GPO

Contract Terms

Quality Assurance Through Attributes Program for Printing and Binding

Prospective suppliers should carefully read this publication as the applicable attributes stated herein become an integral part of printing and binding contracts with the U.S. Government Printing Office when so cited in specifications. This copy should be retained for reference.

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GPO Contract Terms
Quality Assurance Through Attributes Program
For Printing and Binding
Publication 310.1

is available as follows:

Prospective Bidders—
* Free single copies are available from the GPO Central Office Bid Room and all Regional Printing Procurement Offices.
* Bulk Copies are available from the Superintendent of Documents.

U.S. Government Agency Personnel—
* Copies are available from your GPO Customer Services Representative or Regional Printing Procurement Office through your agency's printing officer.

U.S. Government Printing Office Personnel—
* Individual copies are available from the Quality Assurance Section.
* Bulk copies are available from GPO Stores Division, Stock No. 51573–6.

Comments and suggestions from users of Contract Terms, Pub. 310.1, are invited. All such correspondence should be addressed as follows:

U.S. Government Printing Office
North Capitol and H Sts., N.W.
Chief, Quality Assurance Section
Contract Management Branch
Washington, DC 20401

Questions of applicability to individual contracts should be addressed to the respective Contracting Officer.

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The U.S. Government Printing Office
Quality Assurance Through Attributes Program (QATAP)

THIS FOREWORD IS NOT PART OF THE CONTRACT.
IT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

QATAP—An Informational Overview

The quality of printing and binding contracted for by the U.S. Government Printing Office (GPO) is addressed in three GPO documents.

First and foremost are the specifications for the specific contract being performed; these should be read and followed exactly. If there ever is a conflict between the specifications and the other two documents, the specifications take precedence. Next, *GPO Contract Terms (Publication 310.2)* is a part of every GPO contract by reference. Article 1 deals with quality requirements in a general manner. Third is *QATAP, Printing and Binding, Contract Terms (GPO Pub. 310.1)*, which specifies the contractual requirements of the Quality Assurance Through Attributes Program (QATAP). Most contracts incorporate it by reference.

The purposes of QATAP are:
— to provide for the precise expression, prior to production, of quality requirements for printing and related products; and
— to provide for the objective determination of conformity to these requirements once the product has been produced or received.

The Quality Attributes

QATAP is based on the use of quality attributes, which are measurable properties including tolerances of a printed piece which define its compliance with requirements. Quality attributes vary with each quality level.

The program has 30 attributes. Examples are trim size, measured in inches or centimeters; type density, measured in percent reflectance; and hickies and spots, measured by size and number present. The complete list of attributes is as follows:

P–l Hickies and Spots
P–2 Extraneous Marks
P–3 Moire
P–4 Register
P–5 Text and Illustration Image Position
P–6 Newton's Ring
P–7 Type Quality and Uniformity
P–8 Halftone Match
P–9 Solid or Screen Tints Color Match
P–10 Process Color Match
P–11 Rub Resistance of Printed Image

Paper (Subdivided into characteristics; e.g. color, opacity, smoothness.)

Evaluation Standards

For all but four of the numbered attributes and some paper characteristics, evaluation is made on an absolute basis, with defects assessed on deviation from explicit or implicit nominal values, rather than on comparisons to a specified physical object called the specified standard. For example, if the trim size is specified as 8 by 10 inches, these are the nominal values from which deviations are measured. Tolerances specify how far the product may deviate from the nominal and still be acceptable.

Specified standards are preidentified reference items (e.g., OK'd press sheets or furnished copy) with which sample items are compared to measure conformance for attributes P–7 through P–10 and some paper characteristics (e.g., paper color and formation). Another example, process color match (P–10) may be evaluated by comparing the printed illustration with an OK'd press sheet. In this instance the OK'd press sheet would have been listed in the job specifications as the specified standard for attribute P–10.

Thus, the evaluation for attributes P–7 through P–10, and some paper characteristics are made relative to a specified standard while the other attributes and paper characteristics are evaluated on an absolute basis.

Product Quality Levels (PQL's)

For each attribute, QATAP indicates either a specified standard or a nominal value along with tolerances that specify the range of acceptability. In either case, any necessary measuring instruments are listed.

Obviously, no single set of tolerances can apply to all products; for instance, tighter conformity is necessary on prestige products than on general information handouts or interoffice forms. Therefore, five Product Quality Levels (PQL's) have been established in QATAP, based primarily on the intended end use of the product.

These levels range from Best Quality (Level I) through Functional Quality (Level V), allowing successively more deviation from design characteristics and furnished reproducibles.

The PQL for each individual printing or binding job is selected by the customer agency, sometimes with GPO's assistance. The PQL is chosen based on the fidelity of reproduction required, the desired aesthetic appearance, and the intended durability of the final product.

Listed below are brief, general descriptions of the five quality levels; the exact definition of each level consists of the tolerances and standards listed in *QATAP Contract Terms, Printing and Binding, (GPO Pub. 310.1).*

Level I

Descriptive Terms—Best quality, highest quality, tightest tolerances.

Fidelity of Reproduction—The information transmitted requires maximum fidelity to the furnished reproducibles in detail, color, and resolution.

Quality of Materials and Workmanship—These products typically involve the highest quality materials, reproducibles, production methods, and workmanship. Finishing must be held to the highest standards of accuracy, durability, and appearance.

Typical Physical Description—At this level products are generally multicolor or process color work. Illustrations may be very fine line drawings, multicolor illustrations, or up to 300-line screen halftones.

Examples of Tolerances—0.5 row of dots for multicolor halftone registration (see attribute P–4); one broken character per page for type quality (see P–7); and one-sixteenth of an inch for trim size (see F–l).

Note:—The tolerance examples shown for each PQL are the starting points at which demerits are assigned for printing attributes and defects for finishing attributes.
—As explained below, defects for printing attributes are based on demerits.
— As explained below, defects for printing, finishing and paper attributes are counted toward an acceptable quality level, which is used to determine acceptance or rejection.
— Some imperfections may by themselves render a product unacceptable.
— This note applies to examples of tolerances at all levels.

Examples—Art books, medical journals, and meat grading charts.

Level II

Descriptive Terms—Better quality, prestige quality, library quality.

Fidelity of Reproduction—Close fidelity to furnished reproducibles is required.

Quality of Materials and Workmanship—These products typically involve high quality materials, reproducibles, production methods, and workmanship.

Typical Physical Description—Overall appearance is of primary importance. Products in this level generally have singlecolor or multicolor subject matter. Finishing must be held to high standards of accuracy, durability, and appearance.

Examples of Tolerances—One row of dots for multicolor halftone registration (see attribute P–4); one broken character per page for type quality (see P–7); and three-thirtyseconds of an inch for trim size (see F–1). See note regarding tolerance examples in Level I.

Examples—Yearbooks, recruiting materials, and illustrated professional papers.

Level III

Descriptive Terms—Good quality, above average quality.

Fidelity of Reproduction—Illustrations must transmit precise information even though fidelity to minutest detail is not required.

Quality of Materials and Workmanship—Typically involves above average quality materials, reproducibles, production methods, and workmanship.

Typical Physical Description—Generally requires clean, sharp printing of single- or multi-color work (general process color work) and halftone reproductions up to 150-line screen. Finishing must be held to above average standards of accuracy, durability, and appearance.

Examples of Tolerances—One row of dots for multicolor halftone registration (see attribute P–4); two broken characters per page for type quality (see P–7); and one-eighth of an inch for trim size (see F–1). See note regarding tolerance examples in Level I.

Examples—Annual reports, general process color work, court decisions, budget reports, catalogs, textbooks.

Level IV

Descriptive Terms—Basic quality, informational quality, utility quality.

Fidelity of Reproduction—Average fidelity and resolution to original copy or film is required.

Quality of Materials and Workmanship—Requires average quality materials, reproducibles, production methods, and workmanship.

Typical Physical Description—Products that provide general information, usually black and white or line color (nonprocess) and occasional halftone reproductions. Utility is important, as well as basic, clean appearance. Finishing must be of an accuracy, durability, and appearance that does not impair the function of the product.

Examples of Tolerances—Multicolor halftone registration is not applicable (see attribute P–4); six broken characters per page for type quality (see P–7); and three-sixteenths of an inch for trim size (see F–1).
See note regarding tolerance examples in Level I.

Examples—Telephone directories, indexes, project reports (technical manuals without process color and with only occasional halftones).

Level V

Descriptive Terms—Functional quality, lowest usable quality, greatest tolerances.

Fidelity of Reproduction—Considered of adequate quality provided there is no information loss.

Quality of Materials and Workmanship—Considered of adequate quality provided there is no information loss and the finishing does not impair the function of the product. These products may be reproduced from any readable copy.

Typical Physical Description—One color type and line work only.

Examples of Tolerances—Multicolor halftone register is not applicable (see attribute P–4); broken characters are not applicable (see P–7); and greater than one-fourth inch for trim size (see F–1).
See note regarding tolerance examples in Level I.

Examples—Interoffice forms, line-only information handouts.

Mixing Product Quality Levels

The foregoing implies a unique PQL for each product. Actually, in some instances it may be desirable to mix quality levels. For example, a bound volume for which heavy use is anticipated may require Level II conformity to attributes related to life and durability, but only Level III conformity to attributes dealing with the quality of the printed image.

Definition of Defects

For each attribute and PQL, QATAP provides tolerances which are the allowable deviation from nominal values or specified standards.

For some of the attributes (e.g., number of flexes to loosen a page), different amounts of deviation from the specified values have vastly different effects on the usability of the finished product. Thus, two different types of defects (major and critical) have been defined.

The major defect, is based on a deviation from specifications or standards which normally would be noticed by the customer; e.g., excessively low type density.

Critical defects are those which render a product extremely difficult to use, or even unusable; e.g., loss of information is always assessed as a critical defect.

Thus, for attributes P–1 through P–11, F-18, and the paper attribute, QATAP assesses only major defects, except when loss of information occurs. For attributes F–1 through F–17, major or critical defects can be assessed.

Inspection by Attributes

Each attribute of each item inspected (individual book, pamphlet etc.) is classified as acceptable, defective at the major level, or defective at the critical level. Therefore, each item can have more than one defect.
(See QATAP Contract Terms, for Printing and Binding (GPO Pub. 310.1).

Specifically, for each printing attribute, P–1 through P–11, demerits are assessed to each page measured. Then the item is assessed a major defect for that attribute if the average demerit level (ADL) per page for that attribute exceeds 4.0.

If the ADL does not exceed 4.0, but if one or more pages is so obviously defective that it significantly impairs the quality of the entire copy, then a single major defect (Conspicuous Single Page Defect) will be assigned for that printing attribute. Examples are: a large hickey at the focal point of an illustration, P–1; a single page with extremely light (but legible) type, P–7; large ink or oil spots, P–1; large off-color spots in process color illustrations, P–10.

For the finishing attributes, F–1 through F–18, no ADL is used to determine defects, nor does the Conspicuous Single Page Defect provision apply. Instead, for each finishing attribute, the individual item is inspected and if necessary, assessed a major defect or a critical defect in accordance with the applicable tolerance table.

QATAP provides for the evaluation of paper characteristics by inspection and testing in accordance with the standards in Part 2, *Government Paper Specification Standards*. Demerits are assessed for each characteristic that deviates from nominal values or specified standards. Then, if the sum of the demerits for that item is 31 or more, the item is assessed a major defect under QATAP.

In summary, each individual item can be inspected for all applicable attributes and then assessed a specific number of major or critical defects; e.g., seven major defects and one critical defect.

Acceptance Sampling

There is an inherent variability in every group of manufactured items. One could inspect every item in the lot, but the cost would be prohibitive.

Therefore, determining the acceptability of an entire job, which may contain thousands of individual items, is somewhat more complicated than the inspection of a single item as described above.

One alternative to 100 percent inspection is a formal process called acceptance sampling which can be employed in many cases to determine the acceptability of an entire job.

Acceptance sampling involves the use of statistics applied to the results of inspecting each item in a representative sample taken from an entire job or shipment, hereafter called a lot. *ANSI/ASQC Z 1.4 Sampling Procedures and Tables for Inspection by Attributes* (ANSI/ASQC Z 1.4 version in effect as of date of bid opening) prescribes the sample size appropriate for varying lot sizes under various circumstances. A full description of the acceptance sampling process is contained in *Government Printing Office, Technical Report No. 27, Acceptance Sampling*.

Acceptable Quality Levels (AQL's)

After selecting and inspecting a representative sample, the question is whether to accept or reject the entire lot based on those results.

Under QATAP, a contractor is not allowed to knowingly ship any defective products. However, in many circumstances, a customer may tolerate a limited, predefined percentage of defective items in a ship-

ment that have not been caught by the contractor's quality system. It is the job of *QATAP, Printing and Binding, Contract Terms (GPO Pub. 310.1)* and *ANSI/ASQC Z 1.4 Sampling Procedures and Tables for Inspection by Attributes*, to define this risk.

Therefore, in order to determine acceptance or rejection of the entire lot, an Acceptable Quality Level (AQL) must be established. The AQL specifies the maximum defects per 100 units (as a process average) considered satisfactory for that lot.

The purpose of sampling and inspection is to determine statistically whether the AQL has been exceeded. Typical AQL's for Government contracts are 1.0 defects per 100 items for critical defects, and 6.5 defects per 100 items for total defects, i.e., major defects plus critical defects.

Acceptability or Rejection of the Lot

After sampling and inspection, the appropriate tables in publication *ANSI/ASQC Z 1.4 Sampling Procedures and Tables for Inspection by Attributes*, are checked to determine for the sample size being used the number of defects that will render the lot acceptable or rejectable, i.e., the number of defects in the sample that correspond to the AQL.

In a typical situation, a product that exceeds the AQL of 1.0 for critical defects or 6.5 for total defects is not deemed acceptable, and the Government has the option of having the lot replaced or the defects corrected, if possible.

In a limited number of cases, where circumstances do not allow reprinting and use “as is” is necessary, QATAP provides the Government the option of accepting the lot with an equitable reduction in the contract price. *QATAP, Printing and Binding, Contract Terms*, provides discount tables to determine such reductions.

Intent of QATAP

While QATAP allows acceptance of a defective lot under an equitable reduction in contract price, in all cases it is the intent of the Government that all of the items meet the quality specified in the contract.

Furthermore, the goal of QATAP is not only enforcement of quality standards through inspection, but also that contractors establish quality control systems that assure production of a product that meets the standards set forth in the contract.

Referenced Documents

Copies of the referenced documents can be obtained as follows:

**GPO Contract Terms—(GPO Pub. 310.2) and*

**QATAP, Printing and Binding, Contract Terms (GPO Pub. 310.1)*

Free single copies are available to prospective bidders from the GPO Central Office Bid Room and all Regional Printing Procurement Offices.

Bulk quantities are available from the Superintendent of Documents, Washington, DC 20402, telephone (202) 512–1800.

**Government Paper Specification Standards*

Subscriptions are available from the Superintendent of Documents, Washington, DC 20402, telephone (202) 512–1800.

**Sampling Procedures and Tables for Inspection by Attributes (ANSI/ASQC Z 1.4)*

Copies of ANSI/ASQC Z 1.4 are available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036; telephone (212) 642–4900; fax (212) 302–1286.

**Technical Report No. 26, The GPO Quality Attributes Program—An Update* and *Technical Report No. 27, Acceptance Sampling*

Free single copies are available from the U.S. Government Printing Office, Quality Assurance Section (Stop PPSQ), Washington, DC 20401, telephone (202) 512–0542.

Note: For all publications, U.S. Government agency personnel should contact their GPO customer service representative or regional printing procurement office through their agency's printing officer.

QATAP SUMMARY

* There are 30 measurable attributes.

* The attributes are evaluated against nominal values or specified standards.

* There are five Product Quality Levels (PQL's), I-Best, through V-Functional.

* For the printing attributes:

  Demerits are assigned if specified tolerances are exceeded.

  When an individual copy has an Average Demerit Level (ADL) of more than 4.0 (4 per page), the copy is assessed a major defect.

  When the ADL is 4.0 or less, if a conspicuous single page defect is present, a single major defect can be assessed to the appropriate printing attribute.

* For the other attributes (excluding paper):

  Major and critical defects can be assessed.

* For the paper attribute:

  Demerits are assessed in accordance with *Government Paper Specification Standards*.

  If the demerits equal 31 or more, a major defect is assessed.

* Loss of Information for any reason is assessed a critical defect.

* Total Defects are the sum of major and critical defects in the entire sample inspected.

* The Acceptable Quality Level (AQL) is the maximum number of defects per 100 units the government will tolerate the risk of accepting at the contract price.

  A typical AQL is 1.0 for critical defects and 6.5 for total defects.

* Acceptance Sampling, an alternative to inspecting every unit in the lot, can be used to determine if the entire lot meets the AQL.

  The appropriate sample size for determining a representative sample is derived by using *ANSI/ASQC Z 1.4, Sampling Procedures and Tables for Inspection by Attributes* (version in effect as of date of bid opening).

* If the defects exceed either or both AQL's:

  The government has the option of having the lot replaced or corrected if possible, or accepting the lot with an equitable reduction in the contract price.

(END OF INFORMATIONAL FOREWORD)

Quality Assurance Through Attributes Program (QATAP)

1. DEFINITIONS

1–1. *Quality Attribute*—A quality attribute is a property of a printed product which affects its quality. Examples are trim size, image position, type quality, and paper.

1–2. *Lot or Batch*—A lot or batch is a quantity of copies of a publication from which a sample is drawn. A lot or batch consists of copies which are produced under essentially the same conditions and at essentially the same time.

1–3. *Critical Defect*—A critical defect is a serious deviation from specifications. Critical defects are designated in the tolerance tables for finishing attributes.

1–4. *Major Defect*—A major defect is a deviation from specifications which is less serious than a critical defect. Major defects are designated in the tolerance tables for printing attributes, finishing attributes and the paper attribute.

1–5. *Total Defects*—Total defects are the sum of all critical and all major defects (e.g., 3 critical defects + 2 major defects = 5 total defects).

1–6. *Acceptable Quality Levels (AQL's)*—The AQL's are the maximum number of defects per 100 copies that the Government will accept at the contract price. Unless otherwise specified, the AQL's are 1.0 for critical defects and 6.5 for total defects.

1–7. *Product Quality Levels (PQL's)*—The PQL's specify the degree of quality required in the final product. QATAP contains five PQL's ranging from Level I (Best) to Level V (Functional). Generally, tolerances for attributes vary with the PQL.

1–8. *Inspection Levels*—The inspection levels are the means used to determine the relationship between the lot or batch size and the minimum sample size. Inspection Levels will be specified in accordance with page 9 of "ANSI/ASQC Z 1.4, Sampling Procedures and Tables for Inspection by Attributes" (version in effect as of date of bid opening). Copies of ANSI/ASQC Z 1.4 are available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036; telephone (212) 642–4900; fax (212) 302–1286.

1–9. *Specified Standards*—The specified standards are the criteria on which printing attributes P–7, P–8, P–9, and P–10 are evaluated. For example, process color match (P–10) might be evaluated by comparing a printed illustration with an "OK'd press sheet." In this example, the "OK'd press sheet" would be listed in the specifications as the specified standard for printing attribute P–10.

Standards will be specified for the following attributes:

P–7	Type Quality and Uniformity
P–8	Halftone Match
P–9	Solid or Screen Tints Color Match
P–10	Process Color Match

1–10. *Average Demerit Levels (ADL's)*—ADL's are one of the means used to classify defects for printing attributes.

1–11. *Standard Viewing Conditions*—Standard viewing conditions are those defined in ISO 3664–2000, Viewing conditions—Graphic technology and photography.

2. DETERMINATION OF PRODUCT QUALITY

a. QATAP establishes attributes for quality and it defines tolerances for those attributes for five quality levels of printing. When attributes deviate from the allowable tolerances, the deviations will be classified as either major or critical defects pursuant to the applicable tolerance table.

b. Attributes which are not identified as quality attributes under QATAP (e.g., stitching position) will be evaluated in accordance with the article entitled "Quality" in U.S. Government Printing Office Contract Terms (Pub. 310.2).

3. DETERMINING ACCEPTABILITY—Because inspection of all copies of a publication is usually impractical, the Government will utilize statistical sampling to determine quality. When the Government determines that both the number of critical defects and the number of total defects in the lot or batch do not exceed their respective AQL's, the lot or batch will be accepted at the contract price. ANSI/ASQC Z 1.4, Sampling Procedures and Tables for Inspection by Attributes, will be used to make this determination.

If the defects exceed either or both AQL's, the Government will have the option of having the lot or batch replaced, having the defects corrected, or accepting the lot or batch with an equitable reduction in the contract price. The discount tables contained in Appendices A & B will be used as a guide by the Contracting Officer to determine reductions. Failure to agree to such reduction of price shall be a dispute concerning a question of fact within the meaning of the article entitled "Disputes" of GPO Contract Terms (Publication 310.2). In all cases it is the intent of the Government that the products meet the quality required in the specifications.

4. CATEGORIES OF ATTRIBUTES—Quality attributes are divided into three categories which consist of printing attributes, finishing attributes, and the paper attribute.

4–1. *Printing Attributes*—For each copy that is inspected, the Government will evaluate each applicable printing attribute by separately inspecting:

a. outside covers (i.e., the spine and covers 1 & 4)

b. text (i.e., pages and covers 2 & 3)

ADL's will be determined as follows:

(i) Outside covers will be inspected and evaluated as one unit. The unit will be assessed demerits (i.e., 4, 20, 100) pursuant to the demerit table for each printing attribute that deviates from specifications. The demerits which are assessed constitute the ADL for outside covers for that printing attribute for that copy.

(ii) The text will be evaluated by inspecting pages (each page is an individual unit), cover 2, and cover 3 as individual units. Each unit will be assessed demerits (i.e., 4, 20, 100) pursuant to the demerit table for each printing attribute that deviates from specifications. The demerits which are assessed will be summed, and each sum will be divided by the number of individual units that were inspected for that printing attribute. The quotient constitutes the ADL for text for that printing attribute for that copy.

(iii) In each copy the ADL's for each printing attribute will be classified as follows:

Tolerance Table for Printing Attributes

ADL's	*Classification of Defect*
4 or less for both outside covers and text	None.
More than 4 for either or both outside covers and text	Major.

Conspicuous Single Page Defects—When one or more pages have been assessed demerits for a printing attribute but the ADL does not exceed 4, a single major defect will be assessed for that printing attribute if one or more pages is so conspicuously defective that it significantly impairs the quality of the entire copy. Examples include a large hickey at the focal point of an illustration, a single page with extremely light (but legible) type, large ink spots, large oil spots, and large off-color spots in illustrations.

4–2. *Finishing Attributes*—The Government will evaluate finishing attributes by inspecting individual copies of publications. When each copy is inspected, each applicable finishing attribute that deviates from specifications will be classified as either a critical or major defect in accordance with the tolerance table for that attribute.

4–3. *Paper Attribute*—The Government will evaluate the paper attribute by inspecting and testing paper characteristics in individual copies of publications. The paper characteristics will be tested in accordance with the current edition of "Government Paper Specification Standards" which is published by the Joint Committee on Printing. When each copy is inspected, paper that deviates from specifications will be assessed a major defect.

Tolerance Table for the Paper Attribute

Sum of Demerits	*Classification of Defect*
Less than 31	None.
31 or more	Major.

5. GOVERNMENT FURNISHED MATERIAL (GFM)—Defects will not be assessed for deviations from specifications which are caused by GFM if the contractor notifies the Government prior to production that the GFM is not satisfactory.

Printing Attributes

P–1. Hickies and Spots

Definition: Hickies and spots are small deformities, specks, or other imperfections on a page, cover, or spine, which result from the printing or reproduction process.

Examples: Ink spatter, hickies caused by dirty blanket, spots due to paper picking.

Instruments:
1. Visual evaluation
2. Magnifier with scale graduated in increments of .1 mm or .005 inch

Procedure:
1. Evaluate hickies, off-color spots, and ink spots in accordance with the following table:

Diameter	*Count*
less than 1 mm (.04 in.)	1
1 to but not including 2 mm (.08 in.)	3
2 through 3 mm (.12 in.)	15
greater than 3 mm (.12 in)	45

Demerit Table for Hickies and/or Spots

Product Quality Levels		*Demerits*		
		4	20	100
Level I	5 to and including 14 counts	X		
	15 to and including 29 counts		X	
	greater than 29 counts			X
Level II	10 to and including 19 counts	X		
	20 to and including 39 counts		X	
	greater than 39 counts			X
Level III	20 to and including 29 counts	X		
	30 to and including 49 counts		X	
	greater than 49 counts			X
Level IV	30 to and including 39 counts	X		
	greater than 39 counts		X	
Level V	Not applicable to Level V			

P–2. Extraneous Marks

Definitions and Examples: Extraneous marks are undesirable marks which are not hickies or spots. Examples are lines due to plate scratches, scumming, tinting, wheel marks, oil marks, and ink bleed-through. Showthrough is not evaluated under this attribute. The two categories of deviations for extraneous marks are:

Category 1: These are marks which are readable on a densitometer and which cover an area measuring more than 1/4 inch (6.4 mm) in their smallest dimension. Examples are scumming, set off, and smearing.

Category 2: These are marks that do not fall in Category 1. Examples are roller marks, gear marks, lines due to scratches on negative or plate, and ink bleed-through.

Category 2 marks are classified according to seriousness as follows:

a. *Light Marks*—Light marks are marks which are visible under standard viewing conditions and which slightly detract from the appearance of a page. Examples are visible marks measuring less than .010 square inch (6.5 square millimeters) in total area.

b. *Medium Marks*—Medium marks are marks that moderately detract from the appearance of a page. Examples are visible marks measuring between .010 and .020 square inch (between 6.5 and 12.9 square millimeters) in total area.

c. *Heavy Marks*—Heavy marks are marks that seriously detract from the appearance of a page. Examples are marks greater than .020 square inch (12.9 square millimeters) in total area. Marks caused by foreign matter such as oil will always be classified as heavy marks.

Instruments:
1. Visual Evaluation
2. Reflection Densitometer
3. Magnifier with scale graduated in increments of .005 inch (.1 millimeter)

Procedures:

Category 1
a. Use a reflection densitometer with the filter giving the highest reading.
b. Measure the three areas of greatest density in the mark. Compute the average and assign demerits on the average.

Category 2
a. Visually inspect the marks under standard viewing conditions.
b. Classify the marks based on the above criteria.
c. Measure area of mark only if there is a dispute regarding the classification.

Demerit Assessment

Assess demerits on the more defective of the two categories. A maximum of 100 demerits will be assessed per page.

Demerit Table for Extraneous Marks (Category 1)

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Visible to but not including 0.01 density	X		
	0.01 through and including 0.02 density		X	
	greater than 0.02 density			X
Level II	0.01 to but not including 0.02 density	X		
	0.02 through and including 0.03 density		X	
	greater than 0.03 density			X
Level III	0.02 to but not including 0.03 density	X		
	0.03 through and including 0.04 density		X	
	greater than 0.04 density			X
Level IV	0.03 to but not including 0.04 density	X		
	0.04 through and including 0.05 density		X	
	greater than 0.05 density			X
Level V	Not applicable to Level V			

Demerit Table for Extraneous Marks (Category 2)

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Light Marks		X	
	Medium Marks			X
	Heavy Marks			X
Level II	Light Marks	X		
	Medium Marks		X	
	Heavy Marks			X
Level III	Light Marks	X		
	Medium Marks		X	
	Heavy Marks			X
Level IV	Light Marks	X		
	Medium Marks	X		
	Heavy Marks		X	
Level V	Not applicable to Level V			

P–3. Moire

Definitions:

1. Moire is defined as objectionable patterns which are created when halftone screens are printed over one another at incorrect screen angles. Moire may also appear when rescreening a single color halftone or screening an original halftone which contains patterned objects (e.g., fabrics).

2. Avoidable moire is moire that is due to poor production methods rather than the inherent limitations of the process (e.g., 15 degree yellow screen angle, rescreened halftones).

Instruments:

1. Visual Evaluation
2. Screen Angle Gauge

Procedures:

1. Visually examine halftone under standard viewing conditions.

2. Determine the deviation of each color from the desired screen angle by means of a screen angle gauge.

Demerit Table for Moire

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Any avoidable moire			X
Level II	Avoidable moire through and including .5°		X	
	greater than .5°			X
Level III	Avoidable moire through and including .5°	X		
	.5° through and including 1.0°		X	
	greater than 1.0°			X
Level IV	.5° to but not including 1.0°	X		
	1.0° through and including 1.5°		X	
	greater than 1.5°			X
Level V	Not applicable to Level V			

P–4. Register

Definition: Register is the alignment of two or more image components. The two categories of register are:

1. Multicolor Halftone Register (Internal and/or Border)
2. Linework Register (solid colors)

Instruments:
1. Visual Evaluation
2. Magnifier with scale graduated in increments of .1 mm or .005 inch

Procedures:
1. *Multicolor Halftone Register (Internal and/or Border)* Establish the measuring base by determining two colors in register within 0.5 row. Sum the rows of misregister for all colors. Enter the sum on the demerit table to assign demerits. If three or more colors are used and no two colors register within 1 row, assign 100 demerits to that page. If more than one illustration appears on a page, assess demerits only on the most defective illustration. A maximum of 100 demerits will be assessed per page.

2. *Linework Register (Solid Colors and Specialty Screens)* Establish the measuring base by determining two colors in register within 0.10 mm. Using a magnifier with a graduated scale, measure in millimeters the misregister for each color. Sum the measurements of misregister for all colors. Enter sum on the demerit table to assign demerits. If no two colors are in register within 0.10 mm, select as the measuring base the color which will result in the smallest number of demerits.

Demerit Table for Multicolor Halftone Register

Product Quality Levels		*Demerits* 4	20	100
Level I	.5 to but not including 1 row	X		
	1 through and including 2 rows		X	
	greater than 2 rows			X
Level II	1 to but not including 2 rows	X		
	2 through and including 3 rows		X	
	greater than 3 rows			X
Level III	1 to but not including 2 rows	X		
	2 through and including 4 rows		X	
	greater than 4 rows			X
Level IV	Not applicable to Level IV			
Level V	Not applicable to Level V			

Demerit Table for Solids and Linework

Product Quality Levels		*Demerits*		
		4	20	100
Level I	.10 mm (.004 in.) to but not including .20 mm (.008 in.)	X		
	.20 mm (.008 in.) through and including .30 mm (.012 in.)		X	
	greater than .30 mm (.012 in.)			X
Level II	.10 mm (.004 in.) to but not including .20 mm (.008 in.)	X		
	.20 mm (.008 in.) through and including .30 mm (.012 in.)		X	
	greater than .30 mm (.012 in.)			X
Level III	.20 mm (.008 in.) to but not including .30 mm (.012 in.)	X		
	.30 mm (.012 in.) through and including .40 mm (.016 in.)		X	
	greater than .40 mm (.016 in.)			X
Level IV	.40 mm (.016 in.) to but not including .50 mm (.020 in.)	X		
	.50 mm (.020 in.) through and including .60 mm (.024 in.)		X	
	greater than .60 mm (.024 in.)			X
Level V	Not applicable to Level V			

P–5. Text and Illustration Image Position

Definitions: The two categories of deviations for image position are:

1. *Misplacement* —Misplacement is the linear displacement of the image between the specified and actual position.

2. *Skewness*—Skewness is the angular displacement of the image in relation to the edges of the page.

Examples: Unintentional bleeds, incorrect placement of text, and improper alignment of two-page spreads.

Instruments:
1. Visual
2. Ruler graduated to 1/64 and .010 inches (or .1 mm)

Procedures:
1. *Misplacement*
By means of a ruler, determine vertical and horizontal deviations of the printed image position from the specified position. Assess demerits on the greater deviation.

2. *Exceptions:*

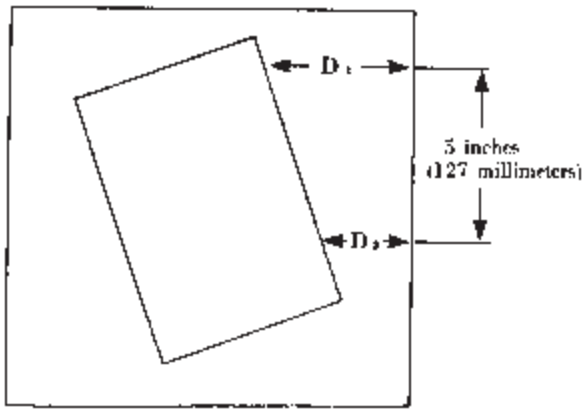
a. *Image Bleeds*
If either a specified image bleed does not occur or an unspecified image bleed does occur, assess 100 demerits for Levels I, II and III and 20 demerits for Level IV.

b. *Facing Pages*
When the vertical deviations of facing pages are in opposite directions from the specified position, sum the measurements of the two deviations. Using the demerit table for misplacement, assess demerits based on the combination of the two pages. For example, in a level III book, one margin is 3/32 inch high and the facing page margin is 2/32 inch low. Assess a total of 20 demerits to the two pages combined based on the sum of 5/32 inch.

c. *Saddle Stitched Publications*
Allowances will be made for normal trade practices for margins of saddle stitched publications.

3. *Skewness*
Measure the distance from the printed image to the edge of the page at two points on the same edge, exactly five inches (127 millimeters) apart (see illustration). Calculate the difference in the two measurements (D_1-D_2) and assess demerits based on this difference. If a five-inch (127 millimeters) distance is not available, extend the edges of the copy and the image to five inches (127 millimeters).

4. *Demerit Assessment*
Assess demerits for each category. A maximum of 200 demerits will be assessed per page.



1. Demerit Table for Misplacement

Product Quality Levels		*Demerits*		
		4	20	100
Level I	1/32 in. (.8 mm) to but not including 1/16 in. (1.6 mm)	X		
	1/16 in. (1.6 mm) through and including 1/8 in. (3.2 mm)		X	
	greater than 1/8 in. (3.2 mm.)			X
Level II	1/32 in. (.8 mm) to but not including 1/16 in. (1.6 mm)	X		
	1/16 in. (1.6 mm) through and including 1/8 in. (3.2 mm)		X	
	greater than 1/8 in. (3.2 mm)			X
Level III	1/16 in. (1.6 mm) to but not including 1/8 in. (3.2 mm)	X		
	1/8 in. (3.2 mm) through and including 3/16 in. (4.8 mm)		X	
	greater than 3/16 in. (4.8 mm)			X
Level IV	1/8 in. (3.2 mm) to but not including 3/16 in. (4.8 mm)	X		
	3/16 in. (4.8 mm) through and including 1/4 in. (6.4 mm)		X	
	greater than 1/4 in. (6.4 mm)			X
Level V	Not applicable to Level V			

2. Demerit Table for Skewness

Product Quality Levels	(D_1–D_2 at 5” distance)	*Demerits*		
		4	20	100
Level I	.02 in. (.5 mm) to but not including .04 in. (1.0 mm)	X		
	.04 in. (1.0 mm) through and including .09 in. (2.3 mm)		X	
	greater than .09 in. (2.3 mm)			X
Level II	.02 in. (.5 mm) to but not including .04 in. (1.0 mm)	X		
	.04 in. (1.0 mm) through and including .09 in. (2.3 mm)		X	
	greater than .09 in. (2.3 mm)			X
Level III	.02 in. (.5 mm) to but not including .09 in. (2.3 mm)	X		
	.09 in. (2.3 mm) through and including .18 in. (4.6 mm)		X	
	greater than .18 in. (4.6 mm)			X
Level IV	.04 in. (1.0mm) to but not including .09 in. (2.3 mm)	X		
	.09 in. (2.3 mm) through and including .18 in. (4.6 mm)		X	
	greater than .18 in. (4.6 mm)			X
Level V	Not applicable to Level V			

Approximate Equivalent Degrees of Skewness

	Degrees of Skewness
.02	1/4˚
.04	1/2˚
.09	1˚
.13	1-1/2˚
.18	2˚
.26	3˚

P–6. Newton's Rings

Definition: Newton's rings are irregular circles which are caused by interference (e.g., tape, dirt, etc.) with good contact or by poor contact printing technique.

Examples: Printed halftones and screen tints that have a bleached and/or mottled appearance.

Instruments: Visual

Procedures:

1. Determine the presence of Newton's rings in a single or multicolor halftone by making a visual comparison under standard viewing conditions between the original camera copy and the sample being inspected.

2. Determine the presence of Newton's rings in single color or multicolor screen tints by a visual examination of the sample under standard viewing conditions without the use of camera copy.

Demerit Table for Newton's Rings

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Any visible Newton's rings			X
Level II	Any visible Newton's rings			X
Level III	Any visible Newton's rings		X	
Level IV	Any visible Newton's rings		X	
Level V	Not applicable to Level V			

P–7. Type Quality and Uniformity

Evaluation: Type will be evaluated in four ways:

1. Minimum Type Density (maximum % reflectance).
2. Variation in Type Density (% reflectance) between facing pages, within a page, or from an "OK'd press sheet."
3. Deviation in Type Dimension from the specified standard.
4. Broken characters.

Instruments:

1. Visual
2. Print Contrast Meter (% reflectance convertible to density)
3. 8x type size finder
4. 50x microscope with reticle calibrated to .001"

Procedures:

1. *Minimum Type Density (maximum % reflectance).*
   Inspect each page visually to locate minimum type density (maximum % reflectance).
   Make dry readings of the three lightest characters with a print contrast meter. Compute the average of the readings and assess demerits based on it.

2. *Variation in Type Density (% reflectance) between facing pages, within a page, or from an "OK'd press sheet."*
   Compare measurements for each individual page inspected against a % reflectance reading for its facing page, against each other for variation within a page, or against those of an "OK'd press sheet."

3. *Type Dimension*
   Evaluate type dimension by comparing measurements of the finished publication with the specified standard. Use the 50x microscope or print contrast meter to measure type dimensions. Tolerances are based on the maximum deviation from the specified standard.

4. *Broken Characters*
   Count the number of broken characters on each page.

5. *Demerit Assessment*
   Assess demerits on all of the four categories. A maximum of 400 demerits will be assessed per page.

These tolerances will also be used for the line widths and ink density of line illustrations.

Exception: Evaluation 1 "Minimum Type Density (maximum % reflectance)" and evaluation 2 "Variation in Type Density (% reflectance) between facing pages, within a page, or from an 'OK'd press sheet" will not apply to type printed with colored ink (i.e., a type other than black). Instead, type printed with colored ink will be evaluated for visible density variation (1) between facing pages (2) within a page (3) between the page and the specified standard listed for attribute P–9 "Solids or Screen Tints Color Match." Each page containing any of these variations will be assessed 100 demerits at Levels I and II, and 20 demerits at Levels III and IV.

1. Demerit Table for Minimum Type Density or Maximum Percent Reflectance

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Gloss Coated Paper			
	5% reflectance to 10%	X		
	11% reflectance to 15%		X	
	16% reflectance or greater			X
	Matte Finish, Coated Paper			
	7% reflectance to 10%	X		
	11% reflectance to 15%		X	
	16% reflectance or greater			X
Level II	Gloss Coated Paper			
	6% reflectance to 12%	X		
	13% reflectance to 17%		X	
	18% reflectance or greater			X
	Matte Finish, Coated Paper			
	8% reflectance to 12%	X		
	13% reflectance to 17%		X	
	18% reflectance or greater			X
	Uncoated Paper			
	11% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
Level III	Gloss Coated Paper			
	7% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
	Matte Finish, Coated Paper			
	9% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
	Uncoated Paper			
	13% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X
Level IV	Gloss Coated Paper			
	9% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X
	Matte Finish, Coated Paper			
	11% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X

1. Demerit Table for Minimum Type Density or Maximum Percent Reflectance—Continued

Product Quality Levels		Demerits 4	20	100
	Uncoated Paper			
	16% reflectance to 19%	X		
	20% reflectance to 24%		X	
	25% reflectance or greater			X
	Newsprint			
	20% reflectance to 24%	X		
	25% reflectance to 29%		X	
	30% reflectance or greater			X
Level V	Not applicable to Level V			

Equivalent Densities for Percent Reflectance

Percent Reflectance	Density	Percent Reflectance	Density	Percent Reflectance	Density
2	1.70	12	.92	22	.66
3	1.52	13	.89	23	.64
4	1.40	14	.85	24	.62
5	1.30	15	.82	25	.60
6	1.22	16	.80	26	.59
7	1.15	17	.77	27	.57
8	1.10	18	.74	28	.55
9	1.05	19	.72	29	.54
10	1.00	20	.70	30	.52
11	.96	21	.68		

2. Demerit Table for Percent Reflectance Variation

Product Quality Levels	(Between facing pages, within a page, or from an "Ok'd press sheet")	Demerits 4	20	100
Level I	2% to but not including 3% reflectance	X		
	3% through and including 4% reflectance		X	
	greater than 4% reflectance			X
Level II & III	3% to but not including 4% reflectance	X		
	4% through and including 5% reflectance		X	
	greater than 5% reflectance			X
Level IV	4% to but not including 5% reflectance	X		
	5% through and including 6% reflectance		X	
	greater than 6% reflectance			X
Level V	Not applicable to Level V			

3. Demerit Table for Type Dimension*

Product Quality Levels		Demerits 4	20	100
Level I	.002 in. (.05 mm) to but not including .003 in. (.08 mm)	X		
	.003 in. (.08 mm) through and including .004 in. (.10 mm)		X	
	greater than .004 in. (.10 mm)			X
Level II	.002 in (.05 mm) to but not including .003 in. (.08 mm)	X		
	.003 in. (.08 mm) through and including .004 in. (.10 mm)		X	
	greater than .004 in. (.10 mm)			X
Level III	.003 in (.08 mm) to but not including .004 in. (.10 mm)	X		
	.004 in. (.10 mm) through and including .005 in. (.13 mm)		X	
	greater than .005 in. (.13 mm)			X
Level IV	.004 in (.10 mm) to but not including .005 in. (.13 mm)	X		
	.005 in. (.13 mm) through and including .006 in. (.15 mm)		X	
	greater than .006 in. (.15 mm)			X
Level V	Not applicable to Level V			

*1 point equals 0.0138″ (.351 mm)

4. Demerit Table for Broken Characters

Product Quality Levels		Demerits 4	20	100
Level I	1 to 2 broken characters	X		
	3 to 5 broken characters		X	
	greater than 5 characters			X
Level II	1 to 2 broken characters	X		
	3 to 5 broken characters		X	
	greater than 5 characters			X
Level III	2 to 3 broken characters	X		
	4 to 6 broken characters		X	
	greater than 6 characters			X
Level IV	6 to 8 broken characters	X		
	greater than 8 characters		X	
Level V	Not applicable to Level V			

P–8. Halftone Match (Single and Double Impression)

Definitions:

1. If the "Ok'd press sheet" is the specified standard, the halftone match is the density deviation between the "OK'd press sheet" and the reproduction in the highlights, middletones, and shadows.

2. When the "furnished negatives" are the specified standard, the tone reproduction curve is determined by the negative. However, the contractor is required to meet the minimum solid ink density and to maintain dot structure and two page spread requirements, allowing for normal dot gain from the "furnished negatives."

3. When the "camera copy" is the specified standard, the solid ink density, dot structure, and two-page spread requirements shall apply to halftone match. Because proofs such as dyluxes and veloxes do not truly reflect the quality of the finished product, their "OK" by the ordering agency does not relieve the contractor from meeting these tolerances.

Instruments:

1. Visual Evaluation
2. Reflection densitometer
3. Magnifier

Procedures:

1. *All specified standards.*

   a. Assess 20 demerits if highlight or shadow dot structure is not maintained in the reproduction and 100 demerits if detail is lost. However, normal dropout of extreme highlights is acceptable.

      Assess 20 demerits for excessive compression of highlights or shadows (e.g., midtone shifts).

   b. If a visible denisty shift occurs in a single illustration that occupies a two-page spread, for each page assess 100 demerits at Levels I and II, and 20 demerits at Levels III and IV.

   c. Make a densitometer reading in an area with solid ink density.

      (1) For single impression halftones, use the densitometer filter that indicates the highest total density.

      (2) For double impression black halftones, make comparative readings with the visual filter.

      (3) For two-color duotones, make comparative densitometer readings with the two filters that indicate the highest readings.

   d. Assess demerits only on the most defective of the three areas. Assess a maximum of 100 demerits per page for single color and double black halftones and 200 demerits for two-color halftones.

2. *"OK'd Press Sheet" as the Specified Standard.*

a. Zero densitometer to the paper.

b. Make comparative dry measurements between the "OK'd press sheet" and the reproduction in corresponding highlight and middletone areas.

Demerit Table for Highlights

Highlight densities are measured from an area of not less than 0.15 density on the "OK'd press sheet."

Product Quality Levels		Demerits		
		4	20	100
Level I	± .03 to but not including ± .04	X		
	± .04 through and including ± .05		X	
	greater than ± .05			X
Level II	± .04 to but not including ± .05	X		
	± .05 through and including ± .06		X	
	greater than ± .06			X
Level III	± .06 to but not including ± .07	X		
	± .07 through and including ± .08		X	
	greater than ± .08			X
Level IV	± .07 to but not including ± .08	X		
	± .08 through and including ± .09		X	
	greater than ± .09			X
Level V	Not applicable to Level V			

Demerit Table for Middletones

Middletone densities are measured from an area between 0.45 to 0.60 on "OK'd press sheet."

Product Quality Levels		Demerits		
		4	20	100
Level I	± .10 to but not including ± .11	X		
	± .11 through and including ± .12		X	
	greater than ± .12			X
Level II	± .11 to but not including ± .12	X		
	± .12 through and including ± .13		X	
	greater than ± .13			X
Level III	± .12 to but not including ± .15	X		
	± .15 through and including ± .20		X	
	greater than ± .20			X
Level IV	± .15 to but not including ± .20	X		
	± .20 through and including ± .25		X	
	greater than ± .25			X
Level V	Not applicable to Level V			

Demerit Table for Shadows

Tolerances in the shadow areas are based on the following solid ink densities:

single impression black halftones

coated stock	1.40
uncoated stock	1.10

double impression black halftones

coated stock	1.70
uncoated stock	1.30

Product Quality Levels		*Demerits*		
		4	20	100
Level I	–.02 to but not including –.06	X		
	– .06 through and including – .12		X	
	greater than – .12			X
Level II	– .02 to but not including – .08	X		
	– .08 through and including – .16		X	
	greater than – .16			X
Level III	– .02 to but not including – .10	X		
	– .10 through and including – .20		X	
	greater than – .20			X
Level IV	– .02 to but not including – .10	X		
	– .10 through and including – .25		X	
	greater than – .25			X
Level V	Not Applicable to Level V			

P–9. Solid or Screen Tints Color Match

Definition: Solid or screen tints color match is the density deviation between the reproduction and the specified standard. There are three solid and/or screen tint categories:

1. Single Color Solids or Tints
2. Multicolor Solids or Tints
3. Process Color Solids or Tints

Instruments:
1. Visual Evaluation
2. Reflection Densitometer

Procedures:
1. For single color solids or tints, make a dry comparative densitometer reading using the filter that will indicate the highest density.

2. For multicolor solids or tints, make a dry comparative densitometer reading using the filter that will indicate the highest density.

3. For process color solids or tints, use the scoring system for Process Color Halftones (P–10) to determine demerits.

Exceptions: If a visible density shift occurs within or between, solids or tints (on a single page or on a two-page spread), 100 demerits at Levels I and II, and 20 demerits at Levels III and IV will be assessed for each page.

Demerit Table for Solids and/or Screen Tints

Product Quality Levels		*Demerits*		
		4	20	100
Level I	± .05 to but not including ± .10 density	X		
	± .10 through and including ± .15 density		X	
	greater than ± .15 density			X
	Visible variation within a solid			X
Level II	± .07 to but not including ± .12 density	X		
	± .12 through and including ± .17 density		X	
	greater than ± .17 density			X
	Visible variation within a solid			X
Level III	± .09 to but not including ± .14 density	X		
	± .14 through and including ± .19 density		X	
	greater than ± .19 density			X
	Visible variation within a solid		X	
Level IV	± .12 to but not including ± .17 density	X		
	± .17 through and including ± .22 density		X	
	greater than ± .22 density			X
	Visible variation within a solid		X	
Level V	Not applicable to Level V			

P–10. Process Color Match

Definitions:

1. Process color match is the fidelity of color match between the item being inspected and the specified standard.

2. A perceptible shift is a shift in color between the specified standard and the sample, that is perceptible under standard viewing conditions but is not large enough to be classified as objectionable.

3. An objectionable shift is a shift between the specified standard and the sample causing a definite change of color. Examples are fleshtones shifting slightly towards a yellow or magenta hue, green grass taking on a yellow or cyan cast, browns turning slightly reddish or yellowish, and overall density change.

4. A serious shift is a shift between the specified standard and the sample causing a change of color approaching misrepresentation or loss of identity. Examples are fleshtones, browns, and grays turning green or purple, green grass turning brown or magenta, and plugged shadows or washed out highlights.

Instruments:

1. Visual Inspection
2. Densitometer

Procedures:

1. Compare sample with specified standard for shifts in hue, saturation, and lightness under standard viewing conditions (see paragraph 1–11, “Standard Viewing Conditions”).

2. Assess demerits in accordance with the table below (maximum 100 demerits per page).

3. When a sample of production run press sheets (fan) is required:

a. Assess demerits to each page.

b. Combine corresponding sample numbers from all fans to construct a set of “equivalent books.”

c. Calculate an ADL for each equivalent book.

Demerit Table for Process Color Match

Product Quality Levels		*Demerits*		
		4	20	100
Level I	Perceptible shift		X	
	Objectionable shift			X
	Serious shift: (See finishing attribute F–18)			
Level II	Perceptible shift	X		
	Objectionable shift		X	
	Serious shift			X
Level III	Objectionable shift		X	
	Serious shift			X
Level IV	Not applicable to Level IV			
Level V	Not applicable to Level V			

P–11. Rub-Resistance of Printed Image

Definition: Rub-resistance is the resistance of the printed image to smearing onto similar stock when rubbed with that stock. There are two categories of rub-resistance:

1. Rub-Resistance of Unvarnished Image
2. Rub-Resistance of Varnished Image

Instruments:
1. Visual Evaluation
2. Reflection Densitometer
3. Rub Tester (Sutherland or equivalent)

Procedures: 1. *Unvarnished Image*

a. Calibrate the densitometer to the blank strip of stock.

b. Test a representative sample of the printed product on the Rub Tester. Give a 3" x 6" (76.2 mm x 152.4 mm) printed sample 25 rubs at a pressure of 1.0 P.S.I. against a 2" x 5¼" (50.8 mm x 133.4 mm) blank strip of stock similar to that on which the sample is printed.

c. Make three density readings in the area of highest density on the blank 2" x 5¼" (50.8 mm x 133.4 mm) test strip. Use the densitometer filter which indicates the maximum density for the color of ink used in the printed sample.

d. Calculate an average density for the rub-off smear based on the three independent density readings.

e. Perform all tests at least 72 hours after the printing operation.

2. *Varnished Image*

Follow the same procedure as above with the exception that each sample will be given 50 rubs at a pressure of 1.0 P.S.I. (.70308 gm/mm2).

1. Demerit Table for Rub-Resistance of Unvarnished Image

Product Quality Levels		*Demerits*		
		4	20	100
All Levels	Type			
	.04 through and not including .05 density	X		
	.05 through and including .06 density		X	
	greater than .06 density			X
All Levels	Halftones			
	.05 through and not including .06 density	X		
	.06 through and including .07 density		X	
	greater than .07 density			X
All Levels	Solids			
	.06 through and not including .07 density	X		
	.07 through and including .08 density		X	
	greater than .08 density			X

2. Demerit Table for Rub-Resistance of Varnished Image

Product Quality Levels		*Demerits* 4	20	100
Level I	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Level II	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Level III	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Level IV	Not applicable to Level IV			
Level V	Not applicable to Level V			

Finishing Attributes

F–1. Trim Size

Definitions:

1. Nonspecified trim size is any deviation in the specified horizontal or vertical trim size.
2. Nonflush trim is any variation in length or width within a copy.
3. Unsquare trim is defined as the angular misalignment of the trimmed edges of a copy.

Instruments:

1. Visual Evaluation
2. Ruler graduated in 1/64 and .020 inches or .1 mm.

Procedure:

1. *Nonspecified Trim Size*
   Determine the largest deviations of the horizontal and vertical trim from the specified size. Classify the defect based on these deviations.

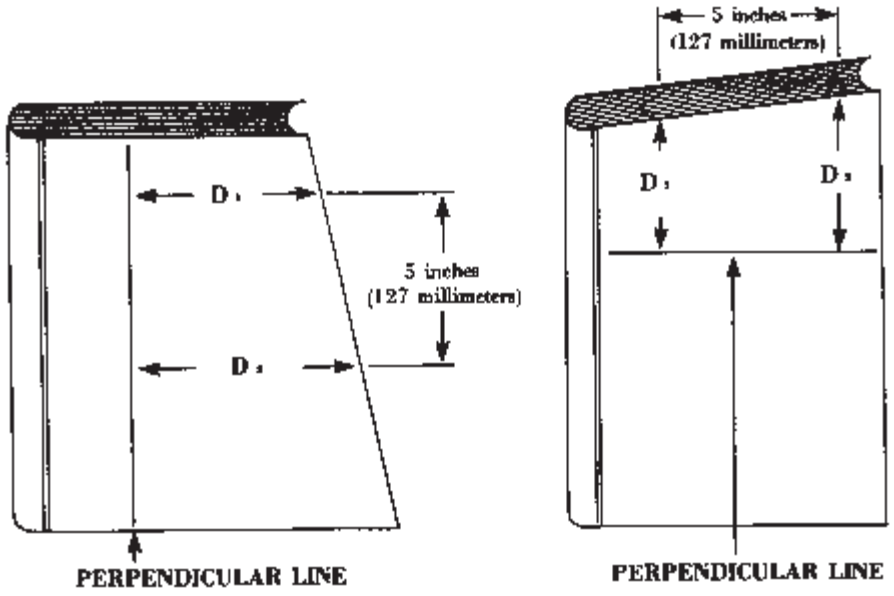
2. *Nonflush Trim*
   Determine the greatest deviations in length and width between two pages in the copy. Classify the defect based on the greater deviation.

3. *Unsquare Trim*

a. Draw a line perpendicular to the edge where the maximum angular misalignment occurs (see diagrams).

b. Measure distances D_1 and D_2 from this line to the edge that should be parallel to it.

c. Classify the defect based on the value of $D_1–D_2$.



4. *Limitation*
Classify a single defect based on the most defective of the three categories.

1 & 2. Tolerance Table for Trim Size and/or Nonflush Trim

Product Quality Levels		*Classification of Defect*
		Major
Level I	greater than 1/16 in. (1.6 mm)	X
Level II	greater than 3/32 in. (2.4 mm)	X
Level III	greater than 1/8 in. (3.2 mm)	X
Level IV	greater than 3/16 in. (4.8 mm)	X
Level V	greater than 1/4 in. (6.4 mm)	X

3. Tolerance Table for Unsquare Trim

Product Quality Levels	(D_1-D_2 at 5" distance)	*Classification of Defect*
		Major
Level I	greater than .04 in. (1.0 mm)	X
Level II	greater than .04 in. (1.0 mm)	X
Level III	greater than .09 in. (2.3 mm)	X
Level IV	greater than .09 in. (2.3 mm)	X
Level V	greater than .13 in. (3.3 mm)	X

Approximate Equivalent Degrees of Skewness

Deviation D_1-D_2	Degrees of Skewness
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

F–2. Misplacement and Misalignment of Cover Image

Definitions:

1. Misplacement is the difference between the specified and actual location of a printed image on a cover.

2. Misalignment is the angular displacement from specifications of a printed image on a cover.

Instruments:

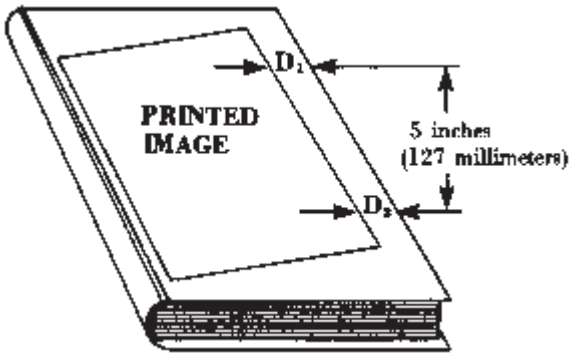
1. Visual Evaluation
2. Ruler graduated in 1/64 and .020 inches or .1 mm.

Procedures:

1. *Misplacement*
   Measure both vertical and horizontal margins for conformance to specified dimensions. Classify the defect based on the greatest deviation.

2. *Misalignment*
   Measure the distance from the printed image to the edge of the cover at two points on the same edge exactly five inches (127 mm) apart (see illustration). If a 5-inch (127 mm) distance is not available on the copy being inspected, extend the image and edge of the cover on a blank sheet. Calculate the difference between the two measurements (D_1-D_2). Classify the defect based on this difference.

3. *Limitation*
   Classify a single defect based on the more defective of the two categories.



1. Tolerance Table for Misplacement of Cover Image

Product Quality Levels		*Classification of Defect*
		Major
Level I	greater than 1/16 in. (1.6 mm)	X
Level II	greater than 1/16 in. (1.6 mm)	X
Level III	greater than 3/32 in. (2.4 mm)	X
Level IV	greater than 1/8 in. (3.2 mm)	X
Level V	greater than 3/16 in. (4.8 mm)	X

2. Tolerance Table for Misalignment of Cover Image

Product Quality Levels	(D_1–D_2 at 5" distance)	*Classification of Defect*
		Major
Level I	greater than .04 in. (1.0 mm)	X
Level II	greater than .04 in. (1.0 mm)	X
Level III	greater than .09 in. (2.3 mm)	X
Level IV	greater than .18 in. (4.6 mm)	X
Level V	greater than .18 in. (4.6 mm)	X

Approximate Equivalent Degrees of Skewness

Deviation D_1-D_2	Degrees of Skewness
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

F–3. Cover Position

Definitions:

1. Cover position is defined as the specified distance between the position of the text and endleaves in relation to the cover.

2. Text flush with cover is defined as a misalignment or misplacement of the text in relation to the cover to such a degree that the text and/or endleaves extend to the edge of the cover.

3. Cover and text overlap is defined as a misalignment or misplacement of the text in relation to the cover to such a degree that the text and/or endleaves extend beyond the edge of the cover.

Instruments:

1. Visual Evaluation
2. Ruler graduated in 1/16 inch or .1 mm.

Procedure:

1. Measure the distance from the edge of the cover to the endleaf at the shortest point.

Tolerance Table for Cover Position

Product Quality Levels		*Classification of Defect*	
		Major	Critical
Levels I-V	Less than or equal to 1/16 in. (1.6 mm) to the point where the text and/or endleaf is flush with the cover.	X	
	Any cover and text overlap		X

F-4. Folding Position and Skewness (Folded Forms and Brochures)

Definitions:

1. A deviation in folding position is the difference between the specified and actual position of a fold.

2. Folding skewness is the angular displacement of a fold from the specified position.

Instruments:

1. Ruler graduated in 1/64 and .020 inches or .1 mm.
2. Visual Evaluation

Procedures:

1. *Deviations in Folding Position*
   Measure the maximum deviation of the fold from the specified position.

2. *Folding Skewness*
   Measure the distance from the fold to the specified fold line at two points exactly 5 inches (127 mm) apart. If a 5-inch (127 mm) distance is not available, extend the two lines on a blank sheet. Calculate the difference in the two measurements and classify the defect on this value.

3. *Limitation*
   Classify only one defect based on the more defective of the two categories.

1. Tolerance Table for Deviation in Folding Position

Product Quality Levels		*Classification of Defect*
		Major
Level I	greater than 1/16 in. (1.6 mm)	X
Level II	greater than 1/16 in. (1.6 mm)	X
Level III	greater than 1/16 in. (1.6 mm)	X
Level IV	greater than 3/32 in. (2.4 mm)	X
Level V	greater than 3/32 in. (2.4 mm)	X

2. Tolerance Table for Folding Skewness

Product Quality Levels	(D_1-D_2 at 5" distance)	*Classification of Defect*
		Major
Level I	greater than .18 in. (4.6 mm)	X
Level II	greater than .18 in. (4.6 mm)	X
Level III	greater than .18 in. (4.6 mm)	X
Level IV	greater than .26 in. (6.6 mm)	X
Level V	greater than .26 in. (6.6 mm)	X

Approximate Equivalent Degrees of Skewness

Deviation D_1–D_2	Degrees of Skewness
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

F–5. Perfect-Bound Book Durability

Definition: Perfect-bound book durability is defined as the durability of the adhesive binding under tests that simulate normal usage of the book during its expected useful life. Four tests will be used:*

1. Subway Test
2. Page Pull Test
3. Page Flex Test
4. Adhesive Temperature Stability Test

Instruments:
1. Page Pull Tester
2. Flex Tester
3. Scale
4. Oven
5. Refrigerator

Procedures:

1. *Subway Test*
   Open the book completely and bring the covers back to back. Perform this test in a minimum of three places: 1/4, 1/2, and 3/4 of the way through the book. Perform the test at 75° F. ± 10° F. (23.9° C. ± 5.6° C.).

2. *Page Pull Test*
   Test pages for the pounds of pull per inch of backbone required to separate the page from the adhesive line. Perform this test in a minimum of three places:1/4, 1/2, and 3/4 of the way through the book. The defect is classified based on the lowest pull value of the pages tested. Perform the test at 75º F. ± 10º F. (23.9° C. ± 5.6° C.).

3. *Page Flex Test*
   Flex a page with 2.5 pounds (1,134 gm) of pull until the page separates from the adhesive line or reaches 126 flexes. Perform this test in a minimum of three places: 1/4, 1/2, and 3/4 of the way through the book. Record the exact page numbers chosen for the test. If a test page separates from the adhesive line, retest that area of the book by moving 10 pages (5 leaves) in either direction from the original location of the defective page. Two failures are required in a book before a defect is classified and the test may be terminated when two pages fail. The defect is classified by using the lowest number of flexes for any of the selected locations in the book. Perform the test at 75° F. ± 10° F. (23.9° C. ± 5.6° C.). *Note*: Failure of individual pages in tests 2 and 3 at a point other than the adhesive line will not be classified as a defect in the perfect binding.

4. *Adhesive Temperature Stability Test*

   Test the book per 1, 2, or 3 after it has undergone the following treatment:

   a. Condition book at 130° F. ± 5° F. (54.4° C. ± 2.8° C.) for 72 hours.

   b. Condition book at 22° F. ± 5° F. (—5.6° C. ± 2.8° C.) for 72 hours.

   c. Condition book at 75° F ± 10° F. (23.9° C. ± 5.6° C.) for 6 hours.

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*An individual book should not be used in more than one of the tests.

5. *Limitation*
Only the most serious defect resulting from the tests above will be classified. For example, if a page pull is a major defect and page flex is a critical defect, the book would be assessed a single critical defect.

Tolerance Table for Perfect-Bound Book Durability

Product Quality Levels		*Classification of Defect*	
		Major	Critical
1. SUBWAY TEST			
All levels	Any loosening of pages at any location		X
2. PAGE PULL TEST			
All levels	2.0 lbs per inch (35.7g/mm) of backbone to and including 1.5 lbs per inch (26.8g/mm) of backbone.	X	
	Less than 1.5 lbs per inch (26.8g/mm) of backbone		X
3. PAGE FLEX TEST			
All levels	125 to and including 75 flexes	X	
	Less than 75 flexes		X

F–6. Loose Cover, Pages, and Binding

Definition: Loose covers are defined as covers which are inadequately attached to the text. The three categories are:

1. Case-bound Cover
2. Glued Cover
3. Sewn or Stitched Cover

Instruments: 1. Visual Evaluation

Procedures: 1. *Case-bound Cover*
Inspect end sheets for wrinkles, bubbles, tears, looseness, tears in the gutter, and improper adherence of end sheets to cover. Inspect cover for looseness of binding materials such as headbands, backing, and crash.

2. *Glued Cover*
Inspect the cover and text to determine that they adhere to the spine at all points.

3. *Sewn or Stitched Cover*
Inspect for any looseness of the cover or text due to any improper stitching, sewing, and/or any signature starts.

Tolerance Table for Loose Cover or Binding

Product Quality Levels		*Classification of Defect*	
		Major	Critical
All levels	1. Case-bound Wrinkles or bubbles in end sheets, end sheets loose or torn around the edges (with the cover securely fastened), or any looseness of binding materials.	X	
	End sheets not glued securely all the way to the joint, or end sheet torn in gutter.	X	
All levels	2. Glued Cover Any looseness of cover or text	X	
	Any separation of cover or text from book		X
All levels	3. Sewn or Stitched Any looseness of cover or text due to stitches or threads, and/or any signature starts	X	
	Any separation of cover or text from book		X

F–7. Excess Glue

Definition: This is defined as glue which is visible on the outside edge or the inside of the cover and/or text.

Instruments:
1. Visual Evaluation
2. Ruler

Procedures:
1. Hold the ruler perpendicular to the glue line.
2. Measure the glue line at the point of maximum spread to determine the classification.

Tolerance Table for Gluing

Product Quality Levels		*Classification of Defect*
		Major
Level I	Greater than 1/8 in. (3.2 mm)	X
Level II	Greater than 1/8 in. (3.2 mm)	X
Level III	Greater than 3/16 in. (4.8 mm)	X
Level IV	Greater than 1/4 in. (6.4 mm)	X
Level V	Greater than 1/4 in. (6.4 mm)	X

F–8. Damaged Pages

Definition: Damaged pages consist of the following categories:

1. Wrinkles radiating from the fold of a book
2. Dog-ears and wrinkles greater than 1/8 of an inch (3.2 mm) in width
3. Connected or torn pages

Instruments: 1. Visual

Procedures: 1. Calculate the percentage of damaged pages in relation to the number of pages in the book.
2. Classify a single defect based on the most defective of the three categories.

1. Tolerance Table for Damaged Pages
Wrinkles radiating from the fold

Product Quality Levels		*Classification of Defect*
		Major
Level I	Greater than 5%	X
Level II	Greater than 8%	X
Level III	Greater than 12%	X
Level IV	Greater than 15%	X
Level V	Greater than 25%	X

2. Tolerance Table for Damaged Pages
Dog-ears and wrinkles greater than 1/8 of an inch

Product Quality Levels		*Classification of Defect*
		Major
Level I	A single dog-ear or wrinkle	X
Level II	Greater than 2%	X
Level III	Greater than 3%	X
Level IV	Greater than 5%	X
Level V	Greater than 7%	X

3. Tolerance Table for Damaged Pages
Connected or torn pages

Product Quality Levels		*Classification of Defect*
		Major
Level I	A single connected or torn page	X
Level II	Greater than 2%	X
Level III	Greater than 5%	X
Level IV	Greater than 7%	X
Level V	Greater than 10%	X

F–9. Damaged Edges

Examples: Examples of damaged edges are untrimmed signatures and edges which are feathered, ragged, or burred.

Instruments:
1. Visual Evaluation
2. Clear Plastic Grid consisting of 1/4 in. (6.35 mm) squares.

Procedures:
1. Measure damaged edges by placing the clear plastic grid over the entire edge where the damage is located.
2. Count the number of squares which cover the damage.
3. Calculate the percentage of squares containing the damage in relation to the number of squares within the entire edge.
4. Classify the defect based on the edge of the copy that contains the most damage.

Tolerance Table for Damaged Edges

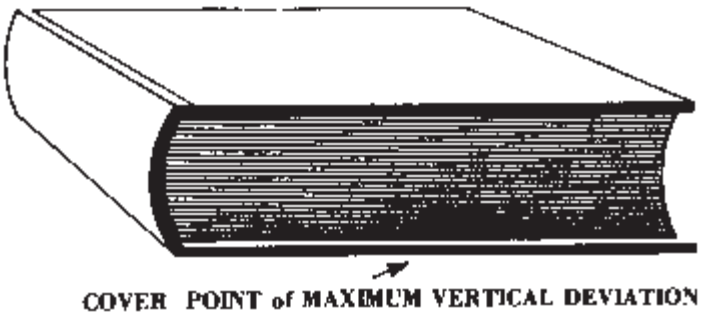
Product Quality Levels		*Classification of Defect*	
		Major	Critical
Level I	Any visible burred, feathered, or ragged edges	X	
	Any untrimmed signatures		X
Level II	Greater than 5% burred, feathered, or ragged edges	X	
	Any untrimmed signatures	X	
Level III	Greater than 10% burred, feathered, or ragged edges	X	
	Any untrimmed signatures	X	
Level IV	Greater than 15% burred, feathered, or ragged edges	X	
	Any untrimmed signatures	X	
Level V	Greater than 25% burred, feathered, or ragged edges	X	
	Any untrimmed signatures	X	

F–10. Warpage of Case-Bound Books (Cover and Text)

Definition: This is defined as a deviation of any page or cover from the horizontal plane formed by a copy when lying on a flat surface.

Instruments:
1. Visual Evaluation
2. Ruler graduated in 1/64 and .020 in. (.1 mm).

Procedure: Place the copy on a flat surface. Measure the maximum deviation perpendicular to the flat surface.



Tolerance Table for Warpage of Case-Bound Books

Product Quality Levels		*Classification of Defect*
		Major
Level I	Greater than .03 in. (.8 mm)	X
Level II	Greater than .03 in. (.8 mm)	X
Level III	Greater than .04 in. (1.0 mm)	X
Level IV	Greater than .10 in. (2.5 mm)	X
Level V	Greater than .12 in. (3.0 mm)	X

F–11. Damaged Covers

Definition: Damaged covers consist of the following categories:

1. *Wrinkles*—Wrinkles are ridges, furrows, or creases formed on the smooth surface of the spine or cover. *Exception*: Wrinkles in the spine of perfect-bound books are classified under a separate tolerance table.

2. *Bubbles*—Bubbles are liftings of the paper or cloth covering on the surface of the cover or spine.

3. *Cuts*—Cuts are breaches in a cover which expose paper or cloth fibers.

4. *Scratches*—Scratches are blemishes which are visible under standard viewing conditions and which do not expose any paper or cloth fibers.

Instruments:
1. Visual Evaluation
2. Clear Plastic Grid consisting of 1/4 in. (6.35 mm) squares.

Procedure:
1. Measure damaged covers by placing the clear plastic grid over the entire surface of the book where the damage is located.

2. Count the squares which cover the damage.

3. Calculate the percentage of squares that cover the damage in relation to the number of squares in the entire area.

4. Classify the defect based on the edge of the copy that contains the maximum amount of damage.

Tolerance Table for Damaged Covers*

Product Quality Levels		*Classification of Defect*	
		Major	Critical
Level I	Any visible wrinkles, bubbles, or scratches	X	
	Any cuts		X
Level II	Any visible wrinkles, bubbles, or scratches	X	
	Any cuts		X
Level III	Greater than 10% wrinkles, bubbles, or scratches	X	
	Any cuts	X	
Level IV	Greater than 20% wrinkles, bubbles, or scratches	X	
	Any cuts	X	
Level V	Any cuts	X	

*Note: See following table regarding wrinkles in spine of perfect-bound books.

Tolerance Table for Damaged Covers
(Wrinkles on Spine of Perfect-Bound Books)

Product Quality Levels		*Classification of Defect*
		Major
Level I	Any visible wrinkles (standard viewing conditions)	X
Level II	Greater than 10%	X
Level III	Greater than 20%	X
Level IV	Greater than 30%	X
Level V	Greater than 30%	X

Tolerance Tables for Miscellaneous Finishing Attributes

			Classification of Defect	
			Major	Critical
F–12.	**Missing Pages**	All Five PQL's		X
F–13.	**Upside Down Cover**	All Five PQL's		X
F–14.	**Upside Down Pages**	All Five PQL's		X
F–15.	**Blank Pages—Other Than Specified**	All Five PQL's		X
F–16.	**Wrong Pagination**	All Five PQL's		X
F–17.	**Loss of Information**	All Five PQL's		X
	Loss of information is defined as any omission of or damage to the printed image which impairs the transmission of the intended information.			
F–18.	**A Serious Shift in Process Color Match** as defined in Printing Attribute P–10, Process Color Match.	Only PQL I	X	

A Guide for Equitable Reductions in the Contract Price

As a guide, reductions in the contract price will be based on the defects in the sample and will be calculated as follows:

a. A discount for critical defects will be determined from the table in Appendix A.

b. A discount for major defects will be determined from the table in Appendix B.

c. The contract price will be reduced by the sum of the two discounts. However, the total reduction in the contract price will not exceed 25%. Appendices A & B list discounts as percentages of the contract price.

Appendix A

Discount Table for Critical Defects

[In percent]

Number of critical defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
1	5.0	5.0	5.0	5.0	5.0	5.0	5.0					
2	20.0	12.9	7.1	5.0	5.0	5.0	5.0	5.0				
3	25	25	21.9	13.2	7.5	5.0	5.0	5.0	5.0			
4	25	25	25	23.0	13.6	8.3	5.0	5.0	5.0	5.0		
5	25	25	25	25	20.2	12.6	7.4	5.0	5.0	5.0		
6	25	25	25	25	25	17.2	10.2	6.0	5.0	5.0	5.0	
7	25	25	25	25	25	22.0	13.2	8.0	5.0	5.0	5.0	
8	25	25	25	25	25	25	16.3	9.9	5.7	5.0	5.0	5.0
9	25	25	25	25	25	25	19.5	12.0	7.0	5.0	5.0	5.0
10	25	25	25	25	25	25	22.8	14.1	8.3	5.0	5.0	5.0
11	25	25	25	25	25	25	25	16.2	9.6	5.6	5.0	5.0
12	25	25	25	25	25	25	25	18.4	10.9	6.5	5.0	5.0
13	25	25	25	25	25	25	25	20.5	12.3	7.4	5.0	5.0
14	25	25	25	25	25	25	25	22.8	13.7	8.2	5.0	5.0
15	25	25	25	25	25	25	25	25	15.1	9.1	5.2	5.0
16	25	25	25	25	25	25	25	25	16.5	10.0	5.7	5.0
17	25	25	25	25	25	25	25	25	17.9	11.0	6.3	5.0
18	25	25	25	25	25	25	25	25	19.3	11.9	6.9	5.0
19	25	25	25	25	25	25	25	25	20.8	12.8	7.5	5.0
20	25	25	25	25	25	25	25	25	22.2	13.7	8.0	5.0
21	25	25	25	25	25	25	25	25	23.7	14.7	8.6	5.0
22	25	25	25	25	25	25	25	25	25	15.6	9.2	5.3
23	25	25	25	25	25	25	25	25	25	16.5	9.8	5.7
24	25	25	25	25	25	25	25	25	25	17.5	10.4	6.1
25	25	25	25	25	25	25	25	25	25	18.4	11.0	6.5
26	25	25	25	25	25	25	25	25	25	19.4	11.6	6.8
27	25	25	25	25	25	25	25	25	25	20.4	12.2	7.2
28	25	25	25	25	25	25	25	25	25	21.3	12.8	7.6
29	25	25	25	25	25	25	25	25	25	22.3	13.4	8.0
30	25	25	25	25	25	25	25	25	25	23.2	14.0	8.4
31	25	25	25	25	25	25	25	25	25	24.2	14.6	8.7
32	25	25	25	25	25	25	25	25	25	25	15.2	9.1
33	25	25	25	25	25	25	25	25	25	25	15.8	9.5
34	25	25	25	25	25	25	25	25	25	25	16.4	9.9
35	25	25	25	25	25	25	25	25	25	25	17.0	10.3
36	25	25	25	25	25	25	25	25	25	25	17.0	10.7

Discount Table for Critical Defects—Continued

[In percent]

Number of critical defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	
37	25	25	25	25	25	25	25	25	25	25	18.3	11.1
38	25	25	25	25	25	25	25	25	25	25	18.9	11.5
39	25	25	25	25	25	25	25	25	25	25	19.5	11.9
40	25	25	25	25	25	25	25	25	25	25	20.1	12.3
41	25	25	25	25	25	25	25	25	25	25	20.8	12.7
42	25	25	25	25	25	25	25	25	25	25	21.4	13.1
43	25	25	25	25	25	25	25	25	25	25	22.0	13.5
44	25	25	25	25	25	25	25	25	25	25	22.6	13.8
45	25	25	25	25	25	25	25	25	25	25	23.3	14.2
46	25	25	25	25	25	25	25	25	25	25	23.9	14.6
47	25	25	25	25	25	25	25	25	25	25	24.5	15.0
48	25	25	25	25	25	25	25	25	25	25	25	15.4
49	25	25	25	25	25	25	25	25	25	25	25	15.7
50	25	25	25	25	25	25	25	25	25	25	25	16.1
51	25	25	25	25	25	25	25	25	25	25	25	16.6
52	25	25	25	25	25	25	25	25	25	25	25	17.0
53	25	25	25	25	25	25	25	25	25	25	25	17.4
54	25	25	25	25	25	25	25	25	25	25	25	17.8
55	25	25	25	25	25	25	25	25	25	25	25	18.2
56	25	25	25	25	25	25	25	25	25	25	25	18.6
57	25	25	25	25	25	25	25	25	25	25	25	19.0
58	25	25	25	25	25	25	25	25	25	25	25	19.4
59	25	25	25	25	25	25	25	25	25	25	25	19.8
60	25	25	25	25	25	25	25	25	25	25	25	20.2
61	25	25	25	25	25	25	25	25	25	25	25	20.6
62	25	25	25	25	25	25	25	25	25	25	25	21.0
63	25	25	25	25	25	25	25	25	25	25	25	21.4
64	25	25	25	25	25	25	25	25	25	25	25	21.8
65	25	25	25	25	25	25	25	25	25	25	25	22.2
66	25	25	25	25	25	25	25	25	25	25	25	22.6
67	25	25	25	25	25	25	25	25	25	25	25	23.0
68	25	25	25	25	25	25	25	25	25	25	25	23.4
69	25	25	25	25	25	25	25	25	25	25	25	23.8
70	25	25	25	25	25	25	25	25	25	25	25	24.3
71	25	25	25	25	25	25	25	25	25	25	25	24.7
72	25	25	25	25	25	25	25	25	25	25	25	25

Appendix B

Discount Table for Major Defects

[In percent]

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
1	5.0											
2	5.0	5.0	5.0	5.0								
3	9.8	5.9	5.0	5.0	5.0							
4	17.7	11.2	5.9	5.0	5.0	5.0						
5	25	16.9	9.4	5.2	5.0	5.0						
6	25	23.0	13.1	7.5	5.0	5.0	5.0					
7	25	25	16.9	9.9	5.4	5.0	5.0					
8	25	25	20.9	12.4	6.9	5.0	5.0	5.0				
9	25	25	25	14.9	8.5	5.0	5.0	5.0				
10	25	25	25	17.5	10.1	5.9	5.0	5.0				
11	25	25	25	20.2	11.7	7.0	5.0	5.0	5.0			
12	25	25	25	22.9	13.4	8.0	5.0	5.0	5.0			
13	25	25	25	25	15.0	9.1	5.0	5.0	5.0			
14	25	25	25	25	16.7	10.2	5.7	5.0	5.0			
15	25	25	25	25	18.5	11.4	6.4	5.0	5.0	5.0		
16	25	25	25	25	20.2	12.5	7.1	5.0	5.0	5.0		
17	25	25	25	25	21.9	13.6	7.8	5.0	5.0	5.0		
18	25	25	25	25	23.7	14.8	8.5	5.0	5.0	5.0		
19	25	25	25	25	25	15.9	9.3	5.3	5.0	5.0		
20	25	25	25	25	25	17.1	10.0	5.7	5.0	5.0		
21	25	25	25	25	25	18.2	10.7	6.2	5.0	5.0		
22	25	25	25	25	25	19.4	11.4	6.7	5.0	5.0	5.0	
23	25	25	25	25	25	20.6	12.2	7.1	5.0	5.0	5.0	
24	25	25	25	25	25	21.8	12.9	7.6	5.0	5.0	5.0	
25	25	25	25	25	25	23.0	13.7	8.1	5.0	5.0	5.0	
26	25	25	25	25	25	24.2	14.4	8.6	5.0	5.0	5.0	
27	25	25	25	25	25	25	15.2	9.0	5.0	5.0	5.0	
28	25	25	25	25	25	25	15.9	9.5	5.2	5.0	5.0	
29	25	25	25	25	25	25	16.7	10.0	5.6	5.0	5.0	
30	25	25	25	25	25	25	17.4	10.5	5.9	5.0	5.0	
31	25	25	25	25	25	25	18.2	11.0	6.2	5.0	5.0	5.0
32	25	25	25	25	25	25	18.9	11.5	6.5	5.0	5.0	5.0
33	25	25	25	25	25	25	19.7	11.9	6.8	5.0	5.0	5.0
34	25	25	25	25	25	25	20.5	12.4	7.1	5.0	5.0	5.0
35	25	25	25	25	25	25	21.2	12.9	7.4	5.0	5.0	5.0
36	25	25	25	25	25	25	22.0	13.4	7.7	5.0	5.0	5.0
37	25	25	25	25	25	25	22.8	13.9	8.0	5.0	5.0	5.0
38	25	25	25	25	25	25	23.6	14.4	8.3	5.0	5.0	5.0
39	25	25	25	25	25	25	24.3	14.9	8.6	5.0	5.0	5.0
40	25	25	25	25	25	25	25	15.4	8.9	5.0	5.0	5.0
41	25	25	25	25	25	25	25	15.9	9.2	5.2	5.0	5.0
42	25	25	25	25	25	25	25	16.4	9.5	5.4	5.0	5.0
43	25	25	25	25	25	25	25	16.9	9.9	5.6	5.0	5.0
44	25	25	25	25	25	25	25	17.4	10.2	5.8	5.0	5.0
45	25	25	25	25	25	25	25	17.9	10.5	6.0	5.0	5.0
46	25	25	25	25	25	25	25	18.4	10.8	6.2	5.0	5.0
47	25	25	25	25	25	25	25	18.9	11.1	6.4	5.0	5.0
48	25	25	25	25	25	25	25	19.4	11.4	6.6	5.0	5.0
49	25	25	25	25	25	25	25	19.8	11.7	6.8	5.0	5.0
50	25	25	25	25	25	25	25	20.3	12.0	7.0	5.0	5.0
51	25	25	25	25	25	25	25	20.8	12.3	7.2	5.0	5.0
52	25	25	25	25	25	25	25	21.3	12.6	7.4	5.0	5.0

Discount Table for Major Defects—Continued

[In percent]

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
53	25	25	25	25	25	25	25	21.8	12.9	7.6	5.0	5.0
54	25	25	25	25	25	25	25	22.3	13.3	7.8	5.0	5.0
55	25	25	25	25	25	25	25	22.8	13.6	8.0	5.0	5.0
56	25	25	25	25	25	25	25	23.3	13.9	8.2	5.0	5.0
57	25	25	25	25	25	25	25	23.8	14.2	8.4	5.0	5.0
58	25	25	25	25	25	25	25	24.3	14.5	8.6	5.0	5.0
59	25	25	25	25	25	25	25	24.9	14.8	8.8	5.0	5.0
60	25	25	25	25	25	25	25	25	15.2	9.0	5.0	5.0
61	25	25	25	25	25	25	25	25	15.5	9.2	5.1	5.0
62	25	25	25	25	25	25	25	25	15.8	9.4	5.2	5.0
63	25	25	25	25	25	25	25	25	16.1	9.6	5.3	5.0
64	25	25	25	25	25	25	25	25	16.4	9.9	5.5	5.0
65	25	25	25	25	25	25	25	25	16.8	10.1	5.6	5.0
66	25	25	25	25	25	25	25	25	17.1	10.3	5.7	5.0
67	25	25	25	25	25	25	25	25	17.4	10.5	5.8	5.0
68	25	25	25	25	25	25	25	25	17.7	10.7	6.0	5.0
69	25	25	25	25	25	25	25	25	18.0	10.9	6.1	5.0
70	25	25	25	25	25	25	25	25	18.4	11.1	6.2	5.0
71	25	25	25	25	25	25	25	25	18.7	11.3	6.4	5.0
72	25	25	25	25	25	25	25	25	19.0	11.5	6.5	5.0
73	25	25	25	25	25	25	25	25	19.3	11.7	6.6	5.0
74	25	25	25	25	25	25	25	25	19.7	11.9	6.7	5.0
75	25	25	25	25	25	25	25	25	20.0	12.1	6.9	5.0
76	25	25	25	25	25	25	25	25	20.3	12.3	7.0	5.0
77	25	25	25	25	25	25	25	25	20.6	12.5	7.1	5.0
78	25	25	25	25	25	25	25	25	20.9	12.7	7.3	5.0
79	25	25	25	25	25	25	25	25	21.3	12.9	7.4	5.0
80	25	25	25	25	25	25	25	25	21.6	13.2	7.5	5.0
81	25	25	25	25	25	25	25	25	21.9	13.4	7.7	5.0
82	25	25	25	25	25	25	25	25	22.2	13.6	7.8	5.0
83	25	25	25	25	25	25	25	25	22.6	13.8	7.9	5.0
84	25	25	25	25	25	25	25	25	22.9	14.0	8.0	5.0
85	25	25	25	25	25	25	25	25	23.2	14.2	8.2	5.0
86	25	25	25	25	25	25	25	25	23.5	14.4	8.3	5.0
87	25	25	25	25	25	25	25	25	23.9	14.6	8.4	5.0
88	25	25	25	25	25	25	25	25	24.2	14.8	8.6	5.0
89	25	25	25	25	25	25	25	25	24.5	15.0	8.7	5.0
90	25	25	25	25	25	25	25	25	24.8	15.2	8.8	5.0
91	25	25	25	25	25	25	25	25	25	15.4	9.0	5.0
92	25	25	25	25	25	25	25	25	25	15.7	9.1	5.1
93	25	25	25	25	25	25	25	25	25	15.9	9.2	5.2
94	25	25	25	25	25	25	25	25	25	16.1	9.3	5.3
95	25	25	25	25	25	25	25	25	25	16.3	9.5	5.3
96	25	25	25	25	25	25	25	25	25	16.5	9.6	5.4
97	25	25	25	25	25	25	25	25	25	16.7	9.7	5.5
98	25	25	25	25	25	25	25	25	25	16.9	9.9	5.6
99	25	25	25	25	25	25	25	25	25	17.1	10.0	5.7
100	25	25	25	25	25	25	25	25	25	17.3	10.1	5.8
101	25	25	25	25	25	25	25	25	25	17.5	10.3	5.8
102	25	25	25	25	25	25	25	25	25	17.7	10.4	5.9
103	25	25	25	25	25	25	25	25	25	18.0	10.5	6.0
104	25	25	25	25	25	25	25	25	25	18.2	10.7	6.1
105	25	25	25	25	25	25	25	25	25	18.4	10.8	6.2
106	25	25	25	25	25	25	25	25	25	18.6	10.9	6.3
107	25	25	25	25	25	25	25	25	25	18.8	11.1	6.3

Discount Table for Major Defects—Continued

[In percent]

108	25	25	25	25	25	25	25	25	25	19.0	11.2	6.4
109	25	25	25	25	25	25	25	25	25	19.2	11.3	6.5
110	25	25	25	25	25	25	25	25	25	19.4	11.4	6.6
120	25	25	25	25	25	25	25	25	25	21.5	12.8	7.4
130	25	25	25	25	25	25	25	25	25	23.7	14.1	8.3
140	25	25	25	25	25	25	25	25	25	25	15.4	9.1
150	25	25	25	25	25	25	25	25	25	25	16.7	10.0
160	25	25	25	25	25	25	25	25	25	25	18.1	10.8
170	25	25	25	25	25	25	25	25	25	25	19.4	11.7
180	25	25	25	25	25	25	25	25	25	25	20.8	12.5
190	25	25	25	25	25	25	25	25	25	25	22.1	13.4
200	25	25	25	25	25	25	25	25	25	25	23.4	14.2
210	25	25	25	25	25	25	25	25	25	25	24.8	15.1
220	25	25	25	25	25	25	25	25	25	25	25	15.9
230	25	25	25	25	25	25	25	25	25	25	25	16.8
240	25	25	25	25	25	25	25	25	25	25	25	17.6
250	25	25	25	25	25	25	25	25	25	25	25	18.5
260	25	25	25	25	25	25	25	25	25	25	25	19.4
270	25	25	25	25	25	25	25	25	25	25	25	20.2
280	25	25	25	25	25	25	25	25	25	25	25	21.1
290	25	25	25	25	25	25	25	25	25	25	25	21.9
300	25	25	25	25	25	25	25	25	25	25	25	22.8
310	25	25	25	25	25	25	25	25	25	25	25	23.7
320	25	25	25	25	25	25	25	25	25	25	25	24.5
330	25	25	25	25	25	25	25	25	25	25	25	25.0

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315

Appendix C
Printing and Binding Problem Index

This index has been compiled to assist readers in determining if and where a specific printing or binding problem is addressed in the QATAP, Printing and Binding, Contract Terms (GPO Pub. 310.1).

THIS INDEX IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
IT IS NOT PART OF THE CONTRACT.

Instructions for Using This Index
This index refers readers to pages in *QATAP, Printing and Binding, Contract Terms (GPO Pub. 310.1)* and *GPO Contract Terms (GPO Pub. 3l0.2).* The four types of references used in the index (for these two documents and job specifications) are explained below. It is suggested that you read this information before using the index.

1. *Items Covered By QATAP*
   If QATAP covers a problem the applicable printing (P), or finishing (F), attribute number is shown in parentheses followed by a page number. If an item is listed under two different categories two entries are shown.
   Example: Copy
   unreadable . . . . . .(P–7) 15
   (F–17) 44
   Note: QATAP does NOT cover multiple-part and marginally punched forms or specialty items.
   Paper problems do not show an attribute number only a page number.
   Conspicuous single page defects can apply to numerous problems, and thus are not referenced for any items; see page 3.

2. *Items Specifically Covered By GPO Contract Terms (GPO Pub. 3l0.2).*
   If a subject is not covered in QATAP but is specifically addressed in the *GPO Contract Terms* (GPO Pub. 310.2, effective December 1, 1987, Rev. 6–01) CT and an item number are shown in parentheses, followed by a page number.
   Example: Banding
   not sealed . . . . . .(CT3f) 7

3. *Items Covered By GPO Contract Terms (GPO Pub. 310.2) Supplemental Specifications, General Quality.*
   If a subject is not specifically addressed in either document but would be covered by the General Quality, Section 2(b), Page 7, (CT2) Page 7 is shown.
   Example: Laminating
   wrinkled . . . . . (CT2) 7

4. *Items Covered By Specifications*
   If the subject is addressed in the specifications or other contract documents of the job (amendments to Purchase Orders, etc.); NPS (not per specifications) is shown.
   Example: Quality Assurance Samples
   missing specs . . . . . .NPS

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