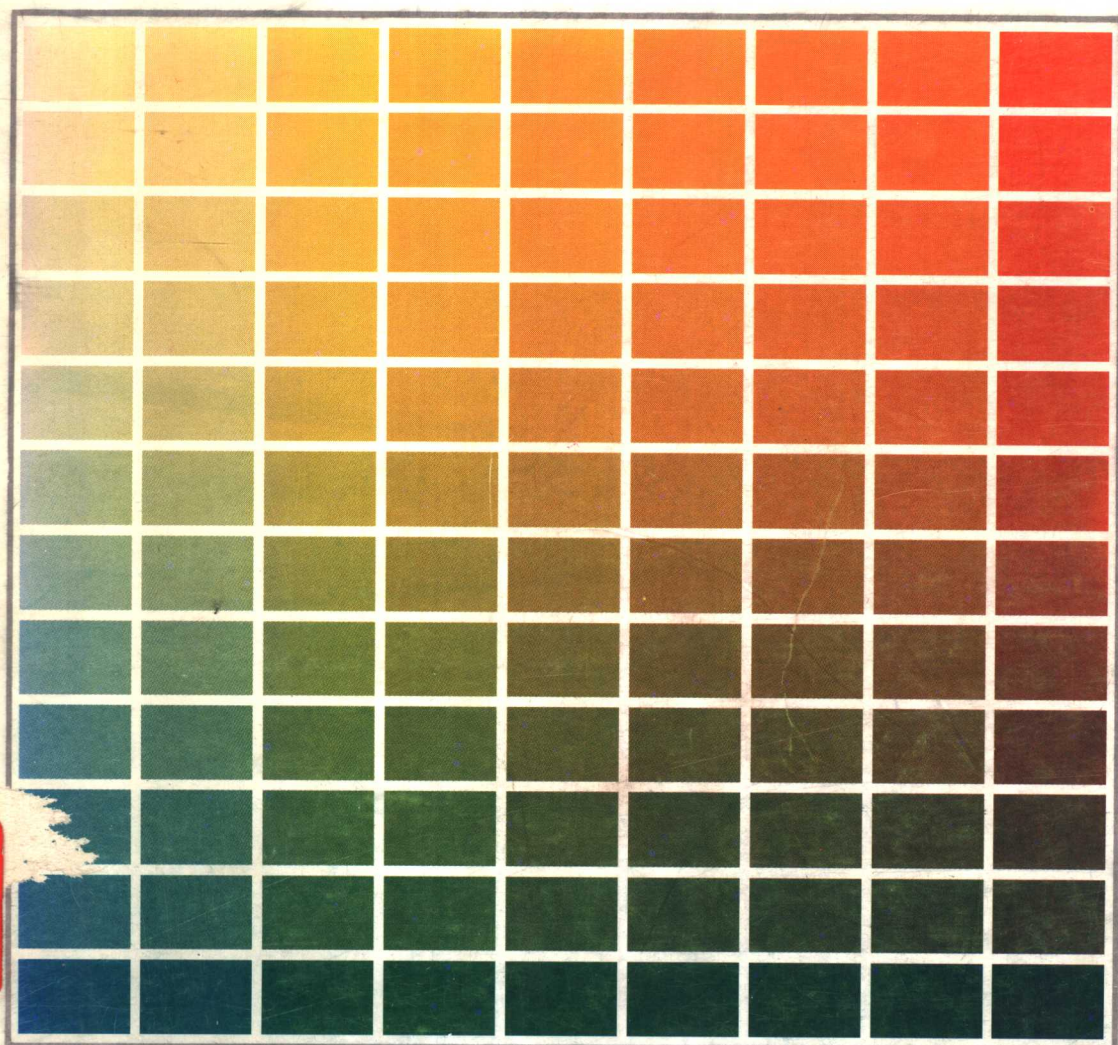


色 谱

COLOUR ATLAS

測 绘 出 版 社



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张 清 浦 等 设计

Chief designer: Zhang Qingpu etc.

Published by the Publishing House
of Surveying and Mapping

Printed by the Printing Factory
of Beijing New Time Publishing House

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责任编辑: 秦金泉

Editor: Qin Jinquan

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说 明

一、色谱是地图、印刷、美术、装璜、包装及图像复制工作者进行科学设色的必备工具书，它的研制是颜色科学的一项基本建设，同时为建立色彩数据库，进而实施计算机辅助设色打下了基础。本色谱以色度学及彩色图像的复制理论为基础，以标准化、数据化为目标，在研制过程中利用先进的测试仪器进行了严格的数据检测，从而保证了良好的科学性。

二、在确定本色谱的内容及结构时，既考虑到地图、印刷、美术、装璜及图像处理的专业特点，又顾及到一般色彩工作者对色谱的技术要求；既要尽量增加色块的数量，又注意到颜色视觉的实际分辨力；在制印材料及制印工艺的选用上，既着眼于赶超国外同类色谱的先进水平，又兼顾国内推广应用的可能性。因此，本色谱具有内容丰富、通用性好的特点。

三、本色谱包括 6768 个色块及 5 幅彩色样张：

1. 黄、品红、青、黑双色套印部分，共 6 页，每页 144 个色块，合计 864 个色块。

2. 黄、品红、青三色套印部分，共 11 页，每页 144 个色块，合计 1584 个色块，

3. 红、棕、黄、桔黄、绿、蓝、紫、灰、浅蓝、深蓝双色套印部分，共 30 页，每页 144 个色块，合计 4320 个色块。

4. 彩色试验样张 5 幅。

四、本色谱采用 54 线/厘米的网点菲林，菲林比例为 5%、10%、15%、20%、30%、40%、50%、60%、70%、80%、实地共 11 级。菲林角度为黄 90°，黑 75°，品红 45°，青 15°。印刷时采用天津油墨厂生产的四色胶印油墨，其编号为：黄 8139，品红 8249，青 8449，黑 8729。上述四色油墨用于三色及四色印刷。专色部分的编号为：红 8224，中黄 8135，绿 8534，中蓝 8443；棕、桔黄、紫、银灰、浅蓝、深蓝等 6 色用专色油墨调配而成。采用 157 克铜版纸印刷。

五、在制作本色谱的过程中，用 Macbeth TR-927 光学密度计、WSC 色差计及 Fogra 信号条进行了严格的质量检测，主要技术参数如下：

1. 网点菲林的比例误差小于 3%。
2. 四色胶印油墨的密度及色度数据见表 1。
3. 专色胶印油墨的密度及色度数据见表 2。
4. 胶印油墨的色偏、灰度及色效率见表 3。

5. 印刷纸张的密度及色度数据见表4。
6. 阳图型PS版的分辨力为 $7\mu\text{m}$ ，曝光宽容度为25~65秒。
7. 印刷色序：黑、青、品红、黄。
8. 印刷反差的控制范围为：黄 0.30 ± 0.03 ，品红 0.35 ± 0.03 ，青 0.35 ± 0.03 ，黑 0.40 ± 0.03 。
9. 色彩反差的控制数据为：黄 $70\% \pm 5\%$ ，品红 $50\% \pm 5\%$ ，青 $55\% \pm 5\%$ 。
10. 四色胶印油墨的最佳实地密度根据印刷反差及色彩反差曲线确定，实际控制数据为：黄 1.05 ± 0.03 ，品红 1.40 ± 0.03 ，青 1.50 ± 0.03 ，黑 1.60 ± 0.03 。
11. 网点扩大值用Murray-Davies公式计算，实际控制数据为 $11\% \pm 2\%$ 。
12. 双色及三色油墨的叠印率控制如下：“青+品红”的叠印率为 $110\% \pm 3\%$ ，“青+黄”的叠印率为 $101\% \pm 3\%$ ，“品红+黄”的叠印率为 $103\% \pm 3\%$ ，“青+品红+黄”的三色叠印率为 $112\% \pm 3\%$ 。叠印率用Murray-Davies公式计算之。
13. 四色胶印油墨的灰平衡曲线见图1。

六、1986年12月，国家测绘局邀请地图、印刷等有关方面的20余位专家对本色谱进行了审查评议。与会专家一致认为：本色谱内容丰富，结构合理，各项技术参数达到了“国际标准化组织”规定的技术指标；印刷质量在国内处于领先地位，达到了国外同类色谱的先进水平，具有较高的学术价值及实用意义。

七、本色谱由张清浦担任总体设计；叶泰棋、赵鸿霞、曹天景、安真臻、金澜等参加研究制作；拷贝、拼版、晒版、打样、印刷等工序在北京新时代出版社印刷厂完成；由栾书俊、曹文祥、赵鸿霞监印。

在本色谱的研制过程中，得到国家测绘局的经费支持及殷幼芳、关大任、袁宝钧、李之光的技术帮助，在此一并致谢。

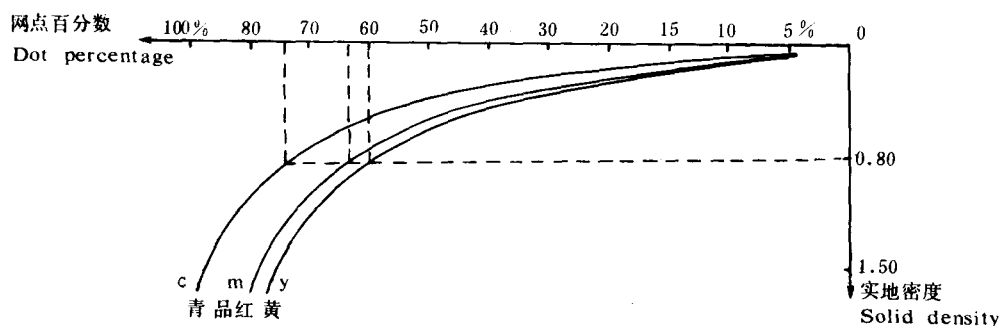


图1 灰平衡曲线示意图 Fig 1 Grey balance curves

表 1 Table 1

墨 色 Ink colour	编号 Code	实地密度 Solid density	三 刺 激 值 Tristimulus Values			匀 色 空 间 坐 标 Uniform colour space		
			X	Y	Z	L *	a *	b *
黄 yellow	8139	1.03	62.14	67.28	10.54	85.65	-7.54	85.37
品红Magenta	8249	1.40	32.99	18.35	34.40	49.92	64.53	-19.67
青 Cyan	8449	1.50	21.80	28.88	7.372	60.68	-26.81	-39.68
黑 Black	8729	1.62	5.48	5.51	7.10	28.14	1.40	-2.68

表 2 Table 2

墨 色 Ink colour	编号 Code	实 地 密 度 Solid density			三 刺 激 值 Tristimulus values			匀色空间坐标 Uniform colour space		
		R	G	B	X	Y	Z	L *	a *	b *
红 Red	8224	0.09	1.13	0.08	39.45	23.62	20.25	55.71	60.98	11.93
黄 Yellow	8135	0.03	0.04	0.95	70.99	77.43	11.74	90.52	-9.02	90.66
绿 Green	8534	1.47	0.62	0.15	23.56	40.97	36.05	70.15	-59.70	13.14
蓝 Blue	8443	1.26	0.58	0.15	21.46	26.24	78.44	58.32	-13.82	-68.61
棕 Brown	Mixed	0.29	0.62	1.30	32.70	29.29	7.18	61.08	15.59	53.72
桔黄 Orange	Mixed	0.04	0.62	1.56	52.67	40.27	6.10	69.64	38.35	72.91
紫 Purple	Mixed	0.40	1.72	0.53	30.11	18.66	46.56	50.25	52.55	-33.20
灰 Grey	Mixed	0.51	0.52	0.55	30.86	31.80	34.50	63.17	-0.30	3.08
浅蓝 L. Blue	Mixed	0.34	0.13	0.06	54.90	64.14	96.13	84.03	-18.08	-15.32
深蓝 C. Blue	Mixed	1.52	1.32	0.70	9.16	8.01	28.19	33.99	11.94	-38.54

表 3 Table 3

墨 色 Ink colour	实 地 密 度 Solid density			编号 Code	色偏 Colour cast	灰 度 Greyness	色 效 率 Colour efficiency
	R	G	B				
黄 Yellow	0.04	0.09	1.06	8139	5%	4%	94%
品红Magenta	0.20	1.40	0.74	8249	45%	14%	66%
青 Cyan	1.54	0.51	0.16	8449	25%	10%	78%

表 4 Table 4

纸 张 Papertype	重 量 Weight (g/m ²)	光 学 密 度 Solid density			匀 色 空 间 坐 标 Uniform colour space		
		R	G	B	L *	a *	b *
铜版纸 Coated	157	0.03	0.01	0.04	97.26	-1.73	-1.21

Explanation

1. The Colour Atlas is an indispensable reference book for colour designers working in the fields of Cartography, Graphic Arts, Art, Packaging and imagery processing. Its publication can be regarded as a capital construction for colour researches, provides a possibility to set up the colour data base and to carry out the computer assisted colour design. Based on the principles of the colorimetry and the colour reproduction, aimed at the standardization and digitalization of colour printing, and checked by the advanced measurement equipment, the Colour Atlas is of great scientific significance.

2. In defining the contents and the structure of the Colour atlas, a considerable attention has been paid not only to the special purpose for Cartography, Graphic Arts, Packaging and the imagery processing, but also to the common demands from the colour researchers. In addition, we have tried to increase the colour blocks as far as possible under the condition of better visual effect on the colour resolving power. In choosing the printing materials, we have attempted at obtaining the best printing quality which can be compared with the similar Colour Atlas published abroad. At the same time, we tried to make Atlas reproducible in the production lines. And therefore, the Atlas is rich in contents and can be used widely.

3. There are 6768 colour nominations and 5 printed samples in this Colour Atlas. They are arranged as follows:

(1) Six pages in the two-colour combination of yellow, magenta, cyan and black are presented. A grand total is 864 colour nominations.

(2) Eleven pages in the three-colour combination of yellow, magenta, and cyan are collected. A grand total is 1584 colour nominations.

(3) There are 30 pages for the two-colour combination of red, brown, yellow, orange, green, blue, purple, silver grey, light blue and concentrated blue. A grand total is 4320 colour nominations.

(4) Five printed samples in the Colour Atlas are demonstrated.

4. The 54 lines/cm dotted screens are utilized, the percentage of which is 5%, 10%, 15%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 100%. The screen angles are arranged as follows: yellow 90 degree, black 75 degree, magenta 45 degree, cyan 15 degree. The printing ink sets produced in the

Tianjin Ink Factory are used. The codes used for the four colour printing are yellow 8139, magenta 8249, cyan 8449 and black 8729. The codes of ink sets for special colours are red 8224, medium yellow 8135, green 8534 and medium blue 8443. The brown, orange, purple, silver grey, light blue and concentrated blue are each produced by proper combinations. The coated paper of 157 g/m^2 is used in printing.

5. During the process of making of the Colour Atlas, strict quality control was exercised by using the Macbeth TR-927 densitometer, WSC spectrophotometer and Fogra Pms control strip. The main technical parameters are specified as follows:

- (1) The percentage error of the dotted screens is less than 3%.
- (2) The density and the spectrophotometric data of the four-colour printing ink sets are shown in Table 1.
- (3) The density and the spectrophotometric data of the ink sets for map printing are presented in Table 2.
- (4) The colour cast, greyness and the colour efficiency of ink sets are shown in Table 3.
- (5) The density and the spectrophotometric data of the printing coated paper are given in Table 4.
- (6) The resolving power of the positive PS plate is $7\mu\text{m}$, and the exposure latitude is 25~65 seconds.
- (7) The printing sequence is black, cyan, magenta and yellow.
- (8) The printing contrast is limited to 0.3 ± 0.03 for yellow, 0.35 ± 0.03 for magenta, 0.35 ± 0.03 for cyan and 0.40 ± 0.03 for black.
- (9) The control data of the colour contrast is $70\% \pm 5\%$ for yellow, $50\% \pm 5\%$ for magenta and $55\% \pm 5\%$ for cyan.
- (10) The optimum solid densities for the four-colour printing inks are determined from the curves of the printing contrast and the colour contrast. The control data is 1.05 ± 0.03 for yellow, 1.40 ± 0.03 for magenta, 1.50 ± 0.03 for cyan and 1.60 ± 0.03 for black.
- (11) The dot gain is calculated with the Murray-Davies Equation. The actual control data is $11\% \pm 2\%$.
- (12) The trapping values are determined with the Murray-Davies Equation. Their control data are $110\% \pm 3\%$ for "cyan + magenta" combination, $105\% \pm 3\%$ for "cyan + yellow" combination, $106\% \pm 3\%$ for "magenta + yellow" combination, and $112\% \pm 3\%$ for "cyan + magenta + yellow" three-colour combination.

(13) The grey balance curves of the four-colour printing inks are shown in Fig 1.

6. At the appraisal meeting of the Colour Atlas, held by the National Bureau of Surveying and Mapping in December of 1986, more than 20 cartographic and printing experts evaluated and investigated the structure and printing quality of this Colour Atlas. They came to the following conclusion: The Colour Atlas is rich in the contents and rational in the structure; its technical parameters conform to the ISO specifications; its printing quality is high and can be compared with the similar Colour Atlas produced abroad, and this Colour Atlas is of great scientific and industrial significance.

7. The Colour Atlas is designed by Zhang Qingpu, compiled and produced by Ye Taiqi, Zhao Hongxia, Cao Tianjing, An Zhenzhen and Jin Lan. The copying, makeup, platemaking, proofing and printing all have been done at the Printing Factory of "Beijing New Time Publishing House".

The authors wish to acknowledge the economical support of the National Bureau of Surveying and Mapping, and the technical assistance of Yin Youfang, Guan Daren, Yuan Baojun and Li Zhiguang.

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双色套印部分 Two-colour combination

页 码 Page	网点百分比 Dot percentage			
	黄 Yellow	品红 Magenta	青 Cyan	黑 Black
1	0—100	0—100	0	0
2	0—100	0	0—100	0
3	0	0—100	0—100	0
4	0—100	0	0	0—100
5	0	0—100	0	0—100
6	0	0	0—100	0—100

三色套印部分 Three-colour combination

页 码 Page	网点百分数 Dot percentage			
	黄 Yellow	品红 Magenta	青 Cyan	黑 Black
7	5	0—100	0—100	0
8	10	0—100	0—100	0
9	15	0—100	0—100	0
10	20	0—100	0—100	0
11	30	0—100	0—100	0
12	40	0—100	0—100	0
13	50	0—100	0—100	0
14	60	0—100	0—100	0
15	70	0—100	0—100	0
16	80	0—100	0—100	0
17	100	0—100	0—100	0

专色的双色套印部分 Two-colour combination of special colour

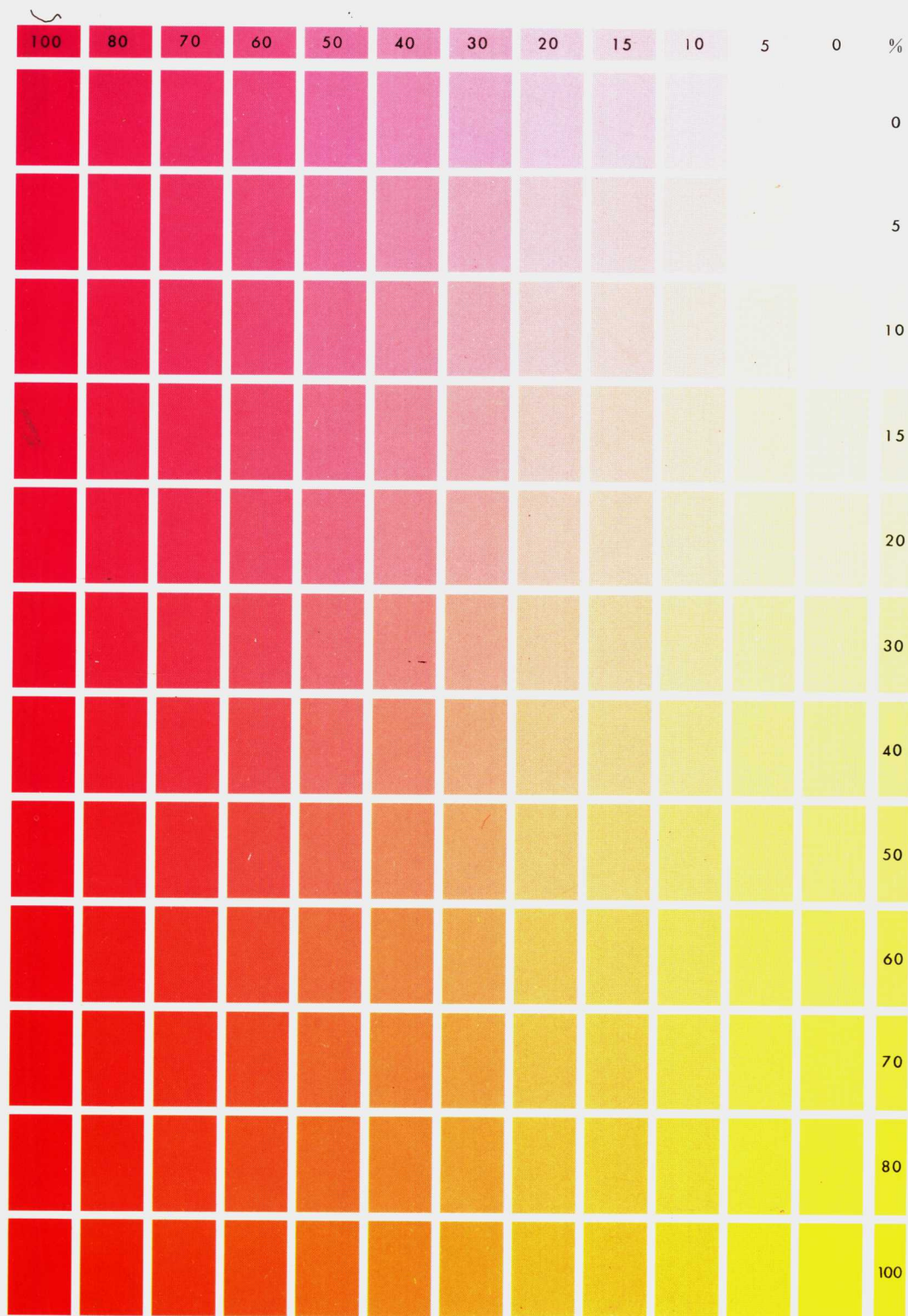
页码 Page	网点百分数 Dot percentage									
	红 Red	棕 Brown	黄 Yellow	桔黄 Orange	绿 Green	蓝 Blue	紫 Purple	灰 Grey	浅 蓝 Bright blue	深 蓝 Conc blue
18	0—100	0—100	0	0	0	0	0	0	0	0
19	0—100	0	0—100	0	0	0	0	0	0	0
20	0—100	0	0	0—100	0	0	0	0	0	0
21	0—100	0	0	0	0—100	0	0	0	0	0
22	0—100	0	0	0	0	0	0—100	0	0	0
23	0—100	0	0	0	0	0—100	0	0	0	0

(续)

页码 Page	网点百分数 Dot percentage									
	红 Red	棕 Brown	黄 Yellow	桔黄 Orange	绿 Green	蓝 Blue	紫 Purple	灰 Grey	浅 蓝 Bright blue	深 蓝 Conc blue
24	0	0	0—100	0	0	0	0	0—100	0	0
25	0	0—100	0—100	0	0	0	0	0	0	0
26	0	0—100	0	0—100	0	0	0	0	0	0
27	0	0—100	0	0	0—100	0	0	0	0	0
28	0	0—100	0	0	0	0—100	0	0	0	0
29	0	0—100	0	0	0	0	0—100	0	0	0
30	0	0—100	0	0	0	0	0	0—100	0	0
31	0	0	0—100	0	0—100	0	0	0	0	0
32	0	0	0—100	0—100	0	0	0	0	0	0
33	0	0	0—100	0	0	0	0—100	0	0	0
34	0	0	0—100	0	0	0—100	0	0	0	0
35	0—100	0	0	0	0	0	0	0—100	0	0
36	0	0	0	0—100	0—100	0	0	0	0	0
37	0	0	0	0—100	0	0—100	0	0	0	0
38	0	0	0	0—100	0	0	0—100	0	0	0
39	0	0	0	0—100	0	0	0	0—100	0	0
40	0	0	0	0	0—100	0—100	0	0	0	0
41	0	0	0	0	0—100	0	0—100	0	0	0
42	0	0	0	0	0—100	0	0	0—100	0	0
43	0	0	0	0	0	0—100	0—100	0	0	0
44	0	0	0	0	0	0—100	0	0—100	0	0
45	0	0	0	0	0	0—100	0	0	0—100	0
46	0	0	0	0	0	0—100	0	0	0	0—100
47	0	0	0	0	0	0	0	0	0—100	0—100

印刷样张 Printed samples

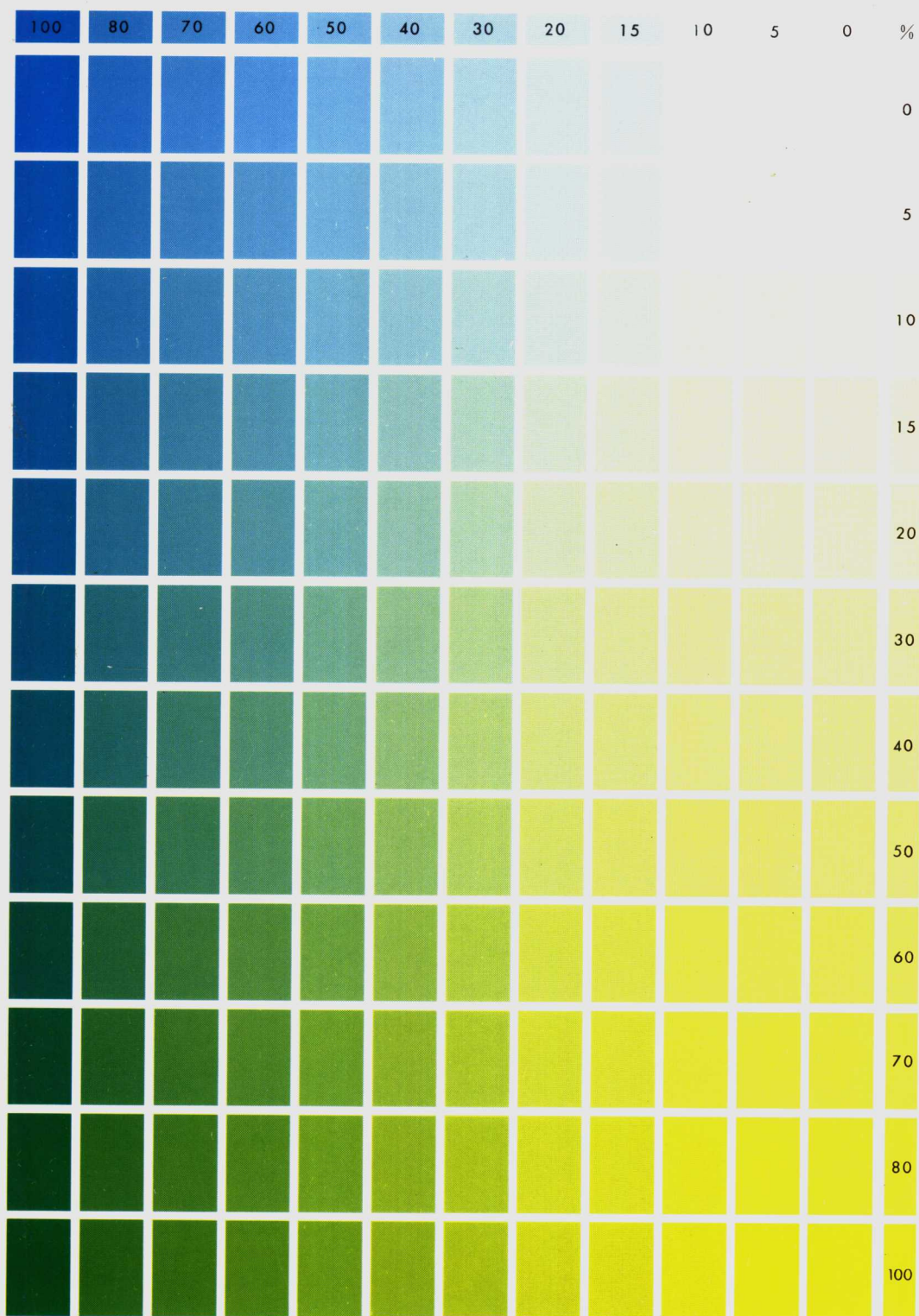
页 码 Page	样张名称 Name of the printed samples
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49	信号条 Control strips
50	风景 Scenery
51	风景 Scenery
52	人物 Art picture



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(0-100)



(0-100)



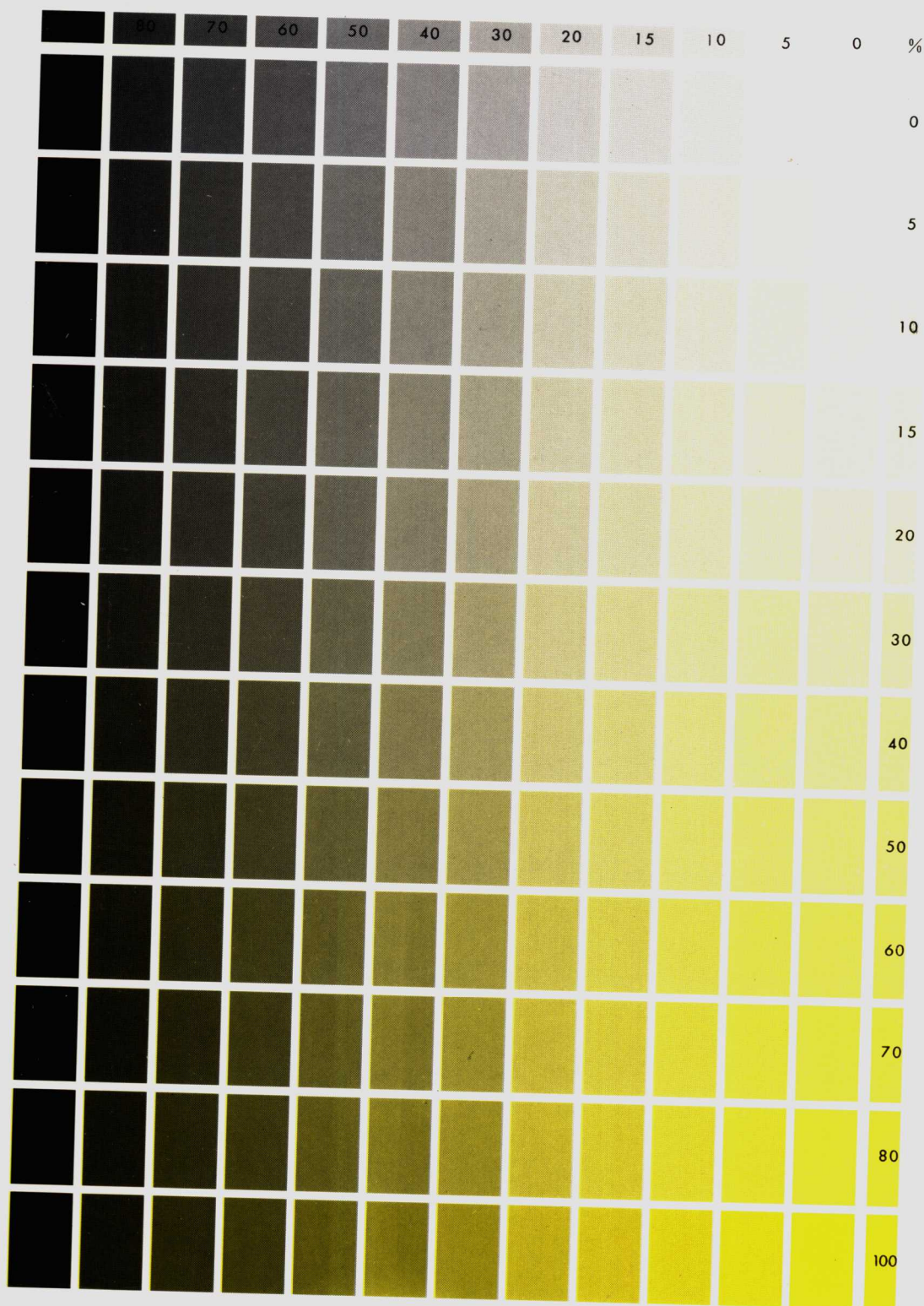
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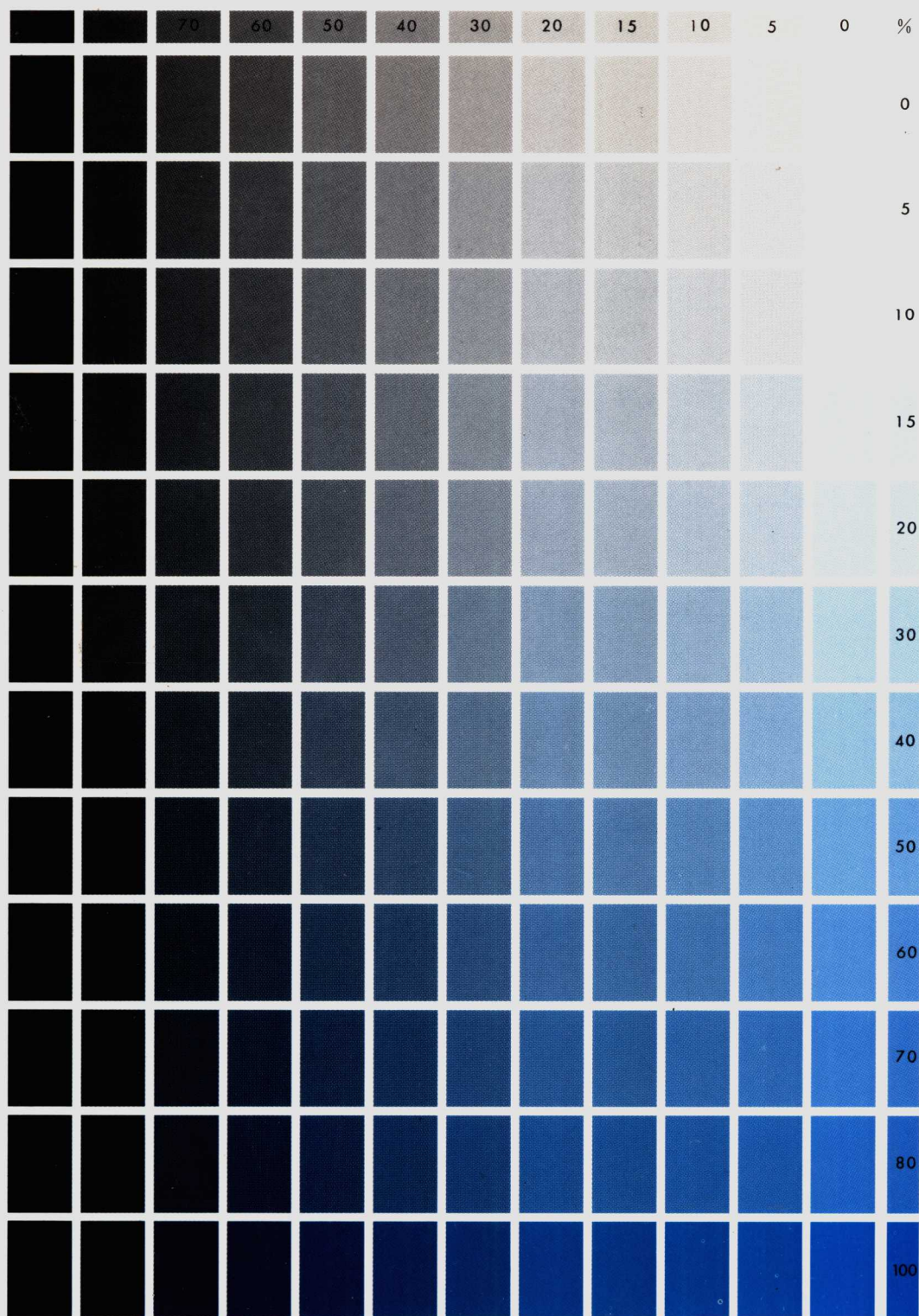
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