

Gold Standard

Formulation Scientist: Research & Development, New Product Development

| | The Gold Standard Job Role skills, knowledge and behaviours | Gold Standard Qualifications & Training Standards (Examples) |
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| Technical competence | <p><i>The individual has...</i></p> <ul style="list-style-type: none"> • <i>Scientific and technical knowledge:</i> <ul style="list-style-type: none"> ○ <i>the underpinning knowledge in the science & technology of formulated products, both chemical and biological</i> ○ <i>Specialist knowledge relevant to the manufacture of formulated products for specific industry applications</i> • <i>Sector-specific to develop new formulations for defined industry applications taking into account technical constraints and market needs.</i> <i>E.g.: Pharmaceutical tablets for oral dosage</i> <i>Moisturizing cream for skincare</i> <i>Redispersible granules for crop protection application</i> <p><i>The individual understands...</i></p> <ul style="list-style-type: none"> • <i>Formulated product design and manufacture and the scientific principles underpinning this including:</i> <ul style="list-style-type: none"> ○ <i>colloid science and particle technology</i> ○ <i>particle size distribution and porosity</i> ○ <i>particle size reduction</i> ○ <i>specific surface area and bulk density</i> ○ <i>crystallisation, co-crystallisation and re-crystallisation</i> ○ <i>dissolution and solubility</i> ○ <i>surface chemistry</i> ○ <i>adhesion science</i> ○ <i>dispersions, surfactant and dispersant technology</i> ○ <i>rheology modifiers</i> ○ <i>emulsions and emulsification</i> ○ <i>encapsulation and controlled release</i> ○ <i>solid state characterisation</i> ○ <i>polymorphs and pseudo-polymorphs</i> | <p>Degree, MSc or PhD in a relevant scientific or engineering subject</p> <p>Eng. D. In Formulation Engineering</p> <p>M.Sc. in Formulation Science</p> <p>MChem in Formulation Science</p> <p>Pharmacy/Pharmaceutics – Degree</p> <p>Pharmaceutical and Cosmetic Science - Degree</p> <p>Diploma in Cosmetic Science by Distance Learning</p> <p>Training:</p> <p>Spring School in Colloids and Surface Chemistry</p> <p>Formulating with surfactants Fundamentals of Formulation Science and Technology eLearning in Formulation Technology</p> |

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| | <ul style="list-style-type: none"> ○ <i>mechanical properties and related phenomena such as compaction</i> ○ <i>the use of characterisation techniques to support formulation development including particle size analysis, specific surface area, porosity, rheology, wettability and microscopy.</i> ○ <i>the use of industrial analytical quality control (QC) techniques.</i> ○ <i>The basic manufacturing requirements for formulation development activities including and not limited to factory trials.</i> ○ <i>Statistical techniques for data analysis</i> ○ <i>Statistical experimental design</i> ○ <i>The use of specialist formulation software to analyse experimental data and design experiments for formulating new products.</i> ○ <i>The fundamentals of protection of Intellectual Property and licensing of technologies.</i> ○ <i>How formulation can be used to provide product differentiation and add commercial value</i> <p><i>The individual can...</i></p> <ul style="list-style-type: none"> ● <i>Interpret the results of physical characterisation and analytical results to guide formulation development and problem solving.</i> ● <i>Conduct physical and chemical evaluations of candidate formulations and competitive products using established analytical techniques.</i> ● <i>Write procedures for initial manufacturing trials prepare laboratory samples for marketing field trials and provide needed information on sample handling and use.</i> ● <i>Use structured problem solving methodologies to resolve issues.</i> | |
| Compliance | <p><i>The individual understands...</i></p> <ul style="list-style-type: none"> ● <i>health, safety and environmental compliance in the process industry both in a laboratory and plant environment</i> ● <i>The essentials of those regulations which apply to the industry or application in question (e.g. medicines, medical</i> | <p>NEBOSH Award in Health & Safety at Work</p> <p>IOSH Managing Safely</p> |

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| | <p><i>devices, GMP, GLP, pesticides, detergents, biocides, cosmetics etc)</i></p> <p><i>The individual can...</i></p> <ul style="list-style-type: none"> • <i>ensure all work complies with relevant quality standards (e.g. ISO 900x, ICH, Good Laboratory Practice (GLP) and current Good Manufacturing Practice (cGMP) etc)</i> • <i>maintain laboratory records to relevant quality requirements</i> • <i>ensure all products are developed to conform to company quality manuals and statutory quality requirements such as cGMP.</i> • <i>Has a basic understanding of the relevant regulatory framework such as REACH, Cosmetics Directive, Biocides Product Directive...</i> | |
| <p>Business improvement</p> | <p><i>The individual can:</i></p> <ul style="list-style-type: none"> • <i>review existing products and practices and recommend and implement changes where necessary</i> • <i>suggest ideas into new or improved products</i> <p><i>The individual understands & can deploy the theory, principles & practice associated with a variety of appropriate business improvement techniques, including an awareness of Lean and Six Sigma techniques.</i></p> <p><i>The individual can create & manage teams to solve problems using structured problem solving methodologies</i></p> <p><i>The individual understands and can deploy the principles of Resource Efficiency</i></p> | <p>Levels 2-3 NVQ Diploma in Business Improvement Techniques (QCF)</p> <p>If required various levels of training in Resource Efficiency are available</p> |
| <p>Functional & Behavioural</p> | | <p>Performance appraisal HR systems</p> |
| <p><i>Autonomy</i></p> | <p><i>The individual</i></p> <ul style="list-style-type: none"> • <i>Can Plan work autonomously to deliver desired results within required timelines.</i> • <i>Is commercially orientated, self motivated with an ability to evaluate and take risks.</i> | |

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| | <ul style="list-style-type: none"> • <i>Has Strong intellectual curiosity and ability to think out of the box.</i> • <i>Can work independently, with minimal supervision.</i> | |
| <i>Management & Leadership</i> | <ul style="list-style-type: none"> • <i>Excellent team, organizational and influencing skills</i> • <i>Participate in the delivery of specific project goals for new formulated products.</i> • <i>Participate in the team delivery of work on specific projects at external laboratories where appropriate.</i> • <i>Applies principle of Project Management where relevant</i> | PRINCE2 Foundation PRINCE2 Practitioner |
| <i>Working with others</i> | <ul style="list-style-type: none"> • <i>Work closely on product development teams with Business Development Managers, Field Researchers, Supply Chain and Manufacturing staff, Registration Managers, Patent Attorneys and other formulation chemists within the companies' network.</i> • <i>Provide technical support to various stakeholders to support process design and validation, manufacturing scale up, cost reduction efforts and production.</i> • <i>Build relationships with knowledge centres that provide formulation expertise.</i> | |
| <i>Personal development</i> | <ul style="list-style-type: none"> • <i>Maintain and develop knowledge of competitive products and novel technologies.</i> • <i>Demonstrates innovation in applying knowledge from other sectors</i> • <i>Develop and demonstrate technical and scientific agility to enable the adoption and application of related technologies (lateral thinking).</i> | |
| <i>Communication</i> | <ul style="list-style-type: none"> • <i>Present the companies formulation expertise at appropriate conferences and commercial / collaborator meetings.</i> • <i>Demonstrate excellent written and verbal communication skill</i> • <i>Can submit reports to industry specific Regulatory Bodies</i> | |
| <i>Business awareness</i> | <ul style="list-style-type: none"> • <i>Has an appreciation of the industry sector, adjacent sectors and competitors</i> • <i>Appreciates the importance of costs in developing a formulation</i> | ILM L3 Award in Business Awareness |

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| | <ul style="list-style-type: none">• <i>Understands the company structure and business processes</i>• <i>Understands the customer base and is aware of customer requirements</i> | |
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