

Carpet Solutions: Cationic Dyeable Polyester

Dyeing and printing of carpets requires specific solutions



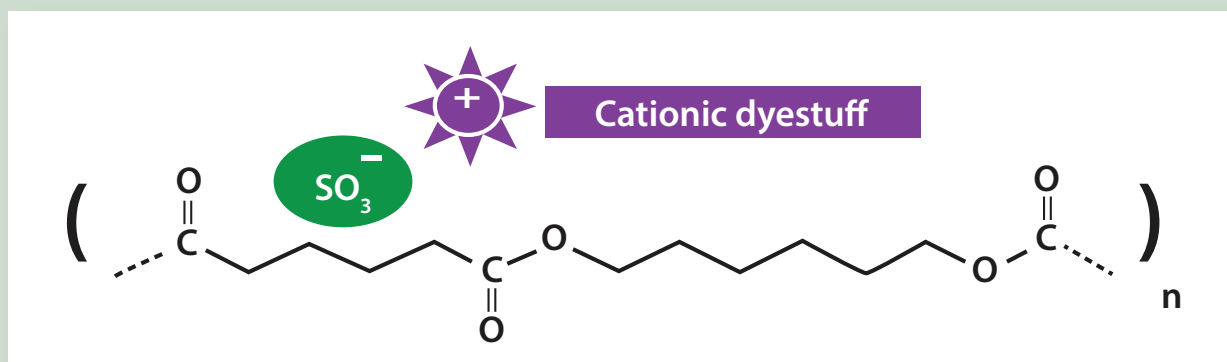
Make your carpet colorful!

Carpet Solutions: Cationic Dyeable Polyester

What is CDP?

Cationic Dyeable Polyester (CDP) is a special modified polyester fiber which is charged with anionic groups during polymerization. Having anionic groups, it can be dyed with cationic dyes giving good results with high brilliancy. The anionic dye sites make the fiber more amorphous causing the dyeing speed to increase when compared to dyeing regular polyester with disperse dyes. Depending on the fiber type, titre and lustre, the cationic dyes have a moderate to very low light fastness.

CDP has been an important fiber for some time now, but the market demand for CDP in carpets has increased in the last few years. DyStar offers the most common classes of dyes and ideal solutions for dyeing and printing of CDP carpet.



Advantages of CDP, dyed with cationic dyes:

- Excellent wet fastness
- Brilliant shades
- Softer handle
- Multicolor effects on blends with PET
- Fixation times between 5 - 15 minutes

Disadvantages of CDP, dyed with cationic dyes:

- Limited light fastness on microfiber: dependent on the fiber type, titre and lustre, the cationic dyes have a moderate to very low light fastness. Appropriate dyestuff selection is necessary.
- Fiber hydrolysis during dyeing
- Price of fiber can be higher than PES
- Often limited dye build-up on dark shades
- Cationic dyes usually give acid solutions (pay attention to the thickener!)
- Specific dye selection is important

Carpet Solutions: **Cationic Dyeable Polyester**

Astrazon® dye selection for:

STANDARD COMBINATION

Astrazon Golden Yellow GL-E 200%

Economical golden yellow for standard combination

Astrazon Red GTLN micro 200%

Economical yellowish red for standard combination with highest steam-, pH- and dyebath stability

Astrazon Red BBL micro 200%

Blueish red with the highest light fastness

Astrazon Red FBL 200%

Clear blueish red for use in standard combination

Astrazon Blue FGRL micro 200%*

Clear blue component for standard combinations, good steam-, pH- and dyebath stability

ADDITIONAL DYES

Astrazon Yellow 8GSL 200%*

Clear greenish yellow, specialty dye with highest light fastness

Astrazon Yellow 7GLL 200%

Clear greenish yellow with high lightfastness

Astrazon Red GL-N 300%*

"Marlboro" red, specialty dye with highest light fastness

Astrazon Blue F2RL 200%

Clearest blue, specialty dye with highest steam-, pH- and dyebath stability

Astrazon Blue FGGL 300%

Clear blue component, limited steam-, pH- and dyebath stability, suitable only for deep shades

Astrazon Blue BRL 200%

Clear blue dye with exceptionally good pH- and steam stability

Astrazon Blue BG micro 200%

Greenish blue for standard combinations

Astrazon Black FDL 200%

Black dye with good steam-, pH- and dyebath stability

* Dye combination for the highest light fastness

Carpet Solutions: Cationic Dyeable Polyester

Fastness Properties of Astrazon® dyes on CDP

Astrazon® Dyeing and fastness properties C. D. Polyester	1/1 Standard depth as illustrated (g/kg)	pH stability from - to	Hot solubility (90 °C) (g/l)	Stability of solution (90 -25 °C) (g/l)	Light fastness (ISO 105-B02)		Water fastness severe (ISO 105-E01)							Washing fastness 40°C (ISO 105-C01)						
					1/6 SD	1/1 SD	F	CA	CO	PA	PES	PAN	WO	F	CA	CO	PA	PES	PAN	WO
Yellow 8GSL 200%	1.00	2-8	50	50	6-7	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Yellow 7GLL 200%	1.10	1-9	80	40	4-5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Golden Yellow GL-E 200%	0.75	1-10	60	30	5	5-6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Red GTLN micro 200%	1.15	3-8	100	10	3-4	4	5	5	5	4-5	5	5	5	5	5	5	4-5	5	5	5
Red GL-N 300%	0.60	1-10	90	10	5	6-7	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Red FBL 200%	0.50	2-6	20	20	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Red BBL micro 200%	0.50	3-10	10	10	3-4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Blue FGRL micro 200%	0.60	1-7	40	20	4	4-5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Blue F2RL 200%	0.55	1-8	50	30	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Blue BRL 200%	0.55	1-9	15	10	3-4	3-4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Blue FGGL 300%	0.40	1-6	30	30	4-5	5-6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Blue BG micro 200%	0.75	1-9	35	35	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Black FDL 200%	2.50	2-6	80	60	3	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5

The fastness results may vary with different C. D. Polyester fiber types.

Carpet Solutions: Cationic Dyeable Polyester

**Water fastness severe
(ISO 105-E01)**



Astrazon®
Yellow 8GSL 200%

Astrazon
Yellow 7GLL 200%

Astrazon
Golden Yellow GL-E 200%

Astrazon
Red GL-N 300%

Astrazon
Red FBL 200%

Astrazon
Red GTLN micro 200%

Astrazon
Blue F2RL 200%

Astrazon
Blue FGGL 300%

Astrazon
Blue FGRL micro 200%

Astrazon
Blue BRL 200%

Astrazon
Blue BG micro 200%

Astrazon
Black FDL 200%

**Wash fastness 40°C
(ISO 105-C01)**



Carpet Solutions: Cationic Dyeable Polyester

Recipe and Printing Parameters / Guidelines

Guide recipes for exhaust dyeing

X	%	Astrazon® dyes
1.0 – 2.0	%	Sera® Sperse M-IW
0.0 – 5.0	%	Sera Gal P-EW or Sera Gal P-BMO
0.2 – 0.6	g/l	Sera Foam M-HTS (Defoamer)
pH:		4 - 6

Guide recipes for continuous dyeing

Prewash:	0.0 - 1.0 g/l	Sera Wash M-SF
Pick-up:	30 - 100%	
Temperature:	20 - 60°C	
Pre-steaming:	0.5 - 1 min, saturated steam approx. 30 sec	

X	g/l	Astrazon dyes
1.0 – 3.0	g/l	Sera Sperse M-IW
0.0 – 10.0	g/l	Sera Gal P-EW or Sera Gal P-BMO
0.5 – 1.0	g/l	Sera Foam M-HTS
0.0 – 3.0	g/l	Thickener
pH:		4 - 6
Pick-up:		100 - 500%

Foulard 100 - 130% // Fluidyer 200 - 400% // Overflow-systems 200 - 500%
Steaming-time: 10 - 15 min, 98°C / saturated steam

Guide recipes for Chromojet printing

Dissolve dye in hot de-ionized water (85 - 90°C) without acetic acid but with Sera Sperse M-IW (½ - 1 : 1 of dye) and cool down to room temperature

Printing Paste:

X	g/kg	Astrazon dye, diluted	
2 – 5	g/kg	Sera Sperse M-IW	(Prevention of precipitation, dispersing agent)
Y	g/kg	Liquid Thickener	
0 – 10	g/kg	Sera Gal P-EW or Sera Gal P-BMO	(dyeing-fixation accelerator)
0 – 2	g/kg	Sera Wet C-NR	(nonionic agent with high wetting effect)

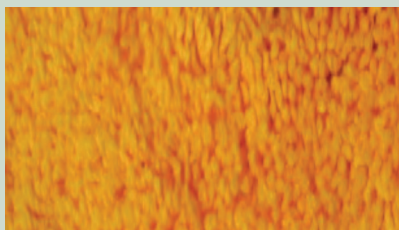
Printing Parameters / Guideline :

pH:	5 – 6	
Viscosity:	200 – 350 cps	(final adjustment with NaCl salt solution)
Pick-up:	200 – 400%	
Fixation:	5 - 15 minutes, 98°C / saturated steam	

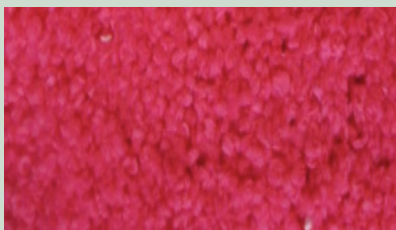
Carpet Solutions: Cationic Dyeable Polyester

Recipe and Printing Parameters / Guidelines

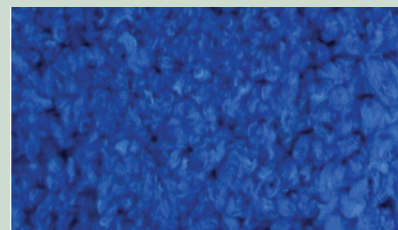
Trichromatic dyes, as self-shade and in combination, including auxiliaries and process parameters:



0.5 g/l
Astrazon® Golden Yellow
GL-E 200%



0.5 g/l
Astrazon Red FBL
200%



0.5 g/l
Astrazon Blue FGRL micro
200%

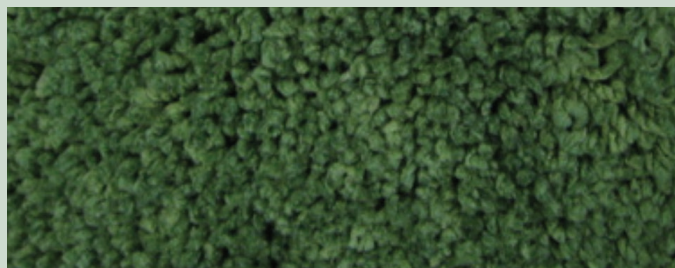
0.072 g/l Astrazon Golden Yellow GL-E 200%
0.22 g/l Astrazon Red FBL 200%
0.28 g/l Astrazon Blue FGRL micro 200%

2 g/l Sera® Sperse M-IW pH 5
2 g/l Sera Wet C-NR Steaming time
10 g/l Sera Gal P-EW 10 min



0.32 g/l Astrazon Yellow 8GSL 200%
0.02 g/l Astrazon Red FBL 200%
0.2 g/l Astrazon Blue FGRL micro 200%

2 g/l Sera Sperse M-IW pH 5
2 g/l Sera Wet C-NR Steaming time
10 g/l Sera Gal P-EW 10 min



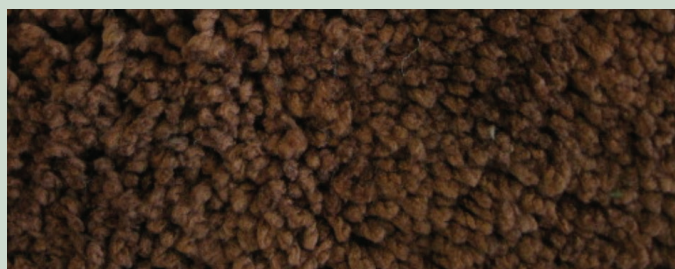
0.06 g/l Astrazon Golden Yellow GL-E 200%
0.04 g/l Astrazon Red FBL 200%
0.07 g/l Astrazon Blue FGRL micro 200%

2 g/l Sera Sperse M-IW pH 5
2 g/l Sera Wet C-NR Steaming time
4 g/l Sera Gal P-EW 10 min



0.2 g/l Astrazon Yellow 8GSL 200%
0.2 g/l Astrazon Red FBL 200%
0.14 g/l Astrazon Blue FGRL micro 200%

2 g/l Sera Sperse M-IW pH 5
2 g/l Sera Wet C-NR Steaming time
6 g/l Sera Gal P-EW 10 min



Committed to Sustainability

At DyStar, our products and services help customers worldwide reduce costs, shorten lead times and meet stringent quality and ecological specifications.



Information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to check its validity and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with our General Conditions of Sale and Delivery.



Astrazon and Sera are registered trademarks of DyStar Colours Distribution GmbH

Global Headquarters
DyStar Singapore Pte Ltd

Tel: +65 66 71 28 00 Fax: +65 66 59 13 28 DyStar.Singapore@DyStar.com

www.DyStar.com

