Transforming Medicines Development and Manufacture

CMAC - Continuous Manufacturing and Advanced Crystallisation Research & Consultancy Services

Primary Processing
Experts in Crystallisation, we take flow chemistry output and develop crystallisation and isolation. We can provide rapid process development and consultation services for crystallisation (batch & continuous) targeting desired particle attributes.

Secondary Processing
CMAC can provide secondary processing formulation services and consultancy on a variety of solid oral dosage platforms e.g. blending, twin screw granulation, milling, hot melt extrusion, fluid bed and spray drying, and compaction.

Advanced Characterisation Services
Materials characterisation techniques to understand the physical properties of materials e.g. BET, porosity, surface energy, vapour sorption, density, solubility.

Working with CMAC
We deliver consultation, training and research services on a global scale. We have experience in leading and supporting projects across academia and industry.

We apply our research expertise to support industry during both early product development phases to fully commercialised product manufacturing.

CMAC offers:
- Dedicated technical support within a World Class Manufacturing Research Facility
- Unique expertise in advanced crystallisation, process development, formulation, product and process analysis
- Continuous processing skids for process development, state-of-the-art analysis and characterisation capabilities and a comprehensive suite of PAT tools
- Proven track record in project delivery and expert consultation services

Contact CMAC with your enquiries
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Primary Processing

Nucleation Platforms:
Valve Mixer, Modular MicroReaction System (MMRS), Ehrfeld/BTS
Impinging Jet Mixer, Microlonova

Discovery Platforms:
OptiMax Synthesis Workstation (1 x 1 L), Mettler Toledo
EasyMax Synthesis Workstation (2 x 100 mL), Mettler Toledo Crystalline (8 mL scale), Technobis
Crystal 16 (2 mL scale), Technobis
Zebra Fish & Polar Bear, Cambridge
Reactor Design
NanoAssembler, microfluidics manufacturing platform, Precision Nanosystems Mitos
DrophiX, Advanced Droplet System, Dolomite
Crystallisation Discovery Platform, Crissy XXL, Zinsser

Continuous Crystallisation Platforms:
Skid mounted modular continuous crystallisation platforms, Microlonova DN10, Cambridge Reactor Design
DN15, Continuous Crystalliser, NiTech & Alconbury Weston Ltd.
Rattlesnake, Continuous Crystalliser, Cambridge Reactor Design
Stirred Tank Reactors, Radleys
Taylor Couette, Scott Glass

Filtration:
Rotary Drum, Continuous filtration, Cordell Group
Nutsche Filters, Powder Systems
Falcon Filtration Robot, Cambridge Reactor Design

Ancillaries:
Rotor-Stator, IKA, Magic Lab, Flow Cells,
Heater/Chillers, Incubators, Pumps various,
Mass Flow Meters & Controllers,
Ultrasonic Baths, Stirrer/Hot Plates.

PAT / Spectroscopy

FBRM (Focused Beam Reflectance Measurement), Particle Track G400, Mettler Toledo
Particle Sizing, InnoPharma, Eyecon
PVM (Particle Vision Measurement), PVM V819, Mettler Toledo
In-Situ Particle Viewer (ISPV), Perdix FT-IR, Matrix MF, Bruker
ATR-FT-IR, ReactIR 15, Mettler Toledo
FT-IR, MB3000, ABB
Raman, RKN2 Hybrid, Kaiser
Raman, RKN1, Kaiser
UV-Vis, NMC 105, NCS, 651, MC 5651, Zeiss
Turbidit, CrystalEyeES, HEL Group
FT-NIR, Matrix F, Bruker
Terahertz Raman, Ondax
pH probes, Mettler Toledo
Conductivity probes, Mettler Toledo

Imaging

Optical Microscopy, Leica
SEM, FE-SEM 8500, Keysight Technologies
AFM, Dimension FastScan, Bruker
AFM, MultiMode 8, Bruker
IR Microscope, Hyperion 3000, Bruker
Raman Microscope, XPiora Plus, Horiba
Thermal Imaging Camera, A6702sc InSb, FLIR

Microscope Stages:
Temperature, Rheology, Freeze Drying, combined DSC Imaging, Linkam
High Speed Imaging, FastCam, Photon
TOF-SIMS, ION-TOF
X-Ray Nano Computed Tomography, SkyScan 2211 Bruker

Secondary Processing

Bin Blender, MB015AB (Agiliblend)
Laborexpert Blender, Pharmatech
High Shear Wet Granulator, TMG 1/6, Vertical Granulator, Glatt
Fluid Bed Dryer, Strea-1 Pro Laboratory Fluid Bed Unit, GEA
Conical/Hammer Mill, Fitz Mill L1A, Fitzpatrick Company
Tablet Press, XP1 Research Tablet Press, Korsch
Dry Granulation, BT120 Bench Top Roller Compactor, Alexanderwerk
11mm Hot Melt Extruder/Twin Screw Extruder, Pharma 11, Thermo Electron
16mm Hot Melt Extruder/Twin Screw Extruder, EuroLab Pharma 40:1, 1000rpm, Thermo Electron
Mini Injection Molder, Haake MiniJet Pro, Thermo Electron
Cube Mixer KB, Erweka
Spray Dryer, B-290, Buchi
Encapsulator, B-395 Pro, Buchi
Custom Made Supercritical CO2 rig, Vessel sizes 200 and 500 cc, fixed bed, 200cc stirred vessel down to 1cc vessel for small scale, Sci-Med
Aerosol Inkjet 3D Printer, AJ200, Optomec
Plastic 3D Printer, Leapfrog

Ancillaries:
Tableting Tools, Disintegration Test, Friability Tester, Sample Divider, Sieves (100mm & 400mm), Filters, Rotary Evaporator

X-Ray Diffraction

Single Crystal XRD, Kappa Apex II, Mo radiation, Bruker
Single Crystal XRD, D8 Venture, Cu radiation, Bruker
Powder XRD, D8 Discover, Cu radiation, variable temperature & humidity stage, capillary, Bruker
Powder XRD, D8 Advance, Cu radiation, 1 x plate & 2 x capillary, Bruker
XRD Pair Distribution Function (PDF) Analysis, Empyrean, Ag & Mo radiation, PANalytical
Benchtop Powder XRD, D2 Phaser, Cu radiation, Bruker
SAXS/WAXS Cu/Cr/Mo Xeuss 2.0 SM, Xenocs

Materials Characterisation

Dissolution Testing:
pH Solubility Studies, inForm, Sirius Surface
Dissolution Imager (SDI), Sirius Dissolution testers, DT722 (USP 1, 2, 5 & 6) and DF2720 (USP 4), Erweka

Thermal Analysis:
Simultaneous Thermal Analysis (DSC/TGA), STA449 F1 Jupiter, Netzsch
Modulated DSC, DSC 214 Polyma, Netzsch

Chromatography:
HPLC-MS, 1290 with Q-TOF, Agilent GC-MS, 5977A with Headspace sampling, Agilent
Physical Property Measurements:
Surface Area Measurement (BET Analysis), Autosorb-iQ-MS-25T, Quantachrome
Mercury Porosimetry, PoreMaster 60, Quantachrome
Gas Pycnometer, MicroUltrapycnometer 1202, Quantachrome
Bulk/Tapped Density, AutoTap, Quantachrome
Surface Energy Analyzer, iGC SEA, Surface Measurement Systems
Dynamic Vapour Sorption, DVS Advantage 1, Surface Measurement Systems
Compression Testing (SN & 10N Load Cells), 5942, Instron
Powder Rheometer, FT4, Freeman
Technology Liquid Rotational Rheometer, Haake MARS, Thermo Fisher
Flowability, Copley, BEP2
Single-Axis Acoustic Levitator with temperature and humidity incubator (OKOLab), Materials Development Inc.
Surface Contact Angle Goniometer, KRUSS Water Activity Measurement, LabMaster AW, Novasina
Moisture Meter MA, Sartorius
Hybrid Karl Fischer Moisture Titrator, MKH-700, Kyoto Electronics Manufacturing Co.
Polarimeter, Autopol V, Rudolph Research

Nanoparticle sizer, IQON, Q-Nano Next Generation Impactor (NGI), USP 601, Copley
Quantitative Circular Dichroism, Applied Photophysics

Benchtop Spectrometry:
FT-NIR, Multipurpose Analyser (MPA), Bruker
FT-IR with ATR, TENSOR II, Bruker
500 MHz NMR, AVHD500, Bruker (located in Department of Pure and Applied Chemistry)

Particle Sizing & Shape Analysis:
Laser Diffraction Particle Sizing, Mastersizer 3000 with HydroOx, Malvern
Particle Size & Shape Analysis, Morpheus G3, Malvern
Particle Size & Shape Analysis, QicPic/R06, Sympatec
Dynamic Light Scattering, ZetaSizer Nano ZS, Malvern

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