



# Technology Readiness Level

| TRL 0   | TRL 1   | TRL 2  | TRL 3   | TRL 4   | TRL 5   | TRL 6   | TRL 7  | TRL 8   | TRL 9  |   |
|---|---|--|---|---|---|---|--|---|--|---|
| <b>Idea</b><br>Unproven concept, no testing has been performed. | <b>Problem Solving</b><br>Core principles are explored and observed but no experimental proof available.  | <b>Concept Generation</b><br>Concept and application have been explored. | <b>Concept Feasibility</b><br>Feasibility tests ran providing a proof of concept. | <b>Proof of concept Prototype</b><br>Testing done on core mechanisms and function.  | <b>Rough Working Prototype</b><br>Tested in intended environment.   | <b>Prototype Field Trials</b><br>Tested in intended environment close to expected performance.                      | <b>Pre-Production Prototype</b><br>Operating in operational environment at pre-commercial scale.   | <b>First Production Runs</b><br>Manufacturing issues solved.  | <b>Full Commercial Production</b><br>Technology available for consumers.   |   |
|   | <ul style="list-style-type: none"> <li>- Concepts identified</li> <li>- Research carried out and refined</li> <li>- Technology development</li> <li>- Identify material concerns</li> </ul>   |  |   | <ul style="list-style-type: none"> <li>- Early indications of materials identified</li> <li>- Manufacturing feasibility determined</li> <li>- Manufacturing processes identified</li> </ul> | <ul style="list-style-type: none"> <li>- Characteristics identified</li> <li>- Early supply chain assessment</li> </ul> | <ul style="list-style-type: none"> <li>- Initial trade studies</li> <li>- Quality thresholds established</li> </ul> | <ul style="list-style-type: none"> <li>- Assessed supply chain</li> <li>- BOM in development</li> <li>- Materials being tested</li> <li>- Demonstrate supply chain</li> <li>- BOM Draft</li> </ul> | <ul style="list-style-type: none"> <li>- Establish multiple sources</li> <li>- Pilot line builds validated</li> <li>- Materials Proven</li> <li>- Quality characteristics validated</li> <li>- BOM Finalised</li> </ul> | <ul style="list-style-type: none"> <li>- Continuous process improvements</li> <li>- Materials in control</li> <li>- Quality validated with LRIP articles</li> <li>- Make / buy supports</li> </ul> | <ul style="list-style-type: none"> <li>- Monitor and manage all key characteristics at a Six Sigma level</li> </ul> |
|   | <b>Prior Consultancy Knowledge</b><br>As a consultancy, having worked on successful solutions for many industries, the first 3 manufacturing readiness levels are tackled and kept in mind by our early stage product development stages. |  |   | <b>Small Scale Prototype</b><br>Crude prototypes to test technologies.  | <b>Refine Manufacturing Strategy</b><br>Identification of enabling technologies and components.                         | <b>Prototype Development</b><br>Manufacturing processes have been defined but requires design for manufacturing.    | <b>Design for Manufacturing</b><br>Manufacturing detailing is underway.  | <b>Pilot Line Demonstration</b><br>Manufacturing processes are proved   | <b>Manufacturing Production</b><br>Getting the quality, costs and performance on target.   | <b>Manufacturing Management</b><br>Applying Six Sigma to the production.  |
|   | MRL 1   | MRL 2  | MRL 3   | MRL 4   | MRL 5   | MRL 6   | MRL 7  | MRL 8   | MRL 9  | MRL 10  |

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