

ZRO TECHNOLOGY & MACHINES



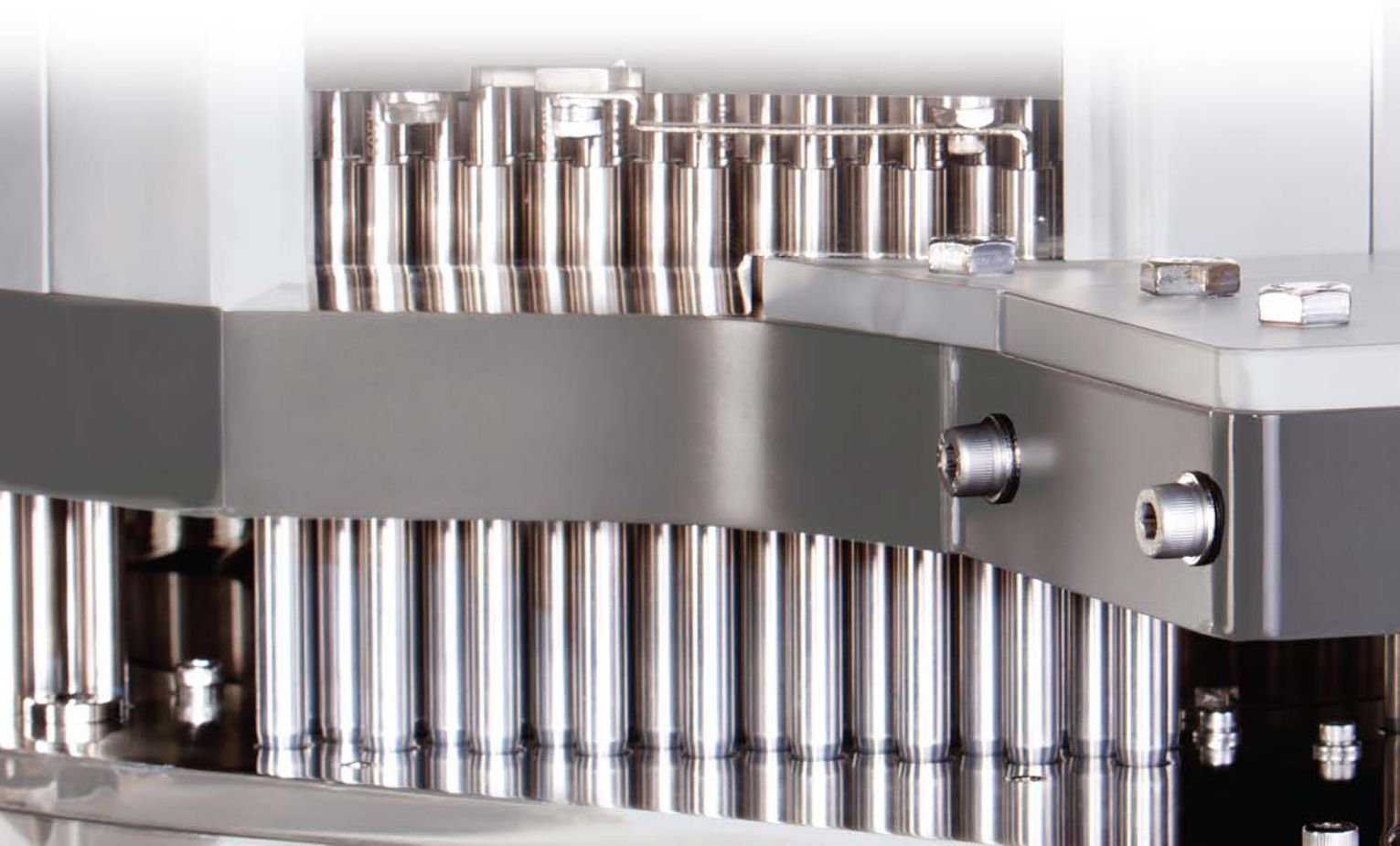
ENHANCED YIELD & IMPROVED SAVINGS



OPTIMIZE YIELD WITH ZRO

Productivity has long been the focus of global pharmaceutical manufacturers. Bigger and faster have been synonymous with new range of encapsulation machines. Although, these have been addressing the industry's growing requirements, costs related to operations have been on the rise, bringing yield optimization into focus.

The ZRO technology, a patented solution by ACG, has been developed with the ideology of stringent weight controls and enhancing yields of capsule filling. The ZRO, with its special design, helps pharmaceutical companies lower wastages and significantly enhance yield. Coupled with ACG's quality promise, ZRO helps in increasing the Overall Equipment Effectiveness (OEE).



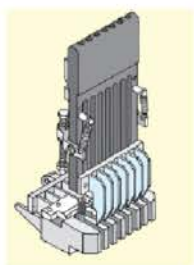


Many formulations that are currently under development or production, present challenges during capsule filling. They are characterized by concerning physical properties such as high percentage of fines, hygroscopicity, elasticity, heat sensitivity, etc.

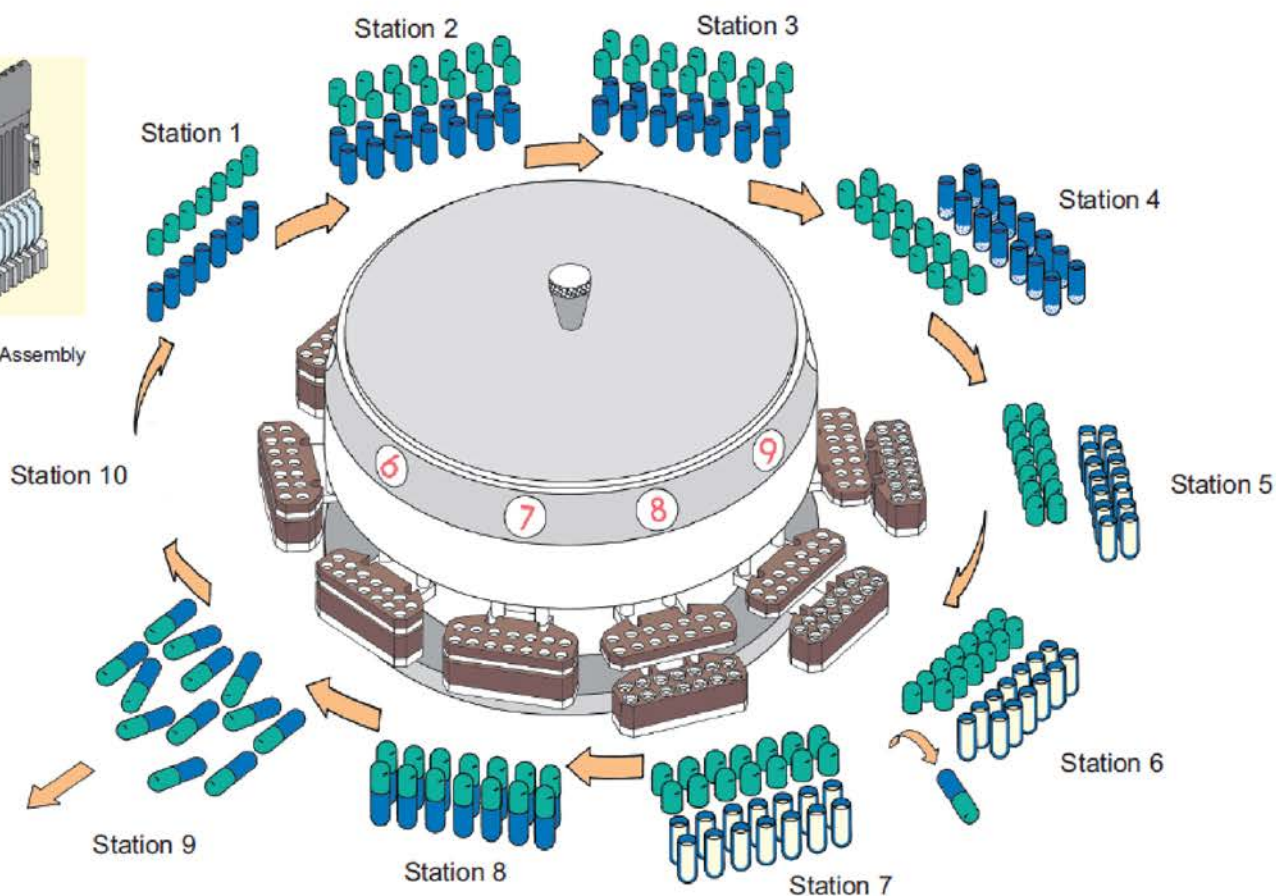
With the path-breaking ZRO technology, encapsulation of difficult formulations is simplified. Built by ACG-Pam, the pioneers of automatic capsule-filling technology in India, ZRO is a modern technology that offers enhanced yield even with difficult formulations.

The ZRO technology is ideal for formulations with characteristics such as:

- Inconsistent particles
- Heat sensitive
- Sticky/hygroscopic in nature
- Free flowing type
- Poor flow & non-slug forming type
- Requiring zero-compaction & direct delivery



Magazine Assembly



OPERATING SEQUENCE

- 1 & 2. Capsules are oriented & loaded into cap/body segment and separated with the aid of vacuum
3. Idle station
4. Optional station for pellet/tablet filling attachment
5. Station for powder filling by tamping
6. Unopened capsule ejection
7. Optional station for pellet/tablet filling attachment
8. Capsule closing station
9. Discharge of filled capsules
10. Cleaning of cap & body segments by air and vacuum

BRIDGING THE GAP WITH ZRO.

The ZRO machines score over conventional capsule fillers by eliminating the gap of 0.8 to 1 mm that exists between the dosing disc and the support pad. This ensures constant support to the slug; hence, better control over dosage characteristics. Nullifying the centrifugal force effects on the powder, the ZRO machine ensures that the powder formulation is contained within the dosing disc during operation.



ZRO 90T

Up to 90,000 capsules/hour



ZRO 200T

Up to 200,000 capsules/hour



Features:

- Patented technology from ACG
- Precise slug dosing principle ensures high fill accuracy
- Capsule size and product changeovers are relatively easy
- Accurate partial filling capability of up to 15 mg
- Conforms with cGMP guidelines

Benefits:

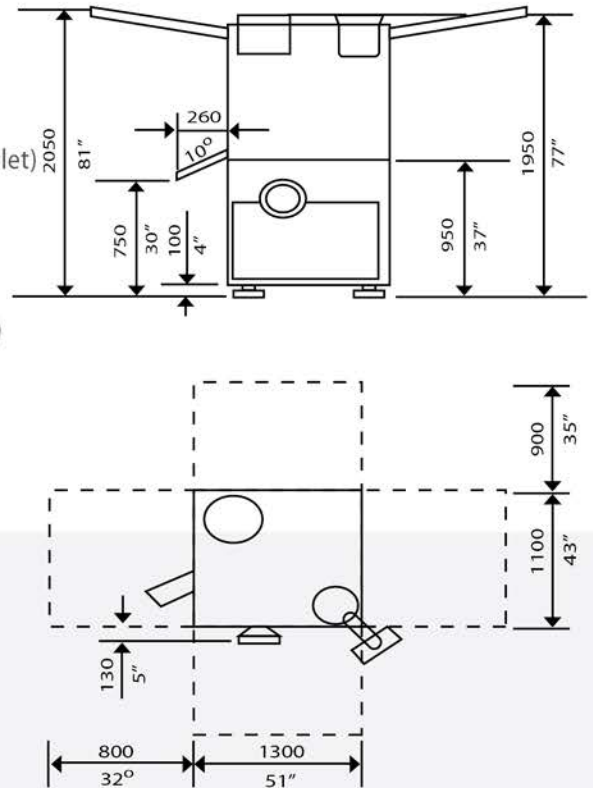
- Increased yield over conventional principles
- Versatility of handling wide variety of powders
- Precise control over weight variation
- Designed to reduce time spent for changeovers
- Offers best-in-class Total Cost of Ownership (TCO) and OEE



Technical Data

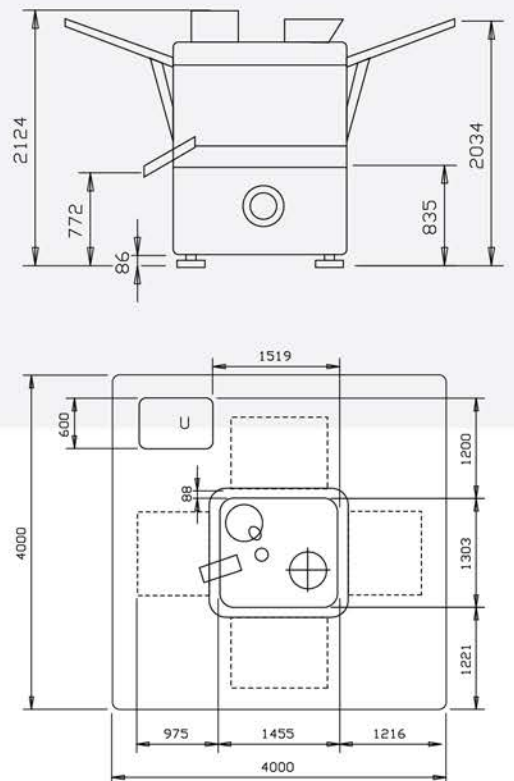
ZRO 90T

| | |
|---------------------|---|
| Output | : Up to 90,000 capsules/hour for power filling : Up to 80,000 capsules/hour for pellet filling : Up to 50,000 capsules for tablet filling (single tablet) |
| Electric Supply | : 415V, 3 Phase +N +E, 50 Hz, A.C. |
| Main Motor | : 1.5 kW (2HP) at 1440 rpm |
| Vacuum Required | : 1,100 LPM at 26° of Mercury (Capsule Separation) |
| Vacuum Required | : 2,800 LPM at 4° of Mercury (Cleaning) |
| Compressed Air | : 300 LPM at 6kg/cm ² |
| Connected Load | : 2.0kW (3HP) approximately for machine only |
| Connected Load | : 8.0kW (11HP) approximately for machine with vacuum pump, air compressor & ADU. |
| Dimensions (mm) | : 1,650 x 1,290 x 2,050 (LxWxH) |
| Gross Weight | : 2,350 kgs. |
| Shipping Dimensions | : 2,140 x 1,600 x 2,200 (LxWxH) |
| Shipping Weight | : 2550 kgs. approx. |



ZRO 200T

| | |
|--------------------------|--|
| Output | : Up to 200,000 capsules/hour for powder filling : Up to 170,000 capsules/hour for pellet filling |
| Electric Supply | : 415V, 3 Phase +N +E, 50 Hz, A.C. |
| Main Motor | : 1.5 kW (2HP) at 1440 rpm |
| Vacuum Required | : 1,100 LPM at 26° of Mercury (Capsule Separation) |
| Vacuum Required | : 2,800 LPM at 4° of Mercury (Cleaning) |
| Compressed Air | : 45 m ³ /hour |
| Connected Load | : 2.0kW (3HP) approximately for machine only |
| Connected Load | : 8.0kW (11HP) approximately for machine with vacuum pump, air compressor & ADU. |
| Dimensions (mm) | : 1,450 x 1,700 x 2,200 (LxWxH) |
| Gross Weight | : 3,200 kgs. |
| Shipping Dimensions (mm) | : 2,100 x 1,950 x 2,400 (LxWxH) |
| Shipping Weight | : 3,500 kgs. approx. |



Due to continuous improvements based on customer interactions, designs and specifications mentioned above are subject to change without prior notice.

Pioneering Technologies Since Four Decades... ACG-Pam.

Technologically Driven

ACG-Pam has been pioneering newer and better technologies for over four decades and helping the pharmaceutical industry address its challenges. With a dedicated team for spearheading the design and development of class-leading technologies, ACG-Pam is constantly engaged in building a range of new product developments (NPDs). From the Accura range of 100% checkweighers to the highly sophisticated ZRO range of capsule-filling machines to the robust and efficient range of tablet presses - ACG-Pam is driven by a passion for innovation and developing market-leading technologies. At the heart of these technologies is our state-of-the-art infrastructure to fabricate precision parts in-house. ACG-Pam is a part of ACG Worldwide, a leading integrated processing, manufacturing and packaging solutions provider for the global pharmaceutical industry.



CODE

Customized Oral Dosage Encapsulation (CODE) helps pharmaceutical companies achieve unique dosage forms for various combinations of formulations. ACG-Pam offers these retrofittable and completely customized attachments for dosing a combination of pellets, powder, mini & micro tablets, capsules, and softgel - all in one capsule. This degree of customization is what differentiates ACG-Pam from the rest. It's not just technology, but solutions that are built to suit specific requirements.



Customer Support

Understanding customer needs and responding with prompt information form the core of ACG-Pam's services. ACG-Pam has a dedicated team of sales and service personnel catering exclusively to customers all over the world. With offices across India, Brazil, China, Indonesia, the UK and the US, ACG-Pam ensures it is within the reach of its customers, always. Customers also have the convenience of logging-in their requests for service, spares and equipment directly through ACG-Pam's website.

Synergistic Solutions

ACG Associated Capsules and ACG Lukaps - both members of ACG Worldwide - are together the world's second largest privately-held manufacturers of empty hard capsules. Catering to the global pharmaceutical and dietary supplement industries in over 100 countries, the companies produce over 80 billion capsules annually through its three plants in and around Mumbai, India, another plant in Ludbreg, Croatia, and a new state-of-the-art facility in Indore, India.

BRANDSHIELD®4C

MARINECAPS®

NATURECAPS®

CLINICAPS®

PEARLZ™

EZEEFIT™

FLOFIT™



About ACG Worldwide

With over fifty years of industry expertise, ACG Worldwide is an integrated processing, manufacturing and packaging solutions provider for the global pharmaceutical industry. The Group synergistically integrates businesses right from granulation and tablet coating equipment to hard capsules and capsule-filling machines; barrier packaging films to blister packing and cartoning machines; tablet compression systems to tablet tooling; vision inspection systems to end-of-line packaging solutions. With the backing of a dedicated R&D facility - SciTech Center - in Mumbai, India, ACG has been committed towards continuous investment in innovative products and technologies that serve the pharmaceutical industry. Recognized as 'Best Vendor' by OPPI, ACG has also bagged awards for several innovative products from IIP & Pharmexcil. ACG serves customers in more than 100 countries and has its subsidiaries and plants in Brazil, Bangladesh, China, Croatia, Indonesia, Thailand, the US and the UK.



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