



# Standard Specification for White Watermarked and Unwatermarked Bond, Reprographic, and Laser Printer Cut-Sized Office Papers<sup>1</sup>

This standard is issued under the fixed designation D3460; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification describes minimum requirements to ensure performance of cut-sized white office papers, including bond, reprographic, and laser printer papers. Grades of brightness and standards for labeling are described.

1.2 This specification covers virgin, recycled, and recycled content paper products (X1.2).

NOTE 1—There is currently no similar or equivalent ISO standard.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

D585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product (Withdrawn 2010)<sup>3</sup>

D644 Test Method for Moisture Content of Paper and Paperboard by Oven Drying (Withdrawn 2010)<sup>3</sup>

D646 Test Method for Mass Per Unit Area of Paper and Paperboard of Aramid Papers (Basis Weight)

D685 Practice for Conditioning Paper and Paper Products for Testing

D774/D774M Test Method for Bursting Strength of Paper (Withdrawn 2010)<sup>3</sup>

D1030 Test Method for Fiber Analysis of Paper and Paperboard

D1968 Terminology Relating to Paper and Paper Products (Withdrawn 2010)<sup>3</sup>

D5625 Test Method for Measuring Length, Width, and Squareness of Sheeted Paper and Paper Products (Withdrawn 2009)<sup>3</sup>

D6789 Test Method for Accelerated Light Aging of Printing and Writing Paper by Xenon-Arc Exposure Apparatus (Withdrawn 2011)<sup>3</sup>

### 2.2 TAPPI Standards:<sup>4</sup>

T 400 Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Products

T 401 Fiber Analysis of Paper and Paperboard

T 403 Bursting Strength of Paper

T 410 Grammage of Paper and Paperboard (Weight Per Unit Area)

T 411 Thickness (Caliper) of Paper, Paperboard and Combined Board

T 412 Moisture in Paper

T 425 Opacity of Paper (15°/Diffuse Illuminant A, 89 % Reflectance Backing and Paper Backing)

T 435 Hydrogen Ion Concentration (pH) of Paper Extracts—Hot Extraction Method

T 437 Dirt in Paper and Paperboard

T 452 Brightness of Pulp, Paper and Paperboard (Directional Reflectance of 457 nm)

T 538 Smoothness of Paper and Paperboard (Sheffield Method)

## 3. Terminology

3.1 *Definitions*—Definitions shall be in accordance with Terminology D1968. For terms used in this specification which are not provided by Terminology D1968, see the *Dictionary of Paper*.<sup>5</sup>

## 4. Classification

4.1 Types, basis weight (grammage), dimensions and grades shall include, but not limited to the following:

4.1.1 *Types*—Bond, reprographic, and laser printer.

4.1.2 *Nominal Basis Weight*—Illustrative range of equivalent values.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> Available from Technical Association of the Pulp and Paper Industry (TAPPI), 15 Technology Parkway South, Norcross, GA 30092, <http://www.tappi.org>.

<sup>5</sup> Available from TAPPI, 5th ed., 1996.

lb/ream (Ream size of 17 by 22 in. - 500 sheets)	g/m <sup>2</sup>
16	60
20	75
24	90

Other basis weights may be available, such as, but not limited to, 28 and 32 lb/ream.

#### 4.1.3 Nominal Sheet Dimensions:

- 8½ by 11 in. (216 by 279 mm)
- 8½ by 14 in. (216 by 356 mm)
- 11 by 17 in. (279 by 432 mm)

#### 4.1.4 Grades:

Grades <sup>6</sup>
25 % Cotton fiber
No. 1
No. 4
No. 5
"N"

## 5. Ordering Information

5.1 Orders for paper to this specification shall specify the type, grade, basis weight (grammage), size, color, grain direction, and may specify recycled fiber content. See [X1.2](#) and [X1.3](#).

5.2 Any drilling or punching requested shall be as specified. All holes are to be round, smooth or serrated, clean, free of lint and torn or ragged edges.

<sup>6</sup> Grades of paper are classified based on brightness levels. Different grades of paper have the same functional performance characteristics. For additional information regarding properties of various grades, see [Table 1](#)

## 6. Composition

6.1 If specific paper composition is felt to be necessary to ensure paper performance, including permanence, the required composition and the test method whereby that composition shall be verified shall be agreed upon between the buyer and the seller.

6.2 The fiber content of cotton fiber paper shall be 25 % minimum cotton fiber with the remainder being fiber derived from bleached chemical pulp.

6.3 All grades may contain cellulose fibers derived from recovered material.

6.4 The recycled fiber content of a recycled content paper shall be determined between the buyer and the seller based on total fiber weight. See [X1.2](#) and [X1.3](#).

## 7. Physical Requirements

7.1 The paper shall be in accordance with reasonable industry practice with regard to texture, formation, finish, caliper, lint, dust, slime spots, wrinkles, folds, and scuff marks. Paper shall be cut squarely on all sides, and be free of knife markings and ragged or torn edges.

7.2 If cleanliness or dirt content is important or critical to the end use, the buyer should establish acceptance standards in the purchase or bid document. See [X1.7](#).

7.3 Each specification and the bid sample shall represent the quality of paper that will be produced and shipped to fulfill the bid. When requested, statistically representative samples of the

**TABLE 1 Functional Requirements for Grades 1, 4, 5, and N Cut-Sized Office Papers**

NOTE 1—Any other requirements deemed to be important should be agreed upon between buyer and seller.

Property	Test Method	Bond			Reprographic/Laser Printer		
		16 lb	20 lb	24 lb	16 lb	20 lb	24 lb
Weight per unit area:							
lb (17in. by 22 in./500 sheets± 5 %)	<b>D646</b>	16	20	24	16	20	24
g/m <sup>2</sup> ± 5 %	T 410 <sup>A</sup>	60	75	90	60	75	90
Opacity, min; %							
Grade 1	T 425 <sup>A</sup>	80	85	88	80	85	88
Grades 4, 5, N	T 425 <sup>A</sup>	74	84	86	79	84	86
Bursting Strength, min:							
Grade 1							
psi	<b>D774/D774M</b>	16	20	24	...	...	...
kPa	T 403 <sup>A</sup>	110	138	165	...	...	...
Grades 4, 5, N							
psi	<b>D774/D774M</b>	13	17	21	13	17	21
kPa	T 403 <sup>A</sup>	90	117	145	90	117	145
Thickness: <sup>B</sup>							
in. ± 0.0004	T 411 <sup>A</sup>	0.0032	0.0040	0.0047	0.0032	0.004	0.0047
mm ± 0.013	T 411 <sup>A</sup>	0.081	0.102	0.120	0.081	0.102	0.120
Smoothness, Sheffield (avg. each side)	T 538 <sup>A</sup>		235 to 100			200 to 50	
Moisture content, %	<b>D644</b>	3.5 to 6.2	3.5 to 6.2	3.5 to 6.2	3.8 to 5.5	3.8 to 5.5	3.8 to 5.5
Extract pH, minimum	T 435 <sup>A</sup>	4.7	4.7	4.7	4.7	4.7	4.7
Nominal sheet dimensions: <sup>C</sup>							
Length ± ½ in. (0.8 mm)							
Width ± ½ in. (0.8 mm)							

<sup>A</sup> TAPPI Standard.

<sup>B</sup> Variation within a lot shall not exceed ± 5 %.

<sup>C</sup> The grades in this table are commonly available in the following width by length combinations:

- 8 ½ by 11 in. (216 by 279 mm),
- 8 ½ by 14 in. (216 by 356 mm), or
- 11 by 17 in. (279 by 432 mm).