

# ACMA5002 Coursework Feedback

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Selected topic/product/project: Protective Mobile Phone Case

Final mark: 70/100

## 1. Engagement with Literature Skills — 12/15

The report demonstrates strong engagement with relevant academic and technical literature covering DFM, DFA, injection moulding, material selection, QFD, FMEA, optimisation and sustainability. Recognised engineering texts and recent research are used to explain wall thickness, draft, fillets, polymer processing and recyclable materials. The literature is regularly linked to the phone-case design and supports the selection of TPU and the interpretation of manufacturing defects. The reference list is substantial and professionally presented. Some technical assumptions, simulation parameters and economic values require more direct referencing, and greater critical comparison between sources would support a higher mark.

## 2. Knowledge and Understanding Skills — 22/30

The submission demonstrates very good understanding of DFM, DFA, injection moulding, polymer selection, manufacturing defects and high-volume production. These principles are applied through uniform wall thickness, rounded corners, fillets, draft angles, a single-piece construction and integrated functional openings. The Granta study compares TPU, TPC and silicone using tensile strength, fatigue strength, elongation, impact resistance, density and price before reaching a clearly justified material decision. The discussion also shows good awareness of recyclability, material efficiency and the relationship between geometry, cooling and dimensional accuracy. Further development is needed in manufacturing process planning, tolerance specification and quality-control procedures.

## 3. Cognitive and Intellectual Skills — 19/30

The QFD identifies important customer and engineering requirements, while the FMEA evaluates relevant risks and demonstrates reduced RPN values following proposed actions. Several CAD stages show evidence of design development, and the simulation results are interpreted in terms of filling, weld lines, sink marks and warpage. The report appropriately recognises that the predicted 1.661 mm warpage exceeds the stated tolerance and recommends further optimisation. Material and sustainability trade-offs are also discussed clearly. However, no formal DOE or equivalent structured comparison of design variables is completed, and the final geometry is not revised and re-simulated after the warpage issue. Some tooling and break-even calculations also require correction.

## 4. Practical Application Skills — 9/15

The work demonstrates competent use of Fusion 360, SolidWorks Plastics and Granta EduPack. Multiple CAD development stages are shown, and the final model includes the essential functional openings and manufacturing features. Particularly useful evidence is provided through the SolidWorks fill progression and the Fusion fill-confidence, defect and warpage studies, which together demonstrate successful cavity filling and identify the main remaining manufacturing concern. The practical mark is limited because numerical FEA results are not included, despite structural analysis being required, and the engineering drawing does not provide sufficiently complete dimensional and tolerance information. A revised design responding to the warpage result would also strengthen the practical evidence.

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

The report is well organised and professionally presented, with a contents page, figure list, numbered sections, clear technical images, equations, discussion, recommendations, conclusion, references and appendices. The document maintains a logical progression from customer requirements through design, materials, simulations, costing and sustainability. Figures are generally readable and appropriately discussed, and the written style is clear despite some grammatical errors. The final discussion identifies the main strengths and limitations of the work and proposes relevant future improvements. More careful checking of calculations and a clearer summary of compliance with the original requirements would improve the final presentation.

## Mark summary

| Assessment category                                    | Maximum mark | Mark awarded |
|--------------------------------------------------------|--------------|--------------|
| Engagement with Literature Skills                      | 15           | 12           |
| Knowledge and Understanding Skills                     | 30           | 22           |
| Cognitive and Intellectual Skills                      | 30           | 19           |
| Practical Application Skills                           | 15           | 9            |
| Transferable Skills for Life and Professional Practice | 10           | 8            |
| Total                                                  | 100          | 70           |