

TECHNICAL BULLETIN



MACHINERIES AND EQUIPMENT FOR SOYBEAN PROCESSING AND UTILIZATION



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Foreword

Soybean is not only a great source of high quality oil, but contains high quality protein and carbohydrates. It has a great potential in combating the protein mal-nutrition that exist in this country as well globally. It is being used as an oil source since long and the meal is utilized as a feed. However, its food uses are limited in India and other countries.

The Centre of Excellence on Soybean Processing and Utilization, earlier named as Soybean Processing and Utilization Centre (SPU), was established in April, 1985 at the Central Institute of Agricultural Engineering (CIAE), Bhopal by the Indian Council of Agricultural Research (ICAR), New Delhi in collaboration with the United States Agency for International Development (USAID), Washington. The mandate of SPU was to develop proper processing technology for soybean and disseminate those for food uses to make available nutritional and health benefits of soybean to population. Concerted and focussed R & D efforts resulted in development of process technology and equipment for more than 40 soy-based food products suiting to Indian tastes and plates.

The center also conducts 6 days Entrepreneurship Development Programme comprising lectures and hands-on practices at regular intervals. It has trained more than 3000 upcoming entrepreneurs so far. More than 250 trained entrepreneurs from different parts of the country have established their enterprises for production of nutritious soy-based value-added food products.

In this technical bulletin, brief details of relevant machinery and equipment developed by R&D institutes and industries related to soybean processing has been included. This technical bulletin will be useful for upcoming entrepreneurs interested in establishing enterprise for production of soybeans-based food products. The efforts put in bringing this technical bulletin by the scientists of the CESPU are highly appreciable and I congratulate them for publishing this document.

Dated 17th June 2021



(CR Mehta)
Director
ICAR-CIAE-Bhopal

Preface

Soybean is known as the “GOLDEN BEAN” and origin is reported from the China. Soybean has great potential as an exceptionally nutritive and very rich protein food. It can supply the much-needed protein to human diets, because it contains approximately 40 per cent protein of superior quality and all the essential amino acids particularly glycine, tryptophan and lysine, similar to cow’s milk and animal proteins. Soybean also contains about 20 per cent oil with an important fatty acid, lecithin and Vitamin A and D. Soybean is fairly rich in phosphorous and calcium. It has a great potential for generating livelihood through enterprise development and also combating malnutrition.

It has emerged as one of the important commercial crops in many countries. Due to its popularity, the international trade of soybean is spread several countries such as Japan, China, Indonesia, Philippines, and European countries are importing Soybean to supplement their domestic requirement for human consumption and cattle feed. The mandate of CESPU is to develop proper processing technology for soybean and disseminate those for food uses to make available nutritional and health benefits of soybean to population. The contribution of Dr. Nawab Ali, Dr B S Bist, (Late) Dr. S D Kulkarni, Dr. R T Patil, Dr. Jaswant Singh, Dr. A P Gandhi, Dr. Joshi, Dr. K Jha, Dr. Dakshinamurti, Dr. S K Khare, Dr. L K Sinha, Dr. P C Bargale, Dr. Sumedha Deshpande in the upliftment of CESPU is highly appreciated

Realizing the importance of entrepreneurship on soybean processing and economic development through establishment of soy processing enterprise, CESPU started 6-day tailor-made regular training programmes package to upcoming entrepreneurs on soybean processing in 1995.

The main objective of the EDP is to promote the food use of the soybean by providing all necessary technical guidance to the upcoming/budding entrepreneurs/aspiring youth to learn manufacturing process for various soy products coupled with technology/project report preparation etc. For the food use of the soybean, it has to be processed at right conditions to ensure the removal of anti-nutrient factors present in it.





Although many documents on soybean processing and related equipment is available, there is no document in the public domain to provide an insight on various equipment and machineries related to soy processing with details of possible suppliers. In this technical bulletin we have tried to provide the details of the almost all the types of machines which is used in soybean processing from cottage level to industrial level in brief at a single source. This document will be useful to all the upcoming entrepreneurs and provide technical guidance for establishing soybeans-based food enterprise.


Shukadev Mangaraj





Ajesh Kumar V





Punit Chandra

Machineries and Equipment for Soybean Processing and Utilization





S.No	Name	Photographs	Purpose, specification & Approx. cost (Rs.)
1	Hand operated manual double screen cleaner		<p>Purpose: To remove undesired foreign materials such as stones, mud particles, straw, other food grains and dust from the desired grains.</p> <p>Capacity: 10 kg/batch</p> <p>Power source: Two persons</p> <p>Estimated cost: Rs. 4500/-</p>
2	Pedal-cum-power operated double screen cleaner		<p>Purpose: To remove undesired foreign materials such as stones, mud particles, straw, other food grains and dust.</p> <p>Capacity: 330-800 kg/h</p> <p>Power source: One person/ 0.5hp motor</p> <p>Estimated cost: Rs. 21000</p>
3	Manual operated soybean dehuller		<p>Purpose: to remove the soybean hull to prepare soy dal</p> <p>Capacity : 35 kg/h</p> <p>Power source: One person</p> <p>Estimated cost: Rs. 10000</p>
4	Power operated soybean dehuller		<p>Purpose: To remove the soybean hull to prepare soy dal</p> <p>Capacity: 100 kg/h</p> <p>Power source: 0.5 hp motor</p> <p>Estimated cost: Rs. 19800</p>





5	Soybean blanching unit		<p>Purpose: To remove the anti-nutritional factor present in the raw soybean. Capacity: 20 kg/batch Power source: 0.5 hp motor Estimated cost: Rs. 18000</p>
6	Soybean Flaking Machines		<p>Purpose: To make soybean flakes from soybean Capacity: 20 kg/h Power source: 1.0 hp motor Estimated cost: Rs. 20000</p>
7	Multipurpose dryer		<p>Purpose: To remove the excess moisture from the agricultural products to obtain a safe moisture level Capacity: 50 kg/ batch Power source: 2.0 hp motor Estimated cost: Rs.100000</p>
8	Multipurpose mini grain mill		<p>Purpose: For cottage scale milling of grains and spices Capacity: 12-18 kg/h Power source: 1 hp single phase electric motor Estimated cost: Rs. 19000/-</p>




9	Deoiled cake grinder		<p>Purpose: Milling of soybean after the beans have been partially deoiled through an oil expeller.</p> <p>Capacity: 12 kg/h</p> <p>Power source: 5 hp three phase motor.</p> <p>Estimated cost: Rs. 2 lakhs</p>
10	Cottage scale soy milk and tofu plant		<p>Purpose: To cook and grind soybean to make soy milk and soy paneer.</p> <p>Capacity: 300 l milk/50 kg paneer per day (8 h)</p> <p>Power source: Cooking LPG Gas/ 2 hp three phase electric motor</p> <p>Estimated cost: Rs. 180000</p>
11	Screw type Paneer pressing device		<p>Purpose: For removing excess water (whey) from the coagulated soy milk and to provide shape to the soy paneer</p> <p>Capacity: 6 kg/h</p> <p>Power source: One person</p> <p>Estimated cost: Rs. 8600</p>
12	Automatic soymilk plant		<p>Purpose: To prepare soymilk automatically without manual intervention</p> <p>Capacity: 100 l/h</p> <p>Power source: 16 kW heaters and 2 hp three phase electric motor</p> <p>Estimated cost: Rs. 4,50,000</p>

13	Soymilk Deodorizer		<p>Purpose: To remove off flavour/ beany flavour of the soy milk Capacity: 100 l/h Power source: 1 hp Estimated cost: Rs. 50,000</p>
14	Noodle making machine		<p>Purpose: For the cottage scale production of noodles Capacity: 15 kg/h Power source: 0.5 hp single phase motor Estimated cost: Rs. 20000</p>
15	Vermicelli making machine		<p>Purpose: For the cottage scale production of vermicelli Capacity: 50 kg/h Power source: 3 hp three phase electric motor Estimated cost: Rs. 50000</p>
16	Dough Mixer		<p>Purpose: For mixing various ingredients such as flour, sugar, fat, water, and other chemicals for making hard, soft, or fermented dough for making biscuits scale production of vermicelli Capacity: 10 -300 kg dough/batch Power source: 5 -15 hp (arm) & 0.5 – 3.0 hp (bowl) Estimated cost: Rs.</p>

			50000-1000000
17	Dough sheeting machines		Purpose: Used to produce a continuous, consistent dough sheet with the correct width for biscuit making Capacity: 20 kg /batch Power source: 0.5 hp Estimated cost: Rs. 200000- 1000000
18	Baking Oven		Purpose: For the baking of the biscuits Capacity: 100 kg/day Power source: Gas/electric Estimated cost: Rs. 6 lakh
19	Extruder		Purpose: To prepare texturized products Capacity: 100 -500 kg/h Power source: Electric, 20-80 hp Estimated cost: Rs. 10-15 lakh
20	Soy Dal Analogue extruder		Purpose: To prepare soy dal analogue from defatted Soy Flour and Wheat flour/Rice flour/Corn flour Capacity: Power source: 67 hp Estimated cost: Rs. 50 lakh

21	Soy nugget machine		<p>Purpose: To prepare soy nuggets from defatted soy flour Capacity: 100 kg/h Power source: 65-135 hp Estimated cost: 6-10lakhs</p>
22	Soy flour mill		<p>Purpose: To prepare soy Soy Flour Capacity: 80-120 kg/h Power source: 5 hp motor Estimated cost: 1- 1.5 lakh</p>
23	Automatic Soy flour mill		<p>Purpose: To prepare soy flour automatically Capacity: 300-400 kg/h Power source: 5 hp motor Estimated cost: 3-4 lakhs</p>
24	Soy stick making machine		<p>Purpose: To prepare soy stick (snack) from soybean Capacity: 50 kg/h Power source: 1 hp motor Estimated cost: 1.0 lakh</p>

25	Ultra-filtration unit		<p>Purpose: To prepare soy milk with different concentration for further processing Capacity: 1000 liter/h Power source: 3 hp Estimated cost: 10 lakh</p>
26	Soy milk powder plant		<p>Purpose: To prepare soy milk powder from soybean Capacity: 20- 200 litre/h Power source: 15-50 hp Estimated cost: 5- 45 lakh</p>
27	Spray dryer		<p>Purpose: to evaporate the soymilk in to powder form Capacity: 5 kg/h water evaporation Power source: 45 hp Estimated cost: 10 lakh</p>
28	Vacuum packaging machine		<p>Purpose: To remove the air from the package to provide airtight packaging condition Capacity: 20 kg Power source: 1 hp motor with 750 W sealing power Estimated cost: 1.0 lakh</p>

29	Package sealing machine		<p>Purpose: To pack the food products in flexible films which thermoplastic in nature by heat sealing</p> <p>Capacity: 190 x 3 mm sealing width</p> <p>Power source: 220 W</p> <p>Estimated cost: Rs. 2000</p>
30	Soy lecithin plant		<p>Purpose: To extract soy lecithin which is a widely used food additive.</p> <p>Capacity: 2 -10 tonne/day</p> <p>Power source: 10- 55 hp</p> <p>Estimated cost: 15-46 lakhs</p>
31	Soybean oil extraction plant		<p>Purpose: To extract the oil from soybean using the solvent extraction method</p> <p>Capacity: 200 tonne/day</p> <p>Power source: 3 phase 400 kVA electric power</p> <p>Estimated cost: 8 crore</p>

Details of Possible Suppliers of Soybean Processing equipment and machineries

Sl no	Name	Supplier details
1	Hand operated manual double screen cleaner	<p>M/s Laxmi Steel Fabs*., Pachama Industrial Area, Near Satya Sai College, Sehore, MP Email: Dhanlaxibhopal@yahoo.in Contact No.: 9425607880, 9425017929</p> <p>M/s Swastik Agro Industries*., 32, Industrial Estate, Rajnandgaon, CG Email: paragb99@gmail.com Contact No.: 07744-281915, 9301899909, 8518888800, 9713014599</p> <p>M/s Ganga Industries*., Near KrishiUpajMandi, AB Road, Dewas (MP) Email: gangaindustries1991@gmail.com Phone: 07272-255620, 255720 Mobile: 9425049585</p> <p>ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038</p>
2	Pedal-cum-power operated double screen cleaner	<p>M/s MaaDurga Plastic Products*., J-19, MIDC Phase 3, Akola-444 104 (M.S.) Email: paragshahakola@yahoo.com 0724-2258523, 2258528,</p> <p>M/s Vasundhara Krishi Yantra*., Plot no. 4, Lambakheda, Berasia Road, Bhopal Email: vkyu.bpl@gmail.com Contact No. – 9893018158, 09424439158</p> <p>M/s Laxmi Steel Fabs*., Pachama Industrial Area, Near Satya Sai College, Sehore, MP Email: Dhanlaxibhopal@yahoo.in Contact No.: 9425607880, 9425017929</p> <p>M/s Swastik Agro Industries*., 32, Industrial Estate, Rajnandgaon, CG Email: paragb99@gmail.com Contact No.: 07744-281915, 9301899909, 8518888800, 9713014599</p> <p>ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038</p>

3	Manual operated soybean dehuller	ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
4	Power operated soybean dehuller	Metalweld Engineering Private Limited No. 58, FB Scheme, No. 78 Vijay Nagar, Indore - 452010, Madhya Pradesh, 094251 01234 ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
5	Soybean blanching unit	ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
6	Soybean Flaking Machines	ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
7	Multipurpose dryer	Technobel India Neralur Post, Attibelle Industrial Area Thirumagondanahalli Village Bengaluru - 562017, Karnataka, India 072599 52001 ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
8	Multipurpose mini grain mill	M/s Shri Manak Industries*, Plot No. 7-B, Sector "H" Industrial Area, Govindpura, Bhopal (M.P.) Email: manakindustriesbhopal@gmail.com Contact No.: 91-755-2581683, 9993035566, 9425687798 8989821564 M/s Laxmi Steel Fabs*, Pachama Industrial Area, Near Satya Sai College, Sehore, MP Email: Dhanlaxibhopal@yahoo.in Contact No.: 9425607880, 9425017929 M/s Vasundhara Krishi Yantra*, Address – Plot no. 4, Lambakheda, Berasia Road, Bhopal Email: vkyu.bpl@gmail.com Contact No. – 9893018158, 09424439158 M/s Chaurasia Agro Industries*, Jhansi Road Transport Nagar, Soura, Chhatarpur M.P.- 471001 Email: info@chaurasiaagro.com Mobile:9425305522/23

9	Deoiled cake grinder	ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038
10	Cottage scale soy milk and tofu plant	<p>Krishna Industries Plot No 105, First Floor NIT 5, Faridabad - 121002, Haryana, India 08048622240</p> <p>Pristine Plants India (Pvt.) Limited 118 DLF Industrial Estate Phase-1, Faridabad, Haryana 121003 08045800466</p> <p>Pushpanjali Agro Industries, Plot No. 29, Gaurav Park, Near Tangri Bridge, Ambala - 133001, Haryana 08048425035</p> <p>Khalsa Engineers, Machhiwara Road, Kohara, Ludhiana- 141112, Punjab, India 09814080012</p> <p>M/s SSP Pvt. Ltd. 19 DLF, Industrial AreII,13/4, Mathura Road, Faridabad-121003, info@sspindia.com</p> <p>ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038</p>
11	Screw type Paneer pressing device	<p>Krishna Industries Plot No 105, First Floor NIT 5, Faridabad - 121002, Haryana, India 08048622240</p> <p>Pristine Plants India (Pvt.) Limited 118 DLF Industrial Estate Phase-1, Faridabad, Haryana 121003 08045800466</p> <p>Pushpanjali Agro Industries, Plot No. 29, Gaurav Park, Near Tangri Bridge, Ambala - 133001, Haryana 08048425035</p> <p>Khalsa Engineers, Machhiwara Road, Kohara, Ludhiana- 141112, Punjab, India 09814080012</p> <p>M/s SSP Pvt. Ltd. 19 DLF, Industrial AreII,13/4, Mathura Road, Faridabad-121003, info@sspindia.com</p> <p>ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasia Road Bhopal, Madhya Pradesh 462038</p>

12	Automatic soymilk plant	<p>Faridabad Sales Corporation New Industrial Town, Faridabad, Haryana 08048372118</p> <p>Pristine Plants India (Pvt.) Limited 118 DLF Industrial Estate Phase-1, Faridabad, Haryana 121003 08045800466</p> <p>Royal Plant Services 587, Motiram road, behind Jindal oil mill, GT road, Shahadra, Delhi, Delhi, 110032 9971519392</p>
13	Soymilk Deodorizer	<p>Pristine Plants India (Pvt.) Limited 118 DLF Industrial Estate Phase-1, Faridabad, Haryana 121003 08045800466</p> <p>SSP Pvt. Ltd 13 Milestone, Mathura Road Faridabad, Haryana-121 003 01294183700, 01294183777</p>
14	Noodle making machine	<p>S.L. Machinery Khasra No. 38/19, Plot No. 930, Tailes Wali Gali, Near Mundka Industrial Area Metro, Mundka, New Delhi - 110041, India Phone :08035929115</p>
15	Vermicelli making machine	<p>Rising Industries Teghoria, Loknath Mandir, Jhowtala Sukantapally Kolkata - 700157, West Bengal, India 08046026247</p>
16	Dough Mixer	<p>Shanti Engineers P4, New Howrah Bridge Approach Changodar Kolkata - 700001, West Bengal, India 08048108638</p>
17	Dough sheeting machines	<p>Techmate Industries RZ-7, Matiala, Near Delhi Public School, Matiala New Delhi - 110059, India 08048076828</p> <p>Vaibhav Enterprises Plot No.9 Gajanand Nagar Behind Vithoba Lawn Pipla Road Nagpur, Maharashtra Nagpur - 440034, 08048980154</p>

18	Baking Oven	<p>Bakeline Enterprises S. No. 137, Pawane Village, MIDC Pawane Mumbai - 400075, Maharashtra, India 08048110975</p> <p>Machinery Point 103 -3rd Floor, Anklikar Building, Sanvid Nagar Bengali Square Indore - 452016, Madhya Pradesh, India 08048960319</p>
19	Extruder	<p>M/s Dynamech Engineers Palsikar Colony, Indore, Madhya Pradesh 452007</p> <p>Grace Food Processing & Packaging Machinery Nambardar Estate, 85, Taimoor Nagar New Friends Colony New Delhi-110065, 8048618058</p>
20	Soy Dal Analogue extruder	<p>Malik Engineers Vasai Rd E, Samarth Krupa Nagar, Vasai East, Vasai-Virar, Maharashtra 401205</p>
21	Soy nugget machine	<p>Sara Udyog Sector 10, Noida, Dist. Gautam Budh Nagar 08048601769</p> <p>Panda Machines Private Limited (OPC) Bhubaneswar, Dist. Khorda 08048119531</p>
22	Soy flour mill	<p>Quickveg Food Processing Solutions Plot No. 120, Birla Hospital, Keshav Nagar, Talwade, Bhopal-485001, Madhya Pradesh, 08068970104</p>
23	Automatic Soy flour mill	<p>Quickveg Food Processing Solutions Plot No. 120, Birla Hospital, Keshav Nagar, Talwade, Bhopal-485001, Madhya Pradesh, 08068970104</p> <p>Krishna Industries Rudrapur, Dist. Udham Singh Nagar-263153, Uttarakhand, India 09458304982</p>
24	Soy stick making machine	<p>Jas Enterprises B-326, 3rd Floor, Sumel 7 Rakhial Ahmedabad - 380023, Gujarat, India 08048764915</p> <p>FRY-TECH FOOD EQUIPMENTS PRIVATE LIMITED S. No. 4, Raviraj Industrial Estate, Bhikhubhai Mukhi Ka Kuwa, Bharwadvas, Ramol, Ahmedabad - 380024, Gujarat, India 08042952490</p>

25	Ultra-filtration unit	<p>Marcuras Water Treatment (India) Pvt. Ltd. W - 194 - B, S - Block, M. I. D. C., Bhosari , Pune - 411026, Maharashtra, India Phone: 08376808277</p> <p>Lotus Environment Technology Pvt Ltd, Office No. 111, 1st Floor, South Block - A, Fortune Estate, Akashwani, Hadapsar, Pune -411028, Maharashtra, India Phone: 08376806482</p> <p>Shiva Global Environmental Pvt. Ltd, G - 42, Ground Floor, Dilsad Colony, New Delhi - 110095, Delhi, India Phone: 08586978340</p>
26	Soy milk powder plant	<p>Global Engineers Hamid Nagar, Asansol, Paschim Bardhaman, West Bengal 713301 08048371584</p> <p>Soy for Health Sector 62, Noida, Gautam Budh Nagar 201309, Uttar Pradesh, India 8048371643 08048371643</p> <p>Krishna Industries Rudrapur, Dist. Udham Singh Nagar-263153, Uttarakhand, India 09458304982</p> <p>SSP Pvt. Ltd 13 Milestone, Mathura Road Faridabad, Haryana-121003 01294183700, 01294183777</p>
27	Spray dryer	<p>Excel Plants & Equipment Pvt Ltd, Pune Gat No. 611, Mouje Kuruli, Chakan M. I. D. C., Tal-Khed , Pune - 410501, Maharashtra 08048610325</p> <p>Advanced Drying Systems 125, Vora Industrial Estate 4, Navghar Vasai East, Mumbai - 401210, Maharashtra, India 08097297073</p> <p>Supreet Engineers Private Limited J-307/1, MIDC, Bhosari , Pune - 411026, Maharashtra, India Phone: 08447571307 9225626901</p>

28	Vacuum packaging machine	<p>Monarch Appliances Jeel Complex, 16, Vijay Plot, Gondal Road Bhakti Nagar Rajkot - 360002, Gujarat, India 08048761962</p> <p>Royal Pack Industries Gala No. 43, Universal Industrial Estate, Ground Floor, Goregaon East Goregaon East Mumbai - 400063, Maharashtra, India 08048077728</p>
29	Package sealing machine	<p>Sepack India Private Limited 3rd Floor, Mathewsons Building, High School Jn. Edappally Kochi - 682024, Ernakulam, Kerala, India +91 - 0484 - 7190990, 3090930</p> <p>Advance Packaging Gala No. 17, Jaimataji Society, Perubauge Compound, Asalpha Ghatkopar West Mumbai - 400084, Maharashtra, India 08046056659</p>
30	Soy lecithin Plant	<p>Pre-Tech Engineering Plot No. 9/1, Industrial Area, Govindpura Govind Pura Industrial Area Bhopal - 462023, Madhya Pradesh, India 08048704583</p> <p>Vinksons India Private Limited Halka No.05, Khatipura, Near Gauri Nagar, Agrawal Compound Sukhlia Indore - 452010, Madhya Pradesh, India Get Directions 08048600201</p> <p>Spectec Techno Projects Private Limited Tapas Kumar Das Off No. 905, 9th Floor, Ansal Bhawan, KG Marg, Connaught Place New Delhi - 110001, India 08048087615</p>

31	Soybean oil extraction plant	<p>Servotech India Limited Eureka Tower Malad West Mumbai - 400064, Maharashtra, India 08048077515</p> <p>Shree Balaji Engineering Works G-677, No. 9, F-2, Vishwakarma Industrial Area, Jaipur - 302013, Rajasthan, India 08048580764</p> <p>Pre-Tech Engineering Plot No. 9/1, Industrial Area, Govindpura Govind Pura Industrial Area Bhopal - 462023, Madhya Pradesh, India 08048704583</p> <p>N & T Engitech Private Limited Shop No 315 3rd Floor, Sh 41 Industrial Area Diamond Complex, Chhapi Banaskantha - 385210, Gujarat 08048923639</p> <p>H K Consultants & Engineers Private Limited, Kakarwal, Barnala Road Dhuri - 148024, Sangrur, Punjab 08048762826</p>
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Disclaimer: The details of the manufacturers are taken from personal discussion and information available in public domain. ICAR-CIAE does not take any guarantee of the quality of the machine from these manufacturers.

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