

DELTA NUTSCHE FILTER DRYER – DNFD

Since 1968 Delta designs and manufactures equipment and dryers for pharmaceutical application. Hundreds of DELTA dryers and filter-dryers have been delivered to the major pharmaceutical companies all over the world and are successfully operating. Delta approach is based on innovation and flexibility, quickly responding to customer needs with smart and easier technological solutions, thus improving DNFD performances in each step of drying process:

Filtration

With Delta DNFD the filtration process reaches a dryness higher than other standard filters, indeed the final squeezed cake is comparable to that obtained by centrifuges.

Washing

Through several cycles of re-slurry and filtration, the machine allows you to wash the product with a suitable solvent and in a more effective way. This process is led by a clockwise agitator movement.

Vacuum drying

The product can be vacuum-dried by means of both bottom and side vessel heating while the chamber is under vacuum. In some cases it's also possible to blow the product with an inert suitable dry hot gas.

Automatic discharge of dried product

Once the product has reached the required dryness level, it is automatically discharged through the side discharge valve.



Design and construction according to the highest quality standards:

- FDA and GMP
- ASME BPE
- ASME U-Stamp
- PED
- ATEX



Construction materials:

- Austenitic stainless steel
- Nickel based Alloys
- 904L, duplex stainless steel
- Other materials on request

DELTA NUTSCHE FILTER DRYER ADVANTAGES

● Product Purity

DNFD greatly improves product purity and minimizes safety and environment problems related to the chemical ingredients manual transport.

● Excellent Cleanability

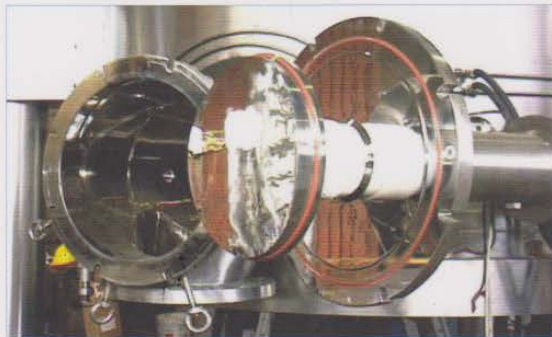
Delta designs and manufactures each component and chooses each material to avoid product contamination and to allow efficient cleanability. The machine is designed for CIP & SIP and easy access to all internal parts

● Easy and safe operations

All DNFD operations and parameters can be easily controlled by local control panel or by a PLC. DNFD allows to work always in safe condition, minimizing operation exposure hazards.

● Efficiency

The robust and smart design of internals allows a smaller gap between the agitator and the bottom thus leading to a higher efficiency and lower quantity of residual product after discharge.



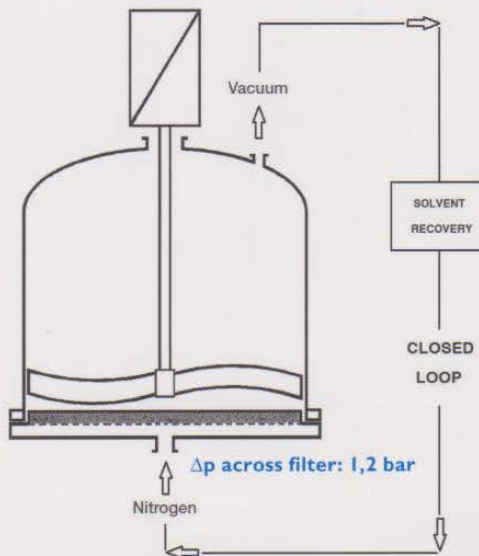
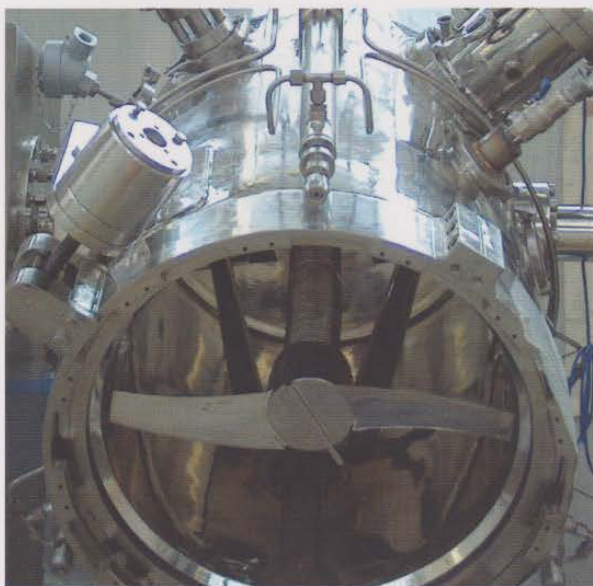
Accessories:

- CIP with spray rotating washing balls that can be extractable
- Sintered stainless steel wire mesh cartridge sterilizable on vacuum line and easy extractable
- Hydraulic power pack
- Electrical and hydraulic panel
- Sample port Instrumentation
- Condensation unit
- Vacuum unit
- Control system with PLC
- Local operator interface
- Hot water production unit

SPECIAL FEATURES

TILTING OPTION

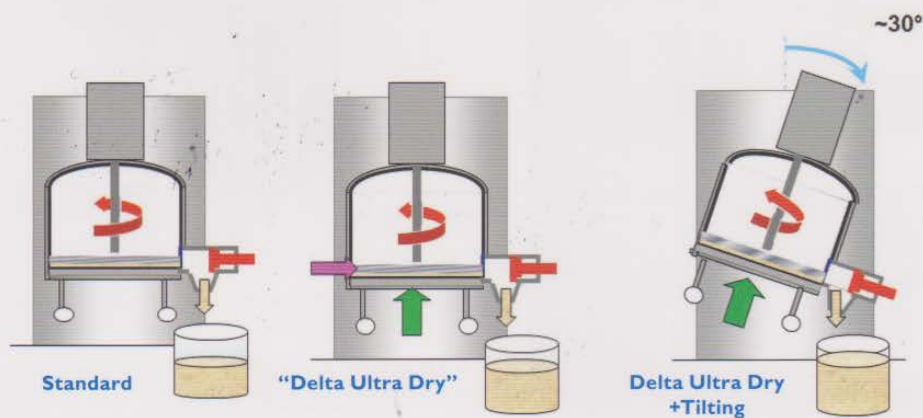
This configuration allows the vessel rotation ($\sim 30^\circ$) for complete heel removal



DELTA ULTRA DRY

The new filter sheet design is particularly suitable for high pressure from the bottom. This reduces deformation of filter sheet and allows better drying performances due to a "FLUID BED EFFECT".

Furthermore the system allows a better product discharge



Discharge Performances:

- 90% of residual heel recovered by Delta Ultra Dry, with fixed machine.
- 100% of residual heel recovered by Delta Ultra Dry & inclination.



DNFD STANDARD UNITS

Model	Nominal Surface [m ²]	Nominal Capacity [l]	Agitator Stroke [mm]	Cake Volume [l]	Internal Diameter [mm]	Cylindrical Height [mm]
DNFD 25	0.3	160	150	40	600	500
DNFD 50	0.5	400	200	100	800	800
DNFD 100	1.0	1,200	300	300	1,200	1,000
DNFD 150	1.5	1,400	650	525	1,400	1,000
DNFD 200	2.0	3,000	350	700	1,700	1,200
DNFD 300	3.0	3,650	450	1,350	2,000	1,200
DNFD 400	4.0	5,000	500	2,000	2,300	1,200
DNFD 500	5.0	6,400	500	2,500	2,600	1,200
DNFD 600	6.0	7,400	600	3,600	2,800	1,200
DNFD 700	7.0	8,500	600	4,200	3,000	1,200
DNFD 800	8.0	9,500	600	4,800	3,200	1,200
DNFD 1000	10.0	16,000	600	6,000	3,700	1,500

* Standard units can be modified upon specific customer request



Pilot Units are available in the following Standard measures

Model	Nominal Surface [m ²]	Nominal Capacity [l]	Cake Volume [l]
DNFD 08	0.08	20	3
DNFD 10	0.1	40	12
DNFD 20	0.2	100	30
DNFD 25	0.3	170	40