



CCS Granulating Line

Mixing, Granulating and Drying in Combination.



Granulating with the experts.

DIOSNA machines are used and highly appreciated by almost all leading pharmaceutical companies worldwide. Our large installed customer base is the result of unrivalled efficiency and reliability of the DIOSNA design. DIOSNA systems stand for efficient pharmaceutical production of constant high quality.

More than 125 years of experience have led to a wealth of process expertise, DIOSNA understands and provides support for **your** process.

DIOSNA offers the principal elements of modern solids production plant - the mixer-granulator and fluid bed dryer - from one source. In our CCS concept these two pieces of equipment are coupled together. This allows optimal arrangement of the production area, and the most effective interfacing. Ancillary equipment can be integrated as required.

Process consulting
Product and process development
Plant engineering
Production, installation
Qualification, start up
Service, training



Laboratory plants
Pilot scale plants
Production plants



CCS with horizontal product flow.

Innovative systems which work.



DIOSNA CIP cartridge filters



Hinged material bowl



Toollift



Tangential spray nozzle



NIR sensor on fluid bed

- **Efficiency:** reproducible processes and automated programmes with low set-up times
- **Safety:** 12 bar pressure-shock proof design, using proven safety concepts
- **Cleanability:** comprehensive cleaning concepts from WIP to CIP
- **Through-the-wall-concept:** strict separation of production and technical area
- **Containment:** special solutions for highly active substances
- **Future-proof:** Top-Spray-/ Bottom-Spray-/ Tangential-Spray-processes in the fluid bed dryer
- **Qualification:** pharma standards according to GAMP 5
- **Quality control:** Integration of PAT
- **Reliability:** Don't worry, it's a DIOSNA!

Machines to meet your quality standards.

Wet granulation with subsequent drying is a reliable and efficient method for the production of tablet granules. It is suitable for most products.

However formulation requirements of the final product can sometimes make spray granulation in the fluid bed necessary. In this case the plant is prepared or modified correspondingly.

We will help to define the most suitable granulating process and ideal process parameters for your special application. From the clinical sample to the production batch.



Mixing blade and chopper.

A complete service from one source

Single sourcing pays.

Mixers and dryers are matched. The installation can be optimised and maximum efficiency of the production process is guaranteed.

Either vertical or horizontal product flow can be provided.

Both pieces of equipment are operated from a common operator interface. Nevertheless, each machine remains independent and can be run without the other at any time. Not only does the combination of the plant components allow for a completely closed product transfer and the utilization of common cleaning devices but also provides simple and effective controls for the operating and maintenance personnel.



Product transfer through stainless steel pipes

Sometimes less is more. DIOSNA does not have the ambition to build all peripheral components by ourselves. Instead we work with a network of certified partners who share our philosophy of high quality and functionality and who maintain a leading role in their field of activity. This strategy provides our customers with integrated systems without the risk of weak links in the process chain.



Effective process controls.

The control system is an important element of the plant. DIOSNA develops the hardware and software on the basis of industry-standard systems - for quick support around the world.

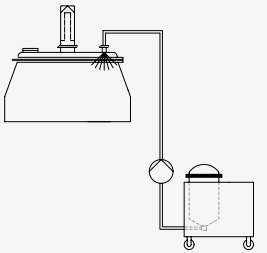
Moreover, the intuitive operator guidance and recipe management interface provides operator-friendly operation.

The software used complies to 21 CFR Part 11 and offers comprehensive acquisition and documentation of batch data.

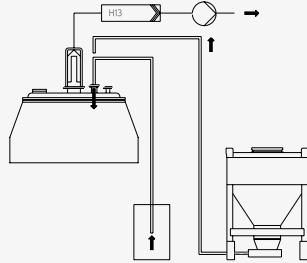


CCS controls for comprehensive and comfortable operation.

Addition of granulating liquid



Vacuum feeding



The DIOSNA mixer and fluid bed systems are configured for the individual single case and adjusted specifically to the concerned requirements by various options. (refer to individual brochures)

DIOSNA P Mixer-Granulator

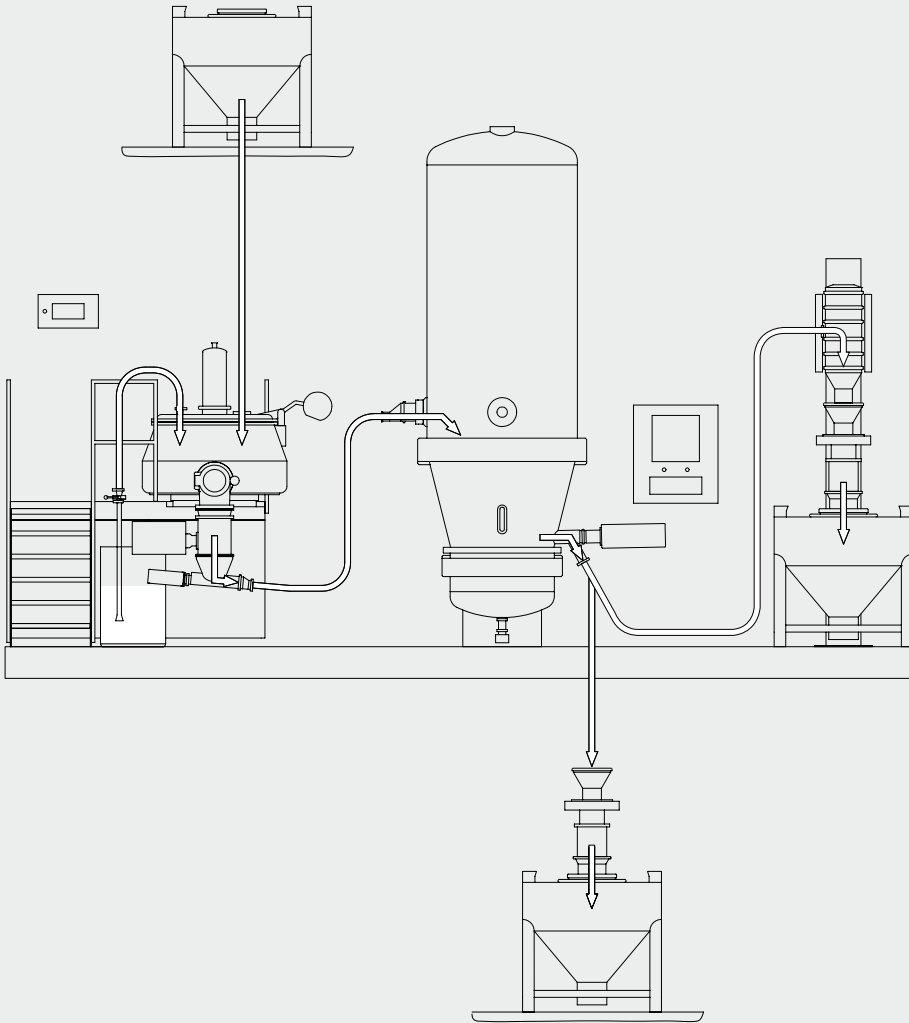
DIOSNA is a pioneer in mixing technology. Continuous development has resulted in the most successful mixer-granulator worldwide. The interaction of bowl shape, chopper and mixing tool geometry makes the machine suitable for a very wide range of applications and guarantees the greatest machine flexibility.

Our design can fulfil any requirements: powder and binder feeding systems and integrated wet mills complete the programme.

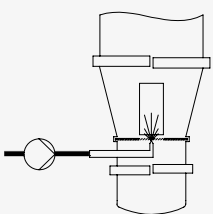
DIOSNA CAP Fluid Bed Processor

The CAP Fluid Bed Processor dries the granules effectively - directly after granulation. The closed system product transfer is achieved pneumatically using vacuum assistance from the dryer.

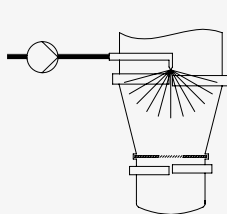
While drying the required residual moisture level of the granule is set. A special air distributor plate provides helical air movement within the chamber allowing better energy utilisation - resulting in faster drying and very gentle product handling. The fluid bed processor can be configured as required to coat or granulate particles with Top-, Bottom- or Tangential-Spray.



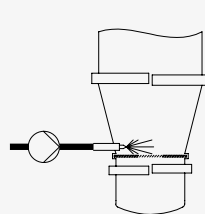
Bottom-Spray-processes



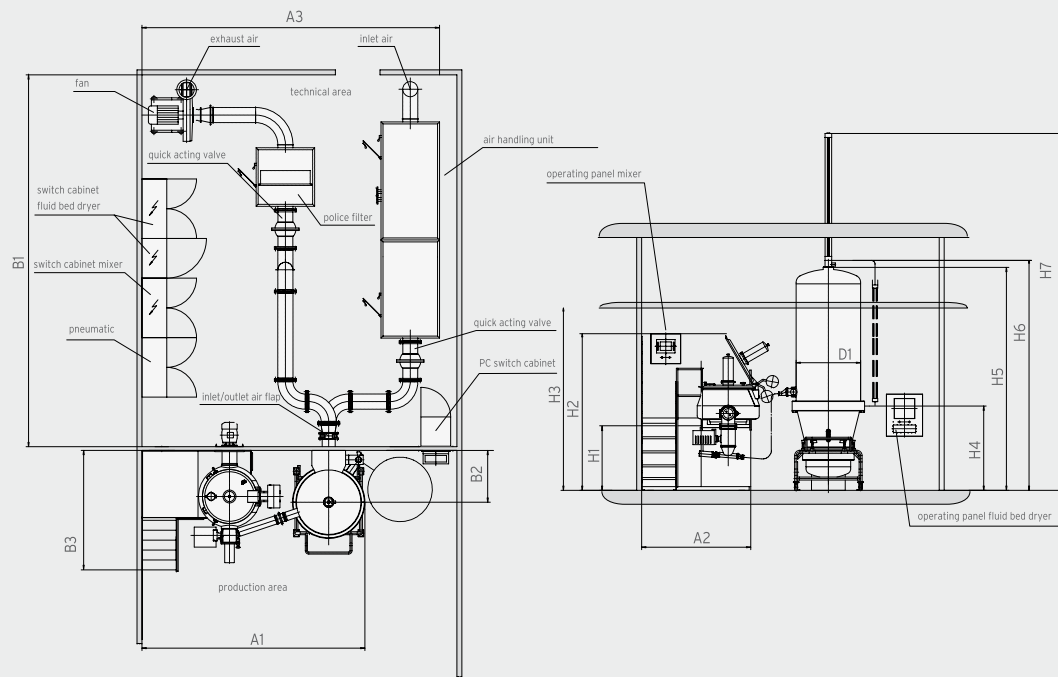
Top-Spray-processes



Tangential-Spray-processes



DIOSNA. Production Scale Processing Plants



Dimensions (mm)	D1	H1	H2	H3	H4	H5	H6	H7	A1	A2	A3	B1	B2	B3
CCS 150	900	800	2000	2900	1220	3600	3750	5700	4500	2000	4500	5500	850	1665
CCS 300	1200	800	2515	2900	1500	4500	4650	7400	5600	1800	6000	7000	1000	1665
CCS 400	1200	1200	2775	3300	1500	4600	4750	7600	5900	2200	6000	7000	1000	2410
CCS 600	1400	1200	3030	3300	1725	4900	5050	8100	6300	2200	6500	7000	1200	2900
CCS 800	1550	1400	3385	3600	1875	5250	5400	8550	7000	2400	7000	8000	1300	2900
CCS 1000	1700	1600	4055	4100	1950	5100	5250	8300	7500	2600	7500	8000	1400	3100
CCS 1250	1900	1600	4055	4100	2200	6000	6150	10800	7500	2600	8000	9000	1500	3100
CCS 1800	2100	1800	4800	4900	2400	6200	6350	11300	8800	3200	8500	9500	1700	3800

* product and process dependent

*² basic design incl. mills and vacuum discharge

*³ saturated steam

*⁴ cooling water 6/12°C

Data refer to the basic design. Further plant sizes on request. We reserve the right to change technical data and design.

Technical Data	max usable volume (l) [*]	Typical batch size range (kg) [*]	air flow rate (Nm ³ /h)	Total Power supply (kW) ^{*2}	max. compressed air supply (Nm ³ /h) ^{*2}	max. steam consumption (m ³ /h) ^{*3}	max. cooling water consumption (m ³ /h) ^{*4}	Total WIP supply [m ³ /h]
CCS 150	150	25 - 75	1650	43	170	80	4	3 - 4
CCS 300	255	40 - 130	3500	62	170	150	6	4 - 5
CCS 400	385	70 - 190	3500	70	170	170	7	4 - 5
CCS 600	550	90 - 280	4500	95	180	210	9	4 - 6
CCS 800	720	120 - 360	6000	125	180	300	12	4 - 6
CCS 1000	1000	200 - 500	8000	180	190	390	17	4 - 6
CCS 1250	1200	200 - 600	9500	205	200	460	20	5 - 7
CCS 1800	1600	270 - 800	12500	275	250	610	25	5 - 7



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