

# Almac Equipment List

## Analytical Operations

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# Location of Almac sites



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Almac Pharma Services  
& Sciences Craigavon,  
Northern Ireland, United  
Kingdom

# 1. Almac Pharma Services & Almac Sciences Ltd Craigavon, Northern Ireland & United Kingdom

## 1.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Chromatography (HPLC)	Agilent 1100 HPLC systems	UV and RID Detectors	8
	Agilent 1200 HPLC systems	UV, PDA, CAD, FLD, RID Detectors	24
	Agilent 1260 HPLC systems	UV, PDA, RI, CAD, ELSD and radio detectors ion and size exclusion systems large prep scale capabilities	50
	Shimadzu LC20 Prominence systems	UV and FLD Detectors	7
	Waters Alliance HPLC	UV, PDA, RI, CAD, ELSD and radio detectors ion and size exclusion systems large prep scale capabilities	50
	Thermo 3000 HPLC	Electrochemical Detector (ECD)	1
Chromatography (UPLC)	Waters H-Class	PDA and UV visible coupled with mass spectrometry	27
	Agilent 1290	PDA and UV visible coupled with mass spectrometry	10
Chromatography (GC)	Agilent 6890/7890/8890 Agilent 7890	ECD, TCD and FID detectors Autosampler and Headspace systems	11
Chromatography (GC/MS)	Agilent 7890/8890/5975/597	Mass spectrometry	2
Disintegration	Agilent 100 Disintegration Bath	Disintegration Testing	1
	Erweka ZT221		1
	Pharma Test Disintegration Bath		1
Dissolution	Distek 2100B, 2100C, 2500 and 6300 Dissolution Baths	Apparatus I and II Peak Vessels / 200mL Vessels	21
	Erweka DT126 and DT958 Dissolution Baths	Apparatus I and II	10
	Hanson Classic 6, Vision Elite 8 and SR8+ Dissolution Baths	Apparatus I and II Peak Vessels / 200mL Vessels	8
	Varian 705DS Dissolution Baths	Apparatus I	2
	Distek Evolution 4300 Autosampler with dual pumps		2
Friability Testing	Copley Friabilitor		3
Hardness Testing	Copley TBF 1000 Tablet Hardness Tester		2

## 1.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Infrared spectroscopy (FTIR)	Thermo Nicolet iS10 with Smart iTR and Omni Transmission, Thermo Nicolet iS5	ATR Accessory	2
	Thermonicolet Avatar 370 Perkin Elmer Spectrum RX1	ATR golden gate	2
pH / Conductivity	Mettler Toledo Seven Excellence / Mettler Toledo Seven Multi		7
Photostability	Suntest XLS+ Photostability Chamber	Using artificial weathering for photostability testing Temperature control via a 'SunCool' Accessory	2
Texture Analyser	TA. XTplusC		1
Ultraviolet- visible spectroscopy (UV-Vis)	Thermo Evolution 300 UV/VIS and Thermo Evolution Pro Spectrophotometers		3
	Analytik Jena, Specord 200 & Hitachi U-2001		2
Water Content	Aqualab 4TE	Water Activity Analyser	1
	Rotronic Hygrolab	Humidity and Water Activity Analyser	1
	Metrohm 901 / 803 Metrohm 874 with 831/851	KF Titration Oven Sampler with KF coulometry	9
	Mettler HS153 Moisture Analyser	Moisture Analyser	2
	Mettler Toledo DL39, C30, V30	Karl Fischer coulometry & titrometry, Stromboli oven	8
Micro	LMS Series 3 Model 400W Incubator	30-35°C	2
	LMS Series 3 Model 400W Incubator	20-25°C	2
	Binder KB400 Incubator	30-35°C	1
	Binder KB400 Incubator	42-44°C	1
	Hettich HettCube 200 Incubator	35-37°C	1
	Monmouth Circulaire VLFT 1500	Laminar Air Flow Cabinet	1
	Monmouth Circulaire HLFT 1800	Laminar Air Flow Cabinet	1
	Monmouth Guardian MSC T1200	Microbiological Safety Cabinet	1
	BioMat Class II	Microbiological Safety Cabinet	1

## 1.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
	LTE Touchclave K300E Autoclave	300 L Chamber	1
	Astell Square AVS360G Autoclave	360 L Chamber	1
	Olympus BX40 Microscope	x100 - x1000	1
	Mettler Toledo Seven Compact S220 pH Meter	Immersion Probe	1
	Mettler Toledo Seven Compact S220 pH Meter	Flat Surface Measurement Probe	1
<b>Kinetic Turbidimetric and Chromogenic Endotoxin Testing</b>	Pyros Kinetix® Flex Tube Reader with Pyros® EQS Software	37°C incubating 32 well tube reader	1
<b>Gel-clot Endotoxin testing</b>	Techne DB-3 Dri-block®	Adjustable 25°-100°C heat block with 60 test tube wells	1
	Techne DB-3 Dri-block®	Adjustable 25°-100°C heat block with 40 test tube wells	1
<b>Other Technologies</b>	Auto titrators	Mettler Toledo T50/T70	2
	Chloride Analysis	Sherwood Scientific Model 926 Chloride Analyser	2
	Flame Photometry	Sherwood Model 420	2
	TOC Analysis	Sievers M9 TOC and Conductivity Analyser with GE Autosampler	1

## 1.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
X-ray powder diffraction (XRPD)	PANalytical Xpert Pro MPD Pixcel detector	Reflection, transmission, variable temperature, auto-sampling	1
	PANalytical Aeris Research Edition	Reflection, transmission, variable temperature, auto-sampling	1
	PANalytical Empyrean with pixel detection	Reflection, transmission, well plates, variable temperature, auto-sampling	1
Differential scanning calorimetry (DSC)	Perkin Elmer DSC 6000	Sub-ambient, auto-sampling	1
Hyper DSC	Perkin Elmer 8500 DSC		1
Thermogravimetric analysis (TGA)	Mettler Toledo STARe	Simultaneous DSC & TGA	1
Dynamic vapour sorption (DVS)	Hiden Isochema IGAsorp	Aqueous and organic vapour	1
Particle size analysis	Malvern Mastersizer 3000	Wet and dry dispersion	2
Intrinsic dissolution	Distek Evolution 6300	Modified for small samples	1
Nuclear magnetic resonance (NMR)	Bruker Advance NEO 500MHz Ultrashield NMRs	Prodigy BBO Cryoprobes	2
Liquid Chromatography Mass Spectrometry High Resolution	Agilent 6530 LC-Q-TOF Agilent 6230 LC-TOF Thermo Scientific Orbitrap Q-Exactive	LC-MS <sup>n</sup> capabilities, accurate mass, Sources include ESI, APCI, ASAP	6
Liquid Chromatography Mass Spectrometry	Agilent 6460 LC-Triple Quad, Waters QDa	LC- MS <sup>n</sup> and MS/MS <sup>n</sup> capabilities	2
Inductively Coupled Plasma Mass Spectrometry (ICP- MS)	Agilent 7900 Thermo Scientific iCAP Q	Elemental impurity and assay analysis	2
Gas Chromatography Mass Spectroscopy	Agilent 7890/5975 Agilent 8890/5977	Simultaneous FID and MS analysis, liquid and headspace sample capabilities, Thermal Separation Probe. MS <sup>n</sup> capabilities, ALS, Headspace and solids probe	2
Ion Chromatography	Dionex, ICS-5000 and IC-6000	Conductivity and electrochemical detectors	5
Polarimetry	Perkin Elmer 341		1
Autotitrator	Mettler Toledo T70, T7		2
Stability testing	All ICH zones	Large humidity chambers	> 300m <sup>3</sup> capacity
TA Discovery	TGA Instrument		1

## 1.2 Analytical equipment (non-GMP)

Technique	Instruments	Numbers
Stability Storage	Binder KMF240, Binder Benchtop Stability Cabinet	9

Technique	Instruments	Features	Numbers
Microscopy	Smiths IlluminatIR Olympus BX51 Linkam hot-stage Keyence microscope	From 10 – 200X, polarizing filters, digital image capture, ATR & ARO objectives, -196 to 350°C, linked to FTIR	1
Raman spectroscopy	Perkin Elmer RamanMicro 200F series Raman Microscope Avalon RamanStation Fusion R1	Microscopy and mapping capabilities	1
Automated solubility determination	Clarity crystallisation station Crystal 16 unit	Multi well reactor block with turbidity probes	1
Crystallisation development	Jacketed glass reactors (100mL – 20L) HEL polyBLOCK 4	Development of robust crystallization procedures with on-line particle size (cord)	1
	BlazeMetrics 900 probe with Raman spectrophotometer	Length distribution, morphology and polymorph monitoring	1
Formulation development	Freeze dryer Spray dryer High shear mixing (Ultra Turrax) Rotary evaporators (Buchi) Ball mill (Retsch)	Development of stabilised amorphous formulations	1
Software modelling tools	Freeze dryer Spray dryer High shear mixing (Ultra Turrax) Rotary evaporators (Buchi) Ball mill (Retsch)	Development of stabilised amorphous formulations	1
Bulked/tapped Density	Vankel tapped density meter	Powder flow	1
FT-IR	Agilent FT-IR	ATR accessory	1





Almac Pharma Services,  
Dundalk, Co.Louth,  
Ireland

## 2. Almac Pharma Services, Dundalk, Co.Louth, Ireland

### 2.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Chromatography (HPLC)	Agilent 1260 HPLC systems	UV, PDA, CAD, RID Detectors	9
Disintegration	Erweka ZT321	Disintegration Testing	1
Dissolution	Erweka DT126, DT727 and DT128 Dissolution Baths	Apparatus I and II	4
Hardness Testing	Copley TBF 100i Tablet Hardness Tester		1
Infrared spectroscopy (FTIR)	Thermo Nicolet iS5 with ID7 ATR Accessory	ATR Accessory	1
pH/ Conductivity	Mettler Toledo Seven Excellence Multiparameter		1
Ultraviolet – visible spectroscopy (UV-Vis)	Thermo Evolution 350		1
Water Content	Metrohm 901 with 803 Metrohm 874 with 831	KF Titration Oven Sampler with KF coulometry	2
	Rotronic Hygrolab	Humidity and Water Activity Analyser	1
Other Technologies	Chloride Analysis	Sherwood Scientific Model 926 Chloride Analyser	1
	Flame Photometry	Sherwood Model 420	1



Almac Sciences  
Ireland Ltd, Athlone,  
Ireland

## 2. Almac Sciences Ireland Ltd, Athlone, Ireland

### 2.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
ICH stability storage	-80°C freezers		3
	5°C refrigerated storage		3
	25°C/60%RH long term stability storage		8
	40°C/75%RH accelerated stability storage		1
	Sciex (X2) API 4000		2
	Sciex API 4000 QTRAP		1
Chromatography	HPLC Waters	RI and Fluorescence detection	2
	HPLC Waters	UV/Vis detection	3
	HPLC Waters	Fluorescence and PDA detection	1
	HPLC Waters	PDA and UV/Vis detection	1
	HPLC Shimadzu LC20 Prominence	UFLC XR	1
	HPLC Shimadzu LC20 Prominence	UFLC	1
	Agilent Technology	1290 Infinity II	2
	UPLC Waters H-Class	TUV detection	3
	UPLC Waters H-Class	TUV and PDA detection	1
	UPLC Waters H-Class	TUV, ELSD and Fluorescence detection	1
	UPLC Waters H-Class (Binary)	TUV	1
	UPLC Waters Acquity Premier	TUV	1
	GC Agilent 7890A	FID Detection	1
	GC Agilent 6890	FID Detection	1
	GC Agilent 7890B	FID Detection	1
	GC Agilent 8890	FID Detection	1
	Agilent Headspace	G1888	2
	Agilent Headspace	7697A	2
	Dani Headspace	86.50 Plus	1
	GC Hewlett Packard 6890	FID detection	1
	Sykam S433 Amino acid analysers	Visible Range and UV/Vis detection	2

## 2.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Spectroscopy	Molecular Devices Spectramax Abs Plus		1
	FT-IR Bruker Alpha-P		1
	FT-IR Thermo Scientific	Nicolet iS5	1
	UV-Vis Shimadzu	UV-2600	1
	SoloVPE from C-Technologies (Slope Spectroscopy)		1
Electrophoresis	BioRad TransBlot Turbo (Western Blots)		1
	BioRad Tetra cell (SDS-PAGE, Native PAGE, 2-D PAGE, DGGE, Gel IEF)		1
	Sciex PA 800 Plus (CE-SDS, CIEF, CZE)		1
	Maurice OBM – Protein Simple (CIEF, CE-SDS)		1
qPCR	Thermo 7500 Fast RT-PCR		1
Drug product analysis	Dissolution baths Agilent	708-DS	2
	Dissolution baths Distek	Dissolution System 2100C	2
	Disintegration bath Caleva Dist 2		1
Particle size	Shimadzu SALD-2201		1
distribution	Malvern (ZSP Nano series) ZEN5600		1
Bacterial Identification system	Biolog Micro station - identification of Bacterial Isolates •Gram positive Rods •Gram Positive cocci •Gram negative rods	ELx8008BLG	1
Micro	Memmert Incubator INE 800	30-35°C	1
	Memmert Incubator IFE 600	42-44°C	1
	Memmert Incubator INE 600	35-37°C	1
	Memmert Incubator INE 600	30-35°C	1
	Memmert Cooled Incubator IPC450	20-25°C	1
	Memmert Cooler Incubator WTW TS 606/4i	20-25°C	1
	Laminar flow unit BASSAIRE	P5VB	2
	Biohazard safety cabinet SCANLAF	Class II	1
	Light Microscope OPTICA	x100-x1000	1
	pH – Meter METTLER Toledo	Seven Compact	1

## 2.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Endotoxin	Pyros ® EQS v 1.2, Pyros Kinetic ® Flex System		2
Particle Counter	Beckman Coulter HRLD150		1
Osmometer	Osmol 1 TM Single Sample Micro Osmometer (Advanced Instruments)		1
Other technologies	Perkin Elmer 2470 Wizard2 (Gamma counter)		1
	Perkin Elmer Filtermate (Cell harvester)		1
	CEM Technologies Mars6 (Microwave assisted digester)		1
	AA with flame and graphite furnace	Agilent 200 Series AA	1
	Metrohm Kark Fischer	Coulometric 851 Titrand	1
	Metrohm Kark Fischer	Volumetric 890 Titrand	1
	Mettler Toledo T70 Auto-Titrator		1
	Metrohm Auto-Titrator	888 Titrand	1
	Colorimeter	Lovibond Comparator 2000 Plus	1
	Refractometer	Bellingham + Stanley RFM970	1
	Polarimeter	Bellingham + Stanley ADP440	2
Melting Point	Thermo Scientific 9100	1	



Almac Pharma Services,  
Charnwood, Loughborough,  
Leicestershire, UK

### 3. Almac Pharma Services, Charnwood, Loughborough, Leicestershire, UK

#### 3.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Chromatography (HPLC)	Agilent 1260 HPLC systems	UV, DAD, FLD Detectors Multisampler	17
	HPLC Shimadzu LC-2040 and Nexera X2 systems	UV Detectors	4
	Waters Acquity ARC	UV / PDA Detectors	7
Chromatography (UPLC)	Agilent 1290 UPLC systems	UV, DAD Detectors	4
	HPLC Shimadzu Nexera X2 systems	PDA Detector	1
	Waters Acquity H Class	UV / PDA Detectors	7
Liquid Chromatography Mass Spectrometry	Waters Acquity and Waters H-Class Systems	QDa and PDA Detectors	2
Chromatography (GC)	Agilent 7890	FID Detector Auto sampler and Headspace System	1
Disintegration	Agilent 100 Disintegration Bath	Disintegration Testing	1
Dissolution	Distek 2500 Dissolution Baths	Apparatus I and II	17
	Distek Evolution 5300 Autosampler		2
Friability Testing	Copley Friabilitor	Friability Testing	1
Hardness Testing	Copley TBF 1000 Tablet Hardness Tester	Hardness Testing	1
Infrared spectroscopy (FTIR)	Thermo Nicolet iS10 with Smart iTR and Omni Transmission	ATR Accessory	1
pH / Conductivity	Mettler Toledo Seven Excellence / Mettler Toledo Seven Multi		5
Photostability	Aralab Photostability Chamber	UV and Vis wavelengths	1
Ultraviolet- visible spectroscopy (UV-Vis)	Thermo Evolution 300		1



### 3.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Water Content	Aqualab 4TE	Water Activity Analyser	1
	Rotronic HW4		1
	Metrohm 901 Volumetric	KF Titration	2
	Metrohm 874 Coulometric	Oven Sampler with KF coulometry	2
	Mettler HS153 Moisture Analyser	Moisture Analyser	1
Micro	Binder Incubator	Multiple temperatures	3
	Beckman Coulter Particle Counter		2
	Motic Light Microscope		1
Raw Materials Testing	Thermolyne Furnace		1
	Thermo Fisher Vacuum Oven		1
Other Technologies	Metrohm 905 Autotitrator	Potentiometry	1
	TOC Analysis	Sievers M9 TOC and Conductivity Analyser with GE Autosampler	1
	ICH stability storage	All ICH conditions. Large capacity chambers	8




Almac Sciences LLC,  
Souderton, Pennsylvania,  
United States

# Almac Sciences LLC, Souderton, Pennsylvania, United States

## 3.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Chromatography (HPLC)	Agilent 1200 HPLC systems	UV, CAD, RID Detectors	3
	Agilent 1260 HPLC system with various detectors (PDA, VWD, CAD, RID)	PDA, UV, CAD, RID) Detectors	7
	Agilent 1290 UPLC system with VWD	UV Detectors	1
	Waters Alliance HPLC	UV Detectors	2
	Waters H-Class systems	UV and PDA Detectors	3
Liquid Chromatography Mass Spectrometry	Waters H Class with QDa	Low resolution LC/MS	1
Chromatography (GC)	Agilent 7890A Agilent 7693 Auto sampler, headspace	FID Direct Inject & Headspace	2
Dissolution	Distek Evolution 6100 Dissolution Baths	Paddles and Baskets	7
	Distek Evolution 6300 Dissolution Bath	Paddles and Baskets	1
	Evolution 4300 Autosampler with dual pumps		4
	Sotax ATMD Robot	Automated Paddles & Baskets with Camera Monitor	1
Disintegration	VanKel 100	Disintegration Testing	1
Infrared spectroscopy (FTIR)	Perkin Elmer Spectrum 100 FT-IR with ATR, DRIFT, Transmission		1
Ultraviolet- visible spectroscopy (UV-Vis)	Perkin Elmer Lambda 35 UV/VIS spectrophotometer		1
Water Content	Mettler C30 Coulometric Karl Fisher titrator	Karl Fischer coulometry, Stromboli oven	1
	Mettler V30 Volumetric Karl Fisher titrator	Karl Fischer volumetric titrator	1
	Metrohm 874 / 851	Karl Fischer coulometry, Stromboli oven	1
Concentration	Metrohm 888	Potentiometric titrator	1
Density	Mettler Densito	Density Meter	1
Melting Point	Buchi M-565	Melting Point Testing	1

A black and white photograph showing a person in a cleanroom environment. The person is wearing a white protective suit, a hairnet, and safety glasses. They are wearing dark gloves and are focused on a piece of equipment, possibly a syringe or a small vial, which they are holding with their hands. The background is a clean, white environment with some equipment visible, including a vertical stand with a black handle. The overall scene suggests a pharmaceutical or laboratory setting.

Almac Pharma Services,  
Audubon, Pennsylvania,  
USA

## 4. Almac Pharma Services, Audubon, Pennsylvania, United States

### 4.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
Chromatography (HPLC)	Agilent 1260 HPLC systems	UV and DAD Detectors	2
Infrared spectroscopy (FTIR)	Cary 630 FTIR	ATR Accessory	1
pH	Hach HQ430d Flexi pH Meter		1
Other Technologies	TOC Analysis	Analytik Jena Multi Win software with 21 CFR Part 11 Compliance	1

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