3M Corporate Packaging Engineering
Global Dieline Requirements
PkgSol-RD-902588

1. SCOPE

This document defines requirements supporting the creation of production Dielines.

2. DEFINITIONS

2.1. **Dieline:** A digital asset which serves as a "design template" that visually represents the structural design of a packaging component to ensure proper layout of printed content. It is a diagram that shows all the fold/crease lines, cut lines, bleed limits, copy limits, etc. of a packaging component in 2-dimensional form to support the creation of production art used to support pre-press work activity for both analog and digital print reproduction.

2.2. Dimensional Drawing: A digital asset which serves as a "visual reference" that represents the structure design of a packaging component to articulate tooling and manufacturing requirements. It is a diagram that reflects design, layout, dimensional, and tolerance requirements of a component in 2-dimensional form. Note: Global Packaging Dimensional Drawing Requirements document shall be covered in a separate document (PkgSol-RD-1029574).

3. ROLES & RESPONSIBLITIES

3.1. 3M Responsibilities:

3.1.1. Request, Review, and approve/reject Dielines submitted by packaging suppliers.

3.1.2. Provide Dieline file name. Refer to Section 5: "Dieline File Naming Requirements" for more details.

3.1.3. Refer to Appendix A: "Additional 3M Responsibilities" for more details.

3.2. Packaging Supplier/Printer Responsibilities:

3.2.1. Provide 3M with Dieline files upon request.

3.2.2. Ensure all structural attributes/features associated with the package component design are completely and accurately represented on the Dieline file. Note: All manufacturing constraints including, but not limited to printing, die cutting, and glueing should be accounted for in the Dieline file.

3.2.3. Ensure Dielines submitted to 3M comply with the requirements outlined in this document.

4. DIELINE FORMATTING REQUIREMENTS

4.1. File Format: Editable Portable Document Format (PDF).

4.1.1. PDF file must be saved without any password protections, retaining editing capabilities.

4.1.2. Do not "outline" a Dieline file as this can sometimes create "double lines".

4.1.3. Refer to Appendix B: "Additional Dieline Formatting Requirements" for more details.

4.2. Scale: All Dielines must be built and saved at 100% scale.

4.3. Format: Dielines must be built and saved as vector art rather than a static image file. Note: This is typically the default PDF export using any available CAD software.

4.4. Line Strokes/Definitions: Each line type (i.e. cut, fold/crease, perforation, outside bleed, copy limit, etc.) must be represented as a unique "spot color" (not RGB color) and should be represented with a line stroke thickness of 1pt. Lines must be exported as "design representation" so that any perforation or cut/crease lines export as individual line segments which accurately represent the length of the cut and/or crease segments. To achieve this using the following CAD software applications:

4.4.1. ArtiosCAD:
- Select File->Export->Artios->PDF with Technical Inks
- Set scale to 'Specify' Scale = 1
- Select 'Properties'
  - In 'Position' tab set 'Device Size' Width and Height to 0.
  - In the 'Processing' tab set Line processing option to "Design Representation" (this should already be the default).

4.4.2. ImpactCAD: Please refer to: https://impact-support.ardensoftware.com/support/solutions/articles/101000496468-adobe-pdf.

4.4.3. All other CAD software: See CAD software vendor documentation OR adjust file in Illustrator to meet all of the Dieline Formatting Requirements.

4.4.4. Alternative Software: If you are using alternative software that does not have export options, the PDF will need to be modified to meet the requirements outlined in this document and be re-saved prior to submission to 3M.

4.5. Line Segments: All line segments (where applicable) must be "connected" (sharing the same end point coordinates where lines meet).

4.6. Line Type Legend: A line type legend must be included in the Dieline file.

4.7. Views: Some packaging components will have print on both the front/back or inside/outside surfaces. In these situations, a separate Die Outline should be created to represent each printed surface and each Die Outline must be appropriately labeled as front/back or inside/outside. Both Die Outlines representing each surface should be saved as part of the same Dieline file (one PDF file containing both inside/outside or front/back Die Outlines).

4.8. File Intellectual Property and Confidentiality Acknowledgement:

4.8.1. All Dieline files provided to 3M by supplier are the sole property of 3M and supplier assigns any rights it may have in the Dieline file. Suppler shall not include any references or markings on or with the file that would assert or otherwise imply that the Dieline file is the confidential and/or proprietary information of the supplier. 3M will remove any such markings if they are included with the Dieline file at its sole discretion.

4.8.2. Supplier acknowledges that 3M may share Dieline files outside of 3M to other suppliers involved in the design process. Supplier acknowledges it has all necessary rights and consents to allow 3M to share this information. If Supplier does not wish to have information shared outside of 3M, Supplier is solely responsible for submitting files without including any personal or confidential information appended to the file. 3M will have no obligation to review, remove, or redact any part of the files before sharing it with a third party.

5. DIELINE FILE NAMING REQUIREMENTS

All Dieline files must be identified with a specific naming convention that establishes uniqueness and enables traceability of the digital asset by 3M, packaging suppliers, and/or graphic designers. An example is provided below for referencing purposes:

Example: PKG-Dieline-123456-001	
PKG-Dieline	Prefix used to identify the digital asset is a Dieline.
123456	Unique part number/ID used to "link" to the structural design of a packaging component (assigned by 3M).
001	Numeric reference that denotes variations/applications of the Dieline. Note: Since a structural design could be re-purposes across two or more applications, the unique part number/ID could also contain a secondary reference to differentiate variation/application. Example: Paperboard back card that will be used in conjunction with multiple, different blisters in terms of size, shape and/or placement. 3M will require separate Dieline files for all variations (PKG-Dieline-123456-001, PKG-Dieline-123456-002, PKG-Dieline-123456-003) to differentiate and establish uniqueness.

6. DIELINE BUILD REQUIREMENTS

Note: Refer to Example 1 in Section 7: "Dieline Examples" for a visual representation of each Element Type listed below in an example Dieline included as part of this document.

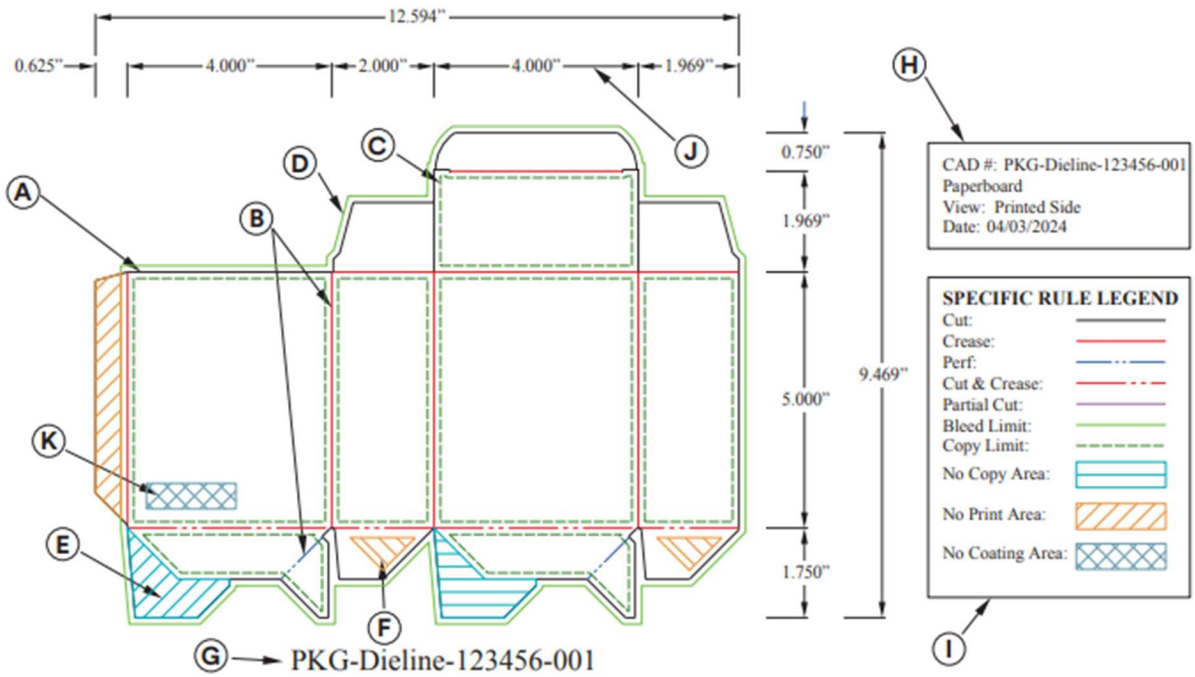
Reference	Element Type	Element Definition	Element Requirements
A	Die Outline	The external cut lines that represent the outline of the packaging	Die outline must be a joined end to end to create a continuous cut path.
B	Internal Features	Represents all the folds, creases or internal die-cut features that are associated with the package component (where applicable).	Dielines must include all folds, creases or internal die-cut features that comprise the packaging component from a design/manufacturing perspective.
C	Copy Limit	Defined as areas within the package structure that are suitable for copy.	Define copy limit/copy are by offsetting area from cuts or creases based on manufacturing tolerances of a given packaging production process.
D	Bleed Limit	Defined as the print area(s) that extend beyond the boundaries of the Die Outline.	Bleed Limit sizing should be set based on print/manufacturing tolerances for a given material/print type. For example, an industry standard 3mm (0.125") Bleed Limit for paperboard or and 8mm (0.25") Bleed Limit for corrugated.
E	No Copy Area	Defined as an area(s) within the Die Outline that can include print but are not recommended for copy.	All No Copy Areas must be indicated on the Dieline where panels or a portion of a panel is hidden when the package is glued and erected (see example 8)
F	No Print Area	Defined as an area(s) within the Die Outline that cannot include any print, copy, ink, or coating.	All No Print Areas associated with a packaging component that shouldn't include any print (printable inks, varnishes, coating, etc.) must be indicated on the Dieline and specified as to which applies. For example, an area might be a no varnish area but still acceptable to have ink coverage. If a Dieline contains both no ink and a no varnish/coating area, each should be identified with a unique line type which is identified in the legend/key.
G	Dieline ID	Defined as the unique identifier that is used to properly identify a specific Dieline asset (this unique ID is assigned by 3M).	Dieline ID must be created as described in Section 5: "Dieline File Naming Requirements" and must be present on the Dieline file. The specific location of the Dieline ID should center below the Die Outline itself, but in proximity for quick and easy identification.

Reference	Element Type	Element Definition	Element Requirements
H	Information Box	Used to communicate important information pertaining to the Dieline (including surface definition of inside/outside, front/back, etc.).	All Dielines must include an Information Box that communicates specific details about the Dieline itself. An Information Box must include the following information: • **Source**: Refer to Section 4.6 "Confidentiality and Privacy Requirements". • **Dieline File Name**: (PKG-Dieline-123456.001) • **Date**: Date the Dieline was created. • **Substrate**: Generic description of input material used to manufacture the packaging component. This generic description should include both "substrate color" (e.g.: white, clear, brown, other) **AND** "substrate description" (paperboard, corrugated, film, label). **Note**: Avoid using technical descriptions/definitions as they may not be understood/known by the graphic designer.
I	Key/Legend	Used to define each line type or hatched area used within the Dieline file.	All Dielines must include a Key/Legend which provides a visual representation of each different line type or hatch area used along with a written (text) definition of each of those different line types. **Note**: Avoid using colors and/or patterns that are hard to distinguish from one another (e.g.: pastel colors, shades of the same color, etc.).
J	Die Dimensions	Indication of the Measurements (Overall X+Y (blank size) and main panel sizes Length/Width/Depth).	To aid in the checking of the scale **ONLY** the Overall and major panel dimensions are allowed. All dimensioning lines and definitions are to be outside the Die Outline and not to touch or cross other lines of the Die Outline.
K	Dieline Notes	Defined as any supporting notes required for accurate creation of graphic design elements in compliance with manufacturing or merchandising requirements.	Any notes or textual comments that need to be communicated to the graphic designer should be incorporated as part of Dieline Notes. Refer to Appendix C: "Glossary of Terms" for detailed definitions for each bullet listed below: • Press Direction • UPC Direction • Eye-Mark • Coating/Varnish Free Area(s) • Ink Free Area(s) • Coding Area(s) • Panel Label

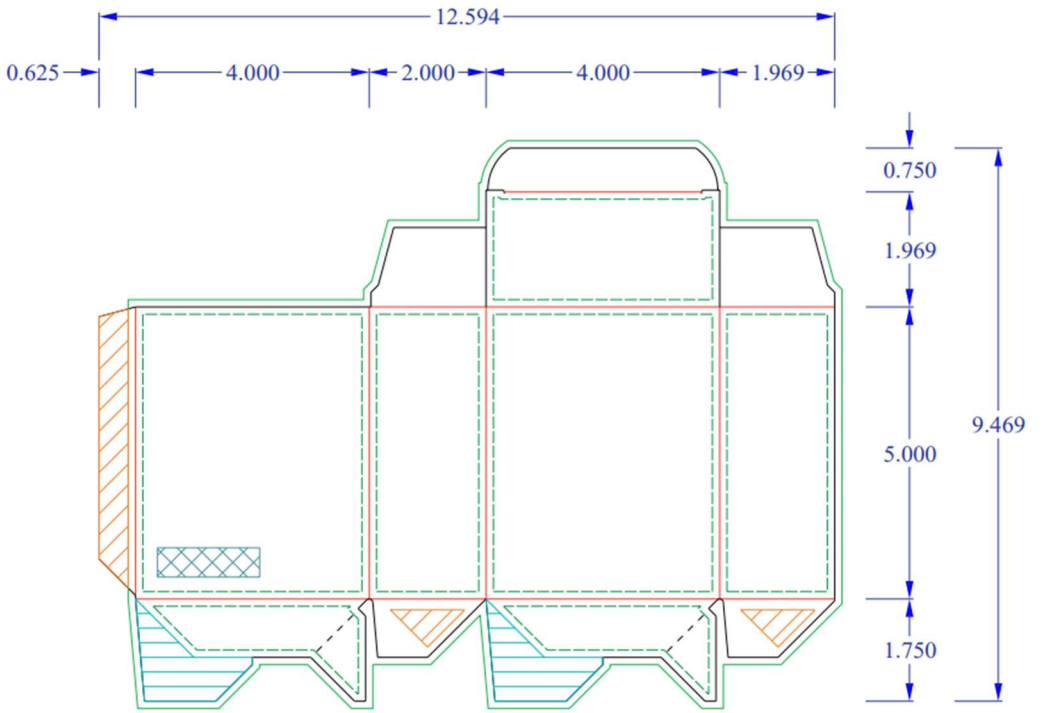
7. DIELINE EXAMPLES

Included below are several illustrations that are intended to act as Dieline examples supporting 3M's dominant package commodities that include "print". Note: The exact colors, lines/line patterns, font usage, etc. shown in the examples included below do not need to be followed exactly. These are just representative examples illustrating how to create a Dieline that would meet the requirements covered in this document.

Example 1: This Dieline example reflects ALL the various Element Types that could be represented on a Dieline.		
Dieline Element Types		
A - Die Outline	G - Dieline ID	Note: The inclusion of the "call-outs" in this Dieline example are intended ONLY to act as a visual reference to describe each Element Type and should NOT be included in any Dieline files supplied to 3M.
B - Internal Features	H - Information Box	
C - Copy Limit	I - Key/Legend	
D - Bleed Limit	J - Die Dimensions	
E - No Copy Area	K - Dieline Notes	
F - No Print Area		



Example 1 (Paperboard) – Auto-Bottom/Tuck-Top Folding Carton



MILLROCK PACKAGING

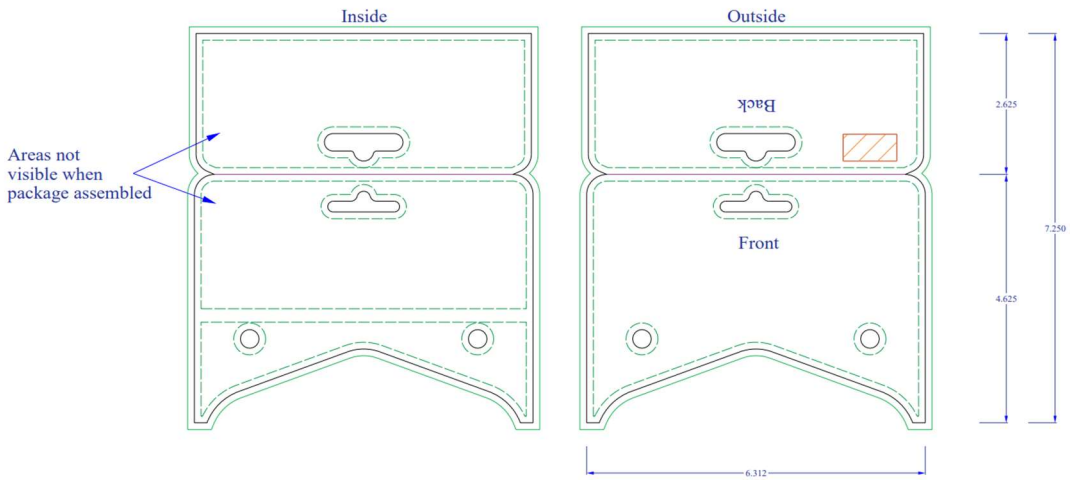
CAD #: 123456A
Paperboard
View: Printed Side
Date: 04/03/2024

SPECIFIC RULE LEGEND

Cut:
Crease:
Perf:
Cut & Crease:
Partial Cut:
Bleed Limit:
Copy Limit:
No Copy Area:
No Print Area:
No Coating Area:

PKG-Dieline-123456-001

Example 2 (Paperboard) – Header Card for Thermoform Clam



MILLROCK PACKAGING

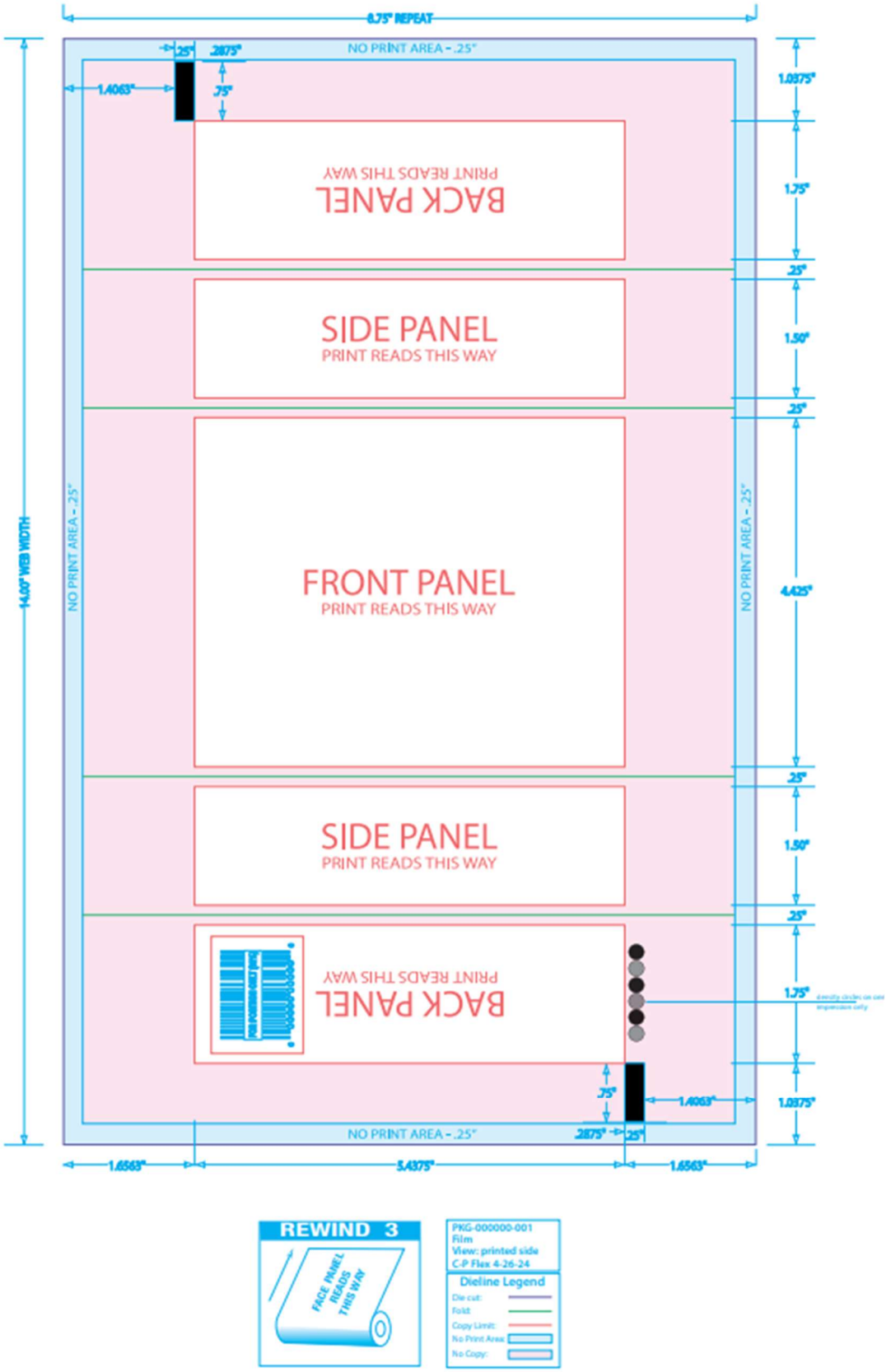
CAD #: 009500B
Paper
View: Printed Side
Date: 05/13/2024

SPECIFIC RULE LEGEND

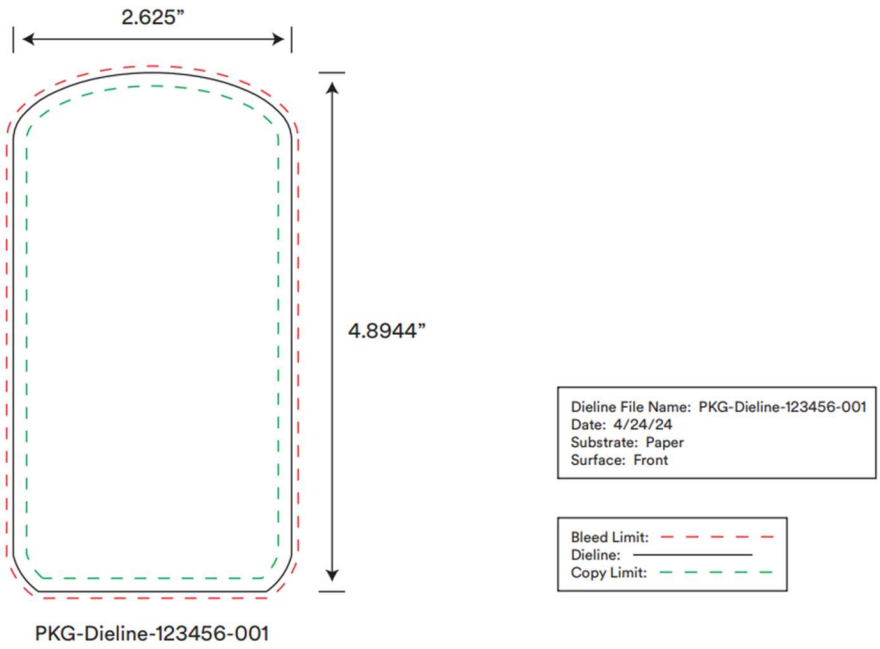
Cut:
Crease:
Perf:
Cut & Crease:
Partial Cut:
Bleed Limit:
Copy Limit:
No Copy Area:
No Print Area:

BL17800-002

Example 3 (Flexibles) – Roll of Unsupported Film



Example 4 (Labels) – Die-Cut Roll-form Label



Example 5 (Corrugated) – Tray Display

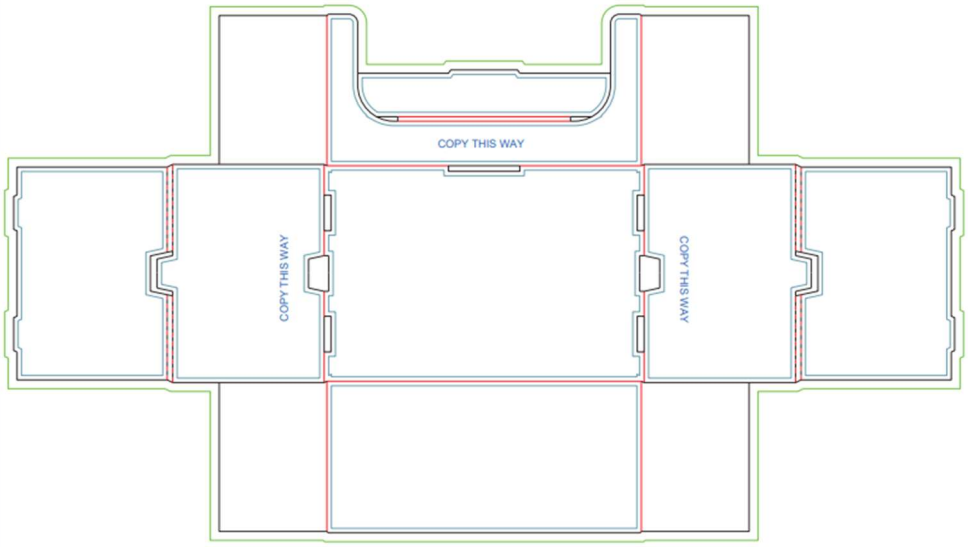
Date:	05/20/2024
Design Style:	D/C TRAY
Part Name:	34-8721-7807-3
Part #:	SS-71577
Inside Dims:	17.187 X 11.937 X 8.5
OutsideDims:	
Blank Size:	29.087 x 52.788
Board Const:	ECT 44 C (Kemi / KL)
Inner Liner:	Kraft
Outer Liner:	Kemi White
Joint:	
View:	outside

LEGEND

Knife:
Score:
Glue Area:
Bleed:
Live Area:
Coating:

LAYER	TYPE
1A	Die Outline
1B	Internal Features
1C	Copy Limits
1D	Bleed Limits
1E	No Copy Areas
1F	No Print Areas
1G	Information Box
1H	Key/Legend
2A	Die Dimensions
2B	Die Line Notes

PKG-Dieline-71577-001



CORR

Design #: 3M15102202-03 Rev: C

APPENDIX

Appendix A: Additional 3M Responsibilities

3M shall…

- Determine final development requirements associated with the packaging structure.
- Communicate pertinent information to the packaging supplier (assuming the creation of the Dieline will be requested of the packaging supplier). Common examples include, but may not be limited to the following:
    a. When package components that are utilized in conjunction with other packaging components, manufacturing automation within 3M Manufacturing Operations, etc. It is the responsibility of the 3M Package Engineer to communicate pertinent requirements to the package supplier so that pertinent details can be defined on the Dieline (examples: Blister used in conjunction with a paperboard back card or vision system that identifies impression repeat related to a roll of printed film).
    b. If a package component will contain print on multiple surfaces (front/back or inside/outside views), a Dieline must be created for each applicable surface (example1: Front and back of a blister paperboard back card or inside and outside view of a paperboard folding carton). Refer to Section 6 "Dieline Build Requirements" for additional details.

3M Supplier shall…

- Ensure all production details are captured in the Dieline including instructions related to erecting, coding and labeling.
- Complete inspections of submitted Dielines (assuming they are created and submitted by a packaging supplier) to verify for completeness and accuracy of the Dieline when compared to the packaging component design (including compliance to the requirements outlined in this document).
- Non-compliance to any/all requirements as defined within this policy shall be reason for "rejection" by 3M and returned to the packaging supplier/printer for correction and resubmission.

Appendix B: Additional Dieline Formatting Requirements Notes

- This file format is being leveraged as a "universal format" to display documents in an electronic form that is independent of the software, hardware, or operating system they are viewed in.
- PDF file must be saved with "editing capabilities" so that the digital asset is a usable asset in both Adobe Illustrator and Adobe In-Design software. Note: If not saved properly, potential exists that connected lines can split at their points or applicable layering can be lost.

Appendix C: Glossary of Terms

- Press Direction: Represents the direction the substrate (web) will travel through the printing press.
- UPC Direction: If there are any restrictions or specific requirements regarding placement/sizing associated with barcode symbols, this information should be represented on the Dieline.
- Eye-Mark: Represents both sizing and placement requirements that need to be integrated as part of the production art as this is classified as printed content associated with the packaging component.
- Coating/Varnish Free Area(s): Represents any requirements associated with imprinting that might be incorporated on the packaging component at the plant level where either printable inks and/or varnishes/coatings cannot exist. (e.g.: in-line inkjet printer to incorporate lot/batch information, thermal imprinter to incorporate a barcode, etc.).
- Ink Free Area(s): Represents any area(s) that may not contain ink.
- Coding Area(s): Represents any area(s) were lot code or date might be printed in-line.
- Panel Label: Used to communicate the intended orientation of the packaging component for accurate graphics placement at the request of the 3M Package Engineer.

Appendix D: Dieline "Intake" Review

Instructions:

1. If any received Dieline file from a 3M Supplier contains one or more defects, fill out the Packaging Dieline Checklist (Microsoft List) and submit it the applicable 3M Supplier so that required update(s) can be processed and re-submitted to 3M.

Note: If the Dieline file meets all of the requirements of the associated package structure and is compliant with the Dieline Requirements document, Dieline is considered "Ready for Use" (processing Packaging Dieline Checklist would not be required).

Dieline "Intake" Review Checklist	
Dieline Review Topic	Supporting Notes:
Dieline Number is present and accurately defined as part of Dieline asset.	• "PKG-Dieline" prefix is represented as part of Dieline Number represented in Dieline file and file name reflect the Dieline Number (Example: PKG-Dieline-123456.001). • Correct structure specification part number follows the "PKG-Dieline" prefix (Example PKG-Dieline-123456.001). • Correct variation/application of Dieline follows structure specification # (Example PKG-Dieline-123456.001).
File Format for Dieline complies with "3M Dieline Requirements" Document.	• PDF file was provided as part of submission from packaging vendor. • Dieline was developed to 100% scale.
Die Outline represented on Dieline is present and accurate.	• Dieline was accurately designed to illustrate all structural requirements associated with corresponding structure specification.
Internal Features (where applicable) on Dieline are present and accurate.	• Any unique design feature(s) related to the package structure are indicated on the Dieline. • All packaging features (folds, scores, glue flaps, perforations, heat seal areas, internal die-cuts, etc.) are indicated on the Dieline.
Copy Limits represented on Dieline are present and accurate.	• Copy Limit definitions are indicated on the Dieline. • All areas of the package structure that require boundaries for setting artwork content are present and accurately represented on the Dieline.
Bleed Limits represented on Dieline are present and accurate.	• Bleed Limit definitions are indicated on the Dieline. • All areas of the package structure where print can bleed off the "finished edge(s)" are present and accurately represented on the Dieline.
No Copy Areas represented on Dieline are present and accurate.	• No Copy Area definitions are indicated on the Dieline. • All areas of the package structure where either 1) copy can't exist and/or 2) is not recommended to set copy are represented on the Dieline.
No Print Areas represented on Dieline are present and accurate.	• No Print Area definitions are indicated on the Dieline. • All areas of the package structure that shouldn't include any print (inks, varnishes, coatings, other) are represented on the Dieline.
Dieline ID is present and accurate on Dieline.	• Dieline ID definition is included on the Dieline. • Dieline ID is located below Die Outline, but in close proximity, for quick and easy identification.
Information Box represented on Dieline is present and accurate.	• Information Box is included on the Dieline. • Minimum content requirements are inclded in Information Box (Dieline Number, Date, Substrate, Printed Surface(s)).
Key/Legend represented on Dieline is present and accurate.	• Key is included on the Dieline that covers all Dieline Element Types applicable to the Dieline.

Dieline Review Topic	Supporting Notes:
Die Dimensions represented on Dieline are present and accurate.	• Primary panel(s)/area(s) are dimensioned on the Dieline. • Dimensional definitions are properly positioned off of the Dieline. • Dimensinal definitions are represented on the Dieline (includes both values and corresponding unit of measure data for each dimensional definition).
Dieline Notes, where applicable, are represented on Dieline.	• Any notes or textual comments that need to be communicated to the production art agency are included. Common examples include, but may not be limited to: press direction, UPC direction, eye-marks, ink/coating free areas, other.