

TOKYO MEDICAL COLLEGE

COLOR VISION TEST

MURAKAMI COLOR RESEARCH LABORATORY

TOKYO

JAPAN

東京醫科大學式
色 覺 檢 查 表



考 案 東京医科大学眼科教室
製 作 株式会社 村上色彩技術研究所

TOKYO MEDICAL COLLEGE COLOR VISION TEST

FIRST EDITION

TWELVE PLATES AND INSTRUCTIONS

Produced
by

Murakami Color Research Laboratory

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Foreword

Investigations on color sensation in our Department were initiated in 1939, but attempts to produce a color vision test were not made until 1949 when R. Seki, later with the co-operation of S. Obi and K. Shimizu, began to engage in critical surveys of various color vision tests. The results of these studies were rewarding and opened a way for producing a new system of test. By means of the newly devised color test plates, we have been able to understand the real nature of congenital color defect from many angles.

Uniting the experiences gained in these studies, the work on the actual construction of a new color vision test was commenced in 1952. It was our good fortune to secure the co-operation of Mr. Shizuo Murakami, Director of Murakami Color Research Laboratory in the preparation of color chips, thus greatly facilitating the progress of our work. During 1953~1954, our endeavor received an encouraging support in form of a grant-in-aid from the Ministry of Education. The contributions made by other members of our departmental staff were also helpful in the perfection of the test.

The results of our studies were made public at the meetings of the Japanese Society of Ophthalmology. We now offer to the public the first part of our color vision test, which has just been completed, for criticism and suggestions. We have to add that our work still continues in order to realize a further improvement in every aspect of the color vision test.

Kakichi Umazume, M. D.

*Department of Ophthalmology,
Tokyo Medical College*

Tokyo, April, 1957

Production of Color Vision Test

The color vision test here presented was first trial under the supervision of professor Kakichi Umazume, Department of Ophthalmology, Tokyo Medical College. The selection of 30 different colors for the test was made in 1955, embodying the combined results of clinical experiences by the members of his department and of investigations on the standard color chips by our Laboratory. The actual planning and colorimetry of color chips were entrusted to Mr. Goro Tanimizu, while Miss Masako Katahira undertook the difficult task of production of the color chips. When it was decided to publish the plates under the name of Tokyo Medical College Color Vision Test, Mr. Hiroshi Tanaka was appointed as the production manager and the first edition was completed in May, 1957.

The average color vision plates utilize printed color chips which are apt to show an uneven distribution or inexact superposition of colors. The surface of the chips often becomes glossy and the colors tend to fade upon exposure to sunlight. To overcome these disadvantages, the plates here presented have been prepared by painting with ignited pigments and synthetic resins. Fastness to light has been fully insured by the use of inorganic ignited pigments.

Again, in the production of color chips, the problem of permissible color tolerance must also be considered. Common sense dictates the application of MacAdam's ellipse of standard deviation, but this is inadequate inasmuch as the density of color chips employed here has been determined on the basis of chromaticity-confusion lines. Thus, the range of permissible color tolerance has been established from the confusion lines.

Grateful acknowledgement is hereby made to professor Giichi Omoto of Tokyo Institute of Technology, and to Mr. Yukio Murakami, President of Japan Electronic Instrument Co., Ltd., for their continual advice and encouragement in the production of the plates. Criticism and suggestions on any aspect of the test are earnestly invited.

Shizuo Murakami

*Director of Murakami Color
Research Laboratory. Japan.*

Tokyo, April, 1957

Investigation and Production Staff

Supervision	Kakichi Umazume, M. D., Professor of Ophthalmology, Tokyo Medical College
Research Chief	Ryo Seki, M. D., Lecturer in Ophthalmogy, Tokyo Medical college
Research Associate	Sakae Obi, M. D., Chief of Ophthalmology, Social Insurance Central Hospital
Research Associate	Kaneo Shimizu, M. D., Department of Ophthalmology, Tokyo Medical College
Production Chief	Shizuo Murakami, Director of Murakami Color Research Laboratory
Production Assistant	Goro Tanimizu, Member of Murakami Color Research Laboratory
Production Assistant	Masako Katahira, Member of Murakami Color Research Laboratory
Production Assistant	Hiroshi Tanaka, Member of Murakami Color Research Laboratory

References

- 1) K. Umazume, R. Seki, and S. Obi: Studies on Trial Production of New Color Vision Test Plates, Report I. Acta Soc. Ophthalm. Jap. 58 (8) : 732, 1954
- 2) K. Umazume, R. Seki, S. Obi, and K. Shimizu: Same paper, Report II. *Ibid.* 59 (7) : 765, 1955.
- 3) K. Umazume, R. Seki, S. Obi, and K. Shimizu: Same paper, Report III. *Ibid.* 60 (11) : 1780, 1956.
- 4) K. Umazume: Studies on Color Sensation and Clinical Use. Jap. J. Ophthal. 2 (1) : 6, 1958.

Precautions to be taken in Using the Plates

1. The most effective results are obtained when the plates are first removed from the fastener and then shown to the subject at random.
2. During the test the subject is seated at a distance of about 45 cm (18 inch, $1\frac{1}{2}$ Ft.) from the object and allowed to read the numerals at right angle to the line of vision.
3. Illumination: The plates must be illuminated by light obliquely coming from behind the subject in a room facing north, between the hours of 9 A. M. and 3 P. M.. On cloudy or rainy days the tests may be performed in a room facing south. Direct sunlight must be strictly avoided. If for unavoidable reasons the tests are to be made at night, a daylight fluorescent lamp must be used. On Illuminance, more than 100 lux is preferable.
4. Two second exposure is allowed for the screening and quantitative plates; no time limits are set for the qualitative plates.
5. The tests cannot be applied in a reliable way to feeble-minded or very immature subjects.
6. The plates must be replaced after use in the case and kept in a dark place.

Directions for Use of the Test Plates

The pseudo-isochromatic plates are used first for screening of the individuals with abnormal color vision, and then for detecting the type and degree of such abnormalities by the use of the qualitative and quantitative plates.

1. The subject is ordered to read Screening plates I and II, the results being recorded as follows:

<u>Screening Plate I</u>	<u>Screening Plate II</u>	<u>Diagnosis</u>
Can read	Can read	Normal
Cannot read	Can read	Protan or Deutan
Can read	Cannot read	Tritan
Cannot read	Cannot read	Total color blindness or Simulation

2. The type and degree of the Protan and of the Deutan are then determined as follows:

① The qualitative plates are shown to determine whether the subject can read the numeral in red or in green. If he can read both, the one which is read more readily is ascertained.

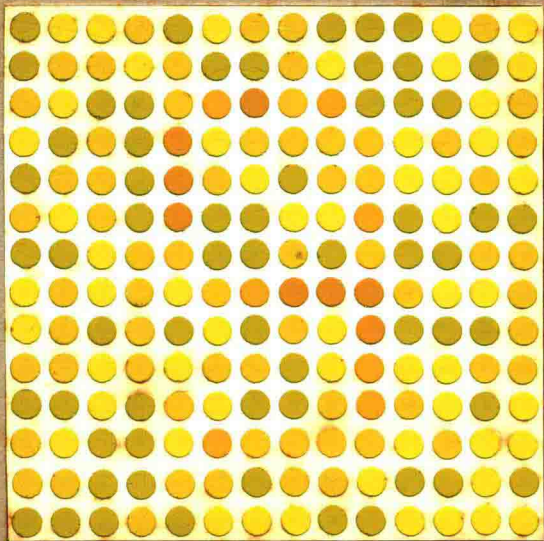
<u>Red</u>	<u>Green</u>	<u>Diagnosis</u>
Cannot read (Difficult to read)	Can read (Easy to read)	Protan
Can read (Easy to read)	Cannot read (Difficult to read)	Deutan

② The two numerals in the quantitative plates are then shown.

<u>Numeral I (Left)</u>	<u>Numeral II (Right)</u>	<u>Diagnosis</u>
Can read	Can read	First degree (Mild)
Can read	Cannot read	Second degree (Medium)
Cannot read	Cannot read	Third degree (Severe)

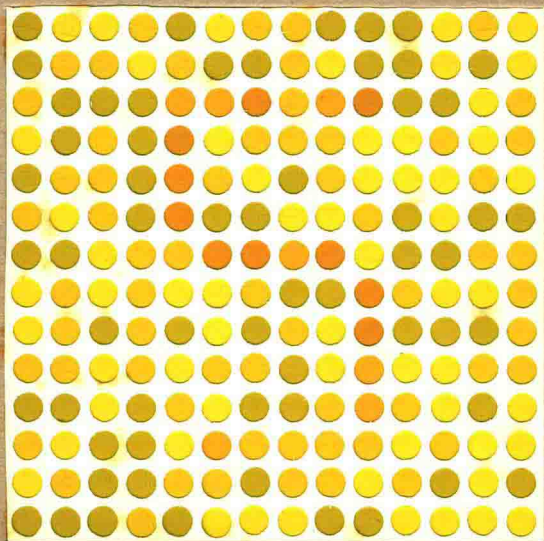
3. The results of tests by the use of the pseudo-isochromatic plates are recorded in the following manner:

(Example) : Protan (First degree)



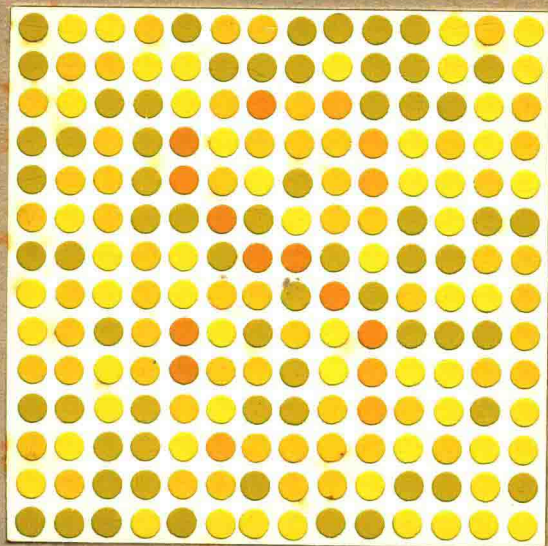
Screening Plate I-1

検出表 I-1



Screening Plate I-2

検出表 I - 2



Screening Plate I-3

檢出表 I - 3