

ACMA5002 Coursework Feedback

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Selected topic/product/project: Injection-Moulded Polycarbonate Mobile Phone Case

Final mark: 68/100

1. Engagement with Literature Skills — 10/15

The report uses relevant sources covering DFM, DFA, QFD, FMEA, DOE, injection moulding, tolerances, materials, costing and sustainability. Literature supports the explanation of the main engineering tools and provides context for customer requirements, recyclability and dimensional accuracy. Granta data is also incorporated into the material comparison, and external figures are normally identified. However, the research is mainly descriptive and relies considerably on websites and general sources, with limited use of journal papers, engineering textbooks and recognised standards. Several important technical values, including processing temperatures, material prices, loading assumptions and acceptance limits, require stronger and more directly relevant evidence. Greater critical comparison of sources would support a higher mark.

2. Knowledge and Understanding Skills — 21/30

The submission demonstrates good understanding of DFM, DFA, injection moulding, customer requirements, material behaviour and high-volume production. The case is developed as a single component with functional cut-outs, raised protective edges and snap-fit retention, while the discussion recognises the importance of uniform walls, draft angles, rounded corners and simplified tooling. The Lucas-method assessment also demonstrates awareness of assembly efficiency. TPU, polycarbonate and silicone are compared in terms of flexibility, stiffness, impact protection, grip and cost before polycarbonate is selected. A significant limitation is that some Granta evidence relates to specialised reinforced grades, including glass-fibre TPU and carbon-fibre polycarbonate, rather than materials representative of the final case. The manufacturing route is also not presented as a complete step-by-step process plan from material preparation through moulding and inspection.

3. Cognitive and Intellectual Skills — 18/30

The report applies a useful range of analytical tools. The QFD links customer needs to design characteristics, while the FMEA identifies risks involving material durability, poor grip, fit, access points and protection and includes reduced RPN values following proposed actions. The DOE contains eight runs and ANOVA-style results, identifying temperature and pressure as influential factors. Cost and break-even calculations are developed in considerable detail, and the discussion recognises trade-offs between rigidity, flexibility, wall thickness, cycle time and cost. However, the DOE processing-temperature range of 80–120°C is not appropriate for polycarbonate melt processing, so its conclusions cannot reliably support the selected material or final simulation settings. The DOE also appears separate from the completed Fusion analysis rather than being validated through the actual design. Some costing inputs and production-time values are inconsistent, and no detailed alternative manufacturing-route comparison is completed.

4. Practical Application Skills — 11/15

The submission provides clear evidence of Fusion 360 CAD modelling, a technical drawing, Granta investigation, injection-moulding analysis and static-stress simulation. The CAD design incorporates the principal phone-case features, including the camera opening, buttons, charging and speaker access, raised edges and retention geometry. The plastics study reports complete filling in approximately 1.28 seconds and identifies the main weld lines around the central panel and functional openings. Packing, cooling and final-part stages are also shown. FEA evidence indicates that the whole case remains above the software safety-factor target, and practical tolerance guidance is included. However, the FEA section does not report numerical

stress, displacement or minimum safety factor, nor does it document loads, constraints, mesh or material properties. Plastics evidence is also limited to one main configuration, with no completed redesign and repeat simulation following the identified weld lines and air traps.

5. Transferable Skills for Life and Professional Practice — 8/10

The report is clearly organised and contains a contents page, figure list, logical headings, CAD and simulation images, equations, costing tables, discussion, recommendations and conclusion. The cost section is particularly substantial and communicates material, operating and tooling costs before calculating break-even quantities at different selling prices. The writing is generally understandable, and the final discussion links the design to manufacturability, cost and sustainability requirements. Presentation is reduced by grammatical errors, incomplete sentences, inconsistent equation values and several figures with small or unclear text. Some conclusions are also more certain than the displayed evidence supports, particularly regarding structural robustness and the acceptability of moulding defects. More careful proofreading and concise numerical result summaries would improve the professional standard.

Mark summary

Assessment category	Maximum mark	Mark awarded
Engagement with Literature Skills	15	10
Knowledge and Understanding Skills	30	21
Cognitive and Intellectual Skills	30	18
Practical Application Skills	15	11
Transferable Skills for Life and Professional Practice	10	8
Total	100	68