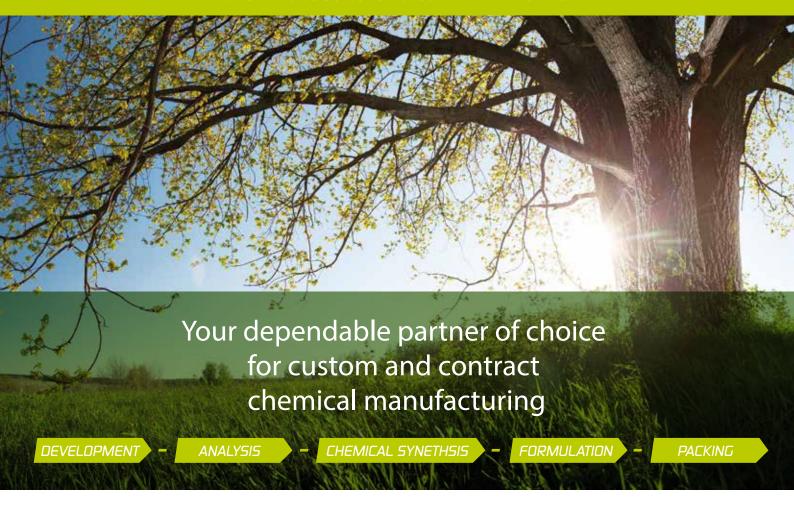




#### **GROWING SUCCESSFUL GLOBAL PARTNERSHIPS**



Briar Chemicals delivers contract and custom manufacturing solutions to customers across the globe. From our site in Norwich, UK, we service world-leading companies in the crop protection, fine and speciality sectors, utilising a broad asset and technology base, underpinned by quality driven project management.

Briar Chemicals have over 65 years of chemical manufacturing heritage and an established reputation for excellence through continuous improvement, dependability, investment in people and social responsibility.

The products we make on behalf of our customers help to protect a wide range of crops, in both the fine and speciality Chemical Sectors and are key building blocks.

It is vitally important to all our stakeholders that we operate in a safe and responsible manner, providing employment opportunities, and contributing to the UK and global economies through the manufacture of chemical products that benefit society.

# Briar Chemicals technologies and services include

- Ammonolysis
   (dedicated ammonia handling capability)
- Bromination
   (various brominating agents including bulk elemental bromine)
- Chlorination (bulk thionyl chloride handling capability)
- Cyanation
  (sodium cyanide
  chemistry and synthesis
  of aromatic nitriles)
- Diazotisation
- Esterification
- lodination
- Nitration
- Oxidation

- Recovery and recycle of solvents and copper salts
- Sulphonamide formation
- Sulphur Dioxide reactions
- Formulation and packing (from bulk down to 0.25l)

#### Extensive Process Development and Analytical Capability

- Laboratory scale from grams to 50 litres
- Process optimisation of new and existing processes
- Seed treatment and formulation development
- Development, validation and implementation of analytical methods
- HPLC, HPLC-MS, GC, GC-MS
- Ion Chromatographic (IC) techniques
- Inductively Coupled Plasma (ICP) Optical Emission Spectrometry (OES) for metals analysis
- UV/FTIR and wet chemistry

## Once a process has been developed and scaled up

- Extensive range of solids and liquids manufacturing assets
- Total reactor capacity in excess of 700m<sup>3</sup>
- Reaction vessels range from 2.3m3 to 25m3
- Materials of construction include glass lined MS, stainless steel, hastelloy, and titanium
- Ethylene Glycol cooling/heating enables us to provide iacket services between -16 deg C and +90 deg C
- Steam heating allows jacket services at pressures up to 17 barg

- Hot oil systems provide heating up to 250 deg C
- Solids handling equipment in a variety of materials of construction (including hastelloy): pan and rotary paddle driers, centrifuges, pressure filters, belt filters, rotary sieves milling equipment
- Batch and continuous distillation
- Bulk storages for raw materials, intermediates and finished products
- Expertise in ammonia, bromine, iodine, cyanides, hydrogen peroxide, sulphur dioxide and thionyl chloride handling

### Formulation and packing (bulk down to 0.25 litres)

- Liquid specialists: Emulsifiable Concentrates (ECs),
   Soluble Concentrates (SLs), Suspoemulsions (SEs) and
   Microemulsions (MEs)
- Rigorous cross contamination prevention protocols
- Heated bulk storage systems, heat traced lines between vessels and storages
- Drum heating ovens (total capacity 186 drums) for handling of solid materials
- Bulk storage capacity 1.8 million litres of formulated product and 1.2 million litres of bulk solvents

- Formulation vessels 14,000 to 27,000 litres (minimum batch size 4,000 litres)
- Bulk and IBC offloading and filling, with steam heating capability
- 6 packing lines capable of packing from 0.25 litre to 200
   litre packs at speeds up to 30 containers per minute
- Packing output of up to 90,000 litres/day
- Robotic palletising equipment with auto stretch wrapping
- Warehouse capacity of 1.1 million litres of packed product including flammable storage areas

## What you can expect from us

- Fast response to enquiries
- Total confidentiality and IP protection
- Laboratory and scale-up capabilities
- Process safety and hazard studies
- Analytical method development
- Project management and commissioning
- Process development and optimisation
- Operational excellence, regulatory compliance



