

AN EXCLUSIVE
GUIDE FOR
POUCH PACKAGERS
REVEALS HOW TO

Fill Right n' Pack Tight



2nd
Edition

By
**Mayank
Shekhar**

India's First Patent Holder
for Linear Weighers

**An Exclusive Guide
for Pouch Packagers reveals how to**

**Fill Right &
Pack Tight
(2nd Edition)**

By

Mayank Shekhar

Creator of Munky™ Linear Weighers
India's First Patent Holder for Linear Weighers

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Introduction

Hello, my name is Mayank Shekhar and I am the Founder and CEO of Shekharson Technologies LLP a fast-growing technology company that manufactures pouch packing machines.

My journey with pouch packing machines started more than a decade ago. I studied Electrical and Electronic Engineering from Manipal Institute of Technology and Management from IIT, Delhi. My quest with pouch packing machines started almost a decade ago when we were making computerised controllers for packing machines. As time progressed I spotted an opportunity where many manufacturers were using volumetric filling leading to multiple issues from inaccurate weights to

sealing problems. I designed an accurate linear weigher and patented it in 2010. We ventured into manufacturing pouch packing machines with these weighers.

I am the creator of the highly accurate Munky Linear Weighing Technology. I can easily say that I am the first Indian to be granted a patent, which makes the kind of work I do unique.

I have authored over 11 books out of which many are in the area of pouch packing.

Over the years I have met many business owners in the field of packaging and have understood their problems and concerns. My machine designs and products are an outcome of all the learnings that I have had over the period of years.

During these years I have understood the way business

owners approach the issue of pouch packing and my research revealed that most of their businesses face some problem or the other in the area of pouch packing.

This book will give you an insight into what are the problems faced by business owners and to solve them easily.

Now you must be wondering as to why am I sharing so much valuable content with you and that too for FREE?

One, I am in love with pouch packing machines and it pains my heart when I see people making wrong choices for lack of knowledge. They land up wasting lakhs of hard-earned money and more than the monetary loss it is the loss of confidence and faith which matters the most.

Two, I am not able to meet each one of you personally and share the understanding and knowledge that I have gained due to time constraints. This book is my small gift

to business owners, plant managers, production heads and maintenance heads who are in the business of packing.

I hope that the following chapters will add some value to your life and will help you succeed in your packing business.

So, let us dive into the content.

Mayank Shekhar



Chapter - 1

Commonly used Filling and Bagging Systems

Filling Systems

Every packing machine has largely two components. One is the filling system and the other is the bagging system.

The filling system as the name suggests is responsible for the accurate dosing of the product in the bag.

Material can be filled in the pouch either on the basis of volume or on the basis of weight. When

the material is filled by volume the volume of the filling unit is calibrated to the weight that is to be packed in the pouch.

To have a deeper understanding of the filling system I would like to explain the concept of bulk density and weight.

Bulk density is the mass of the loosely packed commodity divided by the volume it occupies. Most of the commodities being packed either occur in natural form or undergo some form of processing or they have a mixture of many different products. Due to this the bulk density of the materials usually packed is not consistent. It varies from lot to lot, from time to time and

sometimes within the lot also.

Unit of Packing

One very important point to understand is in which unit do you sell your product? Mostly it is in the unit of weight, which is grams or kilograms. And many units pack their commodities by volume and sell by weight, which is a great anomaly. And then they are concerned that they don't get a good weight accuracy.

$$***Bulk Density (BD) = Mass / Volume***$$

Actually what you are selling in your pouch or jar is by weight (mass) so

$$\text{Mass} = \text{Bulk density} \times \text{Volume}$$

And the Bulk Density is not consistent, so as per the formula above the mass of the material being packed by volume will never be consistent. And weight variation of the packed pouch is only a natural outcome of it.

There are primarily two types of filling systems one that fills by volume and the other that fills by weight.

Volumetric Filling System

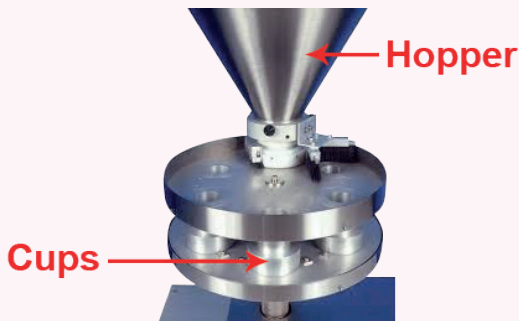
1. Cup Fillers: Used to fill granules and powders

2. Auger Fillers: Used to fill largely free-flowing powders
3. Piston Fillers: Used to fill liquids and pastes

In such systems, there is an inherent variation in the packed weight due to several factors

Factors causing weight variation in volumetric filling systems

1. Cup Fillers

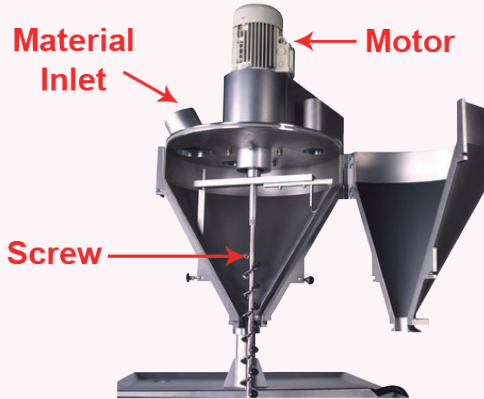


The material is filled in the top hopper from where it falls below in a circular cup whose height can be

adjusted to adjust the volume. The volume of the cup is calibrated to the weight of the material to be packed. As the disc rotates the cups fill below the hopper and when they reach the discharge point the material is discharged in the pouch.

- Sometimes cups are not fully filled with material
- Sometimes cups don't get emptied fully
- Variation in the sizes of the different cups
- Variation in bulk density of the material being packed

2. Auger Fillers

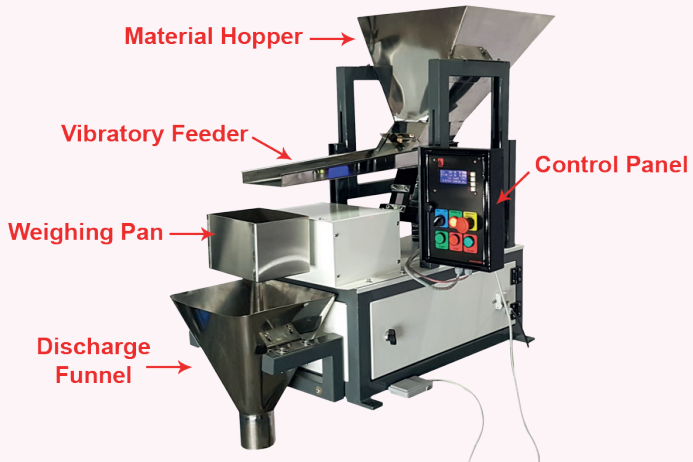


The material that is loaded in the hopper is dosed down into the pouch using a screw. The rotation of the screw pushes the material down in the

pouch. Accurate control of the screw rotation is important for accurate dispensation. The material discharged in one rotation depends on the pitch of the screw. Nevertheless, this is also a volumetric system as material that can be filled in one pitch of the screw is dispensed in one rotation.

- Using induction motors with a clutch brake system. In these machines, the number of revolutions is not accurately controlled so there is a variation. Which can be minimised by using servo-controlled motors.
- Variation in bulk density

3. Weigh Filling System



These filling systems actually fill the material by weight. The material flows through the hopper to the vibratory feeder tray which has two modes:

coarse mode and fine mode for trickle feed and higher accuracy. From here it falls in the weighing pan which is mounted on a load cell where it is accurately weighed before the material is finally discharged into the bagging system.

The weigh fillers can be used effectively for filling both powders and granules. They are available in various footprints of 1 Head, 2 Head, 4 Head, 6 Head and Combination multi-head. Depending on the speed requirement different options can be selected.

Weight variation in Linear Weighers is usually 0.3%-1.0% as against 2.5% - 6% in volumetric fillers.

Bagging System

The bagging system is responsible for converting the laminate roll into a bag, receiving the material from the filling system and then sealing the bag along with the batch coding and batch cutting of the strip.

There are multiple bagging solutions available

1. Sealing with Continuous Band Sealers
2. Chute Bagger
3. Collar Bagger
4. Horizontal Flow Wrap

Sealing with Continuous band sealers

Preformed bags, whether stand up type or pillow pouch or gusset bags can be filled using linear weigher and then sealed using a continuous band sealer.

This forms a simple replacement to manual packing system and is good where chain form of packing is not required and production runs are not very large. Also, they are highly suited where there are many SKUs to be packed and the quantity to be packed per SKU is not high

Chute Bagger

This type of bagger uses a chute former and is suitable for packing pillow packs automatically for weights up to 500gms only.

The pneumatically operated chute baggers have all functionality like pneumatic sealing for both vertical and horizontal seal, batch coding and batch cutting.

Collar Bagger

This type of bagger uses a collar former and is suited for packing pillow packs and gusset packs automatically. The collar former is more

expensive as compared to the chute former. But is more rugged and is preferred for bagging up to 1 kg bags.

This too is pneumatically operated and has pneumatic sealing for both horizontal and vertical seals. It has the functionality of batch coding and batch cutting also.

Horizontal Flow Wrap

This type of bagger is used for filling discrete items like biscuits, cookies, pens, bearings etc. Unlike the collar and chute bagger, it has a horizontal conveyor on which the material is placed and once it travels under the former it wraps the laminate

around the material and seals it.

It also has the provision of batch coding and batch cutting.

Commonly used Filling and Bagging Systems

Chapter - 2

9 Common Problems in Pouch Packing: Causes & Solutions

1. Errors in Packed Weight

Having the correct weight in the pouch is of prime importance not just from a legal standpoint but also from a perspective of customer satisfaction and brand reputation.

To my understanding, no one who is serious about his business will ever give short measures but it is a reality that we do land up in giving short measures much beyond the permissible levels. And I understand that it may not be intentional.

To overcome this issue it is a usual practice to give extra weight so that short measures are taken care of, which results in the upper level of tolerance shifting even further up.

Cause

In my study on reasons for weight variation the two prime reasons why the packed weights are not in conformance with the set weight are :

- 1. Using Volumetric Filling in the packing system.** The variation in volume cannot be controlled effectively and variation in bulk density is another factor that adds to the problem

2. Packing Manually. It is typically a 3 step process where the first station opens the bags and fills the material approximately by hand. The second one weighs it and adds or removes the material till the target weight is reached. The third one does the sealing. In this type of manual weighing and filling methodology, there is a lot of dependence on a person's skill and Human Errors are bound to happen over the whole day's working.

Solution

Using a weigh filling system that weighs the material first and then packs it in the pouch. The accuracy of weight can be easily controlled and

the system can prompt whenever the weight goes out of the set range.

2. Poor Aesthetics

What does a consumer see first in the product? The aesthetics of the pouch that he is going to buy. Poor aesthetics is a fundamental reason why you as a consumer will not have faith in the commodity that is packed inside the pouch.

Having a good seal is not only important for an aesthetically pleasing pouch but also to protect the product packed inside.

Cause

The two reasons for poor sealing quality are

- 1. Sealing by Mechanical Die Rollers.** These are typically used in half pneumatic machines and mechanical FFS machines. There is no control over the temperature of sealing, the time of Sealing and the pressure with which the sealing is done. And in absence of these 3 controls, the sealing area either gets overheated and develops wrinkles or the sealing opens up in case of a weak seal.
- 2. Manual Sealing.** There are several factors to be controlled which may not be possible to be controlled over the entire day's production. Like temperature of sealing, locating the pouch symmetrically every time in the manual sealer.

Solution

Using a fully automatic system with pneumatic sealing for both horizontal and vertical sealing.

If packing manually a continuous band sealer with height adjustment will help in the placement of the bag.

3. Poor Shelf Life

Many packers don't get the desired shelf life for their products and some of the factors that influence the shelf life are given as under which can be easily corrected.

Cause

- 1. Poor sealing.** Results in the outside atmosphere come in contact with the material stored inside the pouch and it gets spoilt before time. This also results in nitrogen (if added to the pouch) leakage thereby losing all the benefits of having an inert atmosphere inside the pouch.

- 2. Poor quality of laminate.** The laminate used for the pouch is made of several layers and each has a different chemistry and purpose. These layers are at times porous and allow the outside atmosphere to come in contact with the material inside. At times the laminate quality is also responsible for a poor quality of sealing which is mostly due to the improper chemistry of the poly that is used in the film of the laminate.

Solution

Use a fully pneumatic machine where both the horizontal and vertical sealing is done using pneumatics. With good control over

- Sealing Temperature
- Sealing Time
- Pressure with which the sealers are operated
- Use a machine that has a provision for nitrogen flushing inside the pouch along with digital control of nitrogen flushing time.
- If using a continuous band sealer then use one with good temperature control and check the pressure of the seal regularly. Also, incorporate a water-dip test at regular intervals to check for leakage.

4. Excessive Loss of Laminate

In many fully automatic machines, a lot of laminate is lost while setting up or while changing from one laminate size to the other. This problem is very typical of mechanical FFS and Half Pneumatic machines.

Causes

- 1. Flimsy Former:** The former is an element of a packing machine that is responsible for converting the laminate in roll form to a pouch. A number of settings are to be done to get the desired shape of the pouch. If the former itself is flimsy the bag shape will never

be consistent and it will take forever to set up the machine

- 2. Flimsy Former Mounting Bracket.** The former is mounted on a bracket. A flimsy mounting bracket with improper fittings will make the former keep shifting and will not allow the bag to be formed in a good shape consistently. Also, it will make the setting of eye-mark and sealing location very difficult.

Solution

1. Use a rigid chute former with the full length
2. Use rigid chute former bracket
3. Use a Collar bagger

5. Empty Pouches in Chain

In India retail pouches of Rs. 5 or Rs. 10 denomination are very popular. They are hung in the form of a chain, the pouches are separated from each other by a perforation cut and the chain may be of 10 or 12 pouches long as the case may be. A common problem faced in this type of packing is that out of all the pouches in the chain one pouch is empty and does not have any material in it.

Causes

- 1. Usage of Mechanical FFS machine for packing**

2. No integration between the filling system and bagging system.

Solution

1. Use a weigh filler coupled with a full pneumatic bagger. And use Weight Ready and Pouch Ready signal logic to integrate both the filler and bagger so that the pouch is formed only once the material falls in the bag.
2. If you are using a cup filler then this problem can be minimised by using position sensors to integrate the filling and bagging system.

6. Unable to pack & dispatch on time

This issue is mostly seen where the packing is being done manually.

Cause

- It is linked to various factors like
- Skill of the person doing the weighing
- Time & motion productivity
- Absenteeism, especially during peak workload
- Labor relations
- Other factors

Solution

Any sort of automation will help.

At a basic level, a simple weigh filler coupled with a continuous band sealer will give immediate relief at a low cost.

7. Difficult to set machine during a change over

There are two aspects to this issue. One is related to the pouch forming and the other is related to the filling accuracy.

a) Pouch Forming

Cause

Mostly found in FFS machines

Solution

Use Full Pneumatic Packing Machine

b) Filling Accuracy

Cause

This is endemic in cup fillers and there is no escape.

Solution

Use Weigh filler, as it has programmable parameters, different settings can be easily recalled for quick changeover.

8. Unhygienic Packing

This issue is mostly seen where the packing is being done manually.

Cause

It is linked to various factors

- Material being packed comes in direct contact with the hand which increases the micro-bacterial load in the material being packed.
- High chance of external contaminants entering the pouch
- Personal hygiene of the operator doing the packing

Solution

Any sort of automation which reduces the human contact with the material being packed will help.

9. Wastage of material due to spillage

This issue is also mostly seen where the packing is being done manually.

Cause

It is linked to various factors

- Due to manual handling spillage occurs during bag filling and addition and subtraction of material from the pouch during the weighing operation.
- During the transfer of bag from one station to the other the bags tend to get tilted and

material comes out

- Improper sealing resulting in opening the bag and changing it

Solution

Any sort of automation which reduces the hand contact and handling helps in resolving this.

9 Common Problems in Pouch Packaging: Causes & Solutions

Chapter - 3

The Biggest Problem - EGA

EGA stands for Extra Give Away.

When you- pack materials into pouches, each pouch will not weigh exactly the same as there will be variations from the set standard weight in each packet. Some will be less, and others will be more.

The amount permissible weight variation is given by the government and is specified in the

packaged commodity rules 2011 and 2017. These can be downloaded from the internet. If you want my team can also share the link from where it can be downloaded.

It is a good practice to give slightly more than what is mentioned on the pouch. But here's the catch, if you give more then how much more can you afford. After all you are running a highly competitive business. More so in today's scenario of ever-increasing raw material costs, it is important to keep a close tab on the excess material which is being given away.

When you fill in volumetric cup fillers, the excess weight can have a significant impact on your

profitability. EGA Stands for Extra Give Away

To explain the concept of EGA, I will use the data as given in the following table.

For the sake of easy understanding, I have taken a sample of 6 observations. However, in actual practice, you should do this over a sample size of 100 observations, to get a realistic picture.

Sl. No.	Observed Wt. (gms)	Set Wt. (gm)	Deviation (Set wt. - Observed Wt.) (gms)
1	250.5	250	$250 - 250.5 = +0.5$
2	249.0	250	$250 - 249.0 = -1.0$
3	249.5	250	$250 - 249.5 = -0.5$
4	251.0	250	$250 - 251.0 = +1.0$
5	252.0	250	$250 - 252.0 = +2.0$
6	249.0	250	$250 - 249.0 = -1.0$
Total	1501		+1 gm

In this example, the set weight is 250 grams (as given in the 3rd column), and all the observations are mentioned as observed weight (in the second column.)

For each row, the weight deviation of the observed weight to the set weight gets calculated by subtracting the two (mentioned in the last column.) When you total all the observed weights, you get 1501 grams, and when you total up the deviations, you get +1gm.

Meaning, for every 1501 gms of material getting packed, 1gm of material is going as extra. If you calculate the percentage, it comes to 0.066%, which is quite low. If you extrapolate this, for every 1.5 kg of material packed, 1 gm goes extra. So for 1500 kg of material packed, 600gm will go extra.

Now I request you to follow the table above and

take the sample data from your actual production. Next, calculate EGA for your production system. You will be surprised to see the results!

Once you have the EGA figure, you will know approximately how many kgs of material you are giving extra in one month, in one year and in five years. And what impact it has on your finances.

I have typically seen that in volumetric cup fillers this figure is anywhere upwards of 3% and in some cases, it may be as high as 8%.

To make your life simpler I have created an excel calculator which you can use to calculate the EGA of your existing production. To download this

free calculator please scan the QR-Code below and it will take you to our website where it can be freely downloaded by entering your basic contact details.

The sample data has been entered in green coloured cells. Just go to your floor and draw out 100 samples of a particular SKU. Note down the set weight and the observed weight of all the 100 samples. Enter this data by overwriting in the green cells. Then click on the button to do the calculation on your data and the result will be displayed in the excel sheet in blue coloured cells. And the beauty of this calculator is that if you enter the rate of material being packed and your production, it will calculate how much material

you are losing in 1 year and 5 years.

This is a must-do exercise and it is my personal recommendation that you do this for your products. At Least you will not b not be in the dark. Your results will be in front of you.

SCAN the QR Code to
download the Excel
EGA Calculator



Incase you are unable to scan the above QR-Code you may go directly to the following url :

https://www.munky.in/ega_calculator

Let me give you an example of financial impact of EGA

Item being packed	CTC Tea
Rate of CTC TEA	Approx. Rs. 200/kg
Average wt. Of pouch	250g
Daily Production	10,000 nos.
Existing EGA	3%
EGA with Munky system	0.3%

Saving using Munky's system	$10,000 \times (3-0.3)\% \times 0.250 \times 200 =$ Rs. 13,500 per day
Saving per month	$13500 \times 30 = 4,05,000$ Rs. (4.05 lacs)
Saving per year	$4.05 \times 12 = 48.6$ lacs/ year
Saving in 5 years	$48.6 \times 5 = 2.43$ Crores

You would have lost this much money or it would come to your pocket if you would have had a clear focus on EGA.

As per my study the Indian pouch packing industry is losing crores of rupees because of a lack of focus

on EGA. Which can be easily avoided.

If you are not happy with your EGA numbers then you must schedule a call with my team of pouch packing application specialists.

Chapter - 4

Let's Recap

Now let's do a quick recap of what we have covered in this book so far.

Commonly used Filling and Bagging Systems

Filling Systems

- Bulk Density
- Unit of Packing

Volumetric Filling System

1. Cup Filler
2. Auger Filler
3. Piston Filler

Factors causing Weight Variation in Volumetric Filling System

Weigh Filling System

Bagging System

1. Sealing with continuous Band Sealer
2. Chute Bagger
3. Collar Bagger
4. Horizontal flow wrap

Let's Recap

Chapter - 5

Conclusion

If you have reached this chapter then I must congratulate you on your perseverance and willingness to make a change. It shows that you have some level of commitment and effort in your being and that you are willing to take action to resolve your problem of pouch packing.

Now at this point in time, you have 2 choices.

One, you now go and identify the packing solution that is most suited for you. I have imparted the knowledge to you and using this

new understanding you can do this yourself.

The second option is to have me by your side. I will do a complete analysis of your application and help you select the most appropriate packing solution that is not just right for the current volume of production but will take care of some increased level of production also.

We can do this over a cup of tea at my office or via a video call on zoom or google meet. We will give you a live demo of the packing solution that is most appropriate for your scenario and will help you select the right fit for your need.

To make your understanding easier, I want you to

fill in the following check sheet. Against each of the parameters that I have given below, I want you to give yourself a score on a scale of 0 to 10, where 0 being least satisfied and 10 being extremely satisfied and happy. Be honest to yourself, this is not for me, this is only for you. It will help you zero down to what you really need to focus on to scale up your pouch packing business.

Parameter	Score
Are you satisfied with the weight variation in any of your products	
How do you rate the quality of your pouch packing	
If you are packing manually, Are you satisfied with your manual packing productivity	
If you are using a mechanical FFS machine, Are you satisfied with your pouch packing quality?	
Are you satisfied with your current method of pouch packing?	

If you have given yourself a score of less than 8 in any one or more of the above parameters, then you must schedule a video call over zoom or google meet with our Gold Standard certified pouch packing application experts.

I have made it super easy to schedule a video call. It can be done by any of the following modes:

Calling or sending a whatsapp request on **+91-9599919442**

Or by Clicking on the following link
<https://www.munky.in/bookme/>

Or just simply scan the QR code



Looking forward to hearing from you.

Warm Regards,

Mayank Shekhar

Pouch Packing Machine Expert

Creator of Munky Linear Weighers



SOLUTIONS FOR PACKAGING

Pulses, Tea, Coffee, Namkeen, Rice, Dry Fruits, Seeds
Whole & Powder Spices, Detergent Powder, Grocery Items, Kurkure, Chips
Puffed Snacks, Vermicelli, Poha, Makhana, Candies, Atta, Sugar and more...

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