



Information sheet

Global formulation development and manufacturing capabilities

With over 30 years' experience, Quotient Sciences provides full service support for small molecule non-sterile programs, from dosage formulation development through to GMP clinical trial manufacturing and commercial drug product supply.

Key features

- > Pharmaceutical development and clinical manufacturing facilities in the US and UK
- > High-potency containment facilities and manufacturing expertise
- > API salt selection, polymorphism and characterization studies
- > Pre-clinical formulation development and supply
- > Formulation development of oral, inhalation, nasal and topical products
- > Wide range of technologies to address solubilization challenges
- > Phase I and Phase II clinical trial manufacturing
- > Real-time adaptive manufacturing
- > Batch sizes ranging from small scale (less than 250g) to large scale (up to 500Kg) for tablet/capsule drug products and up to 300 liters for liquid presentations
- > Clinical packaging, labelling and global distribution for Phase I and Phase II
- > Process validation and registration batches
- > Phase III clinical manufacturing and commercial drug product supply



Our team works in partnership with clients to understand molecule properties and define the optimal pharmaceutical development & manufacturing program.”

Global formulation development and manufacturing capabilities

Dosage forms

- > Solid oral dosage forms (IR/MR/SR/ODT tablet and IR/MR/SR/multi-particulate pellet capsule products)
- > Oral and nasal (dry powder, solution, suspension, nebulized) dosage forms
- > Lipidic (SEDDS, SMEDDS, solutions, semi-solids) dosage forms
- > Solutions and suspensions
- > Enhanced solid oral dosage forms (SDD, micronized, HME, microfluidized nano particulate systems)
- > Parenteral (IV, IM, SC)
- > Gels and creams (topical, rectal)

Formulation techniques

- > Spray dried dispersions (SSD)
- > Micronization by air jet milling
- > Hot melt extrusion (HME)
- > Nanomilling by microfluidization
- > Pellet layering and coating
- > Compression (single station and rotary single, bilayer and trilayer units)
- > High shear wet or melt granulation
- > Fluid bed drying
- > Dry granulation – Gerties Mini Polygran Plus & Gerteis MiniFactor (1-100Kg per hour)
- > Encapsulation (solid, semi-solid and liquid)
- > Tablet and capsule film coating (IR/EC)
- > Wurster granulation and coating
- > Homogenization for suspension products

Solid dosage manufacture equipment

	Up to 1Kg	1 – 10Kg	10 – 75Kg	> 75Kg
Wet granulation	Key Granulator 1L, Glatt TMG 1/6 (1L and 5L)	Collette MP20 Mixer T.K Fielder PMA 25L GEA PharmaConnect Key Granulator 5L	T.K Fielder PMA 65 Liter Niro PMA 25/65	Fluid Air Granulator (Jacketed) PX-250
Fluid bed drying	Mendel MFB-1 (11.5L and 18L) w/ Wurster and top spray Vector fluid bed systems O’Hara FBGB1 fluid bed w/ Wurster insert and bottom spray ACG FBII (3 & 12L) FBH5 (20 and 48L, Non potent only) (5kg to 10kg)		Mendel MFBH- 5/8 (20L and 48L) w/Wurster and top spray	Fluid Air Fluid Bed Dryer Model 0120 (270L) with Wurster and top spray
High shear blending	GEA Pharma Connect 1L and 10L			
Blending	5, 10L Bohle Bin Blenders Maxiblend V Blender (2qt) Globe Pharma V-blender 2/4/8/16 Turbula T2F Mixer	5,10 and 20L Bohle Bin Blenders V-blenders (1/2/3/5/10) Maxiblend V blender (4/8/16qt) GEMCO V blender (1cft) Turbula T10B Mixer Pharmatech MB025 Blender (1 – 30L)	40L, 300L Bohle Bin Blenders GEMCO 5 cft Double cone blender 5cft Pharmatech MB100 Blender (25, 50, 100L) Bohle Bin Blender (40L)	300L and 1000L Bohle Bin with drum lifter GlobePharma V Blender (10cft) Keith V-blender 20 cu.ft

Solid dosage manufacture equipment (continued)

	Up to 1Kg	1 – 10Kg	10 – 75Kg	>75Kg
Dry granulation	Vector micro roller compactor			
	Gerteis MiniPactor Gertis Polygran Plus roller compactor Vector TFC 220 pilot scale roller compactor			
Milling / Screening	Quadro Comill 196 Quadro Comill 1975 Sweco Screener (18 – 24") Jet Mill Dec MC2 (2 gm to 1kg)			
Coating	ProCepT perforated pan coater Bench scale Torpac capsule coater O'Hara Lab Coater MX (8 & 12" pan)	O'Hara Lab Coater IIx (15"/17"/19" pans) O'Hara Lab Coater MX (19" pan) O'Hara XCM coater 8.5,12,15 and 19 inch Conventional (300g to 7kg) 12 inch, Minitablets (up to 1kg)	O'Hara Lab Coater IIx (24/30" pan)	O'Hara Coater (48" pan) O'Hara Coater XXL (60" pan)
Encapsulation	Profill 100/300 Quantos Xcelodose 600			
	Harro Höfliger Modu-C LS with Low dose drum dosing unit Zanasi LZ-64 Bonapace In-Cap Encapsulation machine CFS1200 Liquid Capsule Filler			
		Bosch GKE 330 (18,000/hr) Bosch GKF Capsylon 705 (42,000/hr) IMA Zanasi 40F AFT-Lab (25,000/hr)		Bosch Capsylon 1500 (92,000/hr)
	Bosch Model GKF330 Encapsulator Bosch GKF Capsylon 1505 Encapsulator Chemi-Pharm Model 301 Manual Encapsulator Capsugel Ultra-8			
Compression	Carver single station press Netoli tablet press Stokes single station press Natoli tablet press Stokes Trilayer Press Manesty F3 single punch		Korsch XL 400 Press Globe Pharma Minipress-II Manesty BB3B 27 station single/ bilayer Manesty Beta Press 16 station Manesty XPress 25 Station Hercules Press 25 Station Kikusui Libra Press 36 Station Kikusui Aquarius Press 36 Station Manesty BB3B 27 station single/ bilayer Manesty Beta Press 16 station	
		Riva Piccola minipress Korsch XL 100 (B and D) Press Riva Piccola Press Manesty F3 single punch Manesty Beta Press 16 station		

Solid dosage manufacture equipment (continued)

	Up to 1Kg	1 – 10Kg	10 – 75Kg	>75Kg
Weight sorting	SADE SP B20 3000/hour SADE SP 120 4500/hour SADE P2 x2 3600/hour SADE SPI40 (8000/hour) Bosch KKE1700 (100,000/hour) Bosch KKE1700 (100,000/hour) SADE SP40B ACG Accura 40 (40,000/hr) Sade SP 140 (up to 1000 caps/hour), IMA Precisa 150 (up to 100,000 caps/hour), Sensum Spine (Capsules) (50,000 to 300,000/hour based on size)			
Particle size reduction	Fitzpatrick Comminutor fitz mill Quadro Comil 196 Quadro Comil 197S Glen Micro Hammer Mill Stansted FPG12500 Microfluidiser Nano-milling Caleva Extruder 20 Caleva Spheronizer 250 MC-ONE micronizer MC-TWO micronizer Sturtevant 2” micronizer			
Hot melt extrusion	Leistritz 16/18mm Twin Screw HME + K-Tron precision powder feeder, Pelletizer, Chiller Leistritz ZSE - 16/18mm Twin Screw HME + ThermoFisher Pharma II HME			
Spray drying	ProCepT spray dryer SPX Anhydro MS-35 (aqueous and solvent)	GEA Niro Mobile Minor™ Spray Dryer SPX Anhydro MS-35 (aqueous and solvent)		
Secondary Drying	Lab scale convection and vacuum oven, Large scale vacuum oven			
Freeze drying	Cool Safe			
Filling manual / semi-auto / automated Manual	Manual ProFill 3700/3800 (100 and 300 capsules/plate) Perry Accofil Kinematics filler, ProFill 3700/3800 (100 and 300 capsules/plate) Semi-auto: Quantos (up to 350 units/day) Automated: Bonapace (up to 3000 caps/hour) ACG AFT Lab (up to 25,000 caps/hour) MG2 Flexalab (Micro/low dose/dual filling), H&K330 (up to 19,000 caps/hour) Bosch 705 (up to 30,000 caps/hour) Bosch 1505 (up to 70,000 caps/hour)			
Sieve			Sweco Sifter (Manual, up to 15 kg/hour) Sweco Sifter (Manual, 15-20kg/hour)	
Gastroretentive systems				
Zero order release formulations				

Solid dosage manufacture equipment (continued)

	Up to 1Kg	1 – 10Kg	10 – 75Kg	>75Kg
Tableting	<p>Automated</p> <p>Korsch XL 100 B tooling, 10 Station (up to 36,000 tabs/hour) Korsch XL 400 B tooling, 35 station (up to 135,000 tables/hour) Kikusui Libra (B tooling, 36 Station, up to 108,000 tabs/hour) Aquarius (B tooling, 36 station, up to 108,000 tabs/hour) Hercules (D tooling, 29 station, up to 87,000 tabs/hour), Manual Carver Press (30-40 tablets/hour) Natoli single station (30-40 tablets/hour)</p> <p>GlobePharma 10 Station (up to 20,000 tabs/hour)</p> <p>Korsch XL 100 B tooling, 10 Station (up to 36,000 tabs/hour) D tooling, 8 Station (up to 16,000 tabs/hour)</p>			
Polishing	Lock Metal /Polish, Turbo-Kleen Polisher			
Metal Check/Deduster	Lock Metal checker Kramer Deduster, Insight Lock, Safeline Metal Check, Kramer Deduster			
Other	Micromeritics Accupyc/GeoPyc (Solid Fraction Measurement), Key/Schleuniger Hardness Tester, Sotax Friabilator, Sotax Disintegration bath, Mettler Toledo Balances/Scales, LOD Moisture Balance, Flowdex, Lipidic System - Capsugel CFS-1200			

Liquid and semi-solid manufacture (research and production scale)

	Up to 1Kg	1 – 10Kg	10 – 75Kg	>75Kg
Mixer	Oden Mixer and filler (single head and multi head liquid filler) Lightning Mixers Silverson SL2T high shear mixer Silverson L4R1 high shear mixer Silverson AX/AIR Mixer/Homogeniser IKA Ultra Turrax 25 high shear mixer IKA VOS Overhead stirrer IKA RW47 Overhead mixer Heidolph overhead RZR2021 mixer			
		35/125/200/285/350 L round bottom flasks 77 L flat bottom flask		
	Silversen Homogenizer L5M 275UHS MP5 Lightnin Mixer			
Filling	Pamasol Inhalation Filler and Crimper (50 units/hour) Flexicon PF6 peristaltic filling machine CFS liquid and semi-solid filling system Single Oden Servo Filler (install 3x Fill Line) Sachets – AlphaPack PM Kinex Pneumatic Capping Machines KAPS-ALL EB-550 and EB-650A Electronic Torque Testers Pharmatest PT-LT Bottle Leak Tester Spraytech Mini Spray Dryer B-290 - Buchi ProFill 3700/3800 (100 and 300 capsules/plate) Perry Accofil Kinematics filler ProFill 3700/3800 (100 and 300 capsules/plate) Semi-auto: Quantos (up to 350 units/day) Bonapace (up to 3000 caps/hour) ACG AFT Lab (up to 25,000 caps/hour) MG2 Flexalab (Micro/low dose/dual filling), H&K330 (up to 19,000 caps/hour) Bosch 705 (up to 30,000 caps/hour) Bosch 1505 (up to 70,000 caps/hour)			

Packaging

	Up to 1Kg	1 – 10Kg	10 – 75Kg	>75Kg
Blister packaging	Sepha EZ II Blister Thermoforming and Cold Forming Packing Induction sealer			
Bottle packaging	Kinex Pneumatic Capping Machines Electronic Torque Testers Bottle Leak Tester Sure Torque Cap Machine ST100 Kapps All Torque Tester Relco Induction Cap Sealer ICSIH Kirby Lester Tablet/Capsule Counter KL50 Leak tester, Torque tester			

Laboratory equipment

	Equipment
HPLC	Waters, Agilent, Alliance and Shimadzu HPLC systems CAD detector, Agilent/HP1100/1200, Dionex Ultimate 3000 , DVS
Detectors	DAD, CAD, UV and PDA Radiometric, refractive index and FSA Variable Wavelength Agilent
Radiochemical	Radiomatic625TR (x6) Radiomatic525TR (x1)
Diode Array	Dionex
UPLC	Waters, Acquity, and Shimadzu UPLC systems Thermo Scientific Vanquish
Spectrophotometry	Agilent UV/VIS Spectrophotometer, Shimadzu UV/VIS Spectrophotometer
Spectrometer	FT-IR - Bruker Vertex 70, 500 MHz NMR Spectrometer - Bruker AvanceIII HD
Laser Particle Sizer	Malvern Mastersizer2000
FTIR	Perkin Elmer, Agilent
Raman	Thermo Scientific DXR Raman microscope, Nicolet Almega XR Dispersive Raman Microscope with large sample environment for spectroscopy of powders and suspensions.
Microscopy	Olympus BX50 polarising optical microscope, Light microscopy with image analysis software. Polarized light microscopy Carl Zeiss
Thermal analysis	Perkin Elmer Diamond DSC, Perkin Elmer Jade DSC, Perkin Elmer STA 6000 Simultaneous Thermal Analyzer,
Microcalorimetry	TA Instruments TAMiii Calorimeter containing both solution calorimeters and perfusion microcalorimeters, Calorimetry Science Corporation Isothermal titration Calorimeter.
X-ray diffraction	Panalytical X'Pert PRO diffractometer with an X'celerator detector Bruker D5000
LC Fraction Collector	Waters Fraction Collector II
Surface/sorption analyzers	2 Hiden Isochema IGA sorption analyzers, VTI Vapor Sorption Analyzer

Laboratory equipment

	Equipment
Water content	Mettler Toledo, Metrohm 831 Coulimetric, Volumetric, Oven Karl Fisher LOD Moisture Balance
Liquid Particle Counter	Hiac Royco Model 9703
Gas chromatography	ThermoFisher GC with direct and headspace sampling with NPD & FID detectors
Ion Chromatography	Dionex ICS 3000
Nitrogen Emission	ntek8060
GCS Headspace Systems	Perkin Elmer Clarus 500/Turbomatrix110, Perkin Elmer Clarus 590
Dissolution	ATG and Distek Dissolution Baths (50 mL to 1L) with automated samplers Distek Bathless Sotax, Pharmatest Dissolution Baths
Disintegration	Copley DTG2000 disintegration tester
Inhaled testing	Andersen Cascade Impactor Next Generation Impactor Delivered dose apparatus
DSC/TGA	TGA Mettler Toledo TGA 850 1 GMP, DSC Mettler Toledo DSC 823E
ICP-MS with LC Interface	Agilent 7500C Series G3155A
LC-MS	Dionex-Thermo-Ultimate MSQ
Dissolution	USP Type I/II – Distek 2100C, Distek 2500 and Varian VK7010
Dynamic vapour sorption/desorption	SMS Resolution - Surface Measurement Systems DVS 1
Water Determination	KF Coulometer – Metrohm737 and 756, KF Volumetric Homogeniser - Metrohm901, KF Oven Coulometer – Metrohm, Water Activity Meter – NovasinaAW Sprint
Surface area	Surface Area and Porosity Analyser -MicromeriticsASAP2020
Microbiological equipment	Binocular Microscope – EuromexArhem, Microscope and Camera - Nikon Eclipse E600, Sterility Testing Equipment – SteritestEquinox, Microplate Reader for Endotoxin Testing – TecanSunrise, Bioscan, PTS Micro

Laboratory equipment (continued)

	Equipment
Particle size analysis	Sympatec RODOS particle size analyzer (wet and dry) Malvern Mastersizer 2000
Powder flow	Copley BEP 2 flow analyzer (bulk, tapped density, Angle of Repose, Carrs Index, Hausner ratio) Flowdex
Endotoxin	Endosafe PTS
Plate reader	Varioskan Lux Microplate
Viscometer	Brookfield Viscometer cup
Osmometer	Micro osmometer
Balances	Balances – Micro to Top Loading
General	Centrifuges Shakers (wrist, orbital) pH Meters Muffle Furnace Schleuniger and Holland Hardness Testers Sotax hardness tester Ovens and Vacuum ovens
Stability chambers	Stability Chambers Cycling Forma Science Incubators

Who is Quotient Sciences?

Quotient Sciences is a drug development and manufacturing accelerator providing integrated programs and tailored services across the entire development pathway. Cutting through silos across a range of drug development capabilities, we save precious time and money in getting drugs to patients. Everything we do for our customers is driven by an unwavering belief that ideas need to become solutions, molecules need to become cures, fast. Because humanity needs solutions, fast.

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