

CAN LINERS 101

Everything You Need to Know About Can Liners!



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Why Gauge Isn't Always Important.

Film thickness is no longer a satisfactory standard for judging overall strength. The development of improved LLDPE resin in the liner industry has completely changed the standard method for selecting the correct can liners. These materials have allowed manufacturers to produce thinner, lighter trash bags which are stronger and more durable than the thicker bags previously made from low density resin. This is why gauge is no longer an effective way to determine liner strength. Instead of stating actual thickness, it is now generally accepted to use terminology such as "Regular", "Medium", "Heavy", and "Extra Heavy". (See comparison table.)

General Industry Strength Rating	Linear Low Density Mil Thickness Range	Old Low Density Strength Rating
Regular (R)	.35 to .50	1.25
Medium (M)	.45 to .75	1.5
Heavy (H)	.60 to 1.0	2.0
Heavy Plus (H+)	.74 to 1.3	2.5
Extra Heavy (XH)	.90 to 1.5	3.0
Extra Extra Heavy (XXH)	1.3 to 2.0	4.0

Each manufacturer has its own blend formulations, so the proportions of these materials vary from one producer to another. The best way to determine the correct liner is to actually test some suggested samples. At Pitt Plastics, we have our own testing laboratory where we can test our liners or those of another manufacturer and provide you with the test results.

Definitions

It's important to know a little bit about what can liners are actually made of, and how thicknesses are measured. That way, you can determine which of the polyethylene resins and liner gauges will work best for your particular application.

Resin- The basic raw material from which can liners are made. There are 3 types of resins: Low Density, Linear Low Density, and High Density Polyethylene.

Linear Low Density Polyethylene- This resin is highly puncture and tear resistant. These properties make this the best choice for applications where additional strength and stretch are required. Works well for waste with sharp or jagged edges.

High Density Polyethylene- Liners made from this resin are generally available in lower gauges, and are more temperature resistant.

Low Density Polyethylene- This is an older resin still used mainly in lower end liners. It has largely been replaced by Linear Low Density Polyethylene.

Post-Consumer and Post-Industrial Polyethylene- This is made from recycled post-consumer plastics, such as milk jugs and industrial scraps. These are reprocessed and blended with other types of resins.

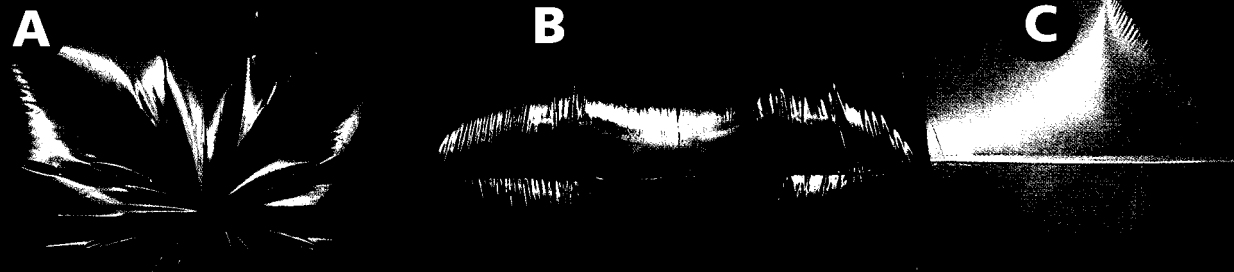
Gauge- A term used to describe the thickness of a liner. Linear Low density liners are measured in mils, while High Density liners are generally measured in microns.

Mil- Measurement based on thousandths of an inch (.000). For example, a .55 mil bag would be 55 one hundred-thousandths of an inch thick. Common Linear Low density liners range from .35 to 2.0 mil in thickness.

Micron- Based on one thousandth of a millimeter or one millionth of a meter. Used to designate the thickness of High Density can liners, which usually range from 6 to 24 microns in thickness.



Types of Common Can Liner Seals



A *Star Seal (or X-Seal)*

The star seal has become the most common type of seal in the market today. Designed without gussets, the star seal eliminates gaps along the seal where leaks can occur. This unique design allows the bag to conform more easily to the shape of the container and distributes the weight of the refuse evenly around the bag. Star seal liners maximize the bag's carrying capacity and virtually eliminate leaks. Star Seal liners are designated in two dimensions, *i.e.*, 40x46.

B *Gusseted Seal*

A flat style bag manufactured with both sides tucked in to form gussets. Where indented, the bag has to be sealed through four layers of film, while the middle of the bag has two layers. Gusseted seal liners are designated in three dimensions, *i.e.*, 23x17x46.

C *Flat Seal*

Just as the name infers, a flat seal is simply a two-dimensional bag with a bottom seal. Flat seal bags are generally leak-proof, but are very clumsy to handle. Also, they do not conform very well to the shape of most trash receptacles. Flat seal liners are designated in two dimensions, *i.e.*, 40x46.

Advantages of Linear Low Density Can Liners

1. Maximum puncture and stretch resistance compared to High Density.
2. Multi-purpose applications.
3. Most prevalent type of film used in the industry today.
4. Manufactured in a wide variety of colors.
5. Compared to traditional low density film, linear low can be run at a lighter gauge with equal strength.

Advantages of High Density Can Liners

1. HMW/HD liners are about 3 times stronger and more durable than ordinary polyethylene liners of the same thickness.
2. HMW/HD liners require two-thirds less petroleum based raw material to manufacture. Accordingly, they can be made about one-third the thickness of ordinary low density polyethylene liners, so they require only about one-third the ordinary shipping, storage and warehousing cost.
3. Substantial cost savings per liner.
4. When they are properly made, HMW/HD liners will rarely "zipper" if punctured.
5. Extremely wide range of temperature resistance from -40°F to +212°F (boiling).
6. USDA and FDA approved (natural colored liners).

Useful Formulas

How to Translate Mils into Micron Equivalents

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

How to Convert Microns to Mils

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

$$7 \text{ Microns} \div 25.4 = .28 \text{ Mil}$$

$$34 \text{ Microns} \div 25.4 = 1.34 \text{ Mil}$$

How to Convert Mils to Microns

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

$$1 \text{ Mil} = 25.4 \text{ Microns}$$

$$.31 \text{ Mil} \times 25.4 = 7.9 \text{ Microns}$$

$$.74 \text{ Mil} \times 25.4 = 18.8 \text{ Microns}$$

How to Figure Case Weights Linear Low

$$\text{Width} \times \text{Length} \times \text{Mil} \div 15 = \text{Lbs./1000 bags}$$

High Density

$$\text{Width} \times \text{Length} \times \text{Mic} \times .0027034 = \text{Lbs./1000 bags}$$

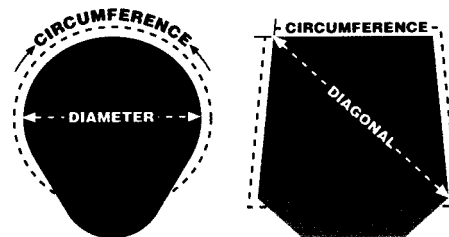
Measuring for Correct Can Liner Size

BAG WIDTH:

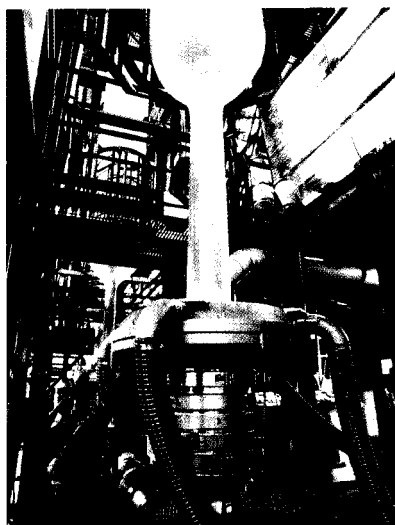
Use 1/2 of the outer circumference of the container.

BAG LENGTH:

Use the height of the container, plus 1/2 of the diameter of the container bottom, plus 3 inches (for overhang). For square or rectangular containers, use the diagonal of the container bottom, rather than the diameter.



State-of-the-Art Production



Every reputable liner manufacturer strives to maintain good production equipment. Everyone receives benefits from up-to-date technology because it makes quality issues easier, while boosting efficiency, thus making prices highly competitive. Pitt Plastics is no exception! We regularly upgrade and replace our equipment, and have just recently added eight new Alpine Extruders, some of the finest in the world. This is just another responsibility in our partnership with you.

An often over-looked component in manufacturing is the quality of the machine operators. Pitt Plastics manufacturing personnel tend to stay with our company an average of ten years, a very high number in the world of manufacturing. These long-term employees bring experience and dedication to the table. We work very hard to maintain an elite population of professional people committed to giving you their very best effort. No machine by itself can produce the legacy of quality and efficiency that well-motivated, highly loyal people can.

Quality Control

A major responsibility in our partnership with you is to be sure at all times you are receiving products which meet our stringent specifications for perfection. It is not enough to design and operate a first rate manufacturing plant. Constant monitoring and testing is required throughout the process to ensure you get what we guarantee - a quality product.

We maintain an in-house lab to

test all materials and products assuring consistent quality. This lab also monitors all products which must meet state and federal regulations. In addition, our lab tests every rail car of resin we receive to ensure the raw materials we use meet our stringent requirements.

Our unconditional guarantee is the best in the business. You know we are going to be sure the quality is in every liner.





3 STEPS TO CHOOSING THE RIGHT CAN LINER

The range of sizes, weights, and types of can liners is nearly overwhelming. How do you figure out which can liner you need? The confusion over the variety of products is understandable, but it's not insurmountable. We have developed an easy 3-step method to make shopping for can liners easy.

1 DETERMINE THE PROPER CAN LINER TYPE FOR YOUR APPLICATION.

There are two types of resins commonly used in the manufacture of can liners: Linear Low and High Density. To decide which one you need, answer this question: "Are sharp objects being thrown away?"

If **yes**, you need **Linear Low**.

If **no**, you need **High Density**.

LINEAR LOW:

- Linear Low is the most prevalent type of film used in the industry. Linear Low features the maximum puncture and tear resistance.
- Manufactured in a wide variety of colors, it is suitable for a wide range of applications.

HIGH DENSITY:

- High Density provides substantial cost savings per liner.
- It is an excellent choice for soft refuse (typical office, restroom, paper products, etc.)
- High Density liners are about three times stronger and more durable than ordinary polyethylene liners of the same thickness.

Now that you have decided which resin type is for you, you've eliminated half the products in the catalog. Next we'll narrow it down even further.

2 WHAT SIZE CONTAINER DOES THE LINER NEED TO FIT?

Ideally, you should have about three to four inches of overhang on the trash receptacles. Anything more or less is wasteful of both time and money.

The following are some guidelines to use when choosing the right size can liner.

- A. Use the product specification charts or the measuring for the correct can liner size formulas to determine the correct size.
- B. The gallon capacity or the size is usually printed on the container.

3 HOW MUCH DOES THE LINER NEED TO HOLD?

Here is where you may need to do a little calculating. You need to determine the average weight of a full can liner in your environment.

Once you have decided on that number, check the product grid in the Pitt Plastics catalog under the can liner type and size that you have determined in the first two steps. Go across the grid to the column marked "Max Load". Find the number closest to the average weight figure that you came up with, and bingo!, that's the can liner you need.



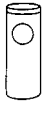
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Can Liner Sizes For Common Receptacles

In the product information throughout this catalog you will see numbered receptacle illustrations next to the capacity figures. Below is a chart of the most commonly used cans, their capacities and sizes. This chart can be utilized to find the liner you need or to suggest alternate sizes to the ones currently used.

1 Aspen/Landmark™ Ash-Trash Round Hole


2.5 Gallon Rigid Inner Liner
 10.25 Sq. x 16 H
Suggested Bag Size
 LLD 20 x 21, 24 x 23
 HD 20 x 22, 24 x 24

2 Steel Combo/ Ash-Trash Funnel Top

3 Gallon Rigid Inner Liner
 10 Dia. x 15 H
Suggested Bag Size
 LLD 20 x 21, 24 x 23
 HD 20 x 22, 24 x 24


3 Rectangle Wastebasket

3.5 Gallon
 11.375 L x 8.25 W x 12.125 H
Suggested Bag Size
 LLD 20 x 21, 24 x 23
 HD 20 x 22, 24 x 24


7 Gallon
 14.375 L x 10.25 W x 15 H
Suggested Bag Size
 LLD 24 x 23
 HD 24 x 24


10 Gallon
 15.25 L x 11 W x 19.875 H
Suggested Bag Size
 LLD 24 x 23, 24 x 32
 HD 24 x 24, 24 x 33


4 Round Wastebasket

6.5 Gallon
 13.5 Dia. x 14.5 H
Suggested Bag Size
 LLD 24 x 23, 24 x 32
 HD 24 x 24, 24 x 33

10 Gallon
 15.75 Dia. x 18 H
Suggested Bag Size
 LLD 24 x 32
 HD 24 x 33

5 Janitorial Cart

25 Gallon
 17.25 L x 10.5 W x 30.5 H
Suggested Bag Size
 LLD 26 x 43, 33 x 39
 HD 30 x 37, 33 x 40

6 Profile Series™

15 Gallon
 19.5 L x 11.875 W x 36.625 H
Suggested Bag Size
 LLD 30 x 46, 33 x 39
 HD 33 x 40

7 Untouchable® Half Round

21 Gallon
 21 L x 11 W x 28 H
Suggested Bag Size
 LLD 30 x 36, 33 x 39
 HD 30 x 37, 33 x 40


8 Untouchable® Round Base

22 Gallon
 15.75 Dia. x 30.175 H
Suggested Bag Size
 LLD 30 x 36, 33 x 39
 HD 30 x 37, 33 x 40

9 Slim Jim™

23 Gallon
 20 L x 11 W x 30 H
Suggested Bag Size
 LLD 26 x 43, 30 x 36, 33 x 40
 HD 30 x 37, 33 x 40

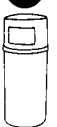
10 Wastemaster™

24 Gallon without Rigid Liner
 14 Sq. x 35.5 H
Suggested Bag Size
 LLD 26 x 43, 36 x 46
 HD 37 x 46, 40 x 48


11 Marshall®/Roun' Top

15 Gallon Rigid Inner Liner
 15.375 Dia. x 27.25 H
Suggested Bag Size
 LLD 26 x 43, 30 x 36
 HD 30 x 37

21 Gallon Rigid Inner Liner
 14.5 Dia. x 30 H
Suggested Bag Size
 LLD 26 x 43, 33 x 39
 HD 30 x 37, 33 x 40

25 Gallon w/o Rigid Inner Liner
 16.25 Dia. x 30.5 H
Suggested Bag Size
 LLD 33 x 39, 40 x 46
 HD 37 x 46, 40 x 48

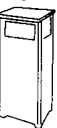
12 Ash-Trash

15 Gallon without Rigid Liner
 15.5 Dia. x 27.25 H
Suggested Bag Size
 LLD 26 x 43, 30 x 36
 HD 30 x 37

25 Gallon without Rigid Liner
 18 Dia. x 30.5 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48

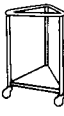
13 Untouchable® Square

19 Gallon
 14.5 Sq. x 24 H
Suggested Bag Size
 LLD 30 x 36
 HD 30 x 37

23 Gallon
 14.5 Sq. x 28 H
Suggested Bag Size
 LLD 26 x 43, 30 x 36
 HD 30 x 37

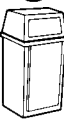
35 Gallon
 19.5 Sq. x 27.625 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48

14 Aspen

12 Gallon Rigid Inner Liner
 13.75 Sq. x 27.375 H
Suggested Bag Size
 LLD 33 x 39
 HD 33 x 40

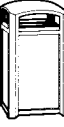
35 Gallon Rigid Inner Liner
 19.5 Sq. x 28 H
Suggested Bag Size
 LLD 40 x 46
 HD 37 x 46

15 Liner Cart

30 Gallon
 18 L x 8 W x 37 H
Suggested Bag Size
 LLD 30 x 46, 33 x 39
 HD 33 x 40


38 Gallon
 18 L x 12 W x 40 H
Suggested Bag Size
 LLD 30 x 46, 33 x 39
 HD 33 x 40

16 Ranger®

35 Gallon Rigid Inner Liner
 16.625 Sq. x 28.5 H
Suggested Bag Size
 LLD 26 x 43, 33 x 39
 HD 33 x 40

45 Gallon Rigid Inner Liner
 18.25 Sq. x 29.125 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48

17 Landmark Series™

35 Gallon Rigid Inner Liner
 19.5 Sq. x 28.5 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48


45 Gallon Rigid Inner Liner
 19.5 Sq. x 34.25 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48


18 Square Brute® Square Huskee

28 Gallon
 21.5 Sq. x 22.5 H
Suggested Bag Size
 LLD 42.5 x 48
 HD 43 x 48


32 Gallon
 21.5 Sq. x 22.5 H
Suggested Bag Size
 LLD 42.5 x 48
 HD 43 x 48

40 Gallon
 23.5 Sq. x 28.75 H
Suggested Bag Size
 LLD 40 x 46
 HD 40 x 48

48 Gallon
 23.5 Sq. x 28.75 H
Suggested Bag Size
 LLD 42.5 x 48
 HD 43 x 48

19 X-Frame

26 L x 25.5 W x 36 H
Suggested Bag Size
 LLD 38 x 58
 HD 38 x 60

20 Galvanized

31 Gallon
 24 Dia. x 27 H
Suggested Bag Size
 LLD 40 x 46
 HD 40 x 48


21 Round Brute®

10 Gallon
 15.625 Dia. x 17.125 H
Suggested Bag Size
 LLD 24 x 32
 HD 24 x 33


20 Gallon
 19.5 Dia. x 22.875 H
Suggested Bag Size
 LLD 30 x 36
 HD 30 x 37

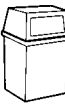
32 Gallon
 22 Dia. x 27.25 H
Suggested Bag Size
 LLD 33 x 39
 HD 33 x 40

44 Gallon
 27 Dia. x 27.25 H
Suggested Bag Size
 LLD 36 x 46
 HD 37 x 46

55 Gallon
 26.5 Dia. x 33
Suggested Bag Size
 LLD 42.5 x 48
 HD 43 x 48

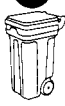
22 Drum

55 Gallon
 24 Dia. x 34 H
Suggested Bag Size
 LLD 36 x 58
 HD 36 x 60


23 Glutton®

56 Gallon without Rigid Liner
 25.5 L x 22.75 W x 31.125 H
Suggested Bag Size
 LLD 42.5 x 48
 HD 43 x 48

24 King Kan

35 Gallon
 20 Sq. x 39.5 H
Suggested Bag Size
 LLD 36 x 58
 HD 36 x 60

50 Gallon Rigid Inner Liner
 22 Sq. x 24.5 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48

65 Gallon Rigid Inner Liner
 22 Sq. x 24.5 H
Suggested Bag Size
 LLD 36 x 46, 40 x 46
 HD 37 x 46, 40 x 48

25 Big Wheel®

50 Gallon
 22.65 L x 26.75 W x 38.75 H
Suggested Bag Size
 LLD 38 x 58
 HD 38 x 60

26 Tilt 'N Wheel

50 Gallon
 27.25 L x 23 W x 41 H
Suggested Bag Size
 LLD 38 x 58
 HD 38 x 60