

Effect of yarn twist on DTP media surface

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1. Introduction

Digital textile printing(DTP) is becoming more important because production system of conventional textile printing is changing to multi items and small lot. And DTP is appropriate for quick response system(QRS). Recently, increasing availability of DTP is closely connected with high value added fashion industry. Quality of DTP is depending on pre-treatment, after-treatment, ink, media. In this study, effect of yarn twist on DTP media surface was studied.

2. Experiment

Specifications of sample are in Table 1.
Knit sample were measured with KES-F system.

3. Results and Conclusion

Measurement results of KES-F system were in the Table 2.

MIU, MMD, SMD's values of hard twist sample is higher than normal twist sample in the same structure. In case of SMD, the values are increased from plain to corduroy as shown in above table.

Yarn twist is caused pill of media surface.

These pills are caused to prevent ink supply into media surface and to clog nozzle. Next step will be to study the relationship between yarn twist and ink printability.

Table 1. Characteristics of knitting fabric according to yarn twisting

Yarn Thickness	Yarn twisting(t.p.m)	Knitting structure		Weight(g/m ²)	Fabric count (Wale/Course)
				KS K 0514	KS K 0511
Coma 30'	Normal twisted yarn (Z twist, 830)	Single	Plain	200	41.0 × 46.0
			Dot	240	39.0 × 48.0
			Pique	270	36.4 × 57.0
			Lacoste	270	35.6 × 57.6
			Corduroy	280	39.6 × 58.0
	Hard twisted yarn (Z twist, 1630)	Single	Plain	250	41.0 × 50.0
			Dot	270	39.0 × 53.6
			Pique	280	36.6 × 62.6
			Lacoste	290	37.0 × 63.6
			Corduroy	300	41.0 × 60.0

Table 2. Surface properties of sample by KES-F system

yarn twist		normal twist yarn					hard twist yarn				
		Plain	Dot	Pique	Lacoste	Corduroy	Plain	Dot	Pique	Lacoste	Corduroy
MIU	warp	0.178	0.199	0.205	0.199	0.221	0.175	0.210	0.198	0.210	0.231
	weft	0.193	0.195	0.196	0.238	0.239	0.198	0.202	0.224	0.245	0.250
	mean	0.186	0.197	0.201	0.219	0.230	0.187	0.206	0.211	0.227	0.241
MMD	warp	0.0119	0.0258	0.0248	0.0215	0.0358	0.0110	0.0127	0.0101	0.0338	0.0436
	weft	0.0153	0.0171	0.0192	0.0236	0.0117	0.0201	0.0211	0.0236	0.0232	0.0125
	mean	0.0136	0.0215	0.0220	0.0226	0.0238	0.0155	0.0159	0.0169	0.0285	0.0281
SMD	warp	3.675	6.055	5.105	5.90	11.860	2.105	6.040	3.950	6.885	15.395
	weft	3.745	3.800	6.501	7.020	3.440	7.580	6.370	9.890	8.755	2.510
	mean	3.710	4.928	5.803	6.460	7.650	4.8413	6.205	6.920	7.820	8.95