

ACMA5002 Coursework Feedback

Student: Chris Morgan

Student ID: 2512679

Selected topic/product/project: Mobile Phone Housing Optimisation

Final mark: 67/100

1. Engagement with Literature Skills — 9/15

The report uses an appropriate range of sources covering DFM, DFA, injection moulding, common defects, material selection, QFD, FMEA, sustainability and manufacturing costs. Relevant academic journal articles, textbooks, institutional guidance and industrial sources are included, and citations are used regularly to support the technical discussion. The literature informs decisions relating to wall thickness, draft, fillets, PC-ABS selection, recyclability and defect mitigation. However, several references are presented as database sign-in or redirection pages rather than complete publication records, one journal source is duplicated, and the work relies considerably on general technical websites. A higher mark would require more accurate reference details, wider use of current peer-reviewed research and stronger evidence supporting specific dimensions, process parameters and cost assumptions.

2. Knowledge and Understanding Skills — 21/30

The submission demonstrates good understanding of DFM, DFA, injection moulding, defect mechanisms, material behaviour and high-volume manufacturing. These principles are applied to the component through uniform wall thickness, filleted edges, functional openings and snap-fit features intended to simplify assembly. Granta is used to compare ABS, polycarbonate and PC-ABS in terms of tensile strength, density, cost, stiffness and processability, leading to a reasonable final material choice. The report also discusses the balance between wall thickness, strength, cooling time, cost and surface quality. Sustainability is considered through recyclability, energy efficiency and waste reduction. Greater depth is needed in dimensional tolerances, processing parameters and the required step-by-step manufacturing process plan from material preparation through production and final inspection.

3. Cognitive and Intellectual Skills — 19/30

The QFD translates customer requirements into ranked technical priorities and identifies cooling, wall thickness, snap-fit geometry and gate location as significant considerations. The FMEA identifies relevant failure modes and presents revised RPN values following proposed mitigation actions, showing a useful connection between risk analysis and design development. Injection-moulding results are interpreted through fill confidence, sink marks and warpage, while the discussion considers material, geometry and cost trade-offs. The cost analysis includes material, machine, tooling, unit cost and break-even calculations. However, no clear DOE or equivalent structured optimisation study is presented, despite this being required by the brief. The acceptance of approximately 1.36 mm warpage is not supported by defined dimensional tolerances, and the cost analysis is relatively simplified, with no detailed comparison of an alternative material or manufacturing approach.

4. Practical Application Skills — 11/15

The report provides clear practical evidence of Autodesk Fusion 360 CAD modelling, technical drawing, Granta material selection and injection-moulding simulation. The CAD model contains camera, charging and speaker openings, snap-fit features, uniform walls and fillets, and the simulation demonstrates complete filling with no predicted short shot. Sink depth is quantified at approximately 0.081 mm, warpage is identified around the walls and corners, and an alternative injection location is reported as having been trialled. The principal practical limitation is the FEA evidence: the section discusses expected stress locations and design features

but does not provide numerical stress, displacement or safety-factor values, defined loads, constraints or mesh information. More complete engineering dimensions, tolerance data, iterative redesign evidence and documented simulation settings would support a higher mark.

5. Transferable Skills for Life and Professional Practice — 7/10

The report follows a coherent engineering structure and includes an abstract, contents page, numbered sections, CAD images, technical charts, simulation outputs, discussion, recommendations and a conclusion. The work progresses logically from design principles and customer needs through material selection, CAD, simulation, costing and sustainability. The discussion identifies relevant design trade-offs and sensible future improvements, including recycled material, cooling optimisation, improved snap-fit geometry and additional structural testing. However, the professional presentation is reduced by frequent grammatical errors, first-person wording, inconsistent figure naming, incomplete contents-page numbering and several unclear or repetitive sentences. More careful proofreading, improved formatting and clearer presentation of calculations and simulation evidence would strengthen the report.

Mark summary

Assessment category	Maximum mark	Mark awarded
Engagement with Literature Skills	15	9
Knowledge and Understanding Skills	30	21
Cognitive and Intellectual Skills	30	19
Practical Application Skills	15	11
Transferable Skills for Life and Professional Practice	10	7
Total	100	67