

CAN LINER TRAINING MANUAL



 **COLONIAL**
BAG CORPORATION
SINCE 1975 *Excellence Realized*

CAN LINER TRAINING MANUAL

I. TYPES OF CAN LINERS MADE TODAY

Trash can liners are usually manufactured using:

- Linear Low Density Polyethylene
- Reprocessed (REPRO) Polyethylene
- High Density Polyethylene
- **Hi/Lo Blended Technology (Colonial Bag Exclusive)**

A. **LINEAR LOW DENSITY:** (Thickness designated in mils such as .80 mil or 1.1 mil, or in terms of strength rating such as light, medium, heavy or extra heavy) About 50% of the institutional trash bags sold today are made from Linear Low Density resin of which there are several popular grades: Butene, Hexene and Super Hexene along with **Recycled Material (REPRO)**. Butene was the first Linear Low Density resin introduced and it dominated the market during the 1980's until stronger Hexene resins became available. Today, most manufacturers use some variation of Hexene resin or Hexene blends and have adopted terminology such as: "Super Resin, Premium Resin, Ultra Strong," etc., to designate and differentiate their products. **Colonial Bag**, along with other manufacturers, have developed a line of Super Hexene liners that offer exceptional performance at reduced gauges. These Linear Low Density Hexene products feature greater tear resistance with excellent stretch and are widely accepted in all market segments.

Also in the Linear Low category are **Recycled Material (REPRO)** liners. Made from recycled material, these liners, although they are made thicker than their Hexene counterparts, are not always as strong as they feel. Despite their thickness, "REPRO" bags generally perform poorly in Dart Impact and Tear tests. Since these bags are made from an ever-changing source of recycled film, their integrity is inconsistent and can vary dramatically from batch to batch.

B. **HIGH DENSITY:** (Thickness designated in microns, such as 16 micron)

The remaining 50% of the market belongs to liners manufactured from High Density Polyethylene. High Density's molecular structure produces greater impact strength than Linear Low Density, allowing for thinner film to be used. This down gauging results in lower cost per bag and has contributed to the continued growth of the High Density market share. High Density products feature superior puncture resistance and are surprisingly strong despite their reduced thickness.

Some drawbacks to High Density Liners are:

- 1) Once punctured, High Density bags are prone to "zippering". Improved resin technology, however, has decreased the "zippering" effect and it is not as

dramatic as it was in the past, although some end users continue to perceive it as such.

- 2) Some customers do not like the "crinkly" feel of High Density.
- 3) There are still skeptical customers who are not convinced that thinner gauge High Density bags will perform adequately.

C. **HI/LO BLENDED TECHNOLOGY**

Colonial Bag's Hi/Lo series of can liners are made from a proprietary blend of Hexene and High Density resins. Featuring the best properties of both resins, these incredibly strong liners are a perfect substitute for reprocessed (REPRO) type bags. They are competitively priced and offer the consistent, dependable performance that REPRO style liners frequently fail to deliver, while reducing the amount of waste stream plastic.

D. **DEGRADE-AWAY / BIODEGRADABLE* BAGS**

The technology utilized by Colonial Bag in the manufacturing of our Degrade-Away Liners renders the plastic bag as biodegradable, while maintaining other desired film properties.

When disposed, this product is able to be metabolized into biomass by the surrounding microorganisms commonly found within our environment.

The biodegradation process can take place aerobically and anaerobically. It can also take place with or without the presence of light.

These factors allow for biodegradation in nearly all landfills, or wherever else the product may end up.

ADDITIONAL FACTS: 100% recyclable • Completely Shelf Stable. Will not degrade under exposure to heat, light or external stresses during storage • The liners maintain traditional performance ratings • Meets federal testing methods, ASTM D5209 – ASTM D5338 – ASTM 5511, Certified.

*49.28% biodegradation in 900 days under non-typical conditions. No further evidence of biodegradation.

E. **CUSTOM FIT CAN LINERS**

Colonial Bag's Custom Fit Can Liners are designed to perfectly fit some of the most popular containers in the industry. They are available for the Slim Jim*, 32 Gallon Brute*, 44 Gallon Brute*, 55 Gallon Square Brute*, 50 Gallon Big Wheel* and 96 Gallon containers. No more tying off the excess film at the top and no more falling into the container. Eliminate wasted film and maximize both cost savings and source reduction benefits.

* "Brute", "Glutton", "Big Wheel" and "Slim Jim" containers are registered trademarks of Rubbermaid Commercial Products, Inc.

II. PROPERTIES OF LOW DENSITY AND HIGH DENSITY CAN LINERS

Linear Low Density Bags (LLDPE) are used for rough or sharp objects under tough transport conditions. These liners are very strong and are more resistant to tearing than High Density.

High Density Bags (HDPE) are used for paper and non-rough edged objects under moderate transport conditions. They are very strong and handle high load capacities but tear easier once punctured.

HOW TO SELECT THE PROPER CAN LINER

Today's market is filled with an abundance of different resins and film thickness is no longer a satisfactory standard for judging overall strength. Instead of stating the actual thickness, many producers have adopted terminology such as "Light," "Medium," "Heavy," and "Value Line." Each manufacturer has its own blend of resin formulations and the proportions of these materials vary from one product to another. To help customers determine the proper can liner, Colonial Bag has developed a "Max Load" designation for each of our liners. Combining the max load designation with what type of refuse is being discarded has led us to develop the following guidelines:

- Is there anything rough or sharp going into the bag?** ➤ Yes – Select Low Density No – Select High Density
- Determine Correct Liner Size – Gallons or Dimensions** ➤ Example: 45 gallons or 40 x 46
- Estimate how much weight will be going into the bag** ➤ Example: 5 gallon pail of liquid weighs approximately 45 lbs.
- Locate appropriate liner from the Max Weight column** ➤ Shown on Colonial Bag literature

APPLICATIONS

LINEAR LOW DENSITY BAG (LLDPE)

Recommended for rough objects under tough conditions.

Example: These liners are very strong and are more resistant to tearing, but handle lower load capacities than similar gauge HDPE liners.

Suggested LLDPE Applications:

- General industrial waste
- Medical isolation liners
- Contractor bags
- Sticks and rough yard trimmings
- Objects with rough corners or protrusions
- Plastic eating utensils
- Demanding transport conditions

HIGH DENSITY BAG (HDPE)

Great for paper and non-rough edged objects under moderate transport conditions.

Example: These liners are very strong and handle higher load capacities than LLDPE liners, but are less resistant to tears once punctured, and are more prone to tears once punctured.

Suggested HDPE Applications:

- Refuse without rough edges
- Paper
- Paper plates / cups
- Food
- Rags / cloth items
- Great for office waste baskets
- Contract cleaners

STYLES OF CAN LINERS

GUSSETED STYLE

A flat style bag manufactured with both sides tucked in to form gussets. Where indented, you have to seal through four layers of film while the middle of the bag has only two layers. This leads to an inherently weak bottom seal.

Designated in three dimensions, i.e., 23 x 17 x 46



FLAT STYLE

Just as the name infers, a flat bag is simply a two-dimensional bag with a bottom seal. Flat bottom bags are generally leakproof but are very clumsy to handle. Also, they do not conform very well to the shape of most trash receptacles.

Designated in two dimensions, i.e., 40 x 46



X-SEAL / STAR SEAL STYLE

Colonial Bag was instrumental in developing the high-tech X-SEAL trash bag, now on the leading edge of trash bag engineering.

Designed without gussets, the X-SEAL eliminates gaps along the seal where leaks can occur. This unique design allows the bag to conform to your container's shape and distributes the weight of the refuse evenly around the bag. X-SEAL liners maximize the bag's carrying capacity and virtually eliminate leaks.

The high-performance, super strong X-SEAL bag is an effective answer to those leaking bag problems — and the X-SEAL saves you time and money in clean up costs too!

Designated in two dimensions, i.e., 40 x 46



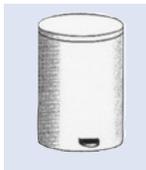
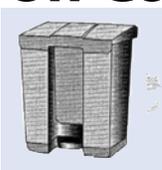
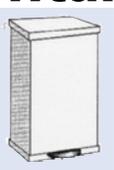
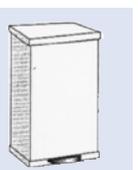
Unique X-SEAL design eliminates seal "gaps" for a virtually leak-proof liner.

CAN LINER SIZES

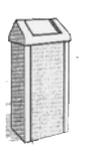
Office Containers

| | | | | | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|
|  |  |  |  |  |  |  | |
| Can Size Bag Size | 3-1/2 Gal. 20x22 | 6-1/2 Gal. 20x22 | 7 Gal. 24x23 | 7-1/2 Gal. 24x23 | 10 Gal. 24x32 | 19 Gal. 30x36 | 22 Gal. 30x36 |

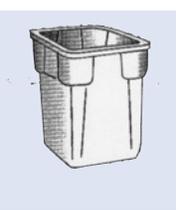
Step-On Containers

| | | | | | | | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|
|  |  |  |  |  |  |  |  |  | |
| Can Size Bag Size | 3-1/2 Gal. 24x23 | 4-1/2 Gal. 24x32 | 7 Gal. 24x32 | 8 Gal. 24x32 | 12 Gal. 24x32 | 12 Gal. 30x36 | 18 Gal. 30x36 | 23 Gal. 33x39 | 24 Gal. 33x39 |

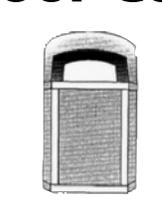
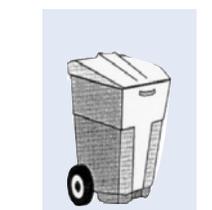
General Use Containers

| | | | | | | |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |
| Can Size Bag Size | 12 Gal. 30x36 | 15 Gal. 30x36 | 16 Gal. 33x39 | 21 Gal. 26x42 | 23 Gal. 30x45 | 29x50 Best Fit |

Brute® Containers

| | | | | | | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------|
|  |  |  |  |  |  |  | |
| Can Size Bag Size | 10 Gal. 24x32 | 20 Gal. 30x36 | 28 Gal. 43x47 | 32 Gal. 33x39 | 44 Gal. 40x46 | 50 Gal. 46x50 | 55 Gal. 40x55 |
| | | | 32.5x45 Best Fit | 36x50 Best Fit | | | |

Outdoor Containers

| | | | | | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |
| Can Size Bag Size | 21 Gal. 33x39 | 35 or 40 Gal. 40x46 | 55 Gal. 36x58 | 56 Gal. 43x47 | 60 Gal. 38x58 | 65 or 96 Gal. 52x75 |

MEASURING INSTRUCTIONS TO DETERMINE PROPER BAG SIZE FOR ANY RECEPTACLE

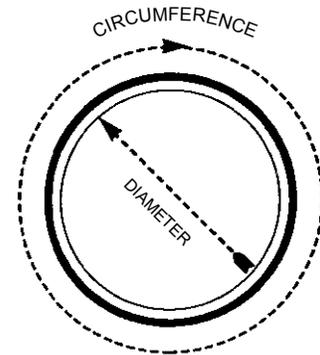
FOR ROUND RECEPTACLES

WIDTH OF BAG REQUIRED =
diameter of receptacle x 3.14 (pi) ÷ 2

HEIGHT OF BAGS REQUIRED =
1/2 diameter of receptacle + 6" (for overhang) + height
of receptacle

DIAMETER is the distance across the top of the receptacle

CIRCUMFERENCE is the distance around the top of
the receptacle

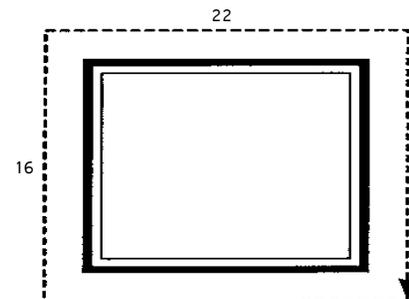


Example: Container is 30" tall with a diameter of 24".
Width: $24 \times 3.14 = 75.36 \div 2 = 37.6$
Height: $30 + 12 + 6 = 48$
Bag Required: 38 x 48

FOR SQUARE OR RECTANGLE RECEPTACLES

WIDTH OF BAG REQUIRED =
the total of 2 adjacent sides

HEIGHT OF BAGS REQUIRED =
1/2 the smallest of the four sides + 6" (for overhang) + height
of receptacle



Example: Container is 22 x 16 x 44
Width: $22 + 16 = 38$
Height: $44 + 8 + 6 = 58$
Bag Required: 38 x 58

USEFUL FORMULAS

HOW TO TRANSLATE MILS INTO MICRON EQUIVALENTS

To convert microns to mil, divide the micron by 25.4 to arrive at the true mil thickness.

To convert mil to microns, multiply the mil by 25.4 to arrive at the true micron thickness.

| | | | | | | | | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Mil Thickness | 0.23 | 0.27 | 0.31 | 0.35 | 0.39 | 0.43 | 0.47 | 0.51 | 0.55 | 0.59 | 0.62 | 0.66 | 0.70 | 0.74 | 0.78 | 0.82 | 0.86 | 0.90 | 0.94 | 0.98 |
| Approx. Micron Equivalent | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |



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205 E. Fullerton Ave.
Carol Stream, IL 60188
630-690-3999
Fax 630-690-1571
www.colonialbag.com