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# Innovation for Softgel Manufacturing System

Ver. English

Satisfactory after-sales  
service to customers!



**CHANGSUNG**

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*Changsung is providing not only machines and equipment but also technology for high value products.*

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## Company History

### 2010's

- Dec 2019** Developed Capsule Inspection & Capsule Printing machine
- Dec 2019** Developed 780SR machine
- Jan 2018** Developed 380SR machine
- July 2017** Developed 770SR machine
- May 2017** Developed 880SR machine
- May 2015** A prize for Good parts & materials
- Dec 2014** Registration of Korean Patent for vegetable materials
- Nov 2014** Registration of Korean Patent for gel-reclaim system (GRS)
- May 2014** Developed servo R&D machine (SRD)
- Dec 2013** A prize for excellent venture activity
- Nov 2013** A prize for employee-friendly company
- Sep 2013** A prize for Global Growth Ladder and a prize for a company people want to work for
- Aug 2013** Received a                    for Good Risky Assessment and Quality Control System
- Sep 2012** Registration of clean plant

### 2000's

- Dec 2009** Completion of new plant
- Oct 2009** Set up of R&D Center
- Aug 2009** Registration of R&D Center
- Dec 2008** Acquisition of UL certificate
- Aug 2008** Company name change to changsung softgel system
- Jun 2006** Developed vegetable machine, CS-OLUSCAP
- Jan 2006** Developed pharmaceutical softgel machine, CS-500R
- Jun 2003** Acquisition of CE Certificate
- Feb 2002** Acquisition of Certificate for good quality control system
- July 2000** Developed auto sorter

### 1990's

- Dec 1993** Developed CS-J1-300R
- May 1985** Developed rotary type mass production machine
- Sep 1979** Developed blister packing machine
- Jun 1972** Developed flat type softgel machine
- May 1972** Established changsung Auto Machinery Company



## Servo Softgel Machine

1. Fully Automation
2. Animal Softgel for High Output
3. SCADA System / 21 CFR Part 11
4. Easy to change the filling volume on the touch screen (EFA)
5. Auto Gel Thickness control system included (AGT)
6. Linear motor type medicine pump drive

# 880SR

### SPECIFICATION

**Dimension:** 2,400(L) × 1,338(W) × 2,346(H)mm

**Weight:** Approx. 1,800 KG

**Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph

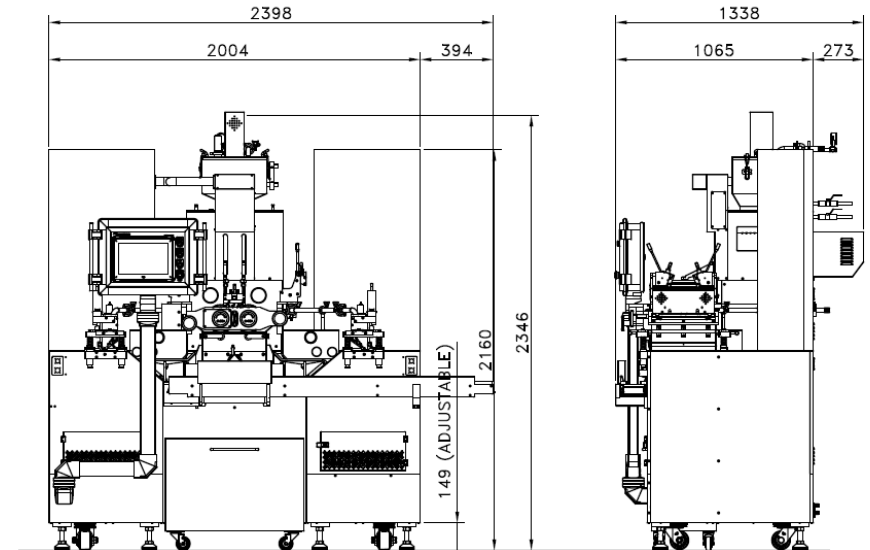
**Power consumption:** 21 kW

**Die roll speed:** 6 rpm

**Compressed Air:** 5 kg f/cm<sup>2</sup>

**Die roll size:** Ø150 x 320 mm

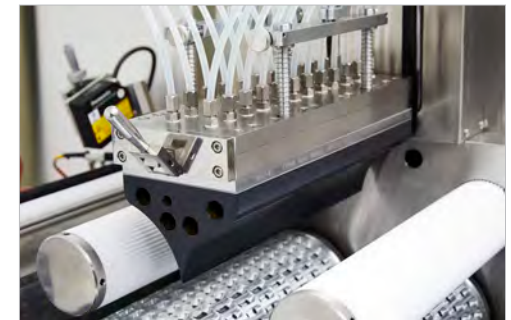
**Productivity:** AVG. 110,000 caps/hr at 6 rpm (Ob#20)



Die Roll Housing



AGT



Wide Wedge



## Servo Softgel Machine

1. Semi-Automation
2. Vegetable Softgel for High Output
3. SCADA System / 21 CFR Part 11
4. Easy to change the filling volume on the touch screen (EFA)
5. Auto Gel Thickness control system included (AGT)
6. Easy attachable capsule striper

# 780SR

### SPECIFICATION

**Dimension:** 2,636(L) X 1,204(W) X 2,429(H)mm

**Weight:** Approx. 1,800 KG

**Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph

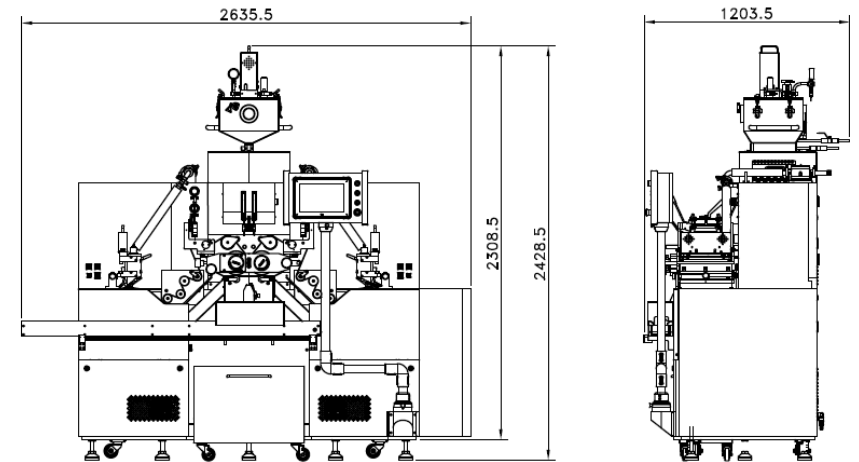
**Power consumption:** 10 kW

**Die roll speed:** 5 rpm

**Compressed Air:** 5 kg f/cm<sup>2</sup>

**Die roll size:** Ø150 x 290 mm

**Productivity:** AVG. 81,600 caps/hr at 5 rpm (Ob#20)



Medicine Filling Pump



Casting Drum



Ribbon extruder



## Servo Softgel Machine

1. Pharmaceutical & Nutraceutical
2. Semi-Automation
3. SCADA System / 21 CFR Part 11
4. Easy to change the filling volume on the touch screen (EFA)
5. Auto Gel Thickness control system included (AGT)

# 770SR

### SPECIFICATION

**Dimension:** 2,329(L) × 1,238(W) × 2,183(H)mm

**Weight:** Approx. 1,700 KG

**Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph

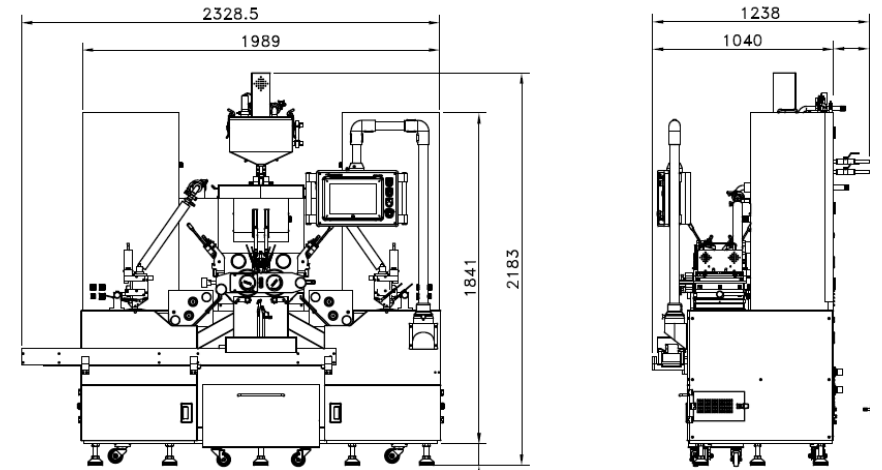
**Power consumption:** 10 kW

**Die roll speed:** 5 rpm

**Compressed Air:** 5 kg f/cm<sup>2</sup>

**Die roll size:** Ø150 x 250 mm

**Productivity:** AVG. 78,000 caps/hr at 5.5 rpm (Ob#20)



Medicine Filling Pump



Oil Roller



Pinch Valve



## Softgel Machine

1. Pharmaceutical & Nutraceutical
2. Easy maintenance
3. Anodizing aluminum and stainless steel frame
4. Contact part with stainless steel 316 or 304
5. Complying with GMP for various safety standard
6. Digital die roll pressure indicator (Load- cell)
7. Metering Pump
8. Complying with TIR securely



# 500R

### SPECIFICATION

**Dimension:** 2,714(L) X 1,245(W) X 2,185(H)mm

**Weight:** Approx. 1,700 KG

**Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph

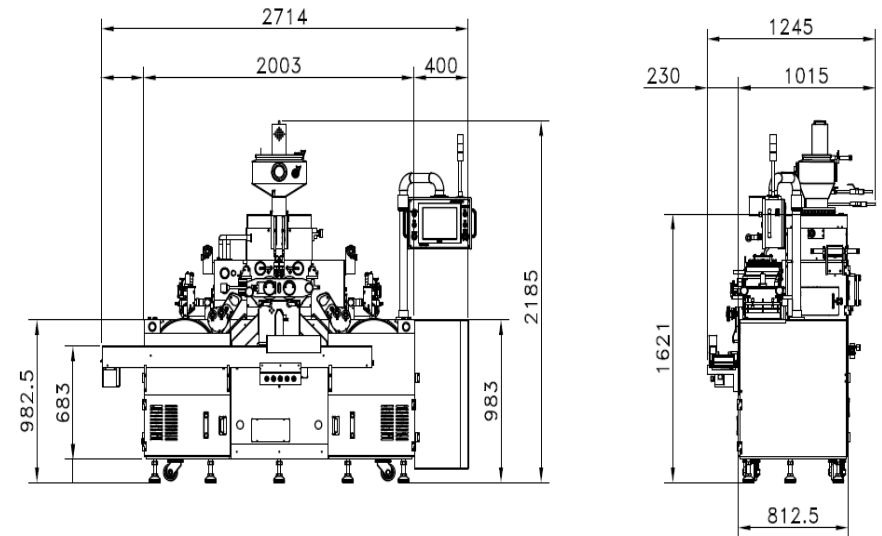
**Power consumption:** 9 kW

**Die roll speed:** 5 rpm

**Compressed Air:** 5 kg f/cm<sup>2</sup>

**Die roll size:** Ø150 x 250 mm

**Productivity:** AVG. 64,600 caps/hr at 4.5r pm (Ob#20)



Medicine Filling Adjustable Knob



Metering Pump



Spreader Box





# Servo Softgel Machine

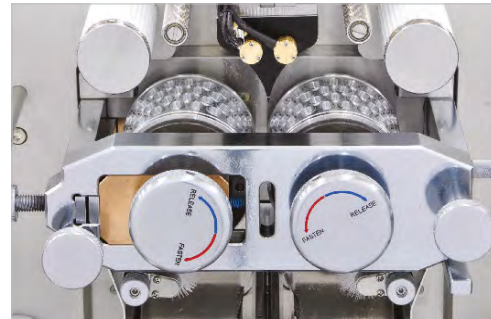
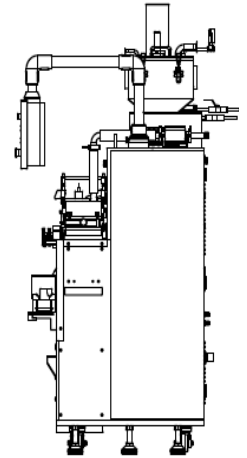
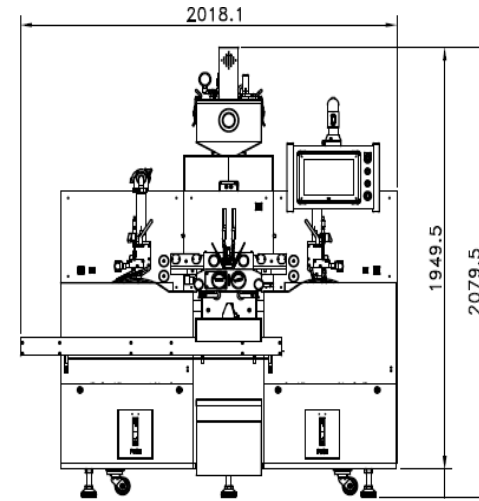
# Fully Automation

- 2. Pharmaceutical & Nutraceutical
- 3. cGMP & Pharmaceutical Softgel production purpose
- 4. SCADA System / 21 CFR Part 11
- 5. Driven by servo motors
- 6. Easy attachable capsule striper

## 380SR

### SPECIFICATION

- Dimension:** 2,018(L) × 960(W) × 2,080(H)mm
- Weight:** Approx. 1,300 KG
- Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph
- Power consumption:** 7 kW
- Die roll speed:** 4 rpm
- Compressed Air:** 5 kg f/cm<sup>2</sup>
- Die roll size:** Ø103 x 183 mm
- Productivity:** AVG. 30,000 caps/hr at 4 rpm (Ob#20)



Die Roll Housing



Wedge



Touch Screen



## Servo Softgel Machine

1. Anodizing aluminum and stainless steel
2. Driven by servo motors
3. Easy to change the filling volume on the touch screen (EFA)
4. Easy attachable capsule striper
5. Complying with GMP
6. Complying with TIR securely

# SRD

### SPECIFICATION

**Dimension:** 1,738(L) X 905(W) X 1,725(H)mm

**Weight:** Approx. 700 KG

**Electric power:** AC 220, 380, 400 V / 50,60 Hz / 3 Ph

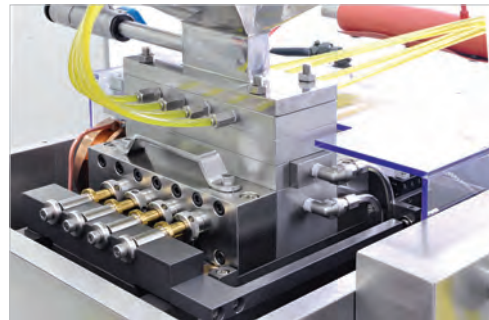
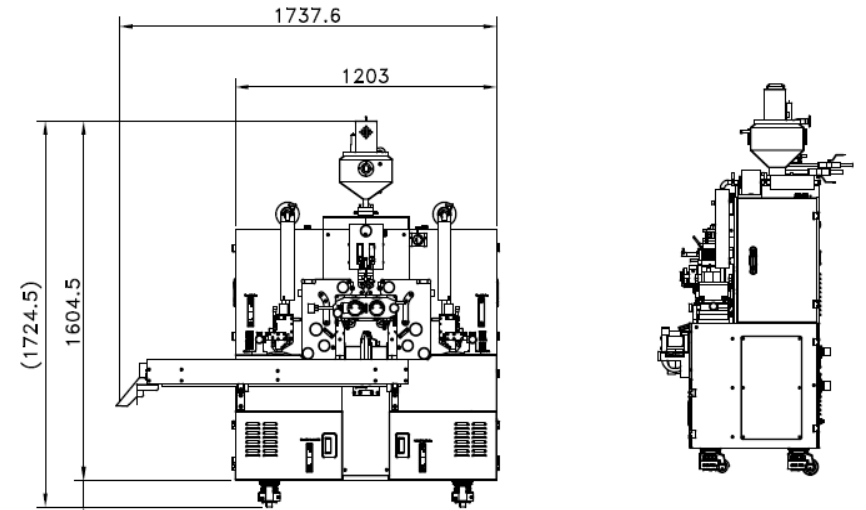
**Power consumption:** 5 kW

**Die roll speed:** 3 rpm

**Compressed Air:** 5 kg f/cm<sup>2</sup>

**Die roll size:** Ø100 x 100 mm

**Productivity:** AVG. 8,000 caps/hr at 3 rpm (Ob#20)



Injection Pump & Pump Block



Separate Control Box



Die Roll Housing



## OLUS Softgel Machine

1. Vegetable shell Softgel production
2. Patented
3. Tapioca Starch or Carrageenan Base Raw material applicable
4. Equipped with Ribbon Extruder to reduce air bubbles

# OLUS

### SPECIFICATION

**Dimension:** 2,400(L) × 1,338(W) × 2,364(H)mm

**Weight:** Approx. 1,800KG

**Electric power:** AC 220, 380, 400V / 50,60 Hz / 3Ph

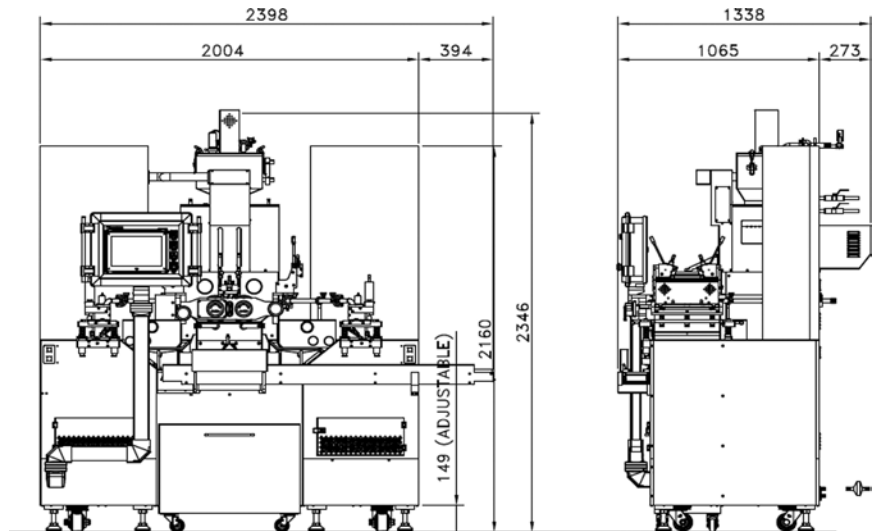
**Power consumption:** 21KW

**Die roll speed:** 3rpm

**Compressed Air:** 5kg f/cm<sup>2</sup>

**Die roll size:** Ø150 x 250mm

**Productivity:** AVG. 43,000caps/h at 3rpm (Ob#20)



Holding Tank for Vegetable Capsule



Ribbon extruder



3 step conveyor



## Auxiliary Equipment - Drying system

1. Seamless Capsules Dryer
2. Batch Dryer
3. TM
4. Drying Tunnel

# Seamless Capsules Dryer

- Seamless capsules drying device
- Improvement air-permeability by double mesh
- Discharge capsules by basket Up-Down and reverse rotation
- Capsule air-gap can be expansion drying by static pressure and air volume



# Batch Dryer

- It is a good dryer for small batch size with expensive products
- Can be connected to air duct from air handling unit
- Can be installed heater for fast dry



# TM

- Standard size of Capsules drying device
- Each basket can be individually controlled (Drying time, and speed)
- Basket size: Ø 650 X 838mm
- About 2,470 CFM/Basket
- Holding capacity: 25,000 caps



# Drying Tunnel

- Faster Drying than open type of drying room
- No cross contamination by various capsules in same room
- Save energy for small batch size of production
- cGMP standard





## Auxiliary Equipment - Drying System

1. TJS
2. Double Deck
3. Capsule Tray

### TJS

- Big batch size dryer
- Can be used for continuous drying system
- Basket size: Ø 730 X 1,320 mm
- Basket lift installed
- About 3,388 CFM / Basket
- Holding capacity: 55,000 caps



### Double Deck

- It is high-efficient to be installed in not enough space.
- It is easy to take in/out basket



### Capsule Tray

- 758(W) X 604(D) X 35(H)mm
- Material-Polypropylene (FDA approved material, 21 CFR 177.1520)
- Loading - 1,000 ~2,000 capsules per tray
- Easy to clean / Protection from scratch and break





## Auxiliary Equipment - Jet Master

1. Each process fully automated by PLC Control
2. Fully GMP compatible
3. Process time & operator ID validation record by printer
4. Various size dryer baskets can be cleaned.



# Basket Washing Machine (BC-500)

### SPECIFICATION

**Power Consumption:** 12.5 kW

**Mist:** 0.4KW

**Voltage:** 220 V, 380 V / 3 Ph

**Detergent pump:** 0.03KW

**Frequency:** 50 /60 Hz

**Water consumption:** Max 40 liter/min

**Main motor:** 0.4 kW

**Fitting type:** Hose nipple (cold, hot, purified water)

**Water pump:** 1.5 kW

**Dimension:** 1,545 X 1,863 X 1,650(H)mm

**Ring blower:** 4 kW

**Heater:** 6 kW

JET MASTER was designed for cleaning tumble dryer basket.

The cleaning time is about 10 minutes for each basket.

The process is pre-washing with cold water > Detergent > rinsing with purified water > Drying



Electronical Basket Trolley



CIP Spray Ball



Touch Screen



## Auxiliary Equipment - Gelatin Preparation System

1. Agitator
  - Anchor & paddle type (with scraper)
  - Cross counter rotation
2. Heating
  - Electronic cartridge
  - Hot water circulation method by heat exchanger
3. Auto gelatin cooking system
  - bubble sensor
  - proportional valve
  - Save cooking recipe
4. reduce the waste gelatin (5-10%)
5. CIP Spray ball



# Gelatin Melting Tank (ONE-POT Series)

### SPECIFICATION

**Capacity:** 300 ~ 800Liter

**Automatic Temperature Control**

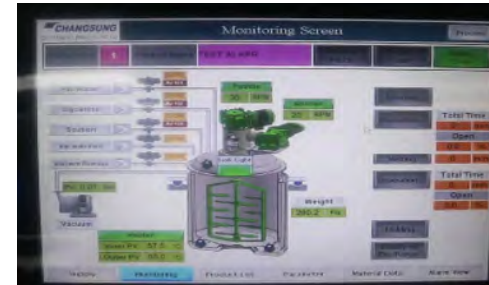
**Material:** STS 316/304

**Touch Screen Panel (Option)**

**Agitator Speed:** 50(1500)

**21 CFR part II (Compliance)**

**Up/Down Type:** Hydraulic Lift



Easy Connection



Sanitary pipeline



Sight glass



## Auxiliary Equipment - Medicine preparation System

1. Impeller(option)
  - Homogenizer type
  - Disper type
  - High share mixer type
2. Heating & cooling (option) is available
3. Nitrogen Blanket (option)
4. Paste medicine preparation is available



# Medicine Preparation System (UFM Series)

### SPECIFICATION

**Capacity:** 100 - 500Liter

**Material:** STS 316/304

**Agitator Speed:** 1,500(3,000)rpm

**Up/Down Type:** Hydraulic Lift

**Touch Screen Panel (Option)**

**21 CFR part II (Compliance)**

**Vacuum pump included**

**LED lighting (Option)**



Sanitary pipeline

Valve system

Touch Screen





## Auxiliary Equipment - Paste Making System

1. Automatic paste preparation system
2. Each tank can be individually controlled(mixing, storage tank)
3. Multi shaft mixer(Anchor type agitator with scraper & high speed saw type disper)
4. Capacity 300-800 liter & vacuum and homogenizer



# Paste Making System (PMS Series)

### SPECIFICATION

**Applicable:** Pharmaceutical, Nutraceutical,

Food industry, Cosmetics

**Dimension:** 4,500 X 1,700 X 2,940 mm

**Material:** STS316, STS304

**Voltage:** 380 V, 60 Hz, 3 Ph / 220 V, 50 Hz, 1 Ph

**Vacuum pump included**

**Colloid mill included**

**Power consumption:** 40 kW

**Weight:** Approx. 2,000 KG

**Positive displacement pump**





## Auxiliary Equipment - Gelatin Reclaim System

1. 99% performance in the material recovered
2. Within 24months invest recovery
3. Any color separation available
4. All STS piping connection
5. Diafiltration
6. Ultra Membrane Filter to improve quality of gelatin
7. Ceramic Membrane Filter to filtering in-organic material

# Gelatin Reclaim System (GRS Series)

### SPECIFICATION

**Dimension:** 12,000X7,000X2,000 mm (GRS4000)

**Amount of water usage:** 50,000 L per day

**Power consumption:** 100 kW (GRS4000)

**Payback period:** Max 24months



1. Gelatin net



2. After M/F



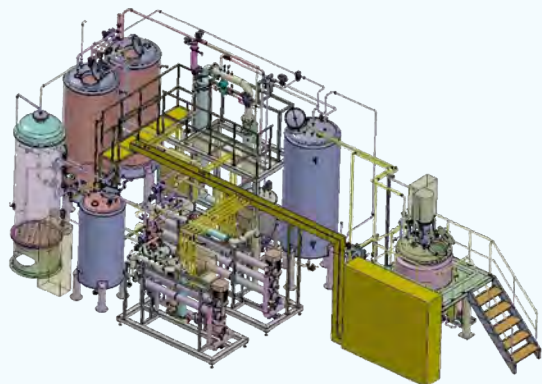
3. After 1st UF



4. After 2nd UF



5. After DC





## Auxiliary Equipment - Capsule Printing Machine

1. Printing available regardless of wet or dried capsules
2. Any size and shape of capsule could be printed
3. No need changing parts
4. Logo(Graphic) printing available



# Capsule Printing Machine (UVP-120)

### SPECIFICATION

**Capacity:** Up to 120,000 caps per hour

**Weight:** Approx. 800 KG

Oblong #20 -> 80k/Hr

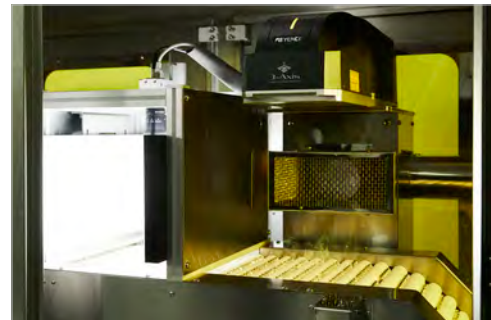
**Input voltage:** 380 V/50 Hz/3 Ph or 208 V/60 Hz/3 Ph

Oval #10 -> 100k/Hr

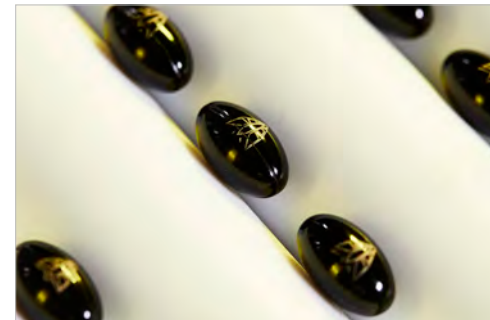
**Power Consumption:** 4.0 kW

Base on less than 5 characters and single layer

**Dimension:** System : 2,200(L) X 950(W) X 2,010(H) mm



UVPrinter



Logo Printing



Letter Printing



## Auxiliary Equipment - Visual Inspection Machine

1. No need changing parts
2. High efficiency lighting plate installed
3. Algorithm method scanning
4. 360° capsule self rotating & analyzing



# Visual Inspection Machine (VIM-100)

### SPECIFICATION

**Capacity :** Up to 100,000 Capsules/Hr  
(Base on characters less than 5 and single layer)

**Total power consumption :** 3.7 kW(Hopper 1.2 kW, Maker 2.5 kW)

**Weight :** Approx. 750 KG

- Features :**
- 360° capsule self rotating & analyzing
  - Total 6 times scanning inspection per capsule by algorithm method
  - Easy defect model registration
  - Enable the utmost sorting ability in applying “Cross Distance Calculating Algorithm” (1.0mm<sup>3</sup> cubical resolution power)
  - With applying the symmetry volume calculation algorithm, realized the highest precise sorting ability (Especially effectiveness for capsule size and deforming sorting ability)



Deforming



Size



Bubble in capsule



Spots



Color



Damaged



Operation part



Roller conveyor



Capsule blowing air holes (2mm gap)



Softgel

# Standard Shapes and Sizes

## ROUND



### 1 Round

minims:0.75-1.00  
cc:0.046-0.062



### 2 Round

minims:1.2-2.0  
cc:0.074-0.124



### 3 Round

minims:2.2-3.0  
cc:0.136-0.185



### 4 Round

minims:2.8-4.0  
cc:0.172-0.246



### 5 Round

minims:3.2-5.0  
cc:0.197-0.308



### 6 Round

minims:4.6-6.0  
cc:0.283-0.370



### 7 Round

minims:5.0-7.0  
cc:0.308-0.431



### 9 Round

minims:7.0-9.0  
cc:0.431-0.554



### 15 Round

minims:12.0-15.0  
cc:0.740-0.925



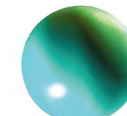
### 20 Round

minims:15.0-20.0  
cc:0.925-1.230



### 28 Round

minims:22.0-30.0  
cc:1.355-1.848



### 40 Round

minims:32.0-41.0  
cc:1.971-2.526



### 90 Round

minims:70.0-80.0  
cc:4.312-4.928



Softgel

# Standard Shapes and Sizes

## OVAL



### 2 Oval

minims:1.5-2.3  
cc:0.092-0.142



### 3 Oval

minims:2.4-3.0  
cc:0.148-0.185



### 4 Oval

minims:3.1-4.0  
cc:0.191-0.246



### 5 Oval

minims:4.3-5.0  
cc:0.265-0.308



### 6 Oval

minims:5.2-6.0  
cc:0.320-0.370



### 7 Oval

minims:6.2-7.5  
cc:0.382-0.462



### 10 Oval

minims:7.5-10.0  
cc:0.462-0.616



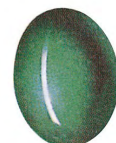
### 20 Oval

minims:17.0-20.0  
cc:1.047-1.232



### 30 Oval

minims:21.0-30.0  
cc:1.294-1.848



### 40 Oval

minims:30.0-40.0  
cc:1.848-2.464



### 60 Oval

minims:41.0-60.0  
cc:2.526-3.696



### 65 Oval

minims:50.0-65.0  
cc:3.080-4.030



### 80 Oval

minims:60.0-80.0  
cc:3.696-4.928



Softgel

# Standard Shapes and Sizes

## OBLONG



**3 Oblong**  
minims:2.3-3.0  
cc:0.142-0.185



**4 Oblong**  
minims:3.0-4.0  
cc:0.185-0.246



**5 Oblong**  
minims:4.0-5.0  
cc:0.246-0.308



**6 Oblong**  
minims:5.0-6.0  
cc:0.308-0.370



**8 Oblong**  
minims:6.5-8.0  
cc:0.400-0.493



**9.5 Oblong**  
minims:7.5-9.5  
cc:0.462-0.585



**11 Oblong**  
minims:10.5-12.2  
cc:0.647-0.752



**14 Oblong**  
minims:12.5-14.0  
cc:0.770-0.862



**16 Oblong**  
minims:14.0-16.0  
cc:0.862-0.986



**20 Oblong**  
minims:16.0-20.0  
cc:0.986-1.232



**22 Oblong**  
minims:18.0-22.0  
cc:1.109-1.355



**24 Oblong**  
minims:20.0-24.0  
cc:1.232-1.478



Softgel

# Standard Shapes and Sizes

## TUBE



### 5 TUBE

minims:2.5-5.0  
cc:0.154-0.308



### 6 TUBE

minims:5.0-6.0  
cc:0.308-0.370



### 8 TUBE

minims:6.0-8.0  
cc:0.370-0.493



### 17.5 TUBE

minims:15.0-17.0  
cc:0.924-1.047



### 30 TUBE

minims:27.0-32.0  
cc:1.663-1.971



### 45 TUBE

minims:40.0-45.0  
cc:2.464-2.772



### 55 TUBE

minims:40.0-55.0  
cc:2.646-3.388



### 120 TUBE

minims:90.0-120.0  
cc:5.544-7.392

## SUPPOSITORIES



### 6 Suppositories

minims:5.0-6.0  
cc:0.308-0.370



### 40 Suppositories

minims:30.0-40.0  
cc:1.850-2.460



### 10 Suppositories

minims:7.0-10.0  
cc:0.430-0.620



### 80 Suppositories

minims:62.0-80.0  
cc:3.819-4.928

## SPECIAL SHAPES

