

STANDARD ST.10/D

Version 1.0

GUIDELINES ON PHYSICAL CHARACTERISTICS OF PATENT DOCUMENTS PARTICULARLY RELEVANT TO REPRODUCIBILITY AND LEGIBILITY OF SUCH DOCUMENTS

Standard adopted during the 1980's

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Introduction

1. The purpose of these Guidelines is to provide for acceptable quality criteria relating to reproducibility and legibility of original paper copies of patent documents published by Industrial Property Offices.
2. Patent documents are published by Industrial Property Offices, either by composing the original text submitted by applicants upon filing their application or by reproducing copies of the originally filed application with or without an intermediate photoreduction step. It is recognized that in the latter event the quality of the original paper copies depends upon the quality of the original text submitted by applicants over which an Industrial Property Office has little control. The Guidelines do however contain statements to assist Industrial Property Offices where such control is possible.
3. Original paper copies are reproduced for many purposes by a variety of techniques. Original paper copies, e.g., stored in bound volumes in libraries, may be reproduced using direct copying involving electrophotographic or thermographic sensitive materials. Microfilming may use 16 mm roll microfilm, 35 mm roll microfilm (e.g., for later production of 8-up aperture cards) or microfiche. Microfilm copies may then be used to produce a paper copy or be directly viewed in optical viewers. In every case the quality of the final copy depends upon the quality of the initial published patent document. At each reproduction step image degradation is unavoidable. To ensure that the final copy is satisfactory from the point of view of legibility requires an appraisal of those physical characteristics which can effect legibility and the realization that, although a published patent document may be legible, copies produced by some of the above techniques may not be satisfactory as regards legibility due to failings in the physical characteristics of the original published patent document.

Definitions

4. For the purposes of these Guidelines the following definitions are given:
 - (a) *Legibility*: The ability of a document to permit reading of the text of the document without undue strain.
 - (b) *Reproducibility*: The ability of a document when subjected to standard copying techniques to provide copies that have a high legibility.
 - (c) *Brightness*: A ratio value, expressed as a percentage of the reflectance to light, in the blue and violet portions of the spectrum, of a white or near white paper (including paper made from naturally colored pulp) compared with that reflected from a freshly prepared magnesium oxide surface.
 - (d) *Opacity*: A ratio value, expressed as a percentage, of the diffuse reflectance of a specimen backed with black to the diffuse reflectance of the same specimen backed with a white body.

Survey conducted by WIPO

5. Reproducibility and legibility of patent documents are influenced by various physical characteristics. A survey of the characteristics of the patent documents of the major issuing countries, those characteristics being given in the document "Physical Characteristics of Patent Documents" (Part 7.5), has resulted in the identification of the following characteristics as being particularly important in affecting the legibility and reproducibility of patent documents:
- (a) physical characteristics of the paper,
 - (b) brightness of the paper,
 - (c) opacity of the paper,
 - (d) characteristics of typewritten or printed characters.

Other characteristics were also identified but they were considered to be of less importance.

Results of survey

(a) Specific values of characteristics

6. Numerical values of the physical characteristics given below quote the arithmetic means and the standard deviation of the documents subject to the survey from this mean.
7. Documents subjected to the survey exhibited a thickness of paper of 0.091 ± 0.021 mm.
8. Documents subjected to the survey exhibited a brightness value of $79 \pm 9\%$.
9. Documents subjected to the survey exhibited an opacity value of $86 \pm 6\%$.
10. For composed documents the type size should not be less than 8 pt. (equivalent height of the lower case "e" is 1.6 mm or "1/16"). The type size for superscript may be 2 points smaller than for the body text.
11. For non-composed patent documents the type size should be greater than 8 pt. if no photo-reduction step is used, e.g., in direct off-set printing process. If a photo-reduction step is used, the type size of the published patent document should be chosen depending upon the quality of the original text and the value of the photo-reduction step.

(b) Interrelationship between characteristics

12. This survey also identified the important role that the interrelationships between these main characteristics play in determining the reproducibility and legibility of patent documents. The survey failed to identify one characteristic of a given patent document as being responsible for that patent document being less acceptable as regards reproducibility and legibility than another patent document. Rather the interrelationships between the main characteristics of that patent document were responsible in an unquantifiable way. Consequently these Guidelines do not specifically define minimal or maximal values of individual main characteristics but highlight the manner in which specific values of the main characteristics interrelate to determine the quality of the original paper copy.
13. Patent documents subjected to the survey that had a low brightness value compared with the mean tended to have a high opacity compared with the mean and in some cases also a high thickness compared with the mean.
14. Patent documents subjected to the survey that had a low thickness compared with the mean tended to have an opacity value near or greater than mean.
15. Patent documents subjected to the survey that had a low opacity compared with the mean tended to have a brightness value near or greater than the mean.
16. The statements in paragraphs 13 to 15, above, illustrate that although the majority of patent documents subjected to the survey possessed good legibility and reproducibility characteristics the main physical characteristics differed from one document to another. It is concluded therefore that the main characteristics interrelate in the manner indicated in those paragraphs to give patent documents that possess good legibility and reproducibility characteristics.

Teaching statements identified during the survey as being of importance

17. The following statements are given to assist offices contemplating publishing documents or wishing to improve the quality of their published documents. For convenience the statements are grouped according to the characteristics identified in

paragraph 5, above.

Physical characteristics of paper

18. Effects of age upon the composition of paper affect reproducibility and, to a lesser extent, legibility. The presence of ground wood pulp causes yellowing of the paper with age, the effect increasing with an increase in the percentage content of ground wood pulp. Contrast between the printed characters and the paper is reduced with age and yields poorer copies upon reproduction. It is recommended that if through economic considerations the presence of ground wood pulp is unavoidable it be present to no more than 30%.
19. Some types of paper become brittle with age and physical handling during reproduction necessitates that the use of such paper should be avoided. The strength and folding endurance of the paper should remain substantially independent of age.
20. Paper having a high gloss finish can seriously reduce the effective contrast between the printed characters and paper during some reproduction techniques, and in some illumination conditions makes legibility difficult. Paper with a low surface reflection coefficient should be used.
21. Offset reproduction of patent documents frequently uses paper having absorbency characteristics which introduce blurring of the printed characters. The economic advantages of offset reproduction are acknowledged but care is essential in the choice of paper and in the adjustment of the machine to permit a sharp rendition of printed characters.
22. Paper can also affect ink drying. Acidity is the main retarder of drying. A pH below 4.5 can cause serious troubles, particularly in humid weather, whereas papers having a pH between 4.5 and 6.0 rarely give trouble. In coated papers, the base acidity has little effect; it is the coatings that determine how fast ink will dry and for this reason they are usually neutral or alkaline; the more alkaline the coating is, the faster the ink will dry.

Brightness of paper

23. Satisfactory reproduction of patent documents can be achieved only if the density difference between the printed characters and the background is sufficiently high to meet the exposure characteristics of the copying material. Since invariably black text is used, this necessitates a high brightness value. Fluorescent optical azurants are sometimes added to the composition of paper in order to increase the brightness, which creates difficulties with regard to reproduction. The use of fluorescent optical azurants should be avoided if possible.
24. The brightness value should remain constant from one patent document to the next for patent documents published in a continuous sequence.
25. Conventional reproduction techniques can copy pastel tinted paper satisfactorily, but deeply colored paper, particularly red, should be avoided. White paper should preferably be used. However, where it is essential to use tinted paper, e.g., for identification of different types of patent documents, it is recommended that reproduction tests be made to ensure that the tinted paper will admit satisfactory legibility and reproducibility before such paper is used for published documents.

Opacity

26. A low opacity value results in the background density of reproduced copies depending more upon the characteristics of the backing material than does a high opacity value: in the latter case the background density of reproduced copies depends solely upon the brightness of the paper. For this reason, a patent document having a low capacity value may reproduce using some techniques to a lower standard than another patent document having a high opacity value, even though the paper of both patent documents have equal brightness values.
27. Paper having a low opacity value may introduce a higher show-through than a paper having a high opacity value. Show-through is also a function of absorbency. In general to mitigate against show-through, an absorbent paper should possess high opacity. The lower the absorbency the lower the opacity may be before show-through is experienced during copying.
28. In some reproduction techniques a patent document possessing a high degree of show-through may be satisfactorily copied by backing the patent document with a matt black surface, e.g., carbon paper, rather than with a matt white surface.
29. The opacity value should be uniform throughout the document to ensure constant density of reproduction of background areas.

Characteristics of typewritten or printed characters

30. The text should be black, of high and uniform density. Bicolored and used typewriter ribbons should be avoided. It is recommended that the typewriter ribbon should not be changed when typing one and the same page of the patent document.
31. The characters should be sharply defined. Due to diffraction effects, each reproduction step introduces some element of image degradation. This has the effect of diffusing the boundary between the text and background. A typeface having hairlines and serifs degrades more than a typeface of the sanserif type. For this reason a typeface with lines of constant thickness should be used.
32. For textual emphasis, e.g., for bibliographic text, bold type or heavy stroke with italics should be used.
33. Character impression should be uniform. For non-composed patent documents the use of a constant impression (e.g., electric) typewriter is recommended.

General conclusion

34. In the event that an office is aware that its documents possess poor legibility or reproducibility characteristics, it is recommended that the characteristics stated in 7 to 11, together with the interrelations stated in paragraphs 12 to 16, should give guidance on remedial action necessary.

[End of Standard]