<table>
<thead>
<tr>
<th>TSC Category</th>
<th>Engineering and Manufacturing Fundamentals</th>
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<tbody>
<tr>
<td>TSC</td>
<td>Geometric Dimensioning and Tolerancing</td>
</tr>
<tr>
<td>TSC Description</td>
<td>Define and verify acceptable engineering tolerances of products' and parts' geometry</td>
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<table>
<thead>
<tr>
<th>TSC Proficiency Description</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
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<tr>
<td>Perform dimensional and geometric measurements of machined parts and components, using a range of measuring tools and equipment</td>
<td>Perform dimensional and geometrical measurements and inspection of manufactured components for evaluation of acceptability</td>
<td>Use tolerance stack-up methods to analyse the cumulative effects of tolerances to determine appropriate engineering interventions</td>
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<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Level 1</th>
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<th>Level 4</th>
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<tbody>
<tr>
<td>Component reference datum</td>
<td>Workplace safety and health (WSH) guidelines and regulations relating to conduct of dimensional and geometric measurements</td>
<td>Principles of precision engineering</td>
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<tr>
<td>Types and applications of measuring tools, gauges and equipment</td>
<td>Specifications and acceptance criteria</td>
<td>Definitions, concepts principles and rules of geometric dimensioning and tolerancing (GD&amp;T)</td>
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<tr>
<td>Types of measuring errors</td>
<td>Principles and approaches to adjusting deviations in tolerance</td>
<td>Types of GD&amp;T symbols in engineering drawings</td>
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<tr>
<td>Operation and function of measuring and testing equipment</td>
<td>Tolerance stack-up in assemblies</td>
<td>Definitions and principles of fit functions</td>
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<tr>
<td>Cleaning of measuring instruments and components to be measured</td>
<td>Use of inspection fixtures and dial indicators</td>
<td>Concept of worst-case tolerance stack</td>
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<tr>
<td>Workplace safety and health (WSH) guidelines and regulations relating to conduct of dimensional and geometric measurements</td>
<td>Types of dimensional measuring gauges and applications</td>
<td>Concept of statistical variation tolerance stack</td>
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<tr>
<td>Concepts of allowable and outside allowable tolerances, and limits of permissible error</td>
<td>Importance of calibration for dimensional measuring gauges and fixtures</td>
<td>Definitions and principles of GD&amp;T systems</td>
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<tr>
<td>Principles and approaches to adjusting deviations in tolerance</td>
<td>Types of visual defects</td>
<td>Methods of reducing or eliminating tolerance accumulation</td>
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<tr>
<td>Organisational procedures and hygiene standards for reinstating work areas</td>
<td>Records of inspection results</td>
<td>Concept of engineering productivity and economics</td>
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<tr>
<td>Knowledge</td>
<td>Principles of precision engineering</td>
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</table>

<p>| Principles of precision engineering |
| Definitions, concepts principles and rules of geometric dimensioning and tolerancing (GD&amp;T) |
| Types of GD&amp;T symbols in engineering drawings |
| Definitions and principles of fit functions |
| Concept of worst-case tolerance stack |
| Concept of statistical variation tolerance stack |
| Definitions and principles of GD&amp;T systems |
| Methods of reducing or eliminating tolerance accumulation |
| Concept of engineering productivity and economics |
| Organisational and legislative requirements |</p>
<table>
<thead>
<tr>
<th>Abilities</th>
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<tbody>
<tr>
<td>• Verify that correct versions of reference drawings are used</td>
<td>• Select and use suitable personal protective equipment appropriate to the job requirements</td>
<td>• Analyse engineering drawings to interpret GD&amp;T requirements</td>
</tr>
<tr>
<td>• Interpret geometrical tolerances, symbols, notations and surface</td>
<td>• Interpret engineering drawings to determine acceptable dimensional and geometrical tolerances</td>
<td>• Perform worst-case tolerance stack analyses on the degree and variation of fit of design assemblies, to determine maximum expected variation</td>
</tr>
<tr>
<td>finish reference charts</td>
<td>• Conduct pre-operational checks and inspections to verify working conditions of tools and fixtures, according to job requirements</td>
<td>• Perform statistical variation tolerance stack analyses on the degree and variation of fit of design assembly, to determine expected variation</td>
</tr>
<tr>
<td>• Set up, locate and secure components to be measured</td>
<td>• Perform calibration checks on measuring gauges</td>
<td>• Determine optimal component tolerances, in accordance with requirements</td>
</tr>
<tr>
<td>• Select appropriate measuring tools and equipment for the components</td>
<td>• Report incidences of equipment abnormalities to be rectified</td>
<td>• Determine methods of reducing or eliminating tolerance accumulation, to meet optimal component tolerances</td>
</tr>
<tr>
<td>to be measured</td>
<td>• Set up components within inspection fixtures securely to achieve accurate measurements</td>
<td>• Report on component tolerances using GD&amp;T systems</td>
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<tr>
<td>• Determine the appropriate techniques to measure components</td>
<td>• Record results and findings</td>
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<tr>
<td>• Calibrate measuring instruments and equipment</td>
<td>• Make decisions to accept or reject components based on measurements</td>
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<td>• Record results and findings</td>
<td>• Maintain measuring tools and equipment</td>
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<td>• Make decisions to accept or reject components based on measurements</td>
<td>• Determine methods of reducing or eliminating tolerance accumulation, to meet optimal component tolerances</td>
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<td>• Maintain measuring tools and equipment</td>
<td>• Update documents according to the approved format</td>
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<td>• Analyse engineering drawings to interpret GD&amp;T requirements</td>
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<td>expected variation</td>
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<td>to meet optimal component tolerances</td>
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