

# Encapsulation



Make it better.

# Contents

## Encapsulation

### SOLID FILLING

#### AF series

- 4 AF 40T
- 4 AF 90T
- 4 AF 150T
- 4 AF 200T
- 5 AFT LAB
- 6 AF 25T

#### ZRO series

- 8 ZRO 90T
- 8 ZRO 200T

#### Semi-automatic filling machine

- 10 SA9

#### SECUREFILL series

- 12 SECUREFILL 6T
- 12 SECUREFILL 12T
- 12 SECUREFILL 25T
- 12 SECUREFILL 40T

### LIQUID FILLING

- 15 FLUIDOCAP F70
- 16 FLUIDOCAP 1000

### BAND SEALING

- 18 PROSEAL 70

### ANCILLARIES

- 20 Empty capsule sorter (ECS)
- 21 Sample checkweigher (CW10)
- 22 De-dusting and polishing machine (DP)
- 23 Filled capsule elevator (FCE)
- 24 Metal detector (MD)
- 25 Sorter elevator (SE)
- 26 Product conveying system (PCS)

### SPECIAL ATTACHMENTS

- 28 Customised oral dosage encapsulation (CODE) series

# **SOLID FILLING** **AF series**

# AF series

Find this information on our website:  
Machinery > Encapsulation > Solid fill > AF series

With 2,227 successful installations (and counting) across the world, ACG's AF (automatic filling) series is a versatile high-speed option with a reputation for robustness over longer production runs. Fulfilling all GMP requirements, our AF machines support operations at hundreds of US FDA, EMA, MHRA, WHO and TGA-approved factories and have handled over 3,000 different formulations.

## Applications

Fills pellets, tablets, micro-tablets, capsules, soft gels, and their combinations in capsules



## Features

Features	Benefits
High capsule-filling accuracy thanks to a precise slug-dosing principle	Provides a better yield of high-quality capsules within optimal weight-variation limits, while reducing powder wastage
Partial filling capability (up to 25mg) for capsule sizes 000 to 5	Allows filling of capsule-based dry-powder inhalation (cDPI) formulations with minimum excipients, as well as filling of low-dose API with or without excipients
Quick and easy mechanical changeover	Increases productivity with minimum downtime
Capable of filling powders, pellets, tablets, micro-tablets, capsules, soft gels, and combinations thereof	Diverse filling options expand opportunities to a wider range of capsule products
Can be integrated with ACCURA - online 100% capsule checkweighers	Allows capsule filling and weight-checking in one pass

## Technical specifications

Model	Capsule size	Maximum speed
AF 40T	000 - 5	40,000 capsules/hr
AF 90T	000-5	90,000 capsules/hr
AF 150T	000-5	150,000 capsules/hr
AF 200T	000-5	200,000 capsules/hr

With 2,227 successful installations (and counting) across the world, ACG's AF (automatic filling) series is a versatile high-speed option with a reputation for robustness over longer production runs. Fulfilling all GMP requirements, our AF machines support operations at hundreds of US FDA, EMA, MHRA, WHO and TGA-approved factories and have handled over 3,000 different formulations.

Creating capsule formulations with different capsule sizes and fill combinations with AFT LAB affords greater flexibility, and ensures pharmaceutical products are ready for technology transfer. A fully automatic R&D-scale capsule-filling machine with a small footprint, AFT LAB is the preferred option for laboratories, while its versatile tamping mechanism for powder filling – and its intuitive interface – ensure a smooth scale-up.



### Applications

Fills pellets, tablets, micro-tablets, capsules, soft gels, and their combinations in capsules

### Features

Allows filling up to four sizes of capsule with a single format part	Saves time and effort while allowing simple scale-up of the development process, without any modification in formulations
Can be upgraded to produce up to 25,000 capsules per hour with an easy kit replacement	Scale from R&D to pilot batches on the same machine
Capable of filling powders, pellets, tablets, micro-tablets, capsules, soft gels, and their combinations	Diverse filling options widen the scope for experimentation
Equipped with caster wheels	Quick and easy to install and use anywhere in your lab  A single system for diverse applications

### Technical specifications

<b>Stations</b>	8		
<b>Capsule sizes</b>	000 to 5		
<b>Maximum speed</b>	<b>Capsule size 4</b>	<b>Capsule size 2</b>	<b>Capsule size 1</b>
	6,000 capsules/hr	12,000 capsules/hr	25,000 capsules/hr

# AF 25T

Find this information on our website:  
Machinery > Encapsulation > Solid fill > AF series

With 2,227 successful installations (and counting) across the world, ACG's AF (automatic filling) series is a versatile high-speed option with a reputation for robustness over longer production runs. Fulfilling all GMP requirements, our AF machines support operations at hundreds of US FDA, EMA, MHRA, WHO and TGA-approved factories and have handled over 3,000 different formulations.

For pilot-scale batches, you want a machine that's not only small and versatile, but also gives you capsules of dependably accurate fill weight. ACG's AF 25T is that very machine. Compact and fully automatic, it's perfect for small batches, and offers multiple capsule-filling options for excellent quality output.



## Applications

Fills pellets, tablets, micro-tablets, capsules, soft gels, and their combinations in capsules

## Features

Features	Benefits
Precise slug-dosing principle	Provides a better yield of high-quality capsules within optimal weight-variation limits, while reducing powder wastage
Partial filling capability (up to 25mg) for capsule sizes 000 to 5	Allows filling of capsule-based dry powder inhalation (cDPI) formulations with minimum excipients, as well as filling of low-dose API with or without excipients
Swift and simple capsule size and product changeover	Minimal downtime means enhanced productivity
Capable of filling powders, pellets, tablets, micro-tablets, capsules, soft gels, and their combinations	Diverse filling options allow you to work on a wide range of capsule products

## Technical specifications

<b>Stations</b>	8
<b>Capsule size</b>	000 - 5
<b>Maximum speed</b>	25,000 capsules/hr

**SOLID FILLING**  
**ZRO series**

# ZRO series

Find this information on our website:  
Machinery > Encapsulation > Solid fill > ZRO series

ZRO is a patented ACG technology, developed with a singular objective – to ensure higher yields during capsule filling. With cutting-edge design, ZRO machines simplify the filling of capsules with powders that are difficult to tamp or compact, and reduce powder waste. They also increase yield significantly, and enhance overall equipment effectiveness (OEE).

## Applications

Fills pellets, tablets, micro-tablets, capsules, soft gels, and their combinations in capsules



## Features

Features	Benefits
Patented ZRO technology in the powder-filling station	Achieves excellent capsule yield thanks to far less powder wastage  It can handle sticky, fluffy, hygroscopic, and heat-sensitive powders – and those with a high percentage of fines
Partial filling capability (as low as 15mg) for capsule sizes 000 to 5	Facilitates capsule filling of low-dose APIs, such as inhalation formulations
Simple mechanical changeover in under an hour	Maximum productivity with minimum downtime
Capable of filling powders, pellets, tablets, micro-tablets, capsules, soft gels, and combinations thereof	Fully adaptable to creating a wide range of capsule products
Can be integrated with ACCURA – ACG’s 100% capsule checkweigher	Guarantees accurately weighed capsule

## Technical specifications

Model	Capsule size	Maximum speed
ZRO 90T	000 - 5	90,000 capsules/hr
ZRO 200T	000 - 5	200,000 capsules/hr

**SOLID FILLING**

# **SEMI-AUTOMATIC FILLING MACHINE**

# SA 9

Find this information on our website:  
Machinery > Encapsulation > Solid fill > SA 9

Manual capsule-filling of pilot-scale batches can be daunting and cumbersome, while investing in automatic filling machinery might not seem economically viable. That's when you turn to SA 9 – ACG's semi-automatic capsule-filling machine. Developed with a degree of automation, SA 9 ensures a high fill-weight accuracy and high yields. And you can operate it easily and safely with minimal intervention or maintenance.

## Applications

Fills powders and pellets in capsules



## Features

Automatic loading station	No need for continuous monitoring
Automatic filling station	Reduces operator workload
Capable of filling capsules with powders and pellets	Facilitates working on a wide range of products

## Benefits

## Technical specifications

<b>Capsule size</b>	00	0	1-5
<b>Maximum speed</b>	21,600 capsules/hr	25,200 capsules/hr	28,800 capsules/hr

**SOLID FILLING / CONTAINMENT FILLING**  
**SECUREFILL series**

# SECUREFILL series

Find this information on our website:  
Machinery > Encapsulation > Solid fill > SECUREFILL series

The SECUREFILL series is our high-level containment capsule-filling machine range. It's designed for filling capsules with highly potent drugs, and complies with occupational exposure band (OEB) up to level 4. Built with operator safety in mind, these machines are equipped for filling capsules with oncological, biopharmaceutical, antiviral formulations, and other such highly potent active pharmaceutical ingredients (HPAPIs).

## Applications

Containment filling of pellets, tablets, micro-tablets, capsules, soft gels, and their combinations in capsules



## Features

## Benefits

Designed as a monoblock structure of SS316L containing HEPA filters, a rapid transfer port (RTP), glove ports, and accurate dosing mechanisms maintained in a negative pressure environment	Ensures complete containment, thereby avoiding operator contact within OEL range 1-10µg/m <sup>3</sup>
Provision for contained charging and discharging	Integrated containment for upstream and downstream processes
Wet-in-place system to ensure wetting of all suspended particles in the pharma zone	Protects the operator and the operational environment from formulation residues – and enables easy cleaning
Certified for highly potent and cytotoxic formulations requiring OEB up to level 4	Supports the production of life-saving drugs that contain HPAPIs, such as oncology products
Can be integrated with check-weighers, metal detectors and de-dusters under containment conditions	Ensures safe production of high-quality capsules

## Technical specifications

<b>Model</b>	<b>Capsule size</b>	<b>Maximum speed</b>	<b>OEL</b>
<b>SECUREFILL 6T</b>	00 - 5	6,000 capsules/hr	1-10µg/m <sup>3</sup>
<b>SECUREFILL 12T</b>	00 - 5	12,000 capsules/hr	1-10µg/m <sup>3</sup>
<b>SECUREFILL 25T</b>	00 - 5	25,000 capsules/hr	1-10µg/m <sup>3</sup>
<b>SECUREFILL 40T</b>	00 - 5	40,000 capsules/hr	1-10µg/m <sup>3</sup>

# LIQUID FILLING

# FLUIDOCAP F70

Find this information on our website:  
Machinery > Encapsulation > Liquid fill > FLUIDOCAP F70

This unique series of fully automatic machines is designed for easy liquid-filling of two-piece hard capsules such as ACGcaps™ GL or ACGcaps™ HL. With output options ranging from 20,000 to 70,000 capsules per hour, you can use the machines not only for free-flowing liquids, but also pastes, suspensions, thixotropics and hot-melts.

Fluidocap F70 works best with medium to large batches.

## Applications

Fills liquid and pellets, tablets, micro-tablets, capsules, soft gels and their combinations in liquid



## Features

Features	Benefits
Equipped with 'no-capsule-no-fill' sensors	Significantly less waste
Can handle formulations with viscosity of 10 to 80,000cP	Far easier filling of capsules with pastes, hot melts and thixotropic solutions
Capable of filling liquid and pellets, tablets, micro-tablets, capsules, soft gels and their combinations in liquid	The versatility to create a wider range of capsule products
A built-in nitrogen/inert gas purging system	Supports the filling of oxygen-sensitive formulations

## Technical specifications

<b>Capsule size</b>	00 - 4
<b>Maximum speed</b>	70,000 capsules/hr

# FLUIDOCAP 1000

Find this information on our website:  
Machinery > Encapsulation > Liquid fill > FLUIDOCAP 1000

If you're looking to fill hard capsules with liquid, FLUIDOCAP 1000 is the ideal R&D or pilot-scale machine. It's semi-automatic, and integrates filling, closing and band-sealing processes in one compact and robust package. It can process a wide variety of capsules, from sizes 00 to 4, in gelatine and vegetarian variants.

## Applications

Capsule filling with liquid, hot melts and pastes, and band sealing

## Features

Features	Benefits
A single, small-footprint machine that integrates filling and sealing operations	Optimal use of space
Can handle formulations with viscosity ranging from 80 to 80,000cP	Easy, reliable filling of capsules with pastes, hot melts and thixotropic solutions
Capable of band-sealing and drying filled capsules	Ensures integrity of the dosage form, provides brand distinction, and enhances shelf life

## Technical specifications

<b>Output</b>	00 - 4
<b>Maximum speed</b>	1,000 capsules/hr



# BAND SEALING

# PROSEAL 70

Find this information on our website:  
Machinery > Encapsulation > Band sealing > PROSEAL 70

PROSEAL 70 is a capsule band sealing machine ideal for sealing two-piece hard capsules that can be filled with liquids of varying viscosities along with pellets, tablets, capsules and combinations thereof. PROSEAL 70 can be integrated with FLUIDOCAP, offering a seamless liquid-filling and band-sealing solution.

## Applications

Capsule band sealing

## Features

## Benefits

Three-drum loading and orientation system	Smooth and efficient capsule loading
Provision for manual and automatic gelatine bath replenishment	Flexibility in operation
Option of automatic viscosity control and gelatine recycling system	Better in-process control – ensures the required viscosity  Prevents wastage of gelatine
Improved drying through two blowers – one for suction and another for discharge	Effective airflow management to help drying of capsule seals

## Technical specifications

<b>Output</b>	70,000 capsules/hr
---------------	--------------------



# ANCILLARIES

# Empty capsule sorter (ECS 100)

ECS 100 is designed for the automatic sorting of empty capsules, loose caps, and loose bodies from the filled capsules produced in the automatic encapsulation machine.



Find this information on our website:  
Machinery > Encapsulation > Encapsulation ancillary > ECS 100

## Features

Features	Benefits
Removes all empty capsules and checks for loose caps or loose body	Ensures only filled capsules move further
Compact dimensions	Can be accommodated in the capsule-filling line easily
Simple sorting mechanism	Easy operation and maintenance

## Technical specifications

<b>Output</b>	Up to 200,000 capsules/hr
---------------	---------------------------

# Checkweigher (CW 10)

Find this information on our website:  
Machinery > Encapsulation > Encapsulation ancillary > CW 10

CW 10 is a fully automatic online sample checkweigher designed for statistical weight control of filled capsules. CW 10 provides you with timely reports on statistics of the weight variation within the batch.



## Features

Features	Benefits
Fully automatic operation for sample collection, weighing and reporting	No manual intervention required
Format-free design	Online sample check weighing of capsules of any formulation and dose
Weighing with an accuracy of +/- 1 mg	Reliable results
Sampling can be done on a 'time-interval' basis or 'number of strokes/interval' basis	Flexibility in sampling

## Technical specifications

<b>Output</b>	Up to 10 capsules/min
---------------	-----------------------

# De-dusting and polishing machine (DP)

Find this information on our website:  
 Machinery > Encapsulation > Encapsulation ancillary > DP

DP is a horizontal de-dusting and polishing system that uses the rotating brush concept to continuously remove excessive powder from the surface of capsule shells. It can be integrated with encapsulation machines.

## Features

## Benefits

A polishing chamber with a spiral brush	Ensures effective dedusting of capsules
Provided with an air displacement unit	Ensures complete removal of dust from the capsule shell surface and prevents from settling back
All product contact parts are food grade certified	Ensures safe handling of the product during operation

## Technical specifications

	DP 100	DP 200
<b>Output</b>	Up to 100,000 capsules/hr	Up to 200,000 capsules/hr



# Filled capsule elevator (FCE)

FCE is used for transferring filled capsules between various processes - for example, from sorting to checkweighing.



Find this information on our website:  
Machinery > Encapsulation > Encapsulation ancillary > FCE

## Features

Features	Benefits
Transfers filled capsules using blower units	Transfers filled capsules without any manual intervention
Conveys capsules of all sizes (000 to 5)	Does not require different format parts for different capsule sizes
Automates the transfer of filled capsules	Supports conformance to cGMP norms

## Technical specifications

<b>Output</b>	Up to 250,000 capsules/hr
---------------	---------------------------

# Metal detector (MD)

Find this information on our website:  
 Machinery > Encapsulation > Encapsulation ancillary > MD

MD detects minute particles of metal – ferrous, non-ferrous, and stainless steel – in tablets and filled capsules. The equipment is interfaced with the encapsulation and tablet compression machine, and separates tablets and capsules containing metal traces from the batch of good products.



## Features

## Benefits

100% online detection	Ensures the highest quality levels by rejecting tablets and capsules containing metal traces
High sensitivity to all metals, including non-magnetic stainless steel	Guarantees against any kind of metallic contamination
All contact parts are manufactured with SS316 or FDA-certified food-grade material	Ensures no metal residues are introduced into the capsules from the detector itself; easy to validate the system

## Technical specifications

<b>Output</b>	270,000 capsules/hr	
<b>Detectable particle diameters</b>	Ferrous	0.15mm
	Non-ferrous	0.2mm
	Stainless steel	0.3mm

# Sorter elevator (SE)

Find this information on our website:  
 Machinery > Encapsulation > Encapsulation ancillary > SE

By connecting the SE to the automatic encapsulation machine's empty capsule hopper, defective empty capsules can be diametrically sorted out at the start. This helps prevent stoppage during the filling process.



Features	Benefits
Output of up to 220,000 capsules per hour (depending on the encapsulation machine)	The high speed of the sorter allows it to stay ahead of the encapsulation machine's consumption
Small footprint line machine	Saves space
Integrates with ACG's encapsulation machines to automate capsule loading	Enables complete automation, for smooth operation

Technical specifications		
	SE 100	SE 200
<b>Output</b>	Up to 100,000 capsules/h	Up to 220,000 capsules/h

# Product conveying system (PCS)

Find this information on our website:  
Machinery > Encapsulation > Encapsulation ancillary > PCS

PCS automatically transfers powder/pellets to the hopper, and can be easily synchronised with the capsule-filling machine. Using the vacuum, it transfers the formulation to be filled in the capsules without segregation. PCS is constructed with stainless steel and other food-grade materials to ensure product safety.



## Features

Features	Benefits
Transfer capacity of up to 400 litres per hour	Ensures a quick and constant supply of powder/pellets to the capsule-filling machine
Blower separated from the filling room	Suitable for a silent operation area
No spillage/dusting during transfer	Fully automated and cGMP-compliant
An additional filter bag fitted inside	Ensures safe working environment

## Technical specifications

<b>Output</b>	Up to 400l/hr
---------------	---------------

# SPECIAL ATTACHMENTS

# CODE series

Find this information on our website:  
 Machinery > Special Attachments > Encapsulation > CODE Series

Enabling many innovations for the pharmaceutical industry, ACG's customised oral dosage encapsulation (CODE) series comprises custom-made attachments for special encapsulation needs. Retrofittable on encapsulation machines developed and manufactured by ACG, the CODE series enables the filling of capsules with a wide range of combinations – such as granules, pellets, powders, mini- and micro-tablets, capsules and soft gels.



## Applications

### Solid filling

Powder, pellets, tablets, micro-tablets, capsules and combinations thereof

### Liquid filling

Liquids and pellets, tablets, micro-tablets, capsules, and their combinations in liquid

## Possibilities of filling capsules with different combinations using CODE

Encapsulation machines	Fill type		
	Powder	Tablets / pellets / micro-tablets / capsules	Liquid
AF series	✓	✓	✗
FLUIDOCAP F70	✗	✓	✓
SECUREFILL series	✓	✓	✗
ZRO series	✓	✓	✗
SA9	✓	✓	✗

Features	Benefits
Adept at filling capsules with powders, tablets, capsules, pellets, liquids – and combinations thereof	<p>Achieve highly versatile dosage forms</p> <p>Possibility of combining more than one drug substance and release profile in a single capsule</p>
Combinations of up to four different products types	Create innovative drug products that can facilitate patients' compliance with treatment regimes
Retrofittable to all encapsulation machines across R&D, pilot and production scales	Enhances the versatility of the encapsulation machine without additional investment
Fully customisable to product weight and dimensions	Every attachment is suited to the needs of the application as required
Vision-based inspection systems	For improved-quality capsules with higher accuracy in weight
Minimal change parts required	Higher value for money on investment, and cost-effective in the long term



**Make it better.**

ACG Engineering  
127, Kandivli Industrial Estate,  
Charkop, Kandivali (West),  
Mumbai 400 067, India

+91 22 5012 0700  
sales.engineering@acg-world.com

[www.acg-world.com](http://www.acg-world.com)