

ACMA5002 Coursework Feedback

Student: Corey Smith

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Selected topic/product/project: iPhone 15 Protective Phone Case

Final mark: 80/100

1. Engagement with Literature Skills — 13/15

The report demonstrates strong engagement with relevant academic and technical literature covering product design, impact protection, material selection, snap-fit design, injection moulding, QFD, DFMEA, cost and sustainability. Sources are generally credible and are used critically rather than only descriptively; for example, the report recognises the limitations of static analysis for predicting drop performance and the limitations of conventional RPN scoring. Literature directly informs decisions concerning wall thickness, retention geometry, material filtering, mouldability and environmental claims. Figures and data from Granta and Fusion are clearly identified, and references are integrated consistently. Minor limitations include some reliance on commercial sources for machinery and cost assumptions and limited use of formal design or manufacturing standards.

2. Knowledge and Understanding Skills — 24/30

The submission demonstrates very good understanding of DFM, DFA, injection moulding, snap-fit behaviour, material properties, defect mechanisms and high-volume production. These principles are applied directly through the single-piece design, 1.5 mm nominal wall thickness, 1° draft, radiused openings, raised screen and camera lips, retention features and consideration of parting line, gating and ejection. Material selection is particularly well developed, comparing impact-modified SAN, polycarbonate and high-impact polystyrene using toughness, impact strength, stiffness and price. The report also demonstrates good understanding of machine selection, clamping force and production economics. However, the explicitly required step-by-step manufacturing process plan is not clearly presented, and sustainability is discussed less fully than the design, simulation and costing sections.

3. Cognitive and Intellectual Skills — 22/30

The QFD is detailed and is used effectively to establish technical priorities and identify competing relationships between retention, insertion force, mass, wall thickness and protection. The DFMEA includes realistic product risks, revised RPN values and clear links between identified risks and design modifications. Structural analysis assumptions and limitations are discussed honestly, and the plastics results are interpreted with appropriate caution regarding weld lines, warpage and material substitution. Cost analysis is transparent and extensive, covering machine selection, labour, tooling, material, cycle time, production rate and break-even volume. The principal limitation is the absence of a clear DOE or equivalent structured optimisation study comparing design or process variables. The report proposes possible refinements but does not demonstrate a completed iterative optimisation cycle through comparative simulation results.

4. Practical Application Skills — 13/15

The submission demonstrates very good practical use of Fusion 360, Granta EduPack and engineering calculations. The CAD model is detailed and includes functional openings, integrated retention, raised protective features, draft and appropriate radii. The FEA section clearly documents the selected SAN material properties, multiple applied forces, load directions and the simplifying fixed constraint. Numerical results include a maximum Von Mises stress of 6.818 MPa and a minimum safety factor of 5.57. Plastics simulation addresses material assumptions, weld lines, warpage and process time, while clamping-force calculations are used to select a suitable 100-tonne machine. The work would be strengthened by mesh information,

deformation results, a drop-test model and evidence that simulation findings were used to produce and retest an improved CAD iteration.

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

The report is clearly structured and professionally presented, with an abstract, contents page, lists of figures, tables and equations, numbered sections, technical images, calculations and a coherent conclusion. Figures are generally readable, labelled and linked directly to the surrounding discussion. The writing is formal and demonstrates independent judgement, particularly when identifying uncertainty in the cooling-time output, limitations in the static FEA assumptions and costs omitted from the break-even calculation. The report also communicates complex material and economic decisions effectively. Professional presentation could be improved through a dedicated recommendations and sustainability section, a clearer manufacturing process plan and more concise integration of some lengthy calculations into summary tables.

Mark summary

Assessment category	Maximum mark	Mark awarded
Engagement with Literature Skills	15	13
Knowledge and Understanding Skills	30	24
Cognitive and Intellectual Skills	30	22
Practical Application Skills	15	13
Transferable Skills for Life and Professional Practice	10	8
Total	100	80