

VRIECO-NAUTA MIXER



Process Technologies for Tomorrow

HOSOKAWA MICRON CORPORATION



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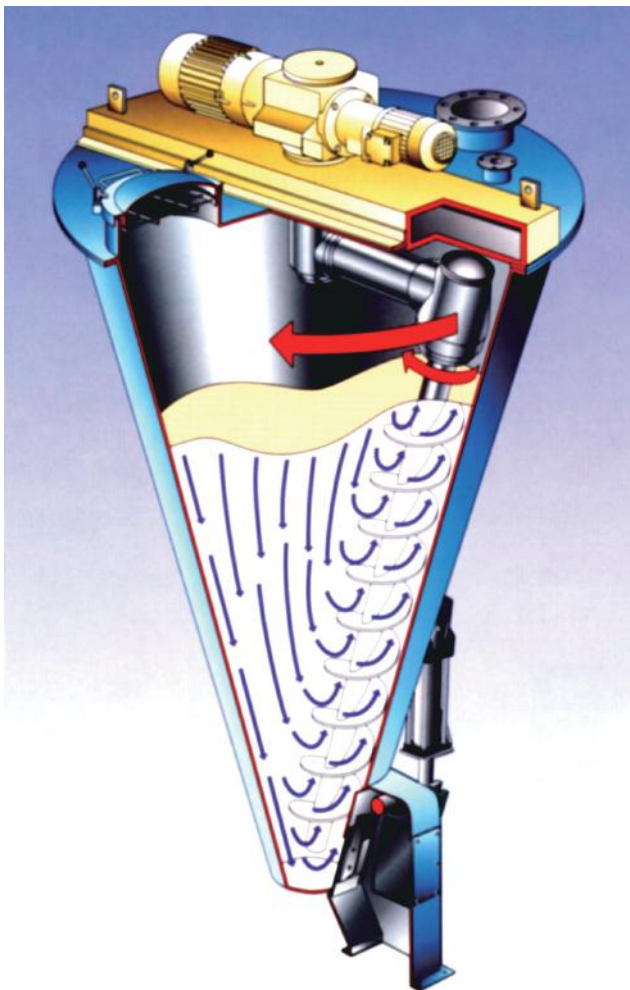
The Newly Born Best Selling Powder Mixer!

New Type Available Now

References over 10,000 units!

Vrieco-Nauta Mixer

High Grade Type With Advanced Technology
Accompanied with a compact body and sanitary design



VN Type Construction

General

Hosokawa Vrieco-Nauta Mixer is the best selling powder mixer in the world.

It features a conical mixing vessel with an orbiting arm and rotating mixing screw. This structure gives the mixer many advantages such like quick mixing time, higher mixing accuracy, and lower power consumption and so on. More than 10,000 units are delivered in the world. There is a wide variety of models and options to meet various material property and characteristics, working environment, operational conditions and applications.

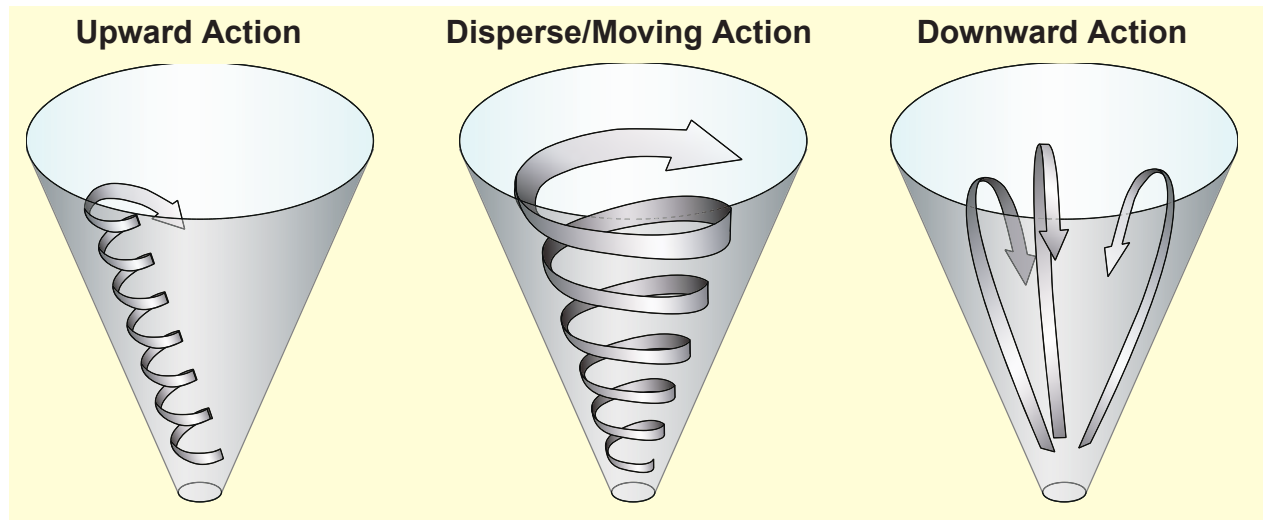
Application

Not only for foods and chemicals but also suitable for pharmaceuticals, agrochemicals, feeds and dyestuffs, pigments and so on. Taking the advantages of the mixing functions, Vrieco-Nauta mixer can be utilized in process of heating, drying, cooling and reaction as well.



Basic Principle of Mixing

Raw materials move upward due to screw rotation. The swing arm orbits the mixing screw along the inner vessel wall, moving and dispersing the material. On the other hand, the material where there is no screw moves downward. Based on this principle, very effective mixing action takes place in the mixer at high accuracy.



Comparison with other powder mixers

	Vrieco Nauta mixer	Container revolving types	Ribbon blender
Mixing time	Excellent	Good	Excellent
Mixing accuracy	Excellent	Good	Good
Low energy	Excellent	High	High
Damage onto powders	Good	Excellent	Some damage
Ease at discharge	Excellent	Difficult	Difficult
Inspection/Cleaning	Good	Excellent	Difficult
Automation	Excellent	Difficult	Good
High capacity	Excellent	Not possible	Difficult
Install area	Excellent	Large	Excellent
Install height	High	High	Excellent
Initial cost	Good	Excellent	Good

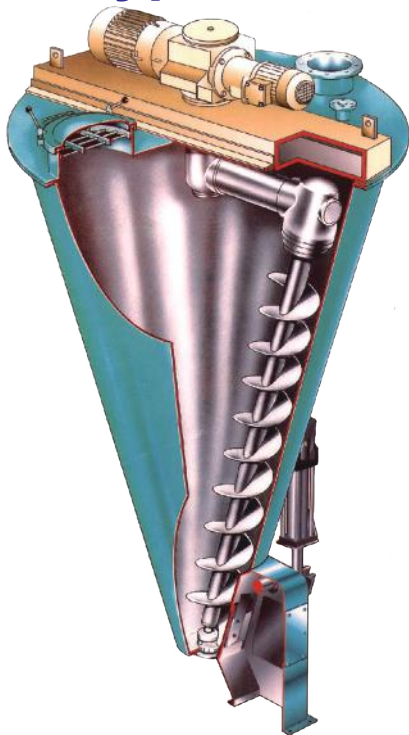
POWDER AND PARTICLE PROCESSING

Vrieco-Nauta Mixer



New Compact Type

VN Type

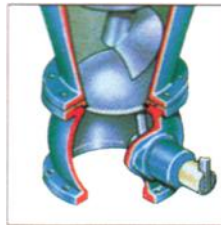


Cost Reduction by standardized parts and specification

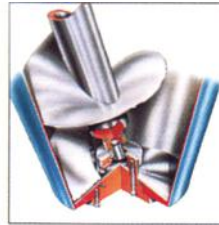
Features

- Gear Transmission Efficiency is increased by 40%
- New Shaft Seals designed for preventing powder into lubrication
- Simplified Design enabled cleanability of interior/outside increased.
- Compact body increase ease of installation
- Cost Reduction by Cantilever design

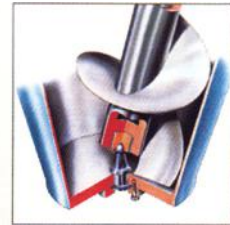
3 types of Bottom Support are available



Cantilever



Radial Locator

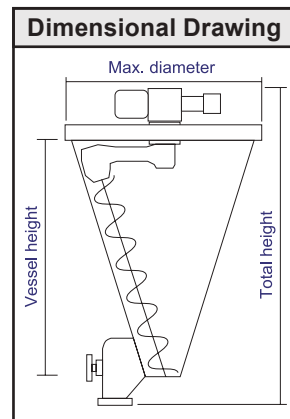


Pin Joint

Specification

Model	VN-	5	10	15	20	
Water filling capacity	(ℓ)	500	1000	1500	2000	
Motor	Screw	(kW)	3.7	3.7	3.7	3.7
	Arm	(kW)	0.4	0.4	0.4	0.4
Dimensions	Max. diameter	(mm)	1450	1710	1910	2090
	Vessel height	(mm)	1750	2180	2510	2800
	Total height	(mm)	2520	2950	3280	3570
Approx. mass	(kg)	960	1090	1210	1320	
Screw supporting		-	-	-	-	

Model	VN-	30	40	50	60	70	80	100	
Water filling capacity	(ℓ)	3000	4000	5000	6000	7000	8000	10000	
Motor	Screw	(kW)	7.5	7.5	15	15	11	11	15
	Arm	(kW)	0.75	0.75	1.5	1.5	1.5	1.5	1.5
Dimensions	Max. diameter	(mm)	2330	2570	2830	2970	3050	3170	3450
	Vessel height	(mm)	3190	3580	3810	4040	4180	4370	4830
	Total height	(mm)	4120	4510	4990	5220	5110	5300	6020
Approx. mass	(kg)	1940	2200	3550	3700	2560	2650	4300	
Screw supporting		-	-	-	-	with	with	with	



Note

- 1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.
- 2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.



Cantilever Screw Type DBX Type

Drive unit is direct coupled with motor. Completely cantilevered, without bottom support. This type is best suited for heat sensitive, abrasive, and brittle.



Specification

Model	DBX-	600	1000	1500	2000	3000	4000	
Water filling capacity	(ℓ)	600	1000	1500	2000	3000	4000	
Motor	Screw	(kW)	3.7	3.7	3.7	3.7	5.5	7.5
	Arm	(kW)	0.4	0.4	0.4	0.4	0.75	0.75
Dimensions	Max. diameter	(mm)	1610	1810	2030	2190	2430	2730
	Vessel height	(mm)	1970	2300	2620	2870	3270	3680
	Total height	(mm)	2940	3270	3590	3840	4240	4810
Approx. mass	(kg)	900	1000	1200	1300	1500	2300	
Model	DBX-	5000	6000	7000	8000	10000	10000	
Water filling capacity	(ℓ)	5000	6000	7000	8000	10000	10000	
Motor	Screw	(kW)	7.5	11	11	11	11	22
	Arm	(kW)	0.75	1.5	1.5	1.5	1.5	2.2
Dimensions	Max. diameter	(mm)	2890	3140	3270	3390	3590	3770
	Vessel height	(mm)	3950	4350	4560	4750	5080	5030
	Total height	(mm)	5080	5610	5810	6000	6400	6640
Approx. mass	(kg)	2500	4000	4300	4600	5000	9000	

Note

1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.

2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.

Original Type NX Type

Available in small, medium and very large capacities. Basic original type with many references and high performance.



Specification

Model	NX-	1	2	3	6	10	15	
Water filling capacity	(ℓ)	100	200	300	600	1000	1500	
Motor	Screw	(kW)	1.5	2.2	2.2	2.2	2.2	3.7
	Arm	(kW)	-	-	-	-	-	-
Dimensions	Max. diameter	(mm)	1060	1220	1330	1550	1760	1980
	Vessel height	(mm)	1130	1380	1560	1950	2290	2600
	Total height	(mm)	2100	2490	2600	2940	3280	3590
Approx. mass	(kg)	500	600	650	750	850	950	
Model	NX-	20	30	40	50	60	70	
Water filling capacity	(ℓ)	2000	3000	4000	5000	6000	7000	
Motor	Screw	(kW)	3.7	5.5	7.5	7.5	11	11
	Arm	(kW)	-	0.75	1.5	1.5	1.5	1.5
Dimensions	Max. diameter	(mm)	2130	2390	2830	2990	3130	3250
	Vessel height	(mm)	2850	3260	3850	4110	4340	4530
	Total height	(mm)	3840	4130	5000	5260	5490	5690
Approx. mass	(kg)	1050	1200	2400	2600	2800	3000	
Model	NX-	80	100	150	200	250	500	
Water filling capacity	(ℓ)	8000	10000	15000	20000	25000	50000	
Motor	Screw	(kW)	11	11	18.5	22	30	37
	Arm	(kW)	1.5	1.5	2.2	2.2	3.7	3.7
Dimensions	Max. diameter	(mm)	3370	3590	3990	4320	4740	5750
	Vessel height	(mm)	4730	5070	5650	6180	6840	8490
	Total height	(mm)	5880	6230	6890	7430	8420	10110
Approx. mass	(kg)	3200	3300	6000	8000	11000	16000	

Note

1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.

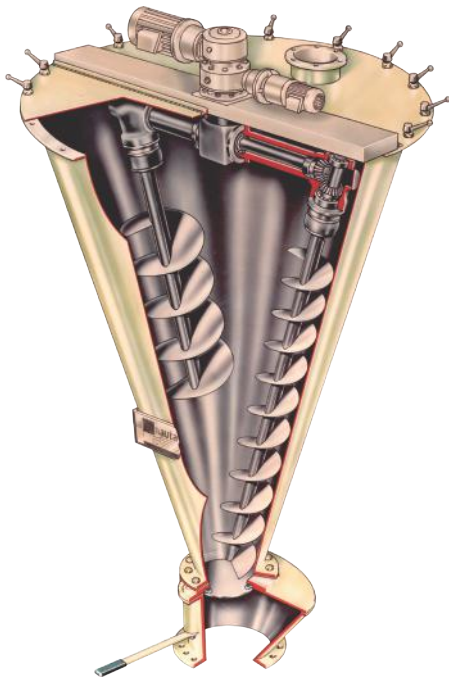
2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.

Vrieco-Nauta Mixer



Satellite Screw Type

D2SX Type



Rational Mixing Performance

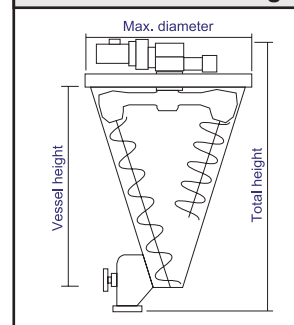
Features

In addition to a standard mixing screw, another large diameter satellite screw is provided. With only 30% increase of running power, mixing time can be reduced by half or below.

Specification

Model	D2SX-	1000	1500	2000	3000	5000	10000	
Water filling capacity	(ℓ)	1000	1500	2000	3000	5000	10000	
Motor	Screw	(kW)	3.7	5.5	5.5	7.5	22	
	Arm	(kW)	0.4	0.55	0.55	0.75	1.5	12.2
Dimensions	Max. diameter	(mm)	1810	2032	2185	2513	4030	5165
	Vessel height	(mm)	2300	2615	2865	3360	2944	3642
	Total height	(mm)	3270	3580	3830	4490	5285	6770
Approx. mass	(kg)	1250	1600	1700	2500	4300	6400	

Dimensional Drawing

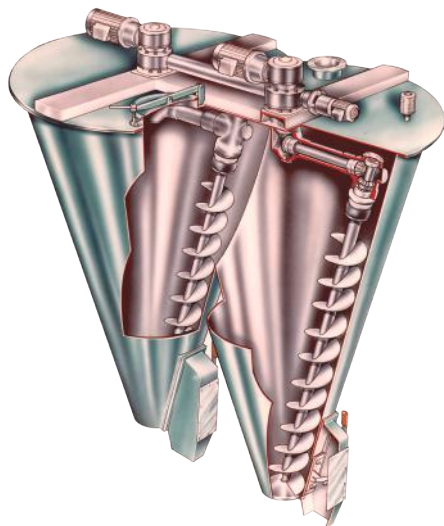


Note

- 1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.
- 2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.

Combi-type mixer, cope with high capacity

CX Type



Features

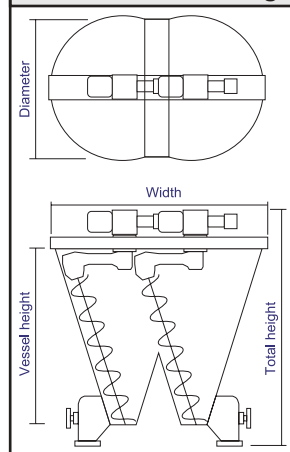
Combi-type mixer, cope with high capacity. In CX type, two units of NX type are combined into one piece. Beside the standard mixing action, material moves adjacent container therefore it accelerates further mixing. CX type also save installation height and processing time. Mixing time and discharge time can be shorter. Screw load is relieved therefore stable operation is possible.

Specification

Model	CX-	4	6	11	18	
Water filling capacity	(ℓ)	400	600	1100	1800	
Motor	Screw	(kW)	2.2	3.7	3.7	5.5
	Arm	(kW)	0.4	0.4	0.4	0.75
Dimensions	Diameter	(mm)	1218	1330	1550	1760
	Width	(mm)	1848	2013	2260	2600
	Vessel height	(mm)	1380	1560	1950	2290
	Total height	(mm)	2451	2630	2910	3250
Approx. mass	(kg)	1200	1300	1500	1700	

Model	CX-	37	55	110	175	
Water filling capacity	(ℓ)	3700	5500	11000	17500	
Motor	Screw	(kW)	7.5	5.5×2	11×3	22×4
	Arm	(kW)	1.5	1.5	2.2	3.7
Dimensions	Diameter	(mm)	2130	2380	3120	3720
	Width	(mm)	3150	3540	4670	5570
	Vessel height	(mm)	2850	3260	4400	5300
	Total height	(kg)	3820	4200	5560	6590

Dimensional Drawing



Note

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- 2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.



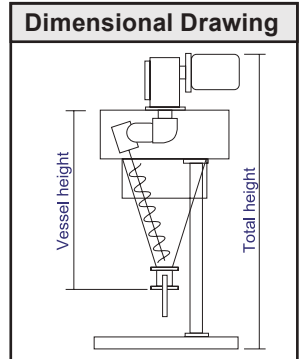
Small lab. production

DBY Type



Features

Down scaled from standard Vrieco-Nauta Mixers, this type is suitable for small production or make small samples. For 10 liter capacity satellite type is also available.



Specification

Model	DBY-	10	20	30	
Water filling capacity	(ℓ)	10	20	30	
Motor	(kW)	0.2	0.4	0.4	
Dimensions	Vessel height	(mm)	470	570	670
	Total height	(mm)	1200	1350	1580
Approx. mass	(kg)	100	130	180	

Note

1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.

2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.

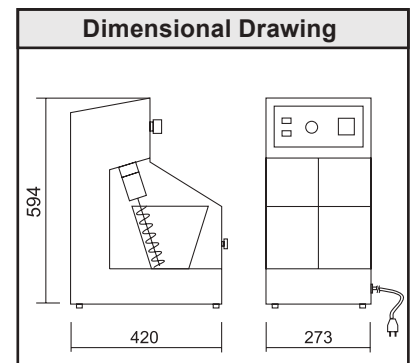
Laboratory Mixer

LV-1 Type



Features

Lab mixer (LV-1) is a small lab mixer. The mixer uses the same principle as Hosokawa Vrieco-Nauta Mixer. However, in this lab mixer, mixing screw arm is stationary and both a mixing screw and conical vessel are rotated. The screw and the conical vessel can be removed one touch from the main unit. The vessel then can be used as a product container. Cleaning of the vessel and the screw is very easy.



Specification

Model	LV-1
Water filling capacity	(ℓ) 2.5
Motor	Speed controlled motor 100V, 50/60Hz, 40W
	Geared motor 100V, 50/60Hz, 25W
Rotational speed	Screw (rpm) 120~240
	Mixing chamber (rpm) 3.5(50Hz), 4.2(60Hz)
Screw	Φ50mm (removable screw)
Outlet	Φ60mm with handle lever
Material of Powder contacting part	SS304 (Polish #300)

Approx. weight 30kgs

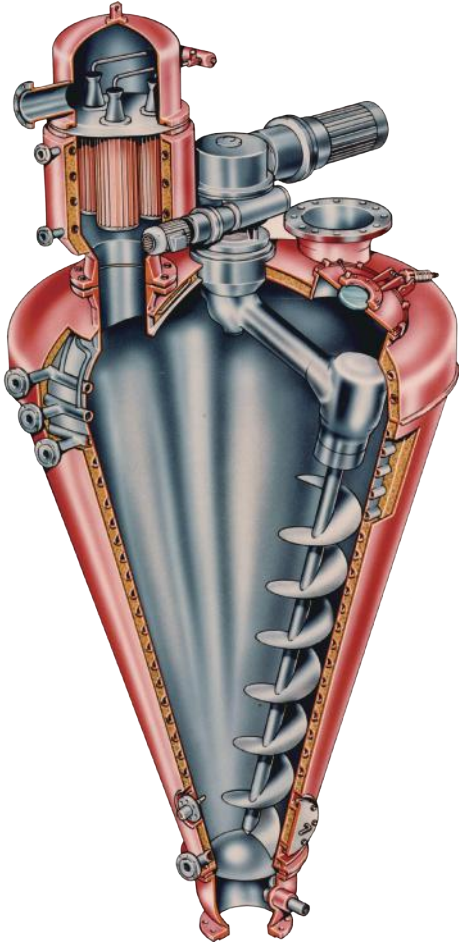
POWDER AND PARTICLE PROCESSING

Vrieco-Nauta Mixer



Multipurpose - Domed type with Jacket

Vacuum / Pressure Type



Features

Taking advantages of Vrieco-Nauta Mixer's superior mixing functions, vacuum/pressure type is so designed that operations of vacuum drying, reacting, heating, cooling and sterilizing are possible. Since applicable range is wide, it is very suitable for rationalization of the production process and labour saving.

Test Plant



Specification (Cantilever Screw Type)

Model	NXV-	1	2	3	6	10	15	20
Water filling capacity	(ℓ)	100	200	300	600	1000	1500	2000
Motor	Screw	(kW)	3.7	3.7	3.7	5.5	5.5	5.5
	Arm	(kW)	-	-	-	0.75	0.75	0.75
Dimensions	Diameter	(mm)	1000	1150	1300	1500	1650	1850
	Vessel height	(mm)	1500	1690	1920	2350	2270	2990
	Total height	(mm)	2360	2570	2800	3300	3600	4400
Approx. mass	(kg)	1000	1200	1300	1800	2500	2700	3300

Model	NXV-	30	40	50	60	80	100
Water filling capacity	(ℓ)	3000	4000	5000	6000	8000	10000
Motor	Screw	(kW)	7.5	11	11	11	11
	Arm	(kW)	0.75	1.5	1.5	1.5	1.5
Dimensions	Diameter	(mm)	2450	2650	2800	2950	3100
	Vessel height	(mm)	4010	3850	5002	4900	5210
	Total height	(mm)	5275	5770	6000	6350	6460
Approx. mass	(kg)	5000	7500	6700	8300	10000	12000

Note

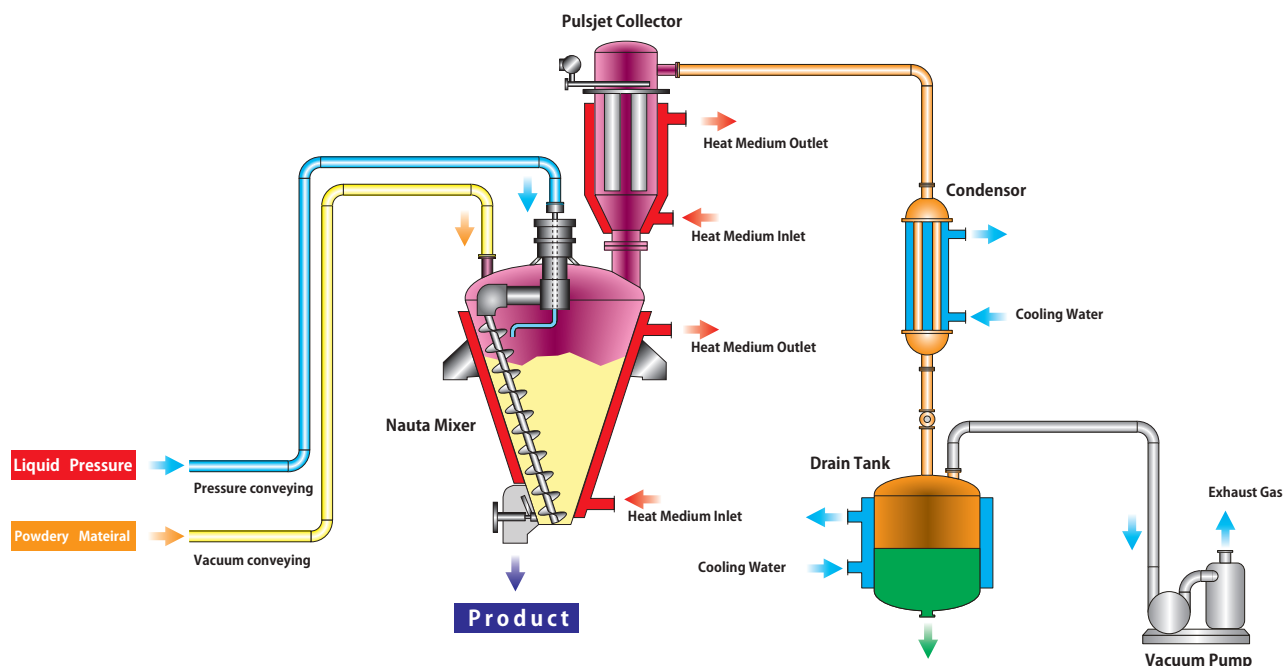
- 1) Motor sizes are calculated for mixing the powder with bulk density = 0.6g/ml.
- 2) The effective capacity differs as powder properties, however, it is about 80-100% of water filling capacity.



Vrieco-Nauta Mixer is Multi-Functional!

Examples of Multi-Processing with a single machine

Following is an example of one single unit of Vrieco-Nauta Mixer, multi-processing of pneumatic feeding of raw material, weighing, mixing with liquid addition, reacting, vacuum drying and cooling.



Specification (Pin Joint Type)

Model	DBX-	600RWV	1000RWV	1500RWV	2000RWV	
Water filling capacity	(ℓ)	600	1000	1500	2000	
Motor	Screw	(kW)	3.7	5.5	5.5	5.5
	Arm	(kW)	0.4	0.75	0.75	0.75
Dimensions	Diameter A	(mm)	1450	1700	1900	2050
	Vessel height B	(mm)	1890	2290	2620	2870
	Total height C	(mm)	3100	3530	3900	4180
Approx. mass	(kg)	2300	3500	3600	3900	

Model	DBX-	3000RWV	4000RWV	5000RWV	6000RWV	
Water filling capacity	(ℓ)	3000	4000	5000	6000	
Motor	Screw	(kW)	7.5	11	11	11
	Arm	(kW)	0.75	1.5	1.1	1.1
Dimensions	Diameter A	(mm)	2300	2650	2800	2950
	Vessel height B	(mm)	3230	3810	4650	4300
	Total height C	(mm)	4570	5350	5880	6130
Approx. mass	(kg)	4800	6000	7000	8000	

Model	DBX-	8000RWV	10000RWV	
Water filling capacity	(ℓ)	8000	10000	
Motor	Screw	(kW)	18.5	22
	Arm	(kW)	2.2	2.2
Dimensions	Diameter A	(mm)	3350	3450
	Vessel height B	(mm)	5400	5640
	Total height C	(mm)	6800	7050
Approx. mass	(kg)	15000	17000	

Note

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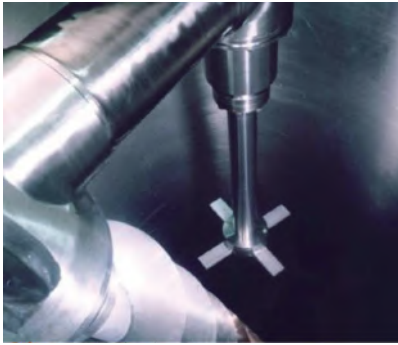


Option

Variation Suited to your needs

Strong Delumping Unit

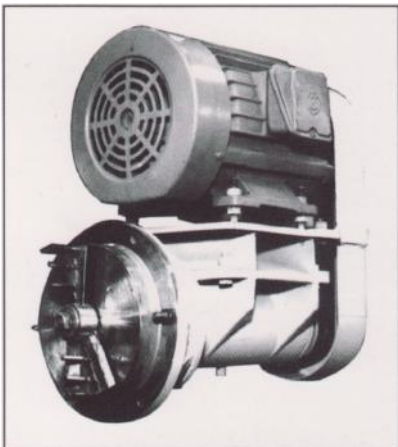
Intensifier



A rotor mounted on the center shaft rotates at very high speed, and prevents agglomeration of the mixture. It is very effective to prevent remaining of the very light powder, generated at mixing of density different materials, over the mixture surface. Or it is also effective when very strong dispersing power is required at the liquid added mixing application. By rotating mixing screw, the material is consecutively fed to the intensifier resulting in effective mixing.

Disintegrator

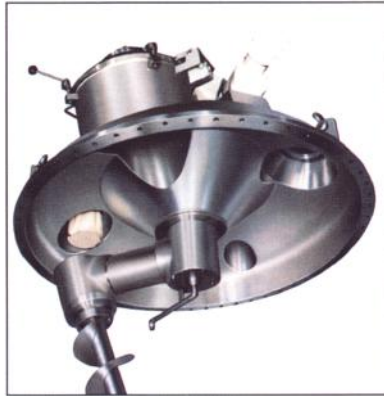
Lump Breaker



The device is to disintegrate the mixture during mixing or liquid adding. One or more units are mounted at the side of the casing, and preventing the agglomeration.

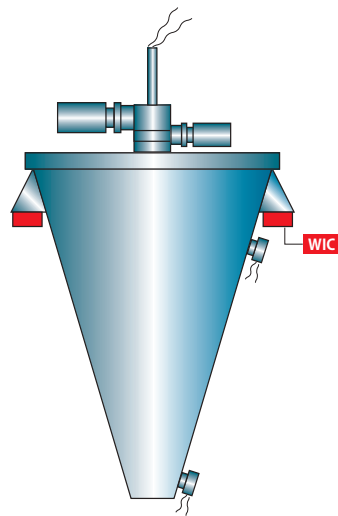
Vacuum/Pressure Sanitary

Dome Cover



Dome cover can be mounted when the vessel interior is in negative or positive pressure during operation. In this case, speed reduction unit or swing arm should be vacuum or pressure specification. And this type is also recommendable when ease of interior cleaning is required.

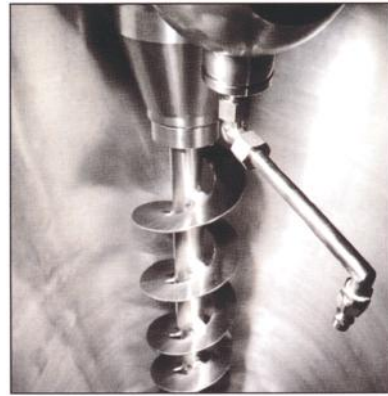
Level Control



With combination of load cells, feed quantity or discharge quantity can be checked during operation. Contents control is possible with the use of common levellers.

Liquid Adding Device

Micro Injection



This is the device to add liquid or condition humidity. The liquid is sprayed over the powder mixture via one or more nozzles, piped through the gear box.

Discharge method

Bottom Discharge

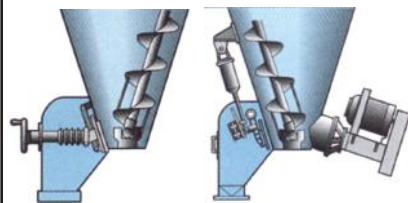


Slide Type



Ball Valve Type

Side Discharge : Swing type



(Manual)

(Automatic)

It is possible to select automatic or manual.



Vrieco-Nauta Mixer References

Classified by applications.

Classification	Material	Process	Model	Capacity (L)	Remark
Food	Egg	Mixing	D2SX-1000	1000	
	Gelatin	Mixing	CX-55	5500	
	Cellulose	Mixing	NX-150	15000	
	Sugar	Mixing	DBX-8000	8000	
	Food additives	Drying	NXV-150	15000	
Pharmacy	Vitamin	Mixing	DBX-5000RWV	5000	
	Pharmaceutical	Mixing	CX-6	600	
	Herb medicine	Mixing	NX-30	3000	
	Pharmaceutical	Mixing	DBX-2000	2000	GMP
	Pharmaceutical	Drying	NXV-100	10000	
	Pharmaceutical	Drying	DBX-600RWV	600	GMP
	Pharmaceutical	Drying	DBX-4000RWV	4000	
Chemicals	Organic chemicals	Mixing	CX-4	400	
	Organic chemicals	Mixing	CX-100	11000	
	Organic chemicals	Mixing	NX-100	1000	
	Chemicals	Mixing	DBX-2000	500	
	Organic chemicals	Drying	NXV-100	10000	
	Organic chemicals	Drying	DBX-4000RWV	4000	
Inorganic materials	Raw material of glass	Mixing	D2SX-1000	1000	
	Cement	Mixing	DBX-5000RWV	5000	
	Calcium carbonate	Drying	DBX-5000RWV	5000	
	Nickel hydrogen compound	Mixing	CX-55	5500	Battery
	Nickel hydrogen compound	Mixing	NX-150	15000	Battery
	Nickel hydrogen compound	Drying	NXV-30	3000	Battery
Paint/Pigment	Dyestuff	Mixing	D2SX-8000	8000	
	-	Mixing	CX-110	11000	
	-	Mixing	NX-200	20000	
	Pigment	Mixing	DBX-2000	2000	
	Dye intermediate	Drying	NXV-80	8000	
	Pigment	Drying	DBX-2000RWV	2000	
Resin	Polyethylene	Mixing	CX-6	600	
	Polymer	Mixing	NS-150	15000	
	Phenol resin	Mixing	DBX-7000	7000	
	PVC	Drying	NXV-40	4000	
	Polymer	Drying	NXV-100	10000	
	AS	Drying	DBX-7000RWV	7000	
Pesticide	Pesticide	Mixing	CX-55	5500	
	Pesticide	Mixing	NX-70	7000	
	Pesticide	Mixing	DBX-5000	5000	
	Pesticide	Drying	NXV-30	3000	
	Pesticide	Drying	NXV-60	6000	
	Pesticide	Drying	DBX-7000RWV	7000	
Others	Adhesive	Mixing	CX-110	11000	
	Bone powder	Mixing	NX-100	10000	
	Silver	Mixing	DBX-1500	1050	
	Titanium compounds	Drying	NXV-100	1000	
	Glue	Drying	DBX-2000RWV	2000	



Process Technologies for Tomorrow

HOSOKAWA MICRON CORPORATION

URL <http://www.hosokawamicron.com/>

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