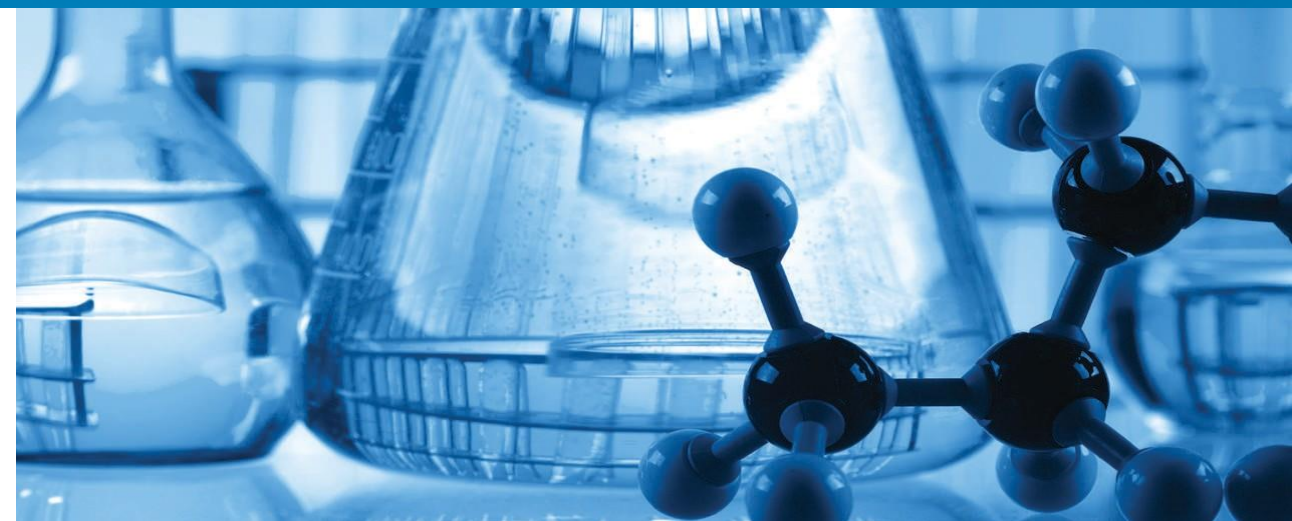


CORPORATE OVERVIEW



2018

Carrington Smith, CEO



MPD CHEMICALS OVERVIEW

US- Based Manufacturing | Custom Synthesis | Proprietary & Catalog Products



Offering Specialty Chemical Products & Custom Synthesis

- We Deliver Quick-turn Contract Manufacturing Services
- Our Capabilities Range from R&D to Metric ton Production
- ISO 9001:2015 certified
- Offering 4,000 Catalog Products with Online Ordering



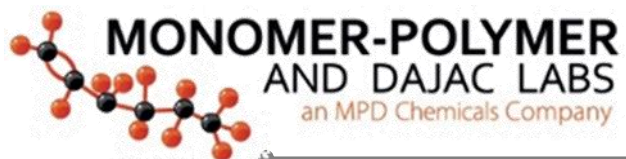
MPD has extensive capabilities utilized across all 4 locations:

- R&D, lab scale and production facilities in PA, NC, and NY,
- Allows for efficient development & scale-up for customers
- 100 years of combined operating history



MPD CHEMICALS CAPABILITIES

Advanced Specialty Chemistry | Scalable Manufacturing | Combined Expertise



- Specialty Monomers
- Custom Polymers
- Fluorinated Materials
- Custom Synthesis



- Organosilanes
- Siloxanes
- Coupling Agents
- Custom Synthesis



- Organic Molecules
- Stable Isotope Labeling
- Custom Synthesis



- Metallocenes
- Catalysts
- Organometallics
- Custom Synthesis

Leading Manufacturer of Specialty Monomer, Polymer & Copolymer Products

MARKET APPLICATIONS



CUSTOM SOLUTIONS

- Monomer-Polymer and Dajac Labs specializes in custom synthesis and contract research as well as maintaining catalog products, developed from our own research programs.

CATALOG PRODUCTS

- We offer over 2,000 catalog products.
- Catalog products are manufactured based on proven scientific principles that have been developed internally with the highest quality and purity.

R&D / LAB

Developing the product
(sub-gram to kg scale)

PILOT SCALE

Developing the process
(10's-100's kg scale)

PRODUCTION

Commercial Production
(100's-1000's kg scale)



Custom and Specialty Manufacturer for Organosilanes, Chlorosilanes, Silicones and Related Materials

- Our products are widely used in a variety of markets including coatings, pharmaceutical, electronics, biomedical devices, chromatography intermediates, adhesives, academic and industrial R&D, and high-performance materials.
- Extensive manufacturing facilities: projects, from kilos to multi-ton commercial scale quantities
- Located in New York and North Carolina
- Customers include large Fortune 500 firms, small venture-backed, and private companies.
- ISO 9001:2015 Certified



R&D / LAB

Developing the product
(sub-gram to kg scale)

PILOT SCALE

Developing the process
(10's-100's kg scale)

PRODUCTION

Commercial Production
(100's-1000's kg scale)

CUSTOM SYNTHESIS & CATALOG PRODUCTS

- **SILAR's ISO 9001:2015 certified custom synthesis services** includes high quality solutions for customers with proprietary manufacturing requirements.
- **We Offer Over 700 Catalog Products**

MARKET APPLICATIONS



Specialty Chemical Manufacturer for Advanced Materials for Highly Air & Moisture Sensitive Organometallic, & Organic Molecules

- Norquay Technology was acquired by MPD Chemicals in Dec. 2017
- Norquay Technology has been manufacturing specialty chemicals for over 30 years for some of the largest firms in the world.
- We are a custom and specialty chemical manufacturer, specializing in processes ranging from lab scale to full commercial production of high quality organic intermediates and highly air and moisture sensitive advanced materials.
- Key expertise in taking specialty chemicals from start-up concepts to commercialization.



MARKET APPLICATIONS



CUSTOM SYNTHESIS

- We offer custom manufacturing solutions.
- Norquay's **ISO 9001:2015** certified custom synthesis services includes high quality solutions for customers with proprietary manufacturing requirements.
- Our R&D team identifies specific market needs and develops new advanced proprietary materials for customers.

FEATURED PRODUCTS

Featured Advanced Product Materials:

- Precursor Metal Complexes
- Polyolefin Catalysts & Ligands
- Performance Materials: UV Absorbers & Coatings
- Medical Device Adhesive Intermediates
- Photochromic/Thermochromic Dyes & Inks
- Custom Manufacturing Solutions

R&D / LAB

Developing the product
(sub-gram to kg scale)

PILOT SCALE

Developing the process
(10's-100's kg scale)

PRODUCTION

Commercial Production
(100's-1000's kg scale)

Specialists in Stable Isotope & Metabolite Synthesis

IsoSciences Is An Innovator, Specializing In The Production Of Isotopically Labeled Internal Standards For Mass Spec Analysis

- Fulfilling the market demands for stable isotope labeled reference compounds, advanced intermediates, final drug substances and metabolites for over 15 years.
- We develop custom synthesized internal standards for global leaders in diagnostic testing laboratories, research universities, pharmaceuticals and government agencies including the CDC, NIH and NIST.
- ISO 9001:2015 certified with extensive, quality control and analytical capabilities located in Ambler, PA.



CUSTOM SOLUTIONS
Complex Projects with a Fast Turn Around

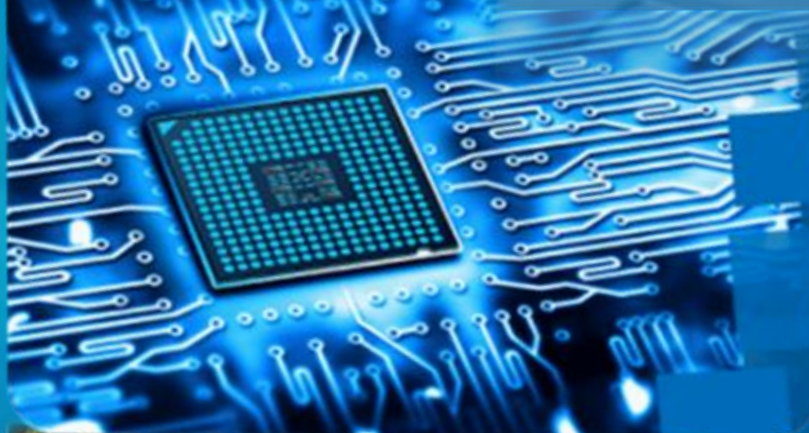
ISOTOPE INCORPORATION
Determination by LC-MS/MS, LC-MS or GC-MS

IsoSciences offers over 1000 catalog products featuring solutions in the categories below:

Steroids	Clinical Diagnostic
Vitamin D	Immunosuppressant
Vitamin K	Synthetic Intermediates
Food & Vitamin	Environmental
Catechins	Caffeine Metabolites
Bile Acids	Toxicology
Fatty Acids	Newborn Screening
Thyroxine	E-Cigarettes

Market Applications

- Biomedical Devices
- Wound Care
- Coatings
- Medical Device Adhesives
- Dental Technologies
- Clinical & Diagnostic Labs
- Pharma R&D
- Chromatography
- Diagnostics Standards
- Specialty Chemicals
- Contact & Intraocular Lenses
- Industrial Applications
- Precursor Metal Complexes
- Polyolefin Catalysts & Ligands
- Dyes and Chromic Materials
- Performance Materials





Analytical and QC Capabilities

MPD Chemicals provides our worldwide customers with reliable, high quality, premium specialty chemicals



QC Data / Results

• Certifies test data taken from production samples



QA Procedural

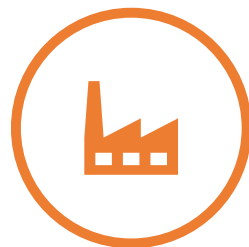
• Ensures proper procedures were followed during the manufacturing process



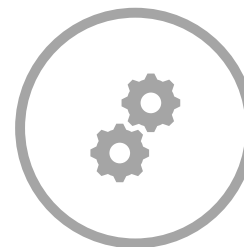
- Our business units utilize a full suite of analytical equipment for in-process checks and for quality control.
- Shared capabilities between business units.
- *Silar, IsoSciences, & Norquay* facilities practices fulfill ISO 9001:2015 requirements.

- Gas chromatography
- High pressure liquid chromatography
- GPC
- NMR
- Mass Spec
- Viscosity measurement & instruments
- UV-Vis
- FTIR
- % Water by Karl Fisher method
- % Solids
- DSC
- Access to others via university relationships

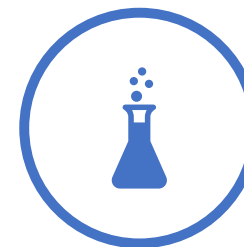
Key Strengths



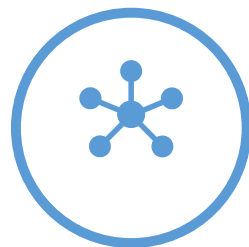
QUOTE AND
MANUFACTURE FROM
SUB-GRAM TO METRIC
TON QUANTITIES



SPEED TO PRODUCE
MATERIALS



RANGE OF CHEMICAL
HANDLING CAPABILITIES



MPD PROPRIETARY
OFFERINGS VIA CATALOG
AND DIRECT LARGE
VOLUME SALES



BROAD RANGE OF
RAW MATERIAL
SOURCING OPTIONS



ALL CUSTOMER
PROPRIETARY MATERIAL
REQUIREMENTS ARE
PROCESSED
CONFIDENTIALLY

MPD Manufacturing Facilities Overview

Reactors

- Reactors: 12 liter - 1500 gallon
- Temperature: -10°C to 225°C
- Larger reactors: Materials of construction are mostly glass-lined and Hastelloy
- Vacuum: Range starts at less than 1 Torr distillation
- Kilo Laboratories – numerous benchtop hoods and over 20 walk-in hoods with glass reactors up to 50 liter scale

Filtration

- Hastelloy® filter dryers (kilo to commercial)
- Centrifuges (316 stainless steel & Hastelloy®)
- Sparkler® filtration
- Vertical plate filters
- Line filters

Utilities

- Steam: 150 psi
- Chiller to -20°C with capability to -76°C in some reactors up to 1200L
- Cooling tower water, compressed air & breathing air
- Liquid Nitrogen

Drying

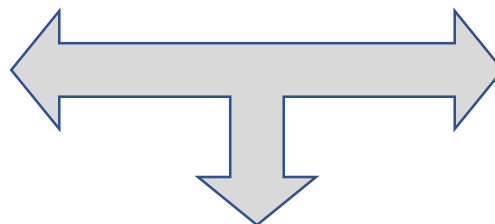
- Teflon® lined double cone dryer
- 316 stainless steel rotary vacuum dryer
- 316 stainless steel shelf dryers
- Filter dryers
- All vacuum dryers equipped with condensers/receivers

MPD Offers Full Spectrum of Products and Services from Contract Research to Toll Manufacturing



MPD Provides Contract Research Services

- Small scale lab synthesis (grams to kilograms)
- Labor costs dominate
- Proof of concept
- Customers may provide very little information



MPD Provides Toll Manufacturing Scale Products

- Large scale manufacturing (100's of kilograms)
- Labor costs diluted
- Specifications firm
- No 'process package' required

Bridging Lab-scale to Full-scale Manufacture

- Develop full-scale process
- Collaborate on specifications

Contact Us

Carrington Smith, CEO

office: (215) 364-1155 ext. 202

cell: (610)751-7467

csmith@mpdchemicals.com

*Combined Expertise for Manufacturing Specialty
Chemicals & Custom Synthesis Solutions*



monomerpolymer.com



silar.com



isosciences.com



norquaytech.com

Over 4,000 Catalog Products  R&D, Lab, Pilot, & Production Scale