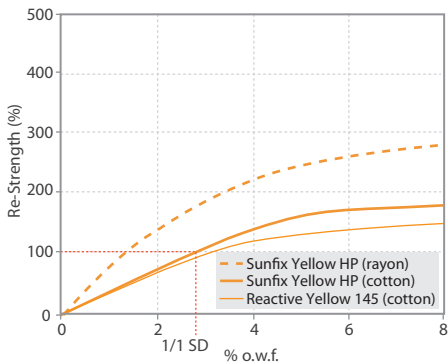
A : Still sufficiently dischargeable

B : In the case of lower demands still sufficiently dischargeable

C : Not dischargeable

Build-up property

Sunfix HP dyes' high color intensity results in lower dye and salt requirements, leading to the Warm Washing System.



*** Exhaustion dyeing**

- Test Fabric : CM 40's Interlock, Rayon 30's/span
- Method : 60°C x 60min. - Liquor Ratio = 1:10
- Chemical Requirement

1. Cotton

1) Sunfix HP

% o.w.f.	0.5	1.0	3.0	5.0	8.0
Glauber's Salt (g/L)	25	30	50	70	80
Soda Ash (g/L)	10	12	15	20	20

2) Sunfix Black HP

% o.w.f.	3.0	5.0	7.0	9.0	11.0	13.0
Glauber's Salt (g/L)	50	70	80	80	80	80
Soda Ash (g/L)	15	20	20	20	20	20

2. Rayon

1) Sunfix HP

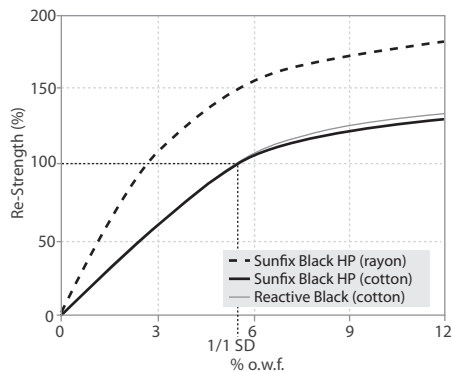
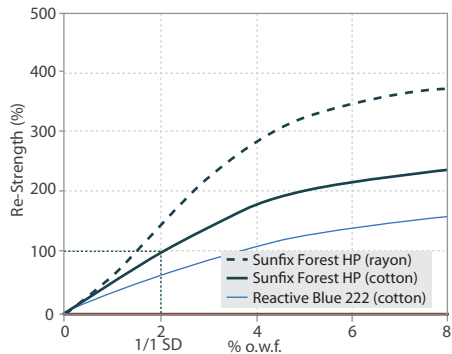
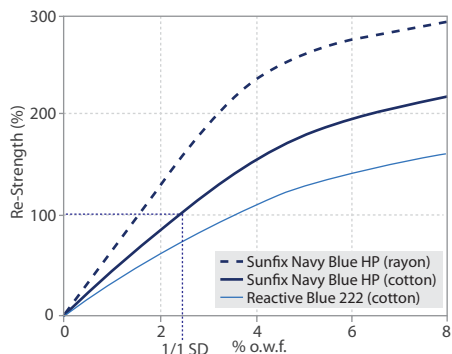
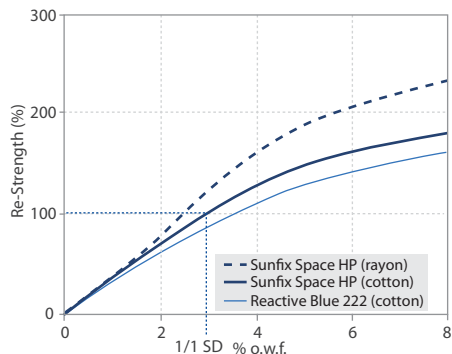
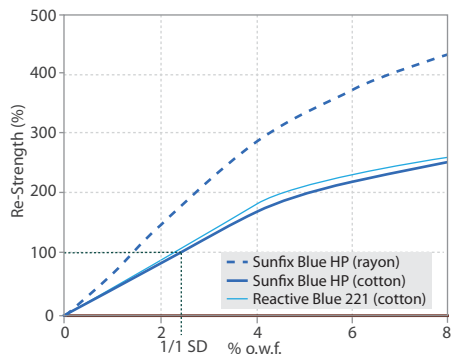
% o.w.f.	0.5	1.0	3.0	5.0	8.0
Glauber's Salt (g/L)	15	20	40	60	60
Soda Ash (g/L)	8	10	12	15	15

2) Sunfix Black HP

% o.w.f.	3.0	5.0	7.0	9.0	11.0	13.0
Glauber's Salt (g/L)	40	60	60	60	60	60
Soda Ash (g/L)	12	15	15	15	15	15

Build-up property

Sunfix HP dyes' high color intensity results in lower dye and salt requirements, leading to the Warm Washing System.



*** Exhaustion dyeing**

- Test Fabric : CM 40's Interlock, Rayon 30's/span
- Method : 60°C x 60min. - Liquor Ratio = 1:10
- Chemical Requirement

1. Cotton

1) Sunfix HP	2) Sunfix Black HP
% o.w.f. 0.5 1.0 3.0 5.0 8.0	% o.w.f. 3.0 5.0 7.0 9.0 11.0 13.0
Glauber's Salt (g/L) : 25 30 50 70 80	Glauber's Salt (g/L) : 50 70 80 80 80 80
Soda Ash (g/L) : 10 12 15 20 20	Soda Ash (g/L) : 15 20 20 20 20 20

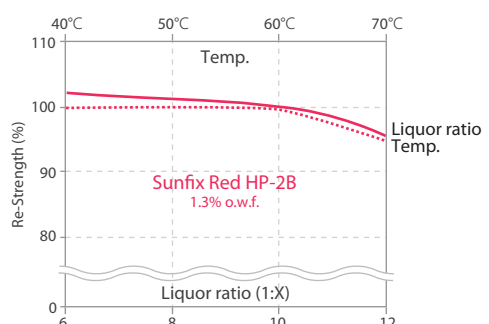
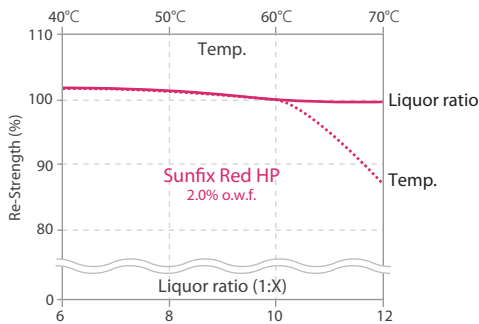
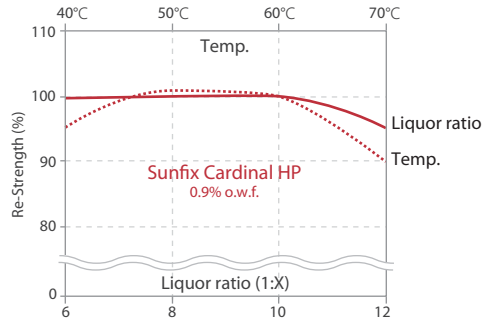
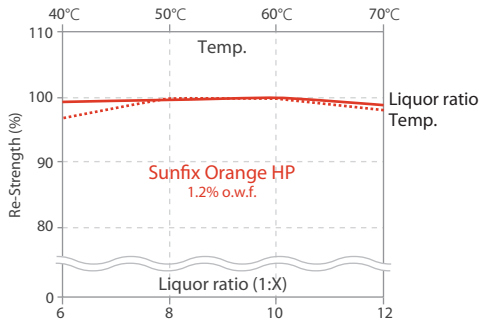
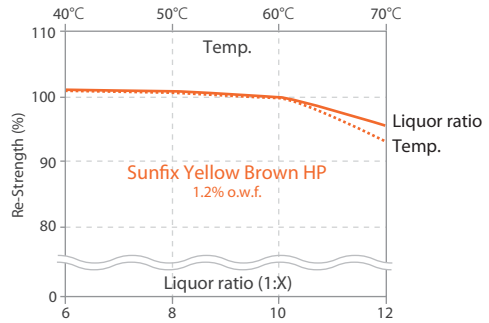
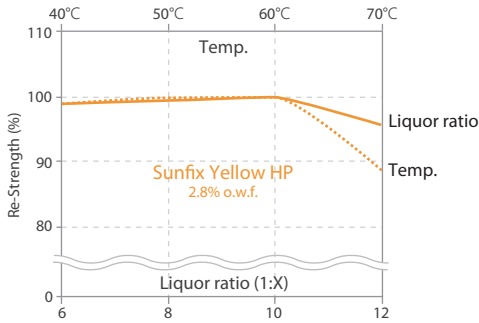
2. Rayon

1) Sunfix HP	2) Sunfix Black HP
% o.w.f. 0.5 1.0 3.0 5.0 8.0	% o.w.f. 3.0 5.0 7.0 9.0 11.0 13.0
Glauber's Salt (g/L) : 15 20 40 60 60	Glauber's Salt (g/L) : 40 60 60 60 60 60
Soda Ash (g/L) : 8 10 12 15 15	Soda Ash (g/L) : 12 15 15 15 15 15

Temperature and Liquor ratio sensitivity

Sunfix HP dyes show high color stability between 50°C and 60°C dyeing temperature.

— Liquor ratio Temp.



*** Test method**

1. Liquor ratio Sensitivity

- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:6 / 1:8 / 1:10(Std.) / 1:12
- Dyeing temp. : 60°C

— Liquor ratio

..... Temp.

2. Temperature Sensitivity

- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:10
- Dyeing Temp. : 40°C / 50°C / 60°C(Std.) / 70°C

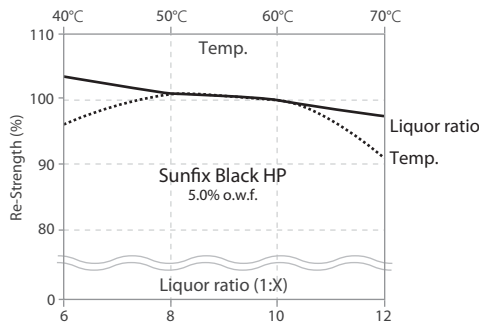
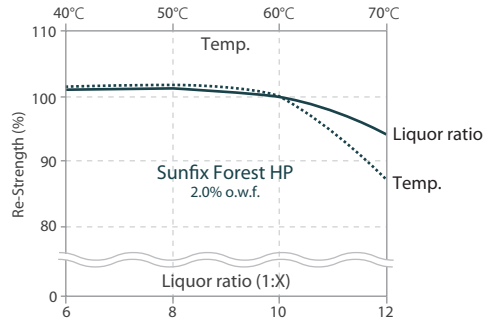
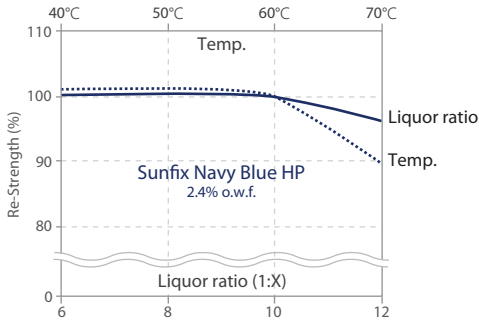
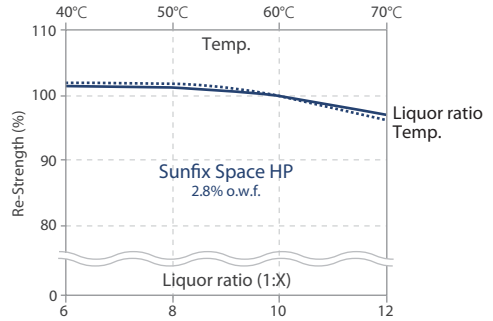
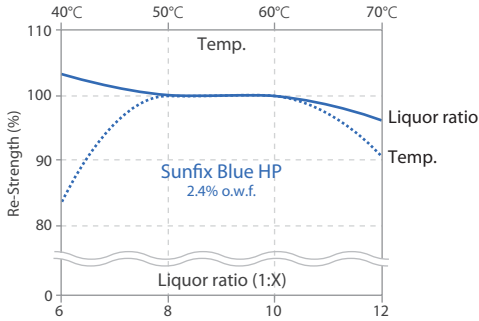
3. Chemicals

	Y HP	YBr HP	O HP	R HP	R HP-2B	Ca HP
Glauber's Salt (g/L) :	50	35	35	40	35	30
Soda Ash (g/L) :	15	12	12	15	12	12

Temperature and Liquor ratio sensitivity

Sunfix HP dyes show high color stability between 50°C and 60°C dyeing temperature.

— Liquor ratio Temp.



*** Test method**

1. Liquor ratio Sensitivity

- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:6 / 1:8 / 1:10(Std.) / 1:12
- Dyeing temp.: 60°C

— Liquor ratio

..... Temp.

2. Temperature Sensitivity

- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:10
- Dyeing Temp.: 40°C / 50°C / 60°C(Std.) / 70°C

3. Chemicals

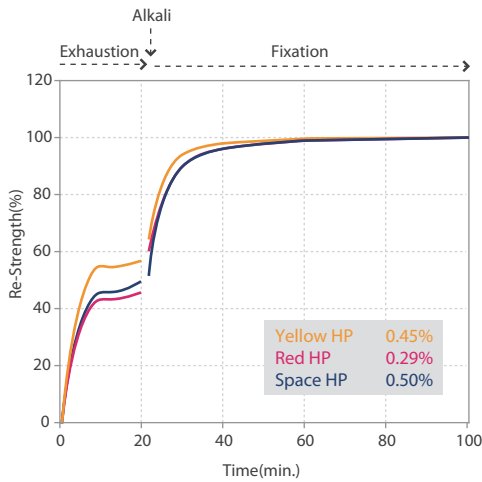
	B HP	Sp HP	Fo HP	NB HP	Bk HP
Glauber's Salt (g/L) :	45	50	40	45	70
Soda Ash (g/L) :	15	15	15	15	20

Compatibility & Reproducibility

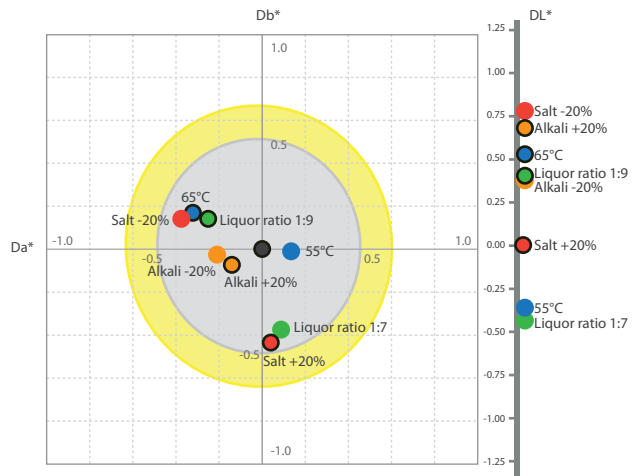
Sunfix HP dyes have good compatibility and reproducibility in lab to bulk and bulk to bulk dyeings with low sensitivity under various dyeing parameters, especially in low temp. (below 60°C) and low liquor ratio (less than 1:6).

1. Medium shade

1) Step dyeing

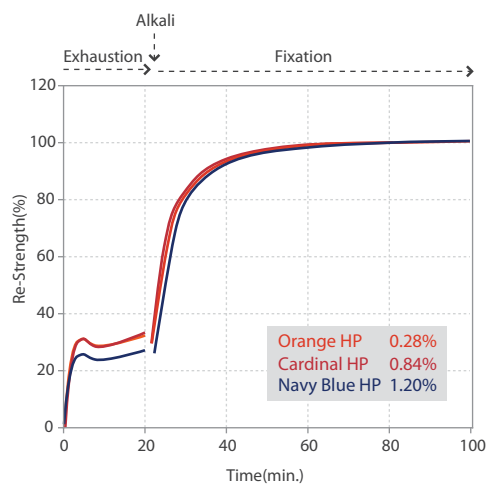


2) Reproducibility in various dyeing conditions

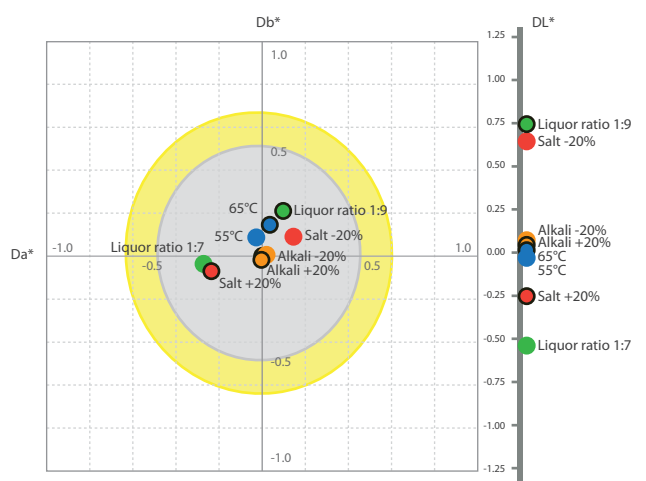


2. Deep shade

1) Step dyeing



2) Reproducibility in various dyeing conditions



Dyeing Methods

1) Step dyeing

- Test Fabric : CM 40's Interlock
- Method : 60°C x 60min.
- Dyeing liquor ratio : 1:10

2) Reproducibility in various dyeing conditions

- Test Fabric : CM 40's Interlock
- Method : 60°C x 60min.
- Standard : Salt 35g/L, Alkali 15g/L, Liquor ratio 1:8, Temperature 60°C

Case study, Bulk production result of Medium Khaki shade

Type	Color	Dyestuffs	Dyeing depth		Chemicals		Strength (Sum of K/S)
			% o.w.f.	Total	Glauber's salt	Soda ash	
Commodity		<ul style="list-style-type: none"> ■ Reative Yellow 145 ■ Reative Red 195 ■ Reative Blue 222 	1.05 0.32 0.81	2.18% (100.0%)	35g/L	20g/L	100.0%
Sunfix HP		<ul style="list-style-type: none"> ■ Sunfix Yellow HP ■ Sunfix Red HP ■ Sunfix Space HP 	0.76 0.29 0.63	1.68% (77.1%)	30g/L	20g/L	99.8%

✓ Wash-off (Liquor ratio = 1:10)



Commodity



Sunfix HP

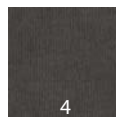
Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C25 : 2010		4-5				
Water ISO 105-E01 : 2013		4				
Perspiration ISO 105-E04 : 2013	Alkali	3-4				

Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C25 : 2010		4-5				
Water ISO 105-E01 : 2013		4-5				
Perspiration ISO 105-E04 : 2013	Alkali	4				

✓ Chlorinated water (20ppm)



✓ M&S C10A (1time)



Dyeing & Fastness Test Methods

* Exhaustion dyeing

- Dyeing Machine : FONG'S
- Fabric : Cotton 100% Single jersey
- Fabric weight : 467.0kg
- Method : 60°C x 60min.
- Dyeing liquor ratio = 1:6
- Wash-off liquor ratio = 1:10

* Washing

- ISO 105-C06, C25 : 2010
- 60°C x 30min.

* Water

- ISO 105-E01 : 2013
- 37°C x 4hrs.

* Perspiration

- ISO 105-E04 : 2013 (Alkali)
- 37°C x 4hrs.



* Chlorinated water

- ISO 105-E03 : 2010
- Active chlorine : 20ppm
- 27°C x 1hr.

* M&S C10A (Color retention)

- 60°C x 30min.
- Liquor ratio = 1:100
- Reagent : ECE Detergent(10.0g/L)
TAED(1.8g/L)
Sodium Perborate(12.0g/L)

Case study, Bulk production result of Deep Brown shade

Type	Color	Dyestuffs	Dyeing depth		Chemicals		Strength (Sum of K/S)
			% o.w.f.	Total	Glauber's salt	Soda ash	
Commodity		<ul style="list-style-type: none"> ■ Reactive Yellow 145 ■ Reactive Red 195 ■ Reactive Blue 222 	2.00 1.50 1.00	4.50% (100.0%)	65g/L	20g/L	100.0%
Sunfix HP		<ul style="list-style-type: none"> ■ Sunfix Orange HP ■ Sunfix Cardinal HP ■ Sunfix Navy Blue HP 	0.48 0.56 0.63	1.67% (37.1%)	35g/L	17g/L	100.2%

✓ Wash-off (Liquor ratio = 1:10)



Commodity



Sunfix HP

Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C25 : 2010		3-4				
Water ISO 105-E01 : 2013		4				
Perspiration ISO 105-E04 : 2013	Alkali	3-4				

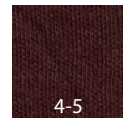
Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C25 : 2010		4-5				
Water ISO 105-E01 : 2013		4-5				
Perspiration ISO 105-E04 : 2013	Alkali	4-5				

✓ Chlorinated water (20ppm)



✓ M&S C10A (1time)



Dyeing & Fastness Test Methods

* Exhaustion dyeing

- Dyeing Machine : SCLAVOS(Greece)
- Fabric : CM 40's Interlock
- Fabric weight : 170.5kg
- Method : 60°C x 60min.
- Dyeing liquor ratio = 1:8
- Wash-off liquor ratio = 1:10

* Washing

- ISO 105-C06, C25 : 2010
- 60°C x 30min.

* Water

- ISO 105-E01 : 2013
- 37°C x 4hrs.

* Perspiration

- ISO 105-E04 : 2013 (Alkali)
- 37°C x 4hrs.



* Chlorinated water

- ISO 105-E03 : 2010
- Active chlorine : 20ppm
- 27°C x 1hr.

* M&S C10A (Color retention)

- 60°C x 30min.
- Liquor ratio = 1:100
- Reagent : ECE Detergent(10.0g/L)
TAED(1.8g/L)
Sodium Perborate(12.0g/L)

Case study, Bulk production result of Deep Black shades

Type	Color	Dyestuffs	Dyeing depth		Chemicals		Strength (Sum of K/S)
			% o.w.f.	Total	Glauber's salt	Soda ash	
Commodity		<ul style="list-style-type: none"> ■ Reative Yellow 145 ■ Reative Red 195 ■ Reative Black 	1.90 1.65 6.00	9.55% (100.0%)	75g/L	24g/L	100.0%
Sunfix HP		<ul style="list-style-type: none"> ■ Sunfix Yellow Brown HP ■ Sunfix Black HP 	0.90 6.50	7.40% (77.5%)	65g/L	24g/L	101.9%

✓ Wash-off (Liquor ratio = 1:10)



Commodity



Sunfix HP

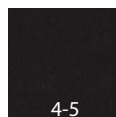
Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C2S : 2010		3-4				
Water ISO 105-E01 : 2013		3				
Perspiration ISO 105-E04 : 2013	Alkali	2				

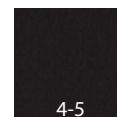
Grade : Grey scale for staining

Color Fastness	CA acetate	CO cotton	PA polyamide	PES polyester	PAN acrylic	WO wool
Washing ISO 105-C06 C2S : 2010		4-5				
Water ISO 105-E01 : 2013		4				
Perspiration ISO 105-E04 : 2013	Alkali	3				

✓ Chlorinated water (20ppm)



✓ M&S C10A (1time)



Dyeing & Fastness Test Methods

* Exhaustion dyeing

- Dyeing Maching : THIES
- Fabric : Cotton 93% + Span 7%,
Single jersey
- Fabric weight : 475.0kg
- Method : 60°C x 60min.
- Dyeing liquor ratio = 1:6
- Wash-off liquor ratio = 1:10

* Washing

- ISO 105-C06, C2S : 2010
- 60°C x 30min.

* Water

- ISO 105-E01 : 2013
- 37°C x 4hrs.

* Perspiration

- ISO 105-E04 : 2013 (Alkali)
- 37°C x 4hrs.

* Chlorinated water

- ISO 105-E03 : 2010
- Active chlorine : 20ppm
- 27°C x 1hr.

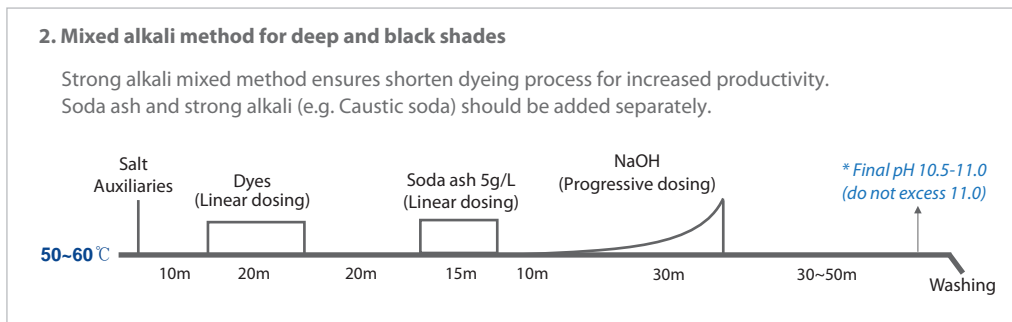
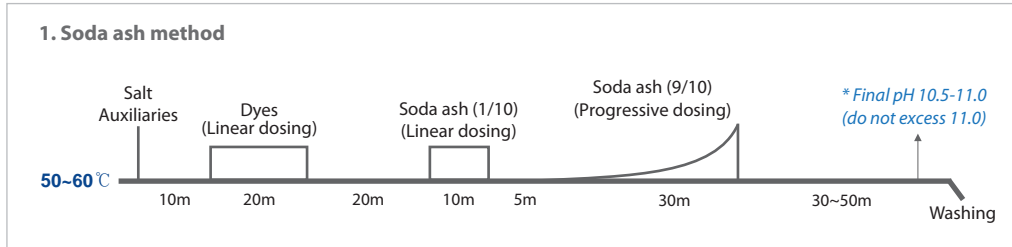
* M&S C10A (Color retention)

- 60°C x 30min.
- Liquor ratio = 1:100
- Reagent : ECE Detergent(10.0g/L)
TAED(1.8g/L)
Sodium Perborate(12.0g/L)

Dyeing process

The optimal dyeing temperature is 50°C~60°C, but the appropriate dyeing temperature depends on the fabric types and dyeing machines.

✓ Standard method (Isothermal)



*Comment

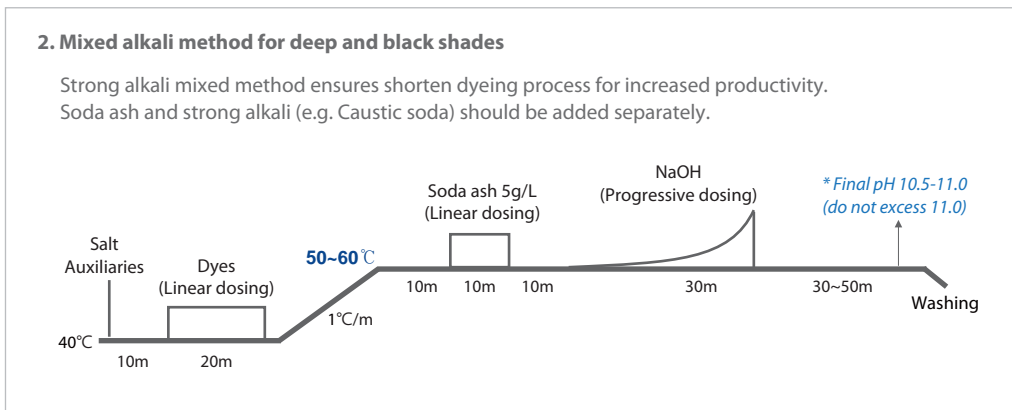
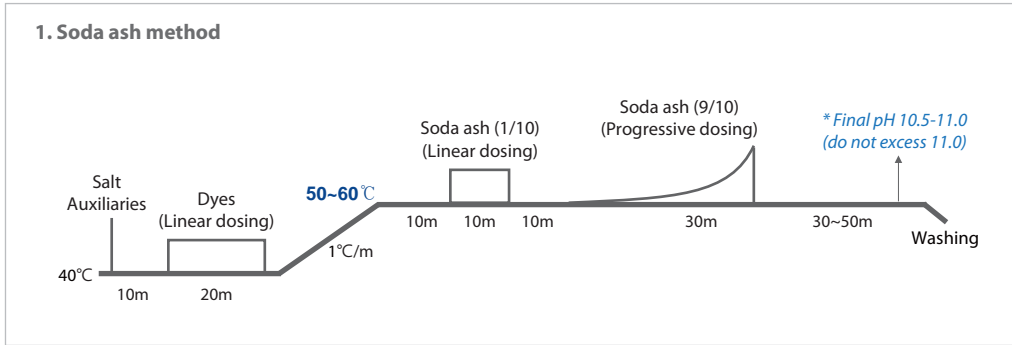
- For optimum color yield, less than final pH 11.0 is recommended to avoid excess hydrolysis.
- 50°C dyeing is possible for additional energy savings.
- Reproducibility is further improved at low liquid ratios dyeing.
- HP dyes have high fixing ability, thus proper alkali dosing is key factors to achieve the targeted dyeing result.



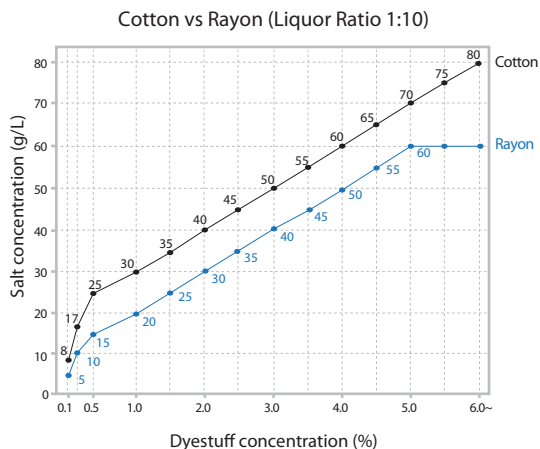
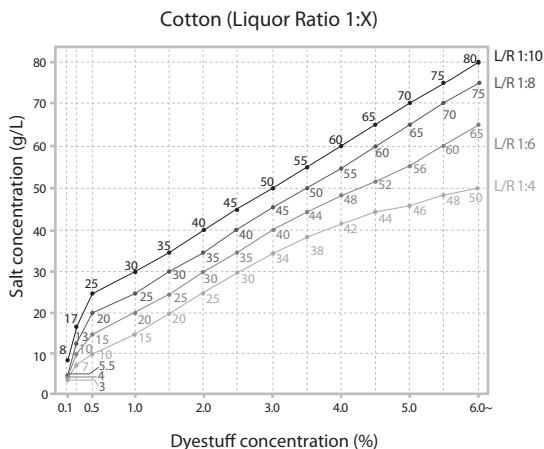
Dyeing process

The optimal dyeing temperature is 50°C~60°C, but the appropriate dyeing temperature depends on the fabric types and dyeing machines.

- ✓ Standard method (Temperature rising)



Recommended amounts of salt and alkali



* Mixed alkali : NaOH 36°Bé (30.0%)

Dyeing depth (% o.w.f.)	Liquor Ratio 1:10						Liquor Ratio 1:8					
	Salt(g/L)		Alkali(g/L)				Salt(g/L)		Alkali(g/L)			
	Cotton	Rayon	Soda ash		Soda ash + NaOH		Cotton	Rayon	Soda ash		Soda ash + NaOH	
up to 0.1	8	5	5	5	5	0.2	5.5	4.5	5.5	5.5	5.5	0.25
0.3	17	10	8	6	5	0.5	13	8	9	7	5.5	0.6
0.5	25	15	10	8	5	0.5	20	13	11	9	5.5	0.8
1.0	30	20	12	10	5	0.8	25	17	15	12	5.5	1.0
1.5	35	25	12	10	5	1.0	30	20	15	12	5.5	1.2
2.0	40	30	15	12	5	1.2	35	25	17	14	5.5	1.5
2.5	45	35	15	12	5	1.5	40	30	17	14	5.5	1.8
3.0	50	40	15	12	5	1.8	45	35	22	17	5.5	2.0
3.5	55	45	20	15	5	2.0	50	40	22	17	5.5	2.0
4.0	60	50	20	15	5	2.0	55	45	22	17	5.5	2.2
4.5	65	55	20	15	5	2.0	60	50	22	17	5.5	2.2
5.0	70	60	20	15	5	2.0	65	55	22	17	5.5	2.2
5.5	75	60	20	15	5	2.0	70	55	22	17	5.5	2.2
above 6.0	80	60	20	15	5	2.0	75	55	22	17	5.5	2.2

Dyeing depth (% o.w.f.)	Liquor Ratio 1:6						Liquor Ratio 1:4					
	Salt(g/L)		Alkali(g/L)				Salt(g/L)		Alkali(g/L)			
	Cotton	Rayon	Soda ash		Soda ash + NaOH		Cotton	Rayon	Soda ash		Soda ash + NaOH	
up to 0.1	4	4	6	6	6	0.3	3	3	7	7	6.5	0.3
0.3	10	7	10	8	6	0.7	7	5	11	9	6.5	0.8
0.5	15	10	12	10	6	1.0	10	8	14	12	6.5	1.2
1.0	20	13	18	14	6	1.2	15	10	20	16	6.5	1.5
1.5	25	15	18	14	6	1.5	20	12	20	16	6.5	1.8
2.0	30	20	20	16	6	1.8	25	15	22	18	6.5	2.0
2.5	35	25	20	16	6	2.0	30	18	22	18	6.5	2.2
3.0	40	30	24	18	6	2.2	34	20	24	20	6.5	2.4
3.5	44	34	24	18	6	2.2	38	24	24	20	6.5	2.4
4.0	48	38	24	18	6	2.4	42	28	24	20	6.5	2.6
4.5	52	42	24	18	6	2.4	44	32	24	20	6.5	2.6
5.0	56	50	24	18	6	2.4	46	34	26	20	6.5	2.6
5.5	60	50	24	18	6	2.4	48	36	26	20	6.5	2.6
above 6.0	65	50	24	18	6	2.4	50	40	26	20	6.5	2.6

* Dyeing result can be different according to salt, alkali and water quality.

Accreditation Certification



ISO 14001
Certification for
Environment Management
System



ISO 9001
Certification for
Quality Management
System



OHSAS 18001
for Health and
Safety Management
System



ISO 50001
Certification for
Energy Management
System



OHYOUNG Laboratory
is accredited with
ISO/IEC 17025



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Management Systems
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Ecological and Toxicological
Association of Dyes and Organic
Pigments Manufacturers

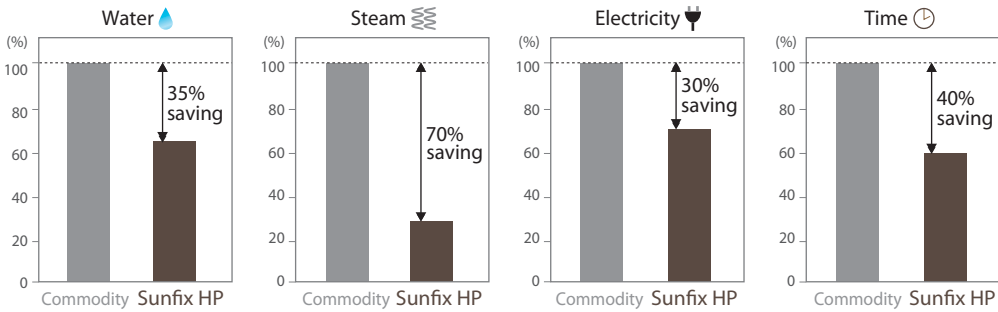
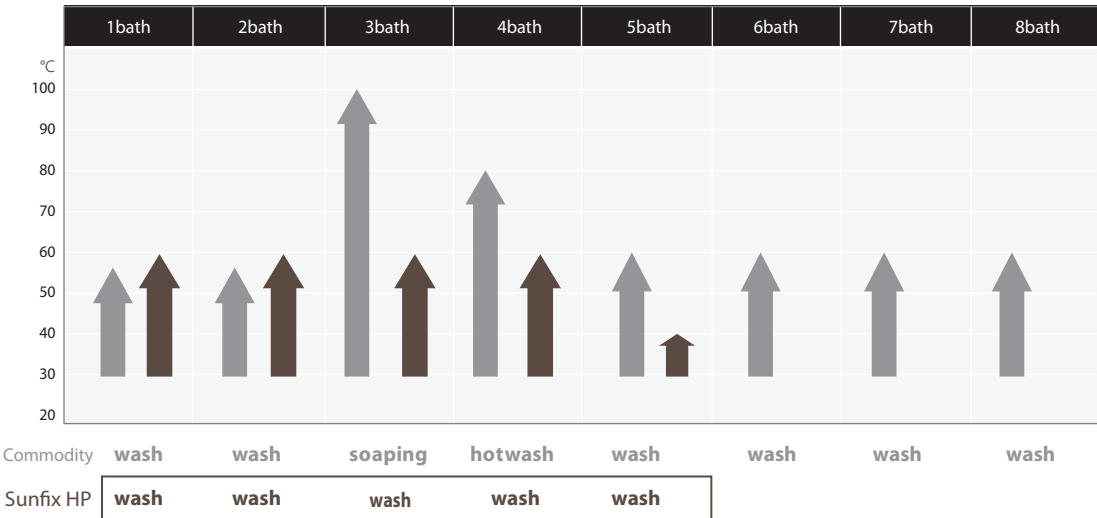


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This information and technical advice were prepared very carefully, however complete guarantee can not be given considering various different conditions of dyeing. Our advice does not release you from obligation to check its validity and to test our products to their suitability for the intended processes and uses. If you have any queries, kindly contact your local OHYOUNG Inc.

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