



301 Physical Standards

Overview

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1.0 Physical Standards for Flats

1.1 General Definition of Flat Size Mail

Flat-size mail other than that in [3.0, Physical Standards for Automation Flats](#), is:

- a. More than 11-1/2 inches long, or more than 6-1/8 inches high, or more than 1/4 inch thick.
- b. Not more than 15 inches long, or more than 12 inches high, or greater than 3/4 inch thick.
- c. Unwrapped, sleeved, wrapped, or enveloped. [C050.3.1]
- d. Pieces are subject to the minimum standards in [601.1.1](#) and may be subject to other minimum dimensions, based on the standards for specific rates. [C100.1.2]

1.2 Length and Height of Flats

The location and orientation of the delivery address on a mailpiece generally establish which dimensions of the piece are the length and the height. The *length* is the dimension parallel to the address as read; the *height* is the dimension perpendicular to the length; the *top* and *bottom* of the piece are the upper and lower edges, respectively, when the address is positioned for normal reading. This general rule does not apply to:

- a. Automation rate flats.
- b. Standard Mail Enhanced Carrier Route flats.
- c. Standard Mail Customized MarketMail.
- d. Pieces thicker than 1/4 inch that are not prepared and mailed as a flat. [C010.1.3]

2.0 Physical Standards for Presorted (Nonautomation) Flats

2.1 First-Class Mail

2.1.1 Maximum Weight

Matter at First-Class Mail rates cannot exceed 13 ounces. First-Class Mail weighing more than 13 ounces is Priority Mail. (Lower size or weight standards apply to mail claimed at certain rates or addressed to certain APOs and FPOs.) [C100.1.1]



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2.1.2 Nonmachinable Surcharge

First-Class Mail flats that weigh 1 ounce or less are subject to the nonmachinable surcharge if any one of the following applies (see [1.2](#) for how to determine the length and height of a mailpiece):

- a. The piece is greater than 1/4-inch thick.
- b. The length is more than 11-1/2 inches or the height is more than 6-1/8 inches.
- c. The aspect ratio (length divided by height) is less than 1.3 or more than 2.5.
[C100.4.0 and E130.2.5]

2.2 Standard Mail

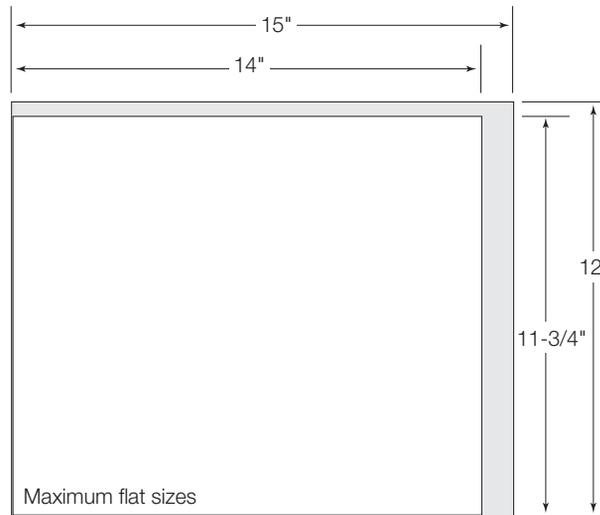
2.2.1 Basic Physical Standards

These standards apply to Standard Mail:

- a. Each piece must weigh less than 16 ounces.
- b. Presorted rate and Customized MarketMail pieces are subject to the basic mailability standards in [601](#).
- c. Except for automation basic carrier route rate pieces and merchandise samples mailed with detached address labels (DALs), the maximum size for Enhanced Carrier Route Standard Mail is 14 inches long, 11-3/4 inches high, and 3/4 inch thick (see [Exhibit 2.2.1c](#)). Merchandise samples whose dimensions exceed these maximums may be sent at the Enhanced Carrier Route rates if mailed using DALs, provided that the samples meet all other applicable standards and the DALs meet the standards in [602.4.0](#). [C600.1.1]



Exhibit 2.2.1c Maximum Dimensions for Standard Mail Flats



Measure Maximums	Enhanced CR Rates	Other Standard Mail
Height	11-3/4"	12"
Length	14"	15"
Thickness	3/4"	3/4"
Weight	Less than 16 ounces	Less than 16 ounces

[Exhibit C600.1.1e]

2.2.2 Cover Page and Protective Cover

If the piece is not completely enclosed in a mailing wrapper, then any protective cover or cover page must cover both the front and back of the host publication and extend to within at least 3/4 inch of the edge opposite the fold or binding. *Exception:* Flat-size pieces may have short covers as provided in 3.7.2. [C600.1.2]

2.2.3 Residual Shape Surcharge

Mail that is prepared as a parcel or is not letter-size or flat-size as defined in 101, *Physical Standards*, is subject to a residual shape surcharge. Mail that is prepared as Customized MarketMail under 705.1.0 also is subject to the residual shape surcharge. There are different surcharges for Presorted rate pieces and Enhanced Carrier Route rate pieces. Only the surcharges for Presorted rate pieces apply to CMM pieces. [C600.3.0]

2.2.4 Nonmachinable Surcharge

The nonmachinable surcharge in 343.1.0 does not apply to Standard Mail pieces (including parcels) that are claimed at any nonletter rate. [C600.4.2]



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2.3 Bound Printed Matter

2.3.1 General Standards

These standards apply to Bound Printed Matter:

- a. Bound Printed Matter may not weigh more than 15 pounds.
- b. Two or more flats may be mailed as a single piece if they are about the same size or shape or if they are parts of one article, if they are securely wrapped or fastened together, and if they do not together exceed the weight or size limits.
- c. Lower size or weight standards apply to mail claimed at certain rates, addressed to certain APOs and FPOs, or sent by the Department of State to U.S. government personnel abroad. [C700.1.0]

2.4 Media Mail

2.4.1 General Standards

These standards apply to Media Mail:

- a. No piece may weigh more than 70 pounds.
- b. Two or more flats may be mailed as a single piece if they are about the same size or shape or if they are parts of one article, if they are securely wrapped or fastened together, and if they do not together exceed the weight or size limits.
- c. Lower size or weight standards apply to mail claimed at certain rates, addressed to certain APOs and FPOs, or sent by the Department of State to U.S. government personnel abroad. [C700.1.0]

2.5 Library Mail

2.5.1 General Standards

These standards apply to Library Mail:

- a. No piece may weigh more than 70 pounds.
- b. Two or more flats may be mailed as a single piece if they are about the same size or shape or if they are parts of one article, if they are securely wrapped or fastened together, and if they do not together exceed the weight or size limits.
- c. Lower size or weight standards apply to mail claimed at certain rates, addressed to certain APOs and FPOs, or sent by the Department of State to U.S. government personnel abroad. [C700.1.0]

3.0 Physical Standards for Automation Flats

3.1 Basic Standards for Automation Flats

Flat-size mail claimed at automation rates must meet the applicable standards in 3.0, and the general and specific mailability and eligibility standards for the class of mail and the rate claimed. The mail may qualify for automation rates either under the dimensions and characteristics for automated flat sorting machine (AFSM) 100 processing in 3.3, or under the dimensions and characteristics for upgraded flat



sorting machine (UFSM) 1000 processing in 3.4, except for Bound Printed Matter (BPM), which can qualify only under AFSM 100 criteria. Additional standards apply as follows:

- a. If a flat-size mailpiece meets all AFSM 100 criteria except for the turning ability or deflection standards under 3.3.4, the piece may be claimed at automation rates if all UFSM 1000 criteria are met.
- b. If polywrap film is used, the film and preparation of the mailpiece must meet the applicable standards in 3.5. [C820.1.0]

3.2 Determining Length and Height

The length and height of an automation-compatible flat-size mailpiece is not determined by the orientation of the address, but by the preparation of the piece:

- a. For a piece prepared as a single sheet or in an envelope, full-length wrapper, or full-length sleeve, the length is the longest dimension. The height is the dimension perpendicular to the length.
- b. For a piece prepared with a bound, folded, or closed edge (e.g., a catalog, a newspaper or tabloid, a folded envelope), the length is the dimension parallel to the bound, folded, or closed edge. The height is the dimension perpendicular to the length. If the piece is folded more than once or is bound and then folded, the length is the dimension parallel to the final fold. [C820.2.1]

3.3 Criteria for AFSM 100 Flats

3.3.1 Final Fold

An AFSM 100 flat-size piece with a final fold must be designed so that the address is in view when the final folded edge is at the bottom of the piece and any intermediate bound or folded edge is to the right. [C820.2.2]

3.3.2 Shape and Size

Each flat-size piece must be rectangular and:

- a. For height, no more than 12 inches and no less than 5 inches high.
- b. For length, no more than 15 inches and no less than 6 inches long.
- c. For thickness, no more than 0.75 inch and no less than 0.009 inch thick. [C820.2.3]

3.3.3 Maximum Weight

Maximum weight limits are as follows:

- a. For First-Class Mail, 13 ounces.
- b. For Periodicals, 20 ounces.
- c. For Standard Mail, less than 16 ounces.
- d. For Bound Printed Matter, 20 ounces. [C820.2.4]

3.3.4 Turning Ability and Deflection

The piece must meet the following standards for turning ability and deflection:

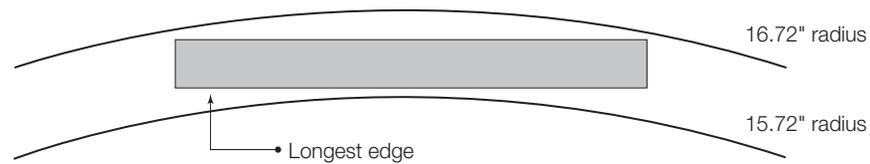


301.3.3.4

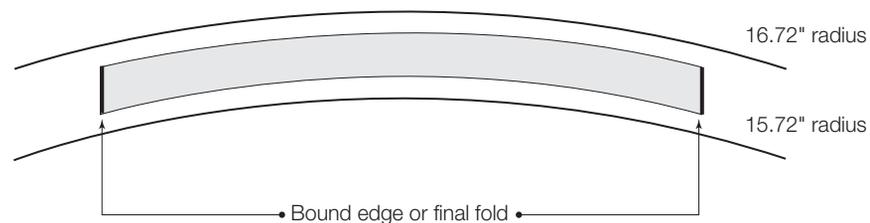
- a. **Turning Ability.** The mailpiece must fit between two concentric arcs drawn on a horizontal flat surface, one with a radius of 15.72 inches and the other with a radius of 16.72 inches, in one of the following ways:
 1. The piece must be flexible enough to bend between the two arcs when positioned vertically, with (if applicable) the bound, folded, or final folded edge perpendicular to the surface where the arcs are drawn.
 2. If rigid (constructed of or containing inflexible materials), the piece must be small enough to allow its longest edge to be placed between the two arcs without touching the lines of the arcs.

Exhibit 3.3.4a Turning Ability Rigid and Flexible Flats

Rigid flat on curved path



Flexible flat on curved path

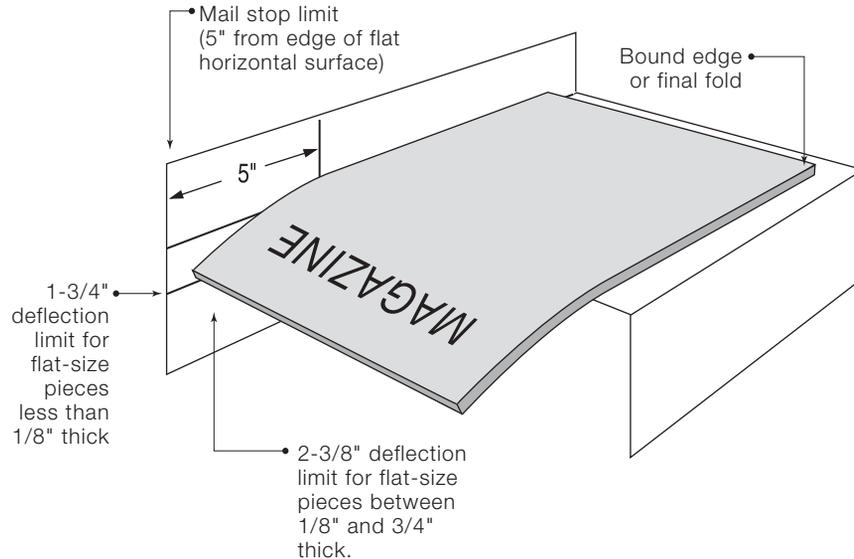


[Exhibit C820.2.5a]

- b. **Deflection.** A flat-size mailpiece meeting the AFSM 100 dimensions must be rigid enough so that, when placed flat on a surface to extend unsupported 5 inches off that surface, no part of the edge of the piece that is opposite the bound, folded, or final folded edge (as applicable) deflects more than 1-3/4 inches (if the piece is less than 1/8 inch thick) or more than 2-3/8 inches (if the piece is from 1/8 to 3/4 inch thick).



Exhibit 3.3.4b Deflection Flat-Size Mail



[Exhibit C820.2.5b]

- c. Test Device. Testing for compliance with the above standards must be done with a flat mail machinability tester constructed to USPS specification USPS-STD-28 and following the instructions for use of that device. Information about obtaining or using the tester is available from the local USPS area or district marketing office or local postmaster. [C820.2.5]

3.4 Criteria for UFSM 1000 Flats

3.4.1 Address Placement and Folded Pieces

The following requirements apply to folded pieces:

- a. A flat-size piece with a final fold must be designed so that the address is in view when the final folded edge is to the right and any intermediate bound or folded edge is at the bottom of the piece.
- b. Unbound flat-size pieces must be at least double-folded. [C820.3.2]

3.4.2 Shape and Size

Pieces must meet the following requirements:

- a. Height: no more than 12 inches or less than 4 inches.
- b. Length: no more than 15-3/4 inches or less than 4 inches.
- c. Minimum thickness:
 1. For pieces at least 5 inches long: 0.009 inch.
 2. For pieces at least 4 inches long but less than 5 inches long: greater than 0.25 inch.



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- d. Maximum thickness:
 1. For pieces 13 inches long or less: 1.25 inches.
 2. For pieces longer than 13 inches up to and including 15-3/4 inches: 7/8 inch. [C820.3.3]

3.4.3 Maximum Weight

Maximum weight limits are as follows:

- a. For First-Class Mail, 13 ounces.
- b. For Periodicals, 6 pounds.
- c. For Standard Mail, less than 16 ounces. [C820.3.4]

3.5 Polywrap Coverings

3.5.1 Polywrap Films

If polywrap film is used to enclose flat-size mailpieces claimed at automation rates, the pieces must meet the standards in 3.5. Film approved for use under 3.5.5 must meet the specifications in Exhibit 3.5.1 as follows:

- a. For mailpieces meeting all the dimensions, turning ability, and deflection characteristics for AFSM 100 criteria under 3.3, the film must meet all eight properties in this exhibit. If the address label is affixed to the outside of the polywrap, the haze property (property 2) is not required.
- b. For mailpieces not meeting all the dimensions and characteristics of the AFSM 100 criteria but meeting all the criteria for the UFSM 1000 under 3.4, the film must meet, at a minimum, only the haze property (property 2) in this exhibit. If the address label is affixed to the outside of the polywrap, the haze property is not required. [C820.4.1]



Exhibit 3.5.1 AFSM 100 Polywrap Specifications

Polywrapped AFSM 100 flats (see 3.3) must be prepared with polywrap that meets all eight properties in this exhibit. Polywrapped UFSM 1000 flats (see 3.4) must be prepared with polywrap that meets, at a minimum, only property 2 (haze).

PROPERTY	REQUIREMENT	TEST METHOD	COMMENT
1. Kinetic Coefficient of Friction, MD			
a. Film on Stainless Steel with No. 8 (Mirror) Finish	<0.28	ASTM D1894	Stainless steel finish must be in accordance with ASTM A 480/A 480M.
b. Film on Film	0.20 to 0.40	ASTM D1894	
2. Haze	<70	ASTM D1003	Affixing address labels to outside of polywrap is an alternative to meeting this requirement.
3. Secant Modulus, 1% elongation			
a. TD	>50,000 psi	ASTM D882	
b. MD	>40,000 psi	ASTM D882	
4. Tensile Strength			
a. TD	>2,000 psi	ASTM D882	
b. MD	>3,000 psi	ASTM D882	
5. Density	0.900 to 0.950 g/cc	ASTM D1505	
6. Nominal Gauge	>0.001 in	ASTM D374	
7. Static Charge	<2.0 kV	ASTM D4470	Antistatic additives can regulate this charge.
8. Blocking	<15 g	ASTM D3354-96	

[Exhibit C820.4.1]

3.5.2 Wrap Direction and Seam Placement

Wrap direction, seam direction, and seam placement must follow these standards:

- a. Wrap direction and seam direction:
 1. For an AFSM 100 mailpiece, the wrap direction must be around the longer axis of the mailpiece, with the seam parallel to that axis. The longer axis is always parallel to the longer edge (the length) of the mailpiece.
 2. For a UFSM 1000 mailpiece, the wrap direction may be around either the longer axis or the shorter axis of the mailpiece, with the seam parallel to that axis. The longer axis is always parallel to the longer edge (the length) of the mailpiece, and the shorter axis is always parallel to the shorter edge (the height) of the mailpiece.
- b. For either an AFSM 100 or a UFSM 1000 mailpiece, the preferred seam placement is on the nonaddressed side of the mailpiece. If the seam is placed on the addressed side, the seam must not cover any part of the delivery address and barcode, postage area, or any required markings or



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endorsements. Regardless of seam placement, the polywrap over the address area must be a smooth surface to avoid interference with address and barcode readability. [C820.4.2]

3.5.3 Overhang

For purposes only of the polywrap standards for overhang (selvage) in 3.5, the edge of the mailpiece designated as top must be one of the two physically longer edges of the piece, regardless of address orientation and whether bound or unbound. Any polywrap overhang (selvage) around the four edges of the mailpiece (top, bottom, and left and right sides) must meet these standards:

- a. For an AFSM 100 mailpiece:
 1. When the mailpiece contents are totally positioned at the bottom of the polywrap, the overhang must not be more than 0.5 inch at the top of the mailpiece.
 2. When the mailpiece contents are totally positioned to the left or to the right side of the polywrap, the overhang must not be more than 1.5 inches on the opposite side.
 3. The polywrap covering must not be so tight that it bends the mailpiece.
 - b. For a UFSM 1000 mailpiece:
 1. When the mailpiece contents are totally positioned at the bottom of the polywrap, the overhang must not be more than 1.5 inches at the top of the mailpiece.
 2. When the mailpiece contents are totally positioned to the left or to the right side of the polywrap, the overhang must not be more than 1.5 inches on the opposite side.
 3. The polywrap covering must not be so tight that it bends the mailpiece.
- [C820.4.3]

3.5.4 Mailpiece Identification

Polywrapped flat-size mailpieces claimed at automation rates must be endorsed to show that the polywrap meets USPS approval as automation-compatible. This requirement is met by printing “USPS AFSM 100 Approved Polywrap” or “USPS 100 Approved Poly” or “USPS UFSM 1000 Approved Polywrap” or “USPS 1000 Approved Poly,” as applicable, directly on the address side of the pieces, preferably below the postage area or in another visible location. Alternatively, the polywrap marking may be printed directly onto the polywrap material. The polywrap marking must not interfere with delivery address or barcode recognition. [C820.4.4]

3.5.5 Polywrap Certification

The USPS polywrap certification program requires plastic manufacturers to provide to a producer of polywrapped flat-size mailpieces a certificate of conformance from the manufacturer stating that the polywrap physical properties meet or exceed the minimum requirements specified in Exhibit 3.5.1. The certification program applies only to polywrap used for AFSM 100 mailpieces. A list of USPS-approved polywrap products is maintained on the USPS Web site <http://ribbs.usps.gov>. The first time



that a specific polywrap product is to be used for an automation rate mailing of flat-size mailpieces and that product is not listed on the USPS Web site, these steps must occur:

- a. The producer of the polywrapped pieces provides a USPS mailpiece design analyst (MDA) with the manufacturer's certificate of conformance verifying that the polywrap film meets the specifications in [Exhibit 3.5.1](#) for AFSM 100 mailpieces.
- b. The MDA reviews the manufacturer's certificate of conformance to confirm that the requirements listed on the certificate for the polywrap film meet the eight properties in [Exhibit 3.5.1](#) for AFSM 100 mailpieces. The reviewing MDA provides written confirmation to the producer of the polywrapped pieces and sends a copy to the appropriate business mail entry unit or detached mail unit and a copy to Mailing Standards (see [608.8.1, *Postal Service*](#), for address).
[C820.4.5]

3.6 Prohibitions

3.6.1 Protrusions

Clasps, strings, buttons, or like materials, or other protrusions that impede or damage mail processing equipment are prohibited. [C820.5.1]

3.6.2 Staples

Staples must not be substituted for tabs or wafer seals on pieces in automation rate mailings. As a binding method, staples may be placed in the fold or spine of a magazine or booklet-type or similar mailpiece if parallel with the bound edge, tightly and securely inserted, and not protruding to damage or interfere with mail processing equipment. [C820.5.2]

3.7 Tabs, Wafer Seals, Tape, and Glue

3.7.1 General

Although not required, mailpieces may be prepared with tabs, wafer seals, cellophane tape, or permanent glue (continuous or spot) if these sealing devices do not interfere with the recognition of the barcode, rate marking, postage information, and delivery and return addresses. Cellophane tape may not be placed over the barcode or where any part of the barcode will be printed. Tabs or seals placed in the area on which any part of the barcode is printed must contain a paper face meeting the standards for background reflectance. Tabs, wafer seals, and tape must have a peel adhesion (shear strength) value of at least 15 ounces/inch at a speed of 12 inches/minute after application to a stainless steel plate; the test is to be conducted 10 minutes after the material is applied to the plate. [C820.6.1]

3.7.2 Short Covers

Flats may be prepared with a cover page or protective cover that is more than 3/4 inch from each edge if the cover page is secured with at least two tabs, wafer seals, or glue spots placed within 1 inch of the top and bottom edges of the cover page or protective cover. [C820.6.2]



301.3.8

3.8 Uniformity and Exterior Format

3.8.1 General Requirements

A flat-size mailpiece prepared and claimed at automation rates must be uniformly thick. Each flat-size mailpiece must have a smooth and regular shape and be free of creases, folds, tears, or other irregularities not compatible with automation equipment. The exterior surface must not have protuberances caused by prohibited closures; attachments (except as provided below); irregularly shaped or distributed contents; or untrimmed excess material from the envelope, wrapper, or sleeve.

[C820.7.1]

3.8.2 Outside Attachment

An attachment to a flat-size mailpiece must be a single sheet, the same size as the cover. The attachment must be permanently, securely, and uniformly affixed to the front or back cover along a bound, folded, or otherwise closed edge. Pieces claimed at a Periodicals rate may bear attachments only if permitted by the applicable standards. [C820.7.2]

3.8.3 Contents

The contents of a flat-size mailpiece must remain uniformly thick so that the dimensions of the envelope, wrapper, or sleeve remain constant. If the contents are of irregular thickness or significantly smaller than the envelope, wrapper, or sleeve, those contents must be secured in place to prevent shifting within the wrapping during processing and surrounded with loose packing material or padding to ensure that the mailpiece remains uniformly thick. [C820.7.3]

3.8.4 Booklet-Type Piece or Magazine

The contents of flat-size mailpieces prepared in sleeves or other wrappers must be sufficiently secure in the sleeve or wrapper to stay in place during processing. If material bearing the delivery address or barcode for the mailpiece is enclosed in a partial wrapper, that wrapper must be sufficiently secure to prevent the contents from shifting and obscuring the delivery address or barcode. [C820.7.4]

3.9 Outside Labels and Stickers

3.9.1 Use

Permanent labels and stickers (i.e., those designed not to be removed or relocated) must be affixed directly to the outside of the mailpiece with permanent adhesive. A mailer may provide recipients with relocatable labels to place on the outside of response pieces sent back to the mailer. On pieces mailed at Periodicals rates, labels and stickers may be used only if permitted by the applicable standards.

[C820.8.1]

3.9.2 Pressure-Sensitive Label

Any pressure-sensitive label or sticker affixed directly to a mailpiece before mailing must have a minimum peel adhesion to stainless steel of 8 ounces/inch. This standard does not apply to pressure-sensitive labels provided by the USPS to label bundles to sortation levels. [C820.8.2]



3.9.3 “Sandwich” Label

A face stock/liner label (“sandwich” label) is a two-part unit with a face stock (top label) attached to a liner (bottom label) affixed to the mailpiece. The face stock must have a peel adhesion value of at least 2 ounces/inch with respect to the liner label and at least 8 ounces/inch when reapplied to stainless steel. [C820.8.3]

