

Sunfix[®] SS

Powerful color for unreachable depth



Version. 3.0

Sunfix® SS

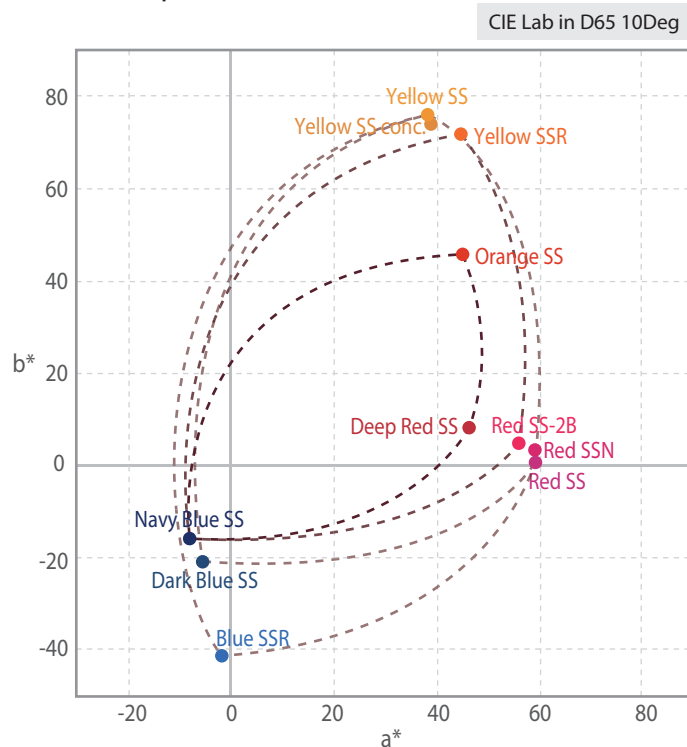
Features / Advantages

Sunfix SS dyes are highly concentrated Reactive dyes for economical dyeing of the deepest shades with an attractive cost, good fastness levels and excellent washing off properties. They have almost perfect compatibility in ternary shades leading to the shorter dyeing processes and the improved repeatability, and are offering competitive solutions for the needs of today's requirements – high productivity and cost effectiveness.

- ✓ Economically achieving saturated deep shades with low recipe costs and the reduced wastewater
- ✓ The best available technology for excellent lab to bulk and bulk to bulk repeatability
- ✓ Easy washing-off properties and good overall fastness level
- ✓ Eco-friendly products that meet Bluesign and ZDHC MRSL requirements

The profiles of Sunfix SS

Color map



Medium	Dark	Ultra deep
Sunfix Yellow SS	Sunfix Yellow SS conc.	Sunfix Orange SS
Sunfix Red SS	Sunfix Yellow SSR	Sunfix Deep Red SS
Sunfix Red SSN	Sunfix Red SS	Sunfix Navy Blue SS
Sunfix Blue SSR	Sunfix Red SSN	
Sunfix Dark Blue SS	Sunfix Red SS-2B	
	Sunfix Navy Blue SS	

The shade of Sunfix SS dyes and Fastness properties

Sunfix

Yellow SS
2.7 %o.w.f.



Yellow SS conc.
2.2 %o.w.f.



Yellow SSR
2.0 %o.w.f.



Orange SS
0.9 %o.w.f.



Red SS
1.2 %o.w.f.



Red SSN
1.2 %o.w.f.



Sunfix

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



Deep Red SS
0.9 %o.w.f.



Blue SSR
1.7 %o.w.f.



Dark Blue SS
1.7 %o.w.f.



Navy Blue SS
2.1 %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 SS	2.7	5 4	4-5 4-5	4-5 4-5	4-5	3-4	4-5	4-5	4-5	4-5	4	3	4-5 4	A W
Yellow SS conc.	2.2	5 4	4-5 4-5	4-5 4-5	4-5	3-4	4-5	4-5	4-5	4-5	4	3	4-5 4	A W
Yellow SSR	2.0	5 4	4-5 4-5	4-5 4-5	4-5	3-4	4-5	4-5	4-5	4-5	4-5	3-4	4-5 3-4	A A
Orange SS	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	3	4 3-4	W A
Red SS	1.2	4 3-4	4-5 3-4	3-4 3-4	4-5	4	4-5	4-5	4-5	4-5	4-5	3-4	4-5 3	B B
Red SSN	1.2	4 3-4	4-5 3-4	3-4 3-4	4-5	4	4-5	4-5	4-5	4-5	4-5	3-4	4-5 3	B B
Red SS-2B	1.3	4 3-4	4-5 4	4 4	4-5	4-5	4-5	4-5	4-5	4-5	2-3	3	4-5 3	B B
Deep Red SS	0.9	5 4	4-5 4-5	4-5 4-5	4-5	4	4-5	4-5	4-5	4-5	4-5	4-5	4 3	W A
Blue SSR	1.7	6-7 5	4-5 4-5	4-5 4-5	4-5	4	4-5	4-5	4-5	4-5	4-5	2	4-5 3	B B
Dark Blue SS	1.7	5 4-5	4-5 4-5	4-5 4-5	4-5	4	4-5	4-5	4-5	4-5	4-5	2-3	4-5 3-4	A A
Navy Blue SS	2.1	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	3-4	4-5 3	A A

Fastness Test Methods

* Light (ISO 105-B02)
- Upper : 1/1 SD
- Lower : 1/6 SD

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

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

* Washing (ISO 105-C06, C2S)
- 60°C x 30min.
- Staining

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

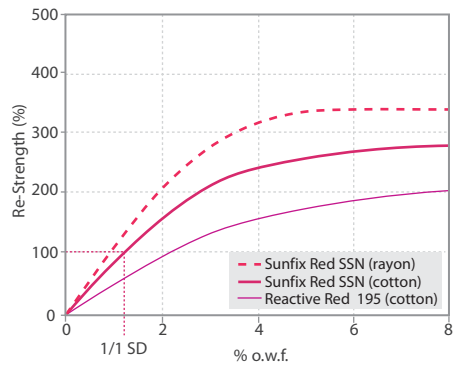
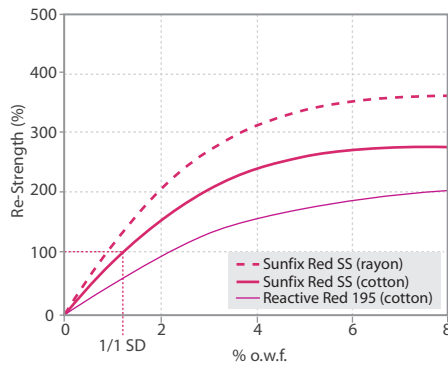
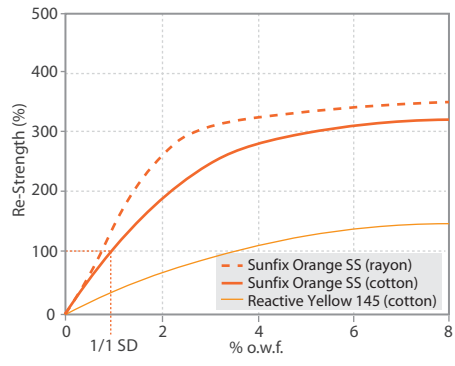
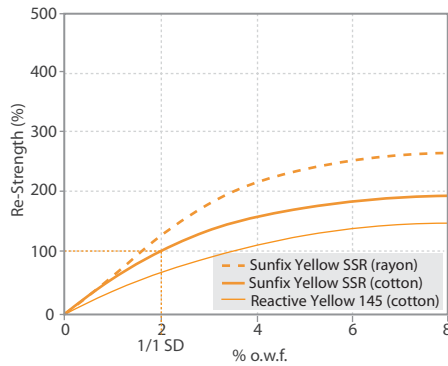
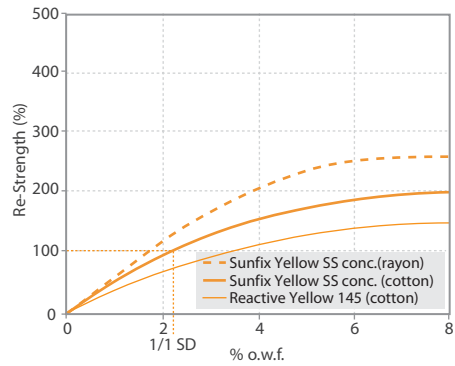
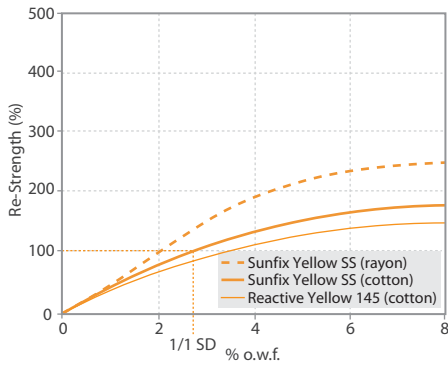
* Chlorinated water (ISO 105-E03)
- 27°C x 1hr.
- Active chlorine : 20ppm

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

* Dischargeability
- Upper : Rongalite C
- Lower : Decrolin
(Grade : W > A > B > C)

Build-up property

Sunfix SS dyes have high tinctorial strength and can be dyed for ultimate deep shades at an economical cost.

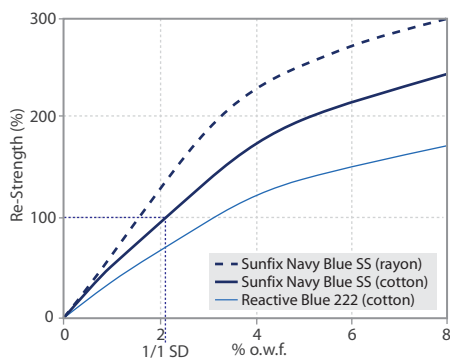
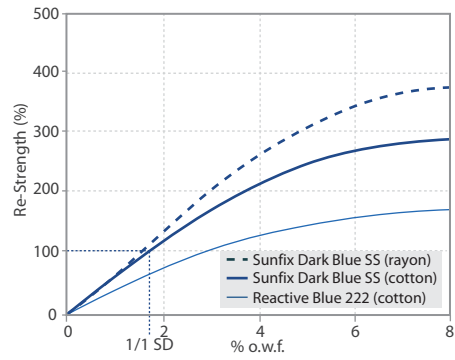
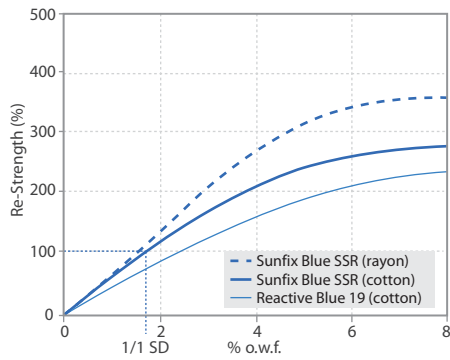
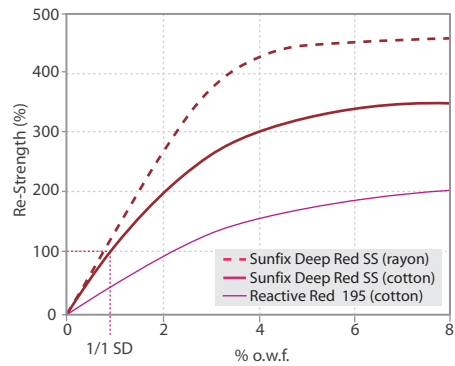
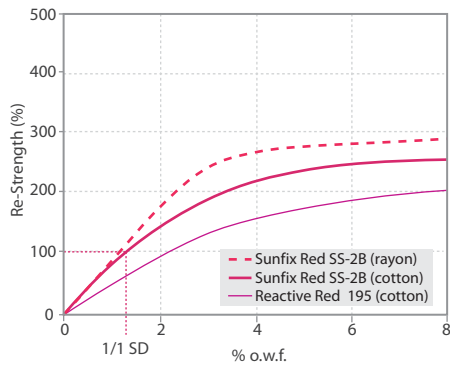


* Exhaustion dyeing
 - Test Fabric : CM 40's Interlock, Rayon 30's/span Single jersey
 - Method : 60°C x 60min. - Liquor Ratio = 1:10
 - Chemical Requirement

1. Cotton					2. Rayon						
% o.w.f.	0.5	1.0	3.0	5.0	8.0	% o.w.f.	0.5	1.0	3.0	5.0	8.0
Glauber's Salt (g/L)	25	30	50	70	80	Glauber's Salt (g/L)	15	20	40	60	60
Soda Ash (g/L)	10	15	20	20	20	Soda Ash (g/L)	8	12	15	15	15

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- Method : 60°C x 60min. - Liquor Ratio = 1:10
- Chemical Requirement

1. Cotton

% 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	15	20	20	20

2. Rayon

% 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	12	15	15	15

Case study, Medium shades

RFT (Right-First-Time) Dyeing

Excellent lab to bulk and bulk to bulk reproducibility with low sensitivity under various dyeing parameters.

Sunfix SS

Yellow SS conc. 0.68%
 Red SS 0.12%
 Dark Blue SS 0.81%

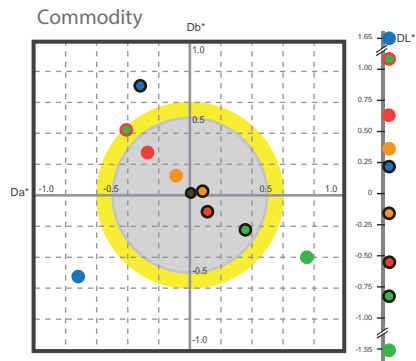
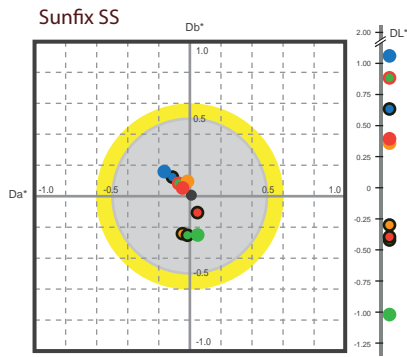
Commodity

Yellow 145 0.96%
 Red 195 0.25%
 Blue 222 0.65%

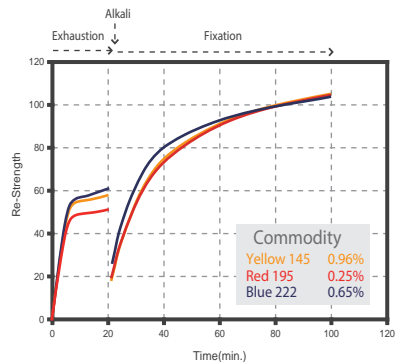
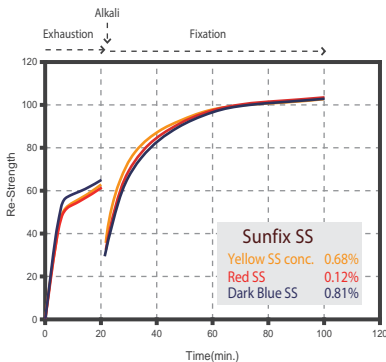
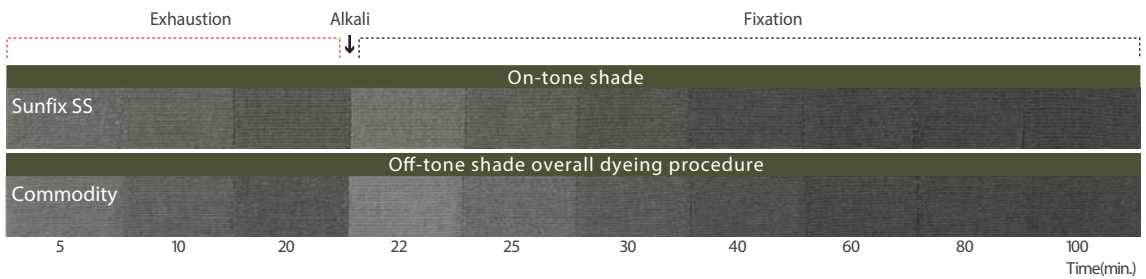
Dyeing condition of Standard

Fabric : CM 40's Interlock
 Temp. x Time : 60°C x 60min.
 Liquor ratio : 1 : 10
 Gluaber's salt : 40g/l
 Soda ash : 15g/l

Standard	Salt		Alkali		Liquor ratio			Temperature	
	● -20%	● +20%	● -20%	● +20%	● 1:6	● 1:8	● 1:12	● 50°C	● 70°C
Sunfix SS	[Visual representation of dyeing conditions for Sunfix SS]								
Commodity	[Visual representation of dyeing conditions for Commodity]								



Outstanding compatibility with on-tone shade



Case study, Medium shades

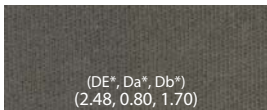
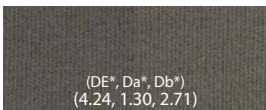






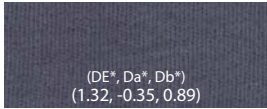
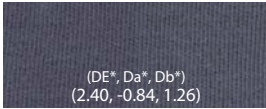
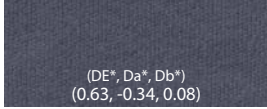
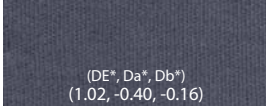
High light fastness with Sunfix Dark Blue SS for medium shades

Sunfix Dark Blue SS is cost effective, and light fast greenish blue dye for dyeing medium shades.

























Test method : ISO 105-B02

Testing Machine : ATLAS Ci3000+ Xenon Fade-Ometer®

Exposure time and assessment : 20hrs.(Blue Wool No.4) and 40hrs.(Blue wool No.5)

		Total dyeing depth		Exposure 20hrs. (Blue wool No. 4)	Exposure 40hrs. (Blue wool No. 5)	
Commodity	Yellow 145	0.96%	1.86%	 (DE*, Da*, Db*) (2.48, 0.80, 1.70)	 (DE*, Da*, Db*) (4.24, 1.30, 2.71)	Grade 3
	Red 195	0.25%				
	Blue 222	0.65%				
Sunfix SS	Yellow SS conc.	0.68%	1.61%	 (DE*, Da*, Db*) (0.89, -0.09, 0.28)	 (DE*, Da*, Db*) (2.09, 0.06, 0.76)	Grade 4
	Red SS	0.12%				
	Dark Blue SS	0.81%				
Sunfron SN	Yellow SN-2R	1.03%	2.52%	 (DE*, Da*, Db*) (0.72, -0.26, 0.03)	 (DE*, Da*, Db*) (1.48, -0.52, -0.17)	Grade 5
	Red SN-2BL	0.59%				
	Blue SN-R	0.90%				
Exposure 20hrs. (Blue wool No. 4) Exposure 40hrs. (Blue wool No. 5)						
Commodity	Yellow 145	0.30%	1.65%	 (DE*, Da*, Db*) (2.19, 0.18, 1.28)	 (DE*, Da*, Db*) (3.87, 0.40, 2.50)	Grade 3-4
	Red 195	0.35%				
	Blue 222	1.00%				
Sunfix SS	Yellow SS conc.	0.22%	1.61%	 (DE*, Da*, Db*) (1.32, -0.35, 0.89)	 (DE*, Da*, Db*) (2.40, -0.84, 1.26)	Grade 4
	Red SS	0.19%				
	Dark Blue SS	1.20%				
Sunfron SN	Yellow SN-2R	0.40%	2.56%	 (DE*, Da*, Db*) (0.63, -0.34, 0.08)	 (DE*, Da*, Db*) (1.02, -0.40, -0.16)	Grade 5 ↑
	Red SN-2BL	0.88%				
	Blue SN-R	1.28%				










Blue wool No. 1~8

	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
Std.								
Exposure 20hrs.								
Exposure 40hrs.								

The grade of light fastness could be different from the above test result as the degree of lightness and the proportion of tri-color dyes even though the same dye combination used. Also it could be low as after-treatment (ex. fixing agent or softner).




Case study, Ultimate deep shades

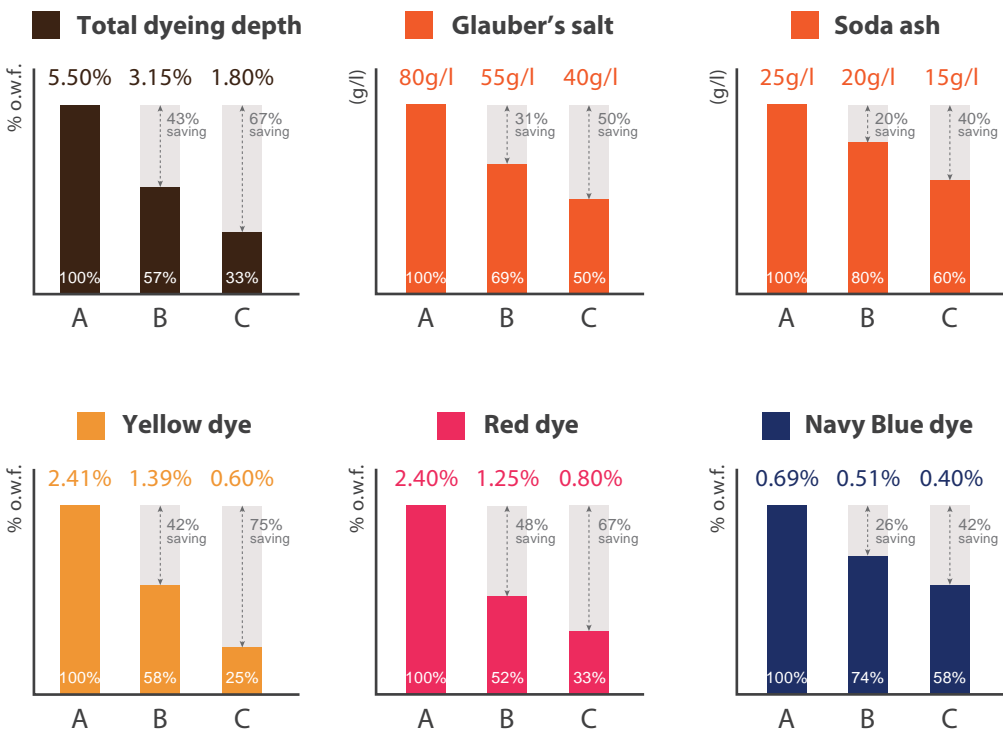
Sunfix SS for deep to intensive shades

 <i>Reactive Yellow 145</i>	 <i>Sunfix Yellow SSR</i>	 <i>Sunfix Orange SS</i>
 <i>Reactive Red 195</i>	 <i>Sunfix Red SS-2B</i>	 <i>Sunfix Deep Red SS</i>
 <i>Reactive Blue 222</i>	 <i>Sunfix Navy Blue SS</i>	 <i>Sunfix Navy Blue SS</i>

The unique properties of the Sunfix SS reactive dyes lead to a significantly reduced impact in the total environment costs and in the wastewater.

Reduced production costs

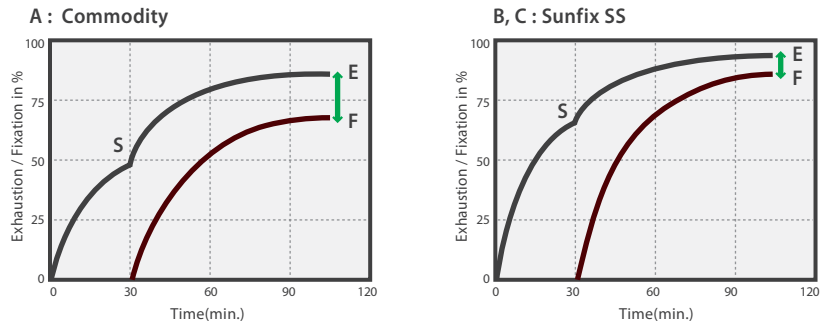
			Total dyeing depth	Glauber's salt	Soda ash	CMC DE* (D65)	
A		Yellow 145 Red 195 Blue 222	2.41% 2.40% 0.69%	5.50%	80g/l	25g/l	0.34
B		Yellow SSR Red SS-2B Navy Blue SS	1.39% 1.25% 0.51%	3.15%	55g/l	20g/l	0.23
C		Orange SS Deep Red SS Navy Blue SS	0.60% 0.80% 0.40%	1.80%	40g/l	15g/l	Standard



Case study, Ultimate deep shades

High fixation rate of Sunfix SS

With Sunfix SS, nearly 80~90 percentage of the dye applied to cotton is fixed, as opposed to 60~70 percentage with conventional reactive dyes.



S : Substantivity

Part of used dyestuff that gets absorbed by the cellulose fiber during the salt phase.

F : Fixation

Part of used dyestuff that is fixed on the cellulose fiber at the end of the dyeing cycle.

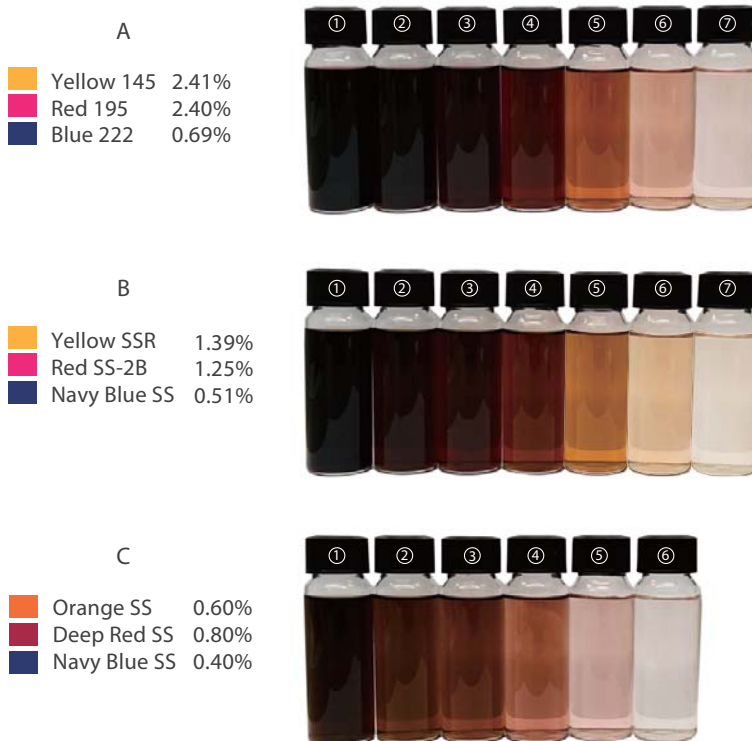
E : Exhaustion

Part of used dyestuff that is either fixed or unfixed on the cellulose fiber at the end of the dyeing cycle.

↑ : Difference between E and F

Means unfixed dyestuff on the cellulose fiber, that should be removed to get higher wet fastness.

Excellent wash-off property



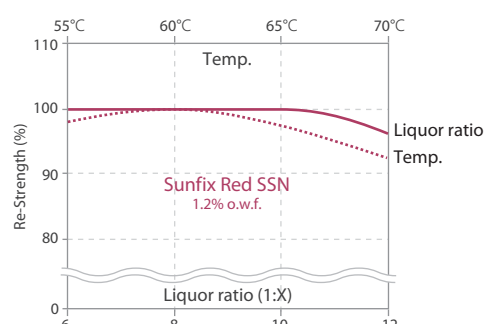
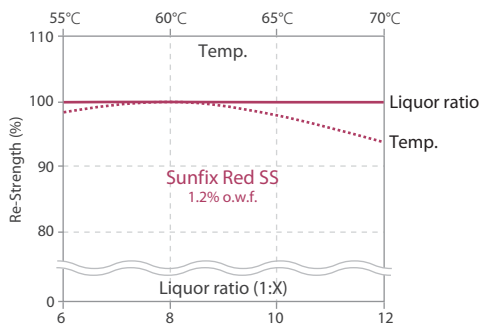
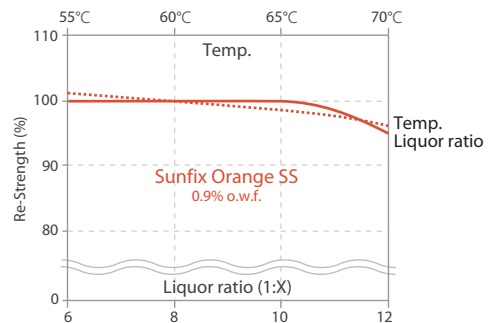
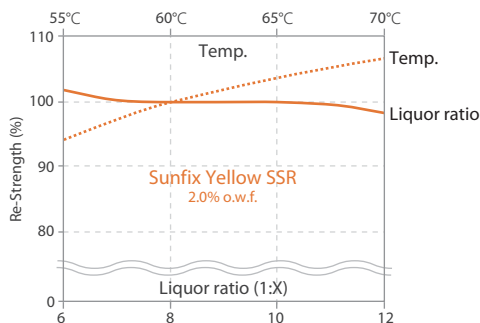
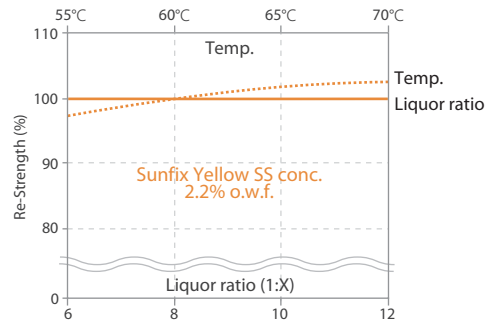
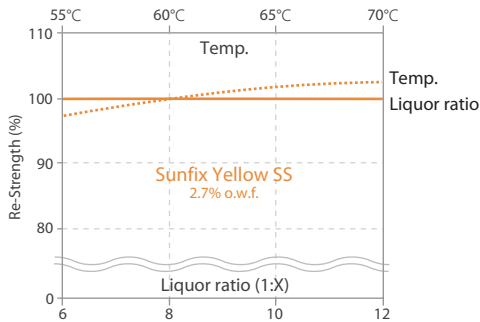
<Test condition>

Fabric : CM 40'S Cotton 100%
 Dyeing Process : Isothermal at 60°C
 Dyeing liquor ratio : 1:10
 Wash-off liquor ratio : 1:10

- ① Cold wash 25°C X 10 min
- ② Neut. 50°C X 10 min
- ③ Hot wash 80°C X 10 min
- ④ Soaping 95°C X 10 min
- ⑤ Hot wash 80°C X 10 min
- ⑥ Cold wash 50°C X 10 min
- ⑦ Cold wash 25°C X 10 min

Temperature and Liquor ratio sensitivity

Excellent reproducibility in dyeing with less sensitivity to dyeing temp. and liquor ratio. Right-first-time dyeing reduces waste and achieves significant cost savings.



*** 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

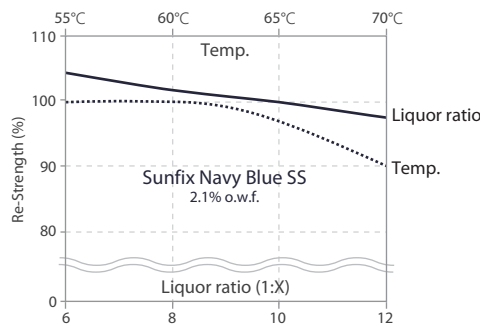
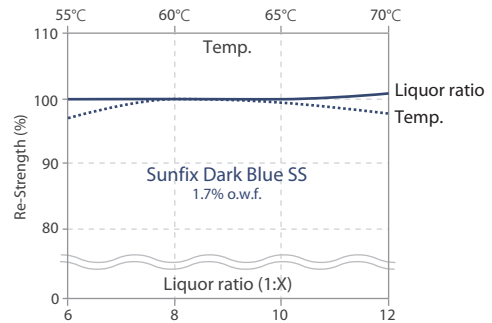
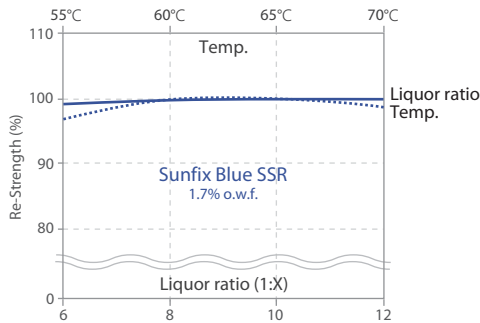
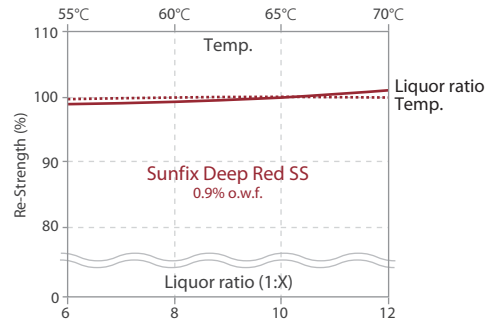
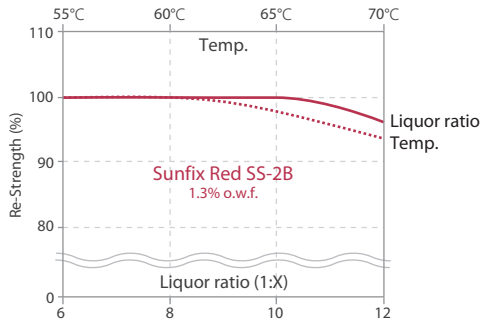
- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:10
- Dyeing Temp. : 55°C / 60°C(Std.) / 65°C / 70°C

3. Chemicals

	Y SS	Y SS conc.	Y SSR	O SS	Red SS	R SSN
Glauber's Salt (g/L) :	50	45	40	30	35	35
Soda Ash (g/L) :	20	15	15	15	15	15

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Excellent reproducibility in dyeing with less sensitivity to dyeing temp. and liquor ratio. Right-first-time dyeing reduces waste and achieves significant cost savings.



* Test method

1. Liquor ratio Sensitivity

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- Dyeing temp. : 60°C

— Liquor ratio
 Temp.

2. Temperature Sensitivity

- Dyeing Fabric : CM 40's Interlock
- Liquor ratio = 1:10
- [Dyeing Temp. : 55°C / 60°C\(Std.\) / 65°C / 70°C](#)

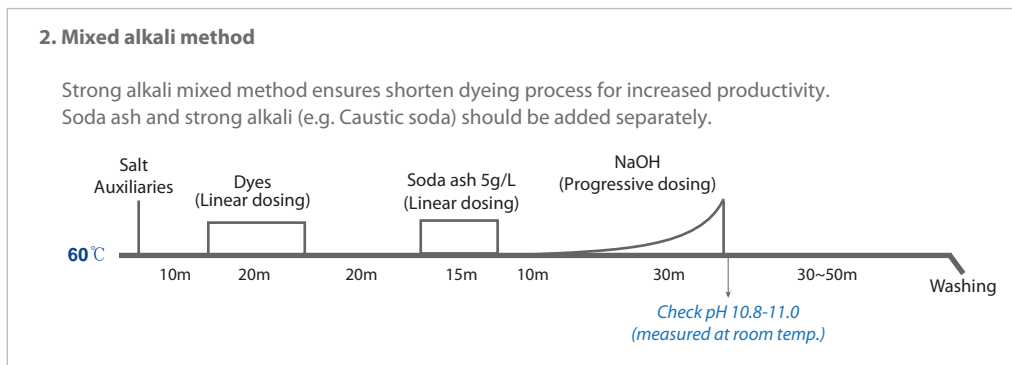
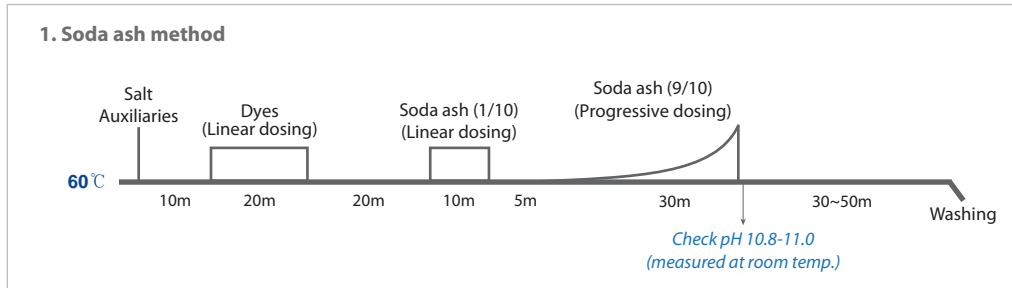
3. Chemicals

	R SS-2B	DR SS	B SSR	DB SS	NB SS
Glauber's Salt (g/L) :	35	30	40	40	45
Soda Ash (g/L) :	15	15	15	15	15

Dyeing process

The optimum dyeing temperature for Sunfix SS dyes is 60 degrees, and offer a high fixation rate and a much shorter washing-off cycle.

✓ Standard method (Isothermal)



* Comment

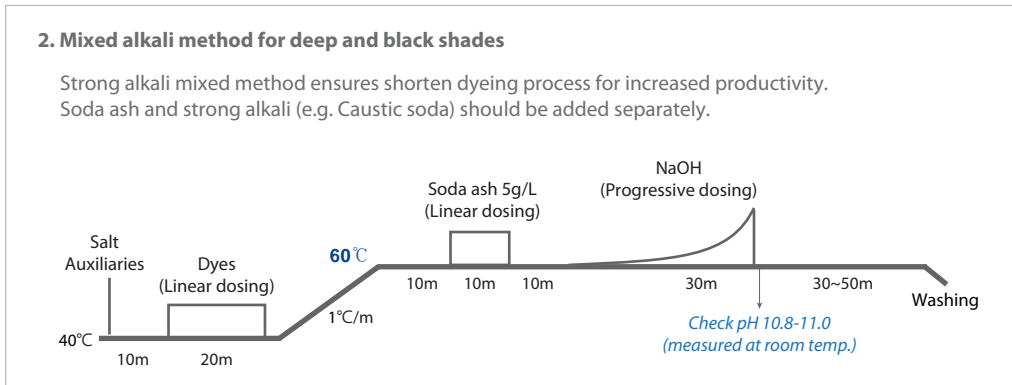
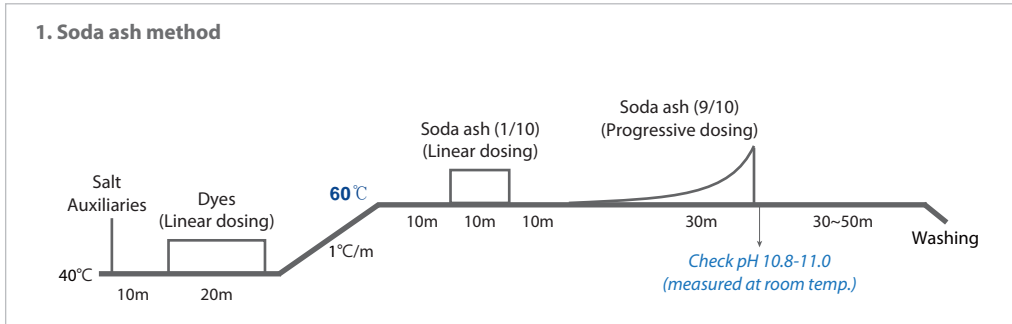
- For optimal dyeing, the pH should reach between 10.8 and 11.0 after alkali addition is complete.
- Depending on the dyeing conditions, both the pre-salt input and post-salt input are all possible.



Dyeing process

The optimum dyeing temperature for Sunfix SS dyes is 60 degrees, and offer a high fixation rate and a much shorter washing-off cycle.

- ✓ Standard method (Temperature rising)

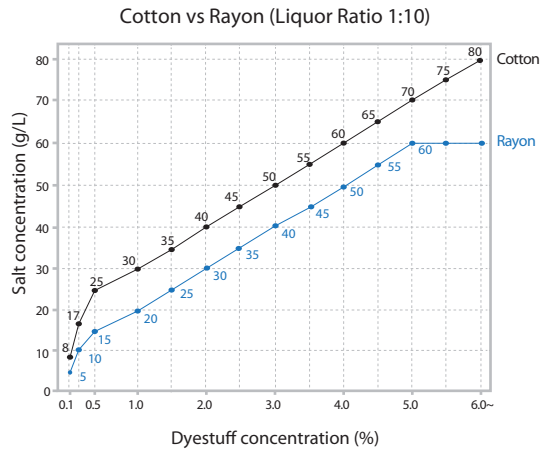
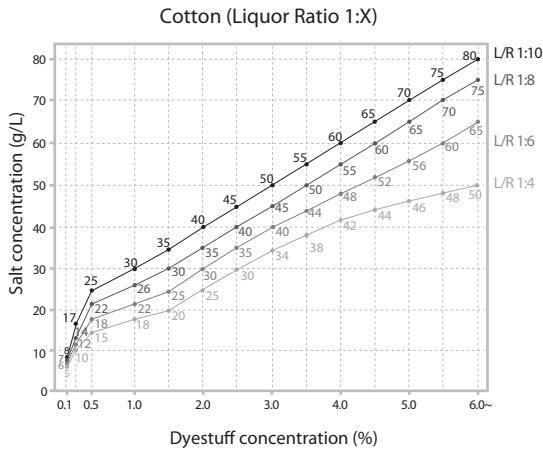


* Comment

- For optimal dyeing, the pH should reach between 10.8 and 11.0 after alkali addition is complete.
- Depending on the dyeing conditions, both the pre-salt input and post-salt input are all possible.



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	7	4.5	5.5	5.5	5.5	0.25
0.3	17	10	8	6	5	0.5	14	8	9	7	5.5	0.6
0.5	25	15	10	8	5	0.5	22	13	11	9	5.5	0.6
1.0	30	20	15	12	5	1.0	26	17	15	12	5.5	1.1
1.5	35	25	15	12	5	1.2	30	20	15	12	5.5	1.3
2.0	40	30	15	12	5	1.5	35	25	17	14	5.5	1.6
2.5	45	35	15	12	5	1.8	40	30	17	14	5.5	2.0
3.0	50	40	20	15	5	2.0	45	35	22	17	5.5	2.2
3.5	55	45	20	15	5	2.0	50	40	22	17	5.5	2.2
4.0	60	50	20	15	5	2.5	55	45	22	17	5.5	2.6
4.5	65	55	20	15	5	2.5	60	50	22	17	5.5	2.6
5.0	70	60	20	15	5	2.5	65	55	22	17	5.5	2.6
5.5	75	60	20	15	5	2.5	70	55	22	17	5.5	2.6
above 6.0	80	60	20	15	5	2.5	75	55	22	17	5.5	2.6

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	6	4	6	6	6	0.3	5	3.5	7	7	6.5	0.35
0.3	12	7	10	8	6	0.7	10	6	11	9	6.5	0.8
0.5	18	10	12	10	6	0.7	15	8	14	12	6.5	0.8
1.0	22	13	18	14	6	1.2	18	10	20	16	6.5	1.3
1.5	25	15	18	14	6	1.5	20	12	20	16	6.5	1.6
2.0	30	20	20	16	6	1.8	25	15	22	18	6.5	2.0
2.5	35	25	20	16	6	2.2	30	18	22	18	6.5	2.4
3.0	40	30	24	18	6	2.4	34	20	24	20	6.5	2.6
3.5	44	34	24	18	6	2.4	38	24	24	20	6.5	2.6
4.0	48	38	24	18	6	2.7	42	28	24	20	6.5	2.8
4.5	52	42	24	18	6	2.7	44	32	24	20	6.5	2.8
5.0	56	50	24	18	6	2.7	46	34	26	20	6.5	2.8
5.5	60	50	24	18	6	2.7	48	36	26	20	6.5	2.8
above 6.0	65	50	24	18	6	2.7	50	40	26	20	6.5	2.8

* 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
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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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