

ACMA5002 Coursework Feedback

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Selected topic/product/project: Injection-Moulded Samsung S22 Ultra Phone Case

Final mark: 65/100

1. Engagement with Literature Skills 8/15

The report uses a range of sources to support discussion of DFM, DFA, FMEA, QFD, DOE, Six Sigma, injection moulding cost and manufacturing quality systems. The literature review explains relevant quality tools and links FMEA, QFD, DOE, simulation and FEA to the injection-moulded phone-case context. Some useful industrial terminology is included, particularly around PPAP, APQP, IATF, go/no-go gauging and poka-yoke controls. However, the source base relies heavily on websites rather than academic texts, standards, material databases or peer-reviewed engineering literature. Several sources are broad quality-management references rather than directly related to polymer product design, material selection or mould-flow validation. A higher mark would require stronger use of authoritative injection-moulding, materials and design references, with clearer links between sources and the technical decisions made.

2. Knowledge and Understanding Skills 20/30

The submission demonstrates good understanding of DFM, DFA, injection moulding, FMEA, QFD, DOE and manufacturing risk control. The report recognises the importance of wall thickness, parting lines, lockover force, mould cavities, draft angles, ejector pins, shrinkage, gate position and defect mechanisms such as flash, gassing, sink marks, weld lines and warpage. CAD development is also explained clearly, with the Samsung S22 Ultra case modelled in Fusion and supported by a drawing with multiple views. Material knowledge is more limited: Nylon, PP and ABS are compared, but the selection process is relatively basic and does not use the required CES/Granta-style systematic material screening. There are also inconsistencies in the mass and volume data, and the final material choice is not fully resolved through mechanical, cost and sustainability evidence.

3. Cognitive and Intellectual Skills 18/30

The report applies QFD to translate customer requirements into design considerations and uses FMEA to identify risks, recommend actions and reduce RPN values through inspection, CMM checks and go/no-go gauges. The DOE section demonstrates the principle of comparing mould temperature and lockover force to reduce flash and gassing, and the simulation work shows useful problem-solving: the original model failed repeatedly, alternative materials and injection locations were tested, and the issue was traced to complex chamfers and geometry. This is a valuable analytical element. However, the DOE is mostly illustrative rather than a completed optimisation study linked to the final CAD and simulation outputs. The simulation results identify persistent warpage and sink-mark concerns, but these are not followed by a redesigned and re-simulated final geometry. Cost analysis is ambitious but contains broad assumptions and limited validation of unit-cost, demand and production-volume claims.

4. Practical Application Skills 8/15

The submission provides practical evidence of Fusion CAD modelling, a dimensioned drawing, material-property comparison and injection-moulding simulation. The practical simulation work is one of the stronger parts of the submission: the report documents failed initial simulation attempts, identifies excessive chamfers and complex geometry as the source of the problem, simplifies the model and then achieves a successful fill analysis. The final fill confidence and 0.51-second fill-time result provide useful mouldability evidence, and further gate-position comparisons are used to assess warpage and sink marks. However, structural FEA results

are not presented, despite FEA being listed as part of the intended methodology. The material selection is also not supported by Granta/CES outputs, and the simulation evidence still shows unresolved sink marks, weld lines and warpage without a completed design iteration to address them.

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

The report is clearly structured with a contents page, figure list, abstract, introduction, literature review, customer requirements, QFD, FMEA, DOE, CAD, simulation, cost, sustainability, discussion, conclusion and bibliography. The writing communicates the manufacturing logic clearly in several places, particularly when explaining FMEA controls, simulation troubleshooting and production-rate assumptions. The report also makes practical recommendations about wall-thickness optimisation, geometry simplification, material validation and prototype testing. Presentation is weakened by grammatical errors, inconsistent formatting, some unclear figure text, an overcrowded title page and occasional overstatement of commercial conclusions. The work would also benefit from clearer summary tables linking final evidence directly to each assessment requirement.

Mark summary

Assessment category	Maximum mark	Mark awarded
Engagement with Literature Skills	15	8
Knowledge and Understanding Skills	30	20
Cognitive and Intellectual Skills	30	18
Practical Application Skills	15	8
Transferable Skills for Life and Professional Practice	10	7
Total	100	65