

## Manufacturing Equipment for drug development

Production Step	Equipment Type	Description	Batch size
Mixing/Granulating	High shear mixer	Diosna P1-6/P1-25	0.5-10 kg
Mixing/Granulating/ Vacuum drying	High shear mixer	Somakon	0.2-10 kg
Mixing	Tumble mixer	Mixomat A 20, Fuchs	0.5-10 kg
Mixing	Tumble mixer	Bohle container mixer	5, 20, 40 L
Mixing	Tumble mixer	Turbula Mixer T2 C	0.1-1.6 L
Sieving	Sieving machine	Quadro® Comil® U3	Up to 10 kg
Sieving	Sieving machine	Quadro® Comil® U5	Up to 20 kg
Compressing/ Extruding	Flat die press	Kahl 14-175	Up to 75 kg
Compacting	Dry granulator	Erweka AR 400 E	0.5-3 kg
Granulation/Drying	Fluid bed granulator	Strea 1	0.2-2 kg
Tabletting	Rotary press	Riva Piccola 10 EU B	max. 30,000 pcs/h
Tabletting	Rotary press	Riva Piccola 8 EU D	max. 24,000 pcs/h
Tabletting	Rotary press	Korsch PH 108 EU B	max. 32,400 pcs/h
Tabletting	Rotary press	Korsch XL 100 EU D	max. 86,400 pcs/h
Tabletting	Rotary press in isolator for high potent APIs	Korsch XL 100	max. 60,000 pcs/h
Filling of hard capsules	Automatic capsule filling machine	Bonapace IN-CAP XL	max. 3,000 pcs/h
Granulation/Drying/ Coating	Fluid bed granulator/ coater	Romaco Innojet Ventilus®	0.5-2.5 kg
Coating	Drum coater	Brooks	--
Granulation	Dry granulator	Erweka TG2000	max. 21 kg/h
Granulation	Wet Granulator	Erweka FGS	max. 30 kg/h
Coating	Pan coater	Stechel ADG 50	2.5-5 kg
Mixing/Homogenising	Homogeniser	Becomix RW 15 CD	1-12 L
Mixing/Granulating	Semi-solid processor	Stephan UMC 5	Up to 3 kg
Drying	Vacuum drying oven	Memmert VO500	--
Dedusting	Dedusting of tablets and capsules	Pharmaproject	Up to 10.000 pcs/h
Weight Control	Weight control	Sade SP 140	Up to 3.000 pcs/h
Drying/Lyophilisation	Freeze dryer	Christ Epsilon 2-6D LSCplus	--
Homogenisation	High pressure homogeni- sation	Emulsiflex-C3	--
Wet ball milling	Dual centrifuge/ball mill with integrated cooling system	DeltaVita 1 (Netzsch) ZentriMix 380 R (Hettich)	(40 samples with max. 2ml)

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Wet ball milling	Wet ball mill incl. 10 L container and master flex pump	Dispermat SL50-Nano (Fa. Getzmann)	1-10 L
Autoclaving/ Terminal sterilisation	Autoclave	Systec DB-23	--
Working with API up to OEL 3b	Safety working bench	WiboBarrier® Vertical Plus	--
Multiple Isolator Containment Systems for handling of APIs up to OEL 5	Isolators	ART	--
4 Laminar flow areas	Laminar flow	Bleymehl	--
Laminar flow working bench	Laminar flow	--	--
Blistering	Semi-automatic sealing of PVC/Alu; PVC-PVDC/Alu; Alu-Alu	Maxi-Pack	max. 100 pcs/h
Printing/Serialisation	Serialisation machine	WIPOTEC-OCS	max. 60 pcs/min
Labelling/ Printing of batch data	Labelling machine/ Printer	HERMA 211 S	max. 20 pcs/min
Mixing (for parenteral solutions, suspensions)	Several stainless-steel double jacket vessels with 10, 20, 25, 60, 100 L	Diessel, Plantech	--
Cross flow double jacket stainless steel system	Up to 20 L (to remove organic solvents after precipitation without agglomeration of particles)	Plantech	Depending on process
Cooling systems	Cooling systems	Lauda	-30 to 150 °C
Filling of solutions & suspensions	Semi-automatic filling system	Base Europe Typ 533	0.15-28 ml
Sealing of vials	Semi-automatic sealing of vials 2R, 4R, 10R, 20R	Base Europe Typ 511	--
Transfer of material under containment	Stainless steel split valves	Andocksystems	--
Dust cleaner for high potent drugs with HEP filters	Removal of dust e.g. during compression	Krahn	--