



Elegant equipment list

Material characterisation

Equipment	Technique	Company	Property
Accupyc 1330	He-Pycnometry (True Density)	Micrometrics, Norcross, USA	Density
Tapping Device PT-TD200	Bulk/Tapped Density	PharmaTest, Hainburg, Germany	Density
Schulze RST-XS	Ring Shear Tester	Schulze Schüttgutmesstechnik, Wolfenbüttel, Germany	Shear
Q2000	DSC	TA Instruments, New Castle, Delaware, USA	Calorimetry
PharmaTron	Combi Tester	Sotax AG, Aesh, Switzerland	Tablet properties
Styl'One	Compaction Simulator	Medelpharm, Beynost, France	Tablet properties
Sotax	Combi Tester	Sotax AG, Aesh, Switzerland	Tablet properties
Pharmatest Dissolution bath	Dissolution bath	PharmaTest, Hainburg, Germany (via Prolyse)	Dissolution
Van Kel VK800	Dissolution bath	Vankel, New Jersey, USA / Agilent, Santa Clara, USA	Dissolution
PharmaTest PTF E	Friabilator	Pharma Test Apparatebau AG, Hainburg, Germany	Friability
PharmaTest DIST 3	Disintegration bath	Pharma Test Apparatebau AG, Hainburg, Germany	Disintegration
QicPic	Image analysis	Sympatec GmbH, Clausthal-Zellerfeld, Germany	Particle size distribution
Malvern Mastersizer S	Laser diffraction	Malvern Instruments, Malvern, UK	Particle size distribution
Partan	Image analysis	Microtrac Retsch GmbH, Haan, Germany	Particle size distribution
TA.HDplusC	Texture analyser	Stable Micro Systems, Godalming, UK	Texture
LoD HC103/01	Loss-on-Drying	Mettler-Toledo, Columbus, Ohio, USA	Water content
Karl Fischer	Water content	Mettler-Toledo, Columbus, Ohio, USA	Water content



HPLC D-7000	HPLC	Merck-Hitachi, Darmstadt, Germany	Composition
HPLC/UPLC	Nexera X3	Shimadzu, Kyoto, Japan	Composition
GranuCharge	Tribo-electric charging	GranuTools, Awans, Belgium	Charge
Haake Mars III	Rheometer	Thermo Fisher, Waltham, USA	Rheology
FT4	Powder rheometer	Freeman Technology, Tewkesbury, UK	Rheology
FlowPro	Powder flowability	IPAT, Turku, Finland	Flowability
GranuHeap	Angle of Repose	GranuTools, Awans, Belgium	Angle of repose



Process equipment

Equipment	Technique	Company	Operation
Roller mill	Roller mill	Oriental Motor, Tokyo, Japan	Milling
Quadro Co-milling	Milling	Quadro, Waterloo, Canada	Milling
Prilling machine	Prilling	Peira, Turnhout, Belgium	Prilling
Modul P, Courtoy	High-speed tablet press	Courtoy (GEA), Halle, Belgium	Tableting
Mini-Jet	Injection moulding	Thermo Fisher Scientific, Waltham (MA), USA	Moulding
Micro Feeder	Micro Feeder	Coperion K-Tron, Niederlenz, Switzerland	Feeding
Memmert	Drying oven	Memmert, Schwabach, Germany	Oven
Prusa 3D-printer 1, 2: i3 MK3S,	3D-printing	Prusa Research, Prague, Czech Republic	3D-printing
MakerBot Replicator 2X	3D-printing	MakerBot Industries LLC, NY, USA	3D-printing
Lyobeta 25	Freeze-drying	Telstar, Terassa, Spain	Freeze-drying
Dome Extruder	Lab-scale Wet Extrusion	Fuji Paudal, Osaka, Japan	Extrusion
Mini screw extruder	Lab-scale Wet Extrusion	Caleva, Sturminster Newton, UK	Extrusion
Mini Lab I	Lab-scale Hot Melt Extrusion	Thermo Fisher Scientific, Waltham (MA), USA	Extrusion
Xplore Pharma Mini Extruder	Mini-Extruder	Xplore, Geleen, Netherlands	Extrusion
Thermo Extruders	Extruder	Thermo Fisher Scientific, Waltham (MA), USA	Extrusion
Inversina	Powder blending and mixing	Bioengineering AG, Wald, Switzerland	Mixing
Stephan Blender UMC 5	Ointment mixer	ProXES GmbH, Hameln, Germany	Mixing
Turbula®	Tumbling mixer	System schatz, Willy A Bachofen AG, Machinefabrik, Switzerland	Mixing



Contimix	Continuous mixing of liquids & semi-solids	Hebold, Cuxhaven, Germany	Mixing
Glatt fluid bed dryer	Granulation + coating	Glatt, Binzen, Germany	Granulation
ConsiGma™-25	Continuous wet granulation	Collette (GEA), Wommelgem, Belgium	Granulation
Niro®	Spray dryer	GEA Group AG, Düsseldorf, Germany	Spray dryer
Procept R&D Spray Dryer	Spray dryer	Procept, Zelzate, Belgium	Spray dryer
B-290	Mini spray dryer	BÜCHI Labortechnik AG, Flawil, Switzerland	Spray dryer



Software experience

Name	Topic	Specifications	Language
SIMCA®	Multi-variate data analysis	Sartorius Stedim, Göttingen, Germany	
Vektor Direktor	Multi-variate data analysis	KAX Group, Scottsdale (AZ), USA	
MODDE®	Design of Experiments	Sartorius Stedim, Göttingen, Germany	
Elegant codebase	Multiple	Elegant BV, Zwijnaarde, Belgium	Python
PLS_Toolbox	Chemometrics	Eigenvector Research Inc., Wenatchee (WA), USA	MATLAB
gPROMS	Process modelling	Process Systems Enterprise (Siemens), London, UK	

