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# **GCE EXAMINERS' REPORTS**

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**GCE (NEW)  
DESIGN AND TECHNOLOGY  
ENGINEERING DESIGN / FASHION  
AND TEXTILES / PRODUCT DESIGN  
AS/Advanced**

**SUMMER 2019**

Grade boundary information for this subject is available on the WJEC public website at:  
<https://www.wjecservices.co.uk/MarkToUMS/default.aspx?!=en>

### **Online Results Analysis**

WJEC provides information to examination centres via the WJEC secure website. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.

### **Annual Statistical Report**

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

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**ENGINEERING DESIGN**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**  
**UNIT 1**

**General Comments**

The number of candidates entered for this examination had not increased as might have been anticipated and it is disappointing that more centres are not taking the opportunity to offer a subject that is intended to prepare students for the demands of careers related to modern engineering design. In some cases, it was evident that candidates had not prepared thoroughly for the examination and in the depth that might be expected. Many lacked the technical knowledge and understanding that would have enabled them to respond at a higher level.

**Comments on individual questions/sections**

**Q.1 (a)** Most candidates were able to suggest two reasons why PLCs have replaced other components and those that provided detailed explanations were awarded full marks. Most answers focused on ease of use and reliability.

**(b) (i)** The response to this part of the question suggested that many candidates did not have a detailed understanding of ladder logic, although most were given some credit for diagrams that partly answered the question. Explanations were limited in most cases although a few candidates achieved full marks.

**(ii)** Most candidates were able to illustrate the appropriate symbols and those that connected them in the correct sequential order were awarded full marks.

**Q.2** Marks will be awarded for the content of the answer and the quality of written communication.

The majority of candidates were able to discuss the work of Jonathan Ive and were aware of the products for which he has been responsible. Those that were able to elaborate on the factors that have influenced his thinking achieved higher marks for this question. Lower level responses tended to be descriptive rather than analytical.

**Q.3** The responses to this question were surprisingly disappointing. It might be assumed at this level that candidates would have developed knowledge of smart and modern materials even if they did not fully appreciate the likely impact on specific products. Many responses suggested that this part of the specification had not been covered in sufficient depth. The majority did show some understanding of these materials but were often unable to provide the working knowledge of their properties and applications.

- Q.4** This question was poorly answered as many candidates did not have an understanding of the way in which concurrent engineering is used in product development. In preparation for questions of this type it is suggested that candidates should be encouraged to undertake case studies based on organisations that use these techniques to support development and production.
- Q.5** (a) Those candidates that had developed an understanding of material testing were able to achieve reasonable marks for their responses to this question. In a number of other cases it was evident that they had not studied this topic in sufficient depth and as a result their answers were limited.
- (b) Although most candidates were able to name a ductile material many were unable to explain why the selected material would be suitable for use in the manufacture of specific products.
- Q.6** (a) This section was poorly answered by the majority of candidates. Many were unable to analyse the specification points in the depth required and as a result justification were limited. Simplistic responses often relied on a restatement of the given criteria without elaboration.
- (b) Many candidates were able to demonstrate an understanding of mechanical systems, but few were able to provide technical illustrations that contained the detail required to achieve higher marks. Most candidates suggested suitable materials but in general justification was limited through failure to recognise the physical properties and characteristics of these materials.
- (c) Those candidates that understood the methods used to reverse a motor were able to make a good response to this part of the question. It was evident that other candidates had not developed an understanding of this aspect of the specification.
- (d) Candidates that knew how to draw block diagrams were able to achieve higher marks for this part of the question.
- (e) In general, this part of the question was well answered. Candidates were able to make interesting proposals for further development and those that discussed these improvements achieved high marks.

### **Summary of key points**

To order improve on their performance I would recommend that candidates are encouraged to:

- Highlight the key information provided in the stem of the question, so that they are better able to use it to answer application of knowledge questions.
- Highlight command words, within the stem of the question, so that they provide relevant answers to the question being asked.

**FASHION AND TEXTILES**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**  
**UNIT 1**

**General Comments**

The format of the paper reflected the layout of the 2018 paper and sample assessment material that was made available through the WJEC Website.

The overall response to this paper was well received with some disappointing areas where candidates did not demonstrate the in-depth technical knowledge and understanding that is required at this level.

It is anticipated that candidates will be able to respond at a higher level in subsequent years as the content of the specification becomes more familiar to those preparing candidates or the examination.

Some centres reacted to the advice delivered during CPDs addressing the need for candidates to show more in-depth subject knowledge and its application in this form of question.

**Comments on individual questions/sections**

- Q1.**    **(a)**    This question was answered by all candidates. All candidates were able to explain what a prototype/toile was.
- (b)**    This question was answered well by almost all candidates. Candidates showed good understanding and were able to describe the benefits to the designer.
- (c)**    This question was answered well by almost all candidates. Candidates were able to describe essential pieces of information and in most cases their descriptions were detailed. In a few cases, candidates were confused and answered the question in relation to a design specification rather than a manufacturing specification.
- Q2.**    Candidates demonstrated their knowledge of CAD and were able to state advantages and disadvantages. Answers were basic from some candidates and did not relate to presenting ideas.
- Q.3**    **(a)**    Some candidates had knowledge of how the bamboo fibre was able to absorb moisture. These candidates were also able to draw a diagram to support their answer. This question was not answered well on the whole and showed a lack of in-depth subject knowledge.
- (b)**    Candidates were able to answer this question relatively well, even if they hadn't answered question (3a) correctly. This shows that candidates are aware of bamboo and its properties.

- Q.4** Candidates demonstrated in-depth knowledge of most of the fibres and were able to give reasoning. Candidates lost marks where not all of the fibres were analysed.
- Q5.** Some candidates answered this question well. They demonstrated an understanding of the work of Julien Macdonald and were able to give examples of his style. Others did not have the knowledge and understanding required in order to obtain full marks. Written communication was weak on the whole.
- Q.6**
- (a)** This question was well received on the whole. Candidates demonstrated knowledge of wearable technology in sports clothing and were able to give detailed advantages and disadvantages in most cases.
  - (b)** Overall the response to this question was disappointing. Ideas were not creative or well communicated on the whole.
  - (c)** Candidates were able to give an explanation with a correct diagram in some cases but did not relate it to its suitability to sportswear. This shows that candidates are not fully reading the question.
  - (d)** Most candidates demonstrated good in-depth knowledge of Gore-Tex but did not relate it to its suitability for a sports jacket. This shows that candidates are not fully reading the question.

### **Summary of key points**

General weaknesses in candidate performance include:

- Failure to develop a detailed response in order to gain the higher marks.
- Candidates are not fully reading the question.
- Weakness in specific textile related knowledge in some areas.

**PRODUCT DESIGN**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**

**UNIT 1**

**General Comments**

The paper was well received by candidates and centres. In general candidate's responses are improving however, many did not demonstrate the depth of technical knowledge and detailed understanding required at AS level.

As the content of the specification and the structure of the questions become more familiar to centres it is assumed that the responses of the candidates will access the higher marks. The format of this paper remained consistent with the sample assessment material that has been available on the WJEC website and the 2018 paper; **however**, centres would be advised that this can change in future. Many centres reacted to the advice delivered during CPDs with candidates showing more in-depth subject knowledge.

**Comments on individual questions/sections**

- Q1 (a)** This first question was attempted by all candidates and was generally well answered. Almost all candidates were able to justify the selection of this process.
- (b)** This question received a wide range of responses. A surprisingly significant number of candidates displayed little or no understanding of the basic injection moulding process. Many student responses displayed an appropriate level of detail and understanding and almost all students used both sketches and notes. At the higher end responses were detailed and well presented with clear, simple supporting sketches/diagrams.
- Q.2 (a)** The majority of responses were able to explain the term in appropriate detail. Many candidates misread this part of the question and also stated a material, this was not awarded a mark. Centres are reminded to instruct candidates to read the questions.
- (b)** Responses to this question were weak in the majority of cases. Many candidates simply stated the wrong material i.e. Mild Steel, High Carbon Steel, Aluminium etc., and were not awarded any marks. The question required an appropriate composite material i.e. Carbon fibre, Fibre glass. Candidates who identified an appropriate material were able to fully justify the selection of that material and were awarded appropriate marks.
- Q.3 (a)** The majority of responses were able to state an advantage for using these types of component i.e. 'they are cheaper to use'. Fewer candidates were able to fully explain the advantage i.e. 'They are cheaper to use because the manufacturer does not need to invest in machinery to produce them'. Candidates who fully explained a reason were awarded appropriate marks.

- (b)** This question was poorly answered with few candidates achieving high marks. Few candidates were able to identify a suitable method of semi-permanent jointing. A significant number of responses referred to the use of Glue and traditional finger joints. It is apparent that most candidates were not familiar with the principles of semi-permanent jointing. Those who identified a suitable system were awarded higher marks. To access the highest marks the response required a suitable sketch, it was noted that the sketching in this context was good and aided the candidate's response.
- Q.4 (a)** All candidates attempted this question. The response to this question was generally good with the majority of candidates able to evaluate the characteristics and properties of the beech and Stainless Steel. It is noted that many candidates spent time in their response restating information that they had been provided with i.e 'The squirrel handle is made from Stainless Steel'. In a few cases candidates only stated the materials used and, in these instances, candidates were not awarded marks.
- (b)** The response to this question was generally good with the majority of candidates able to identify the importance of the finish the products use. Many candidates were able to identify that the product would be in contact with a food item as well as its aesthetic qualities and linked this to the selection of a finish. When a candidate was able to do this, they were awarded appropriate marks. A few responses were generic i.e. 'It is important that products are finished well' this type of response is simplistic at this level and was not credited.
- Q.5** A small number of candidates did not attempt this question. This question posed the greatest challenge to the candidates and is an area that will easily allow them to improve their marks through thorough preparation. A small number of candidates were not able to define the term. Many candidates were able to explain and identify criteria for the term 'design classic'. However, the identified terms not always applied to the identified product. The lower order responses became GCSE in nature and were chronological in structure i.e. development of the Coca Cola bottle. Few candidates were able to identify the impact of their selected design classic on other products. Good responses identified products such as The London underground map, the original Mini and identified how these had impacted upon later designs.
- Q6 (a)** This question was generally well answered by a significant number of candidates. Many candidates were clearly able to identify the key elements of the work of Bethan Gray i.e attention to detail, finish etc. and were able to reference how this could impact their designs. Some candidates responded to the question with a biographical review of Bethan Grays life and work and this was not the response required.
- (b) (i)** All candidates were able to produce a design proposal, however responses to this question varied widely. At the lower end of the mark range many produced a shape with a pattern using the pattern as the only link to the work of Bethan Gray. Higher marks were awarded when candidates were able to produce designs that displayed a level of inspiration in the application of identified influences from the candidates' analysis of Bethan Grays work i.e. shapes, forms, patterns, the use of materials and quality of finishes.



- (ii) This was answered well. Almost all candidates were able to identify how the proposed design met at least two of the points. A minority of candidates did not identify two points.
  - (iii) This question was generally disappointing. A lot of candidates were not able to present their ideas well and the use of freehand drawing was poor. A few candidates were able to present clear 2D/3D drawings that described the ideas well.
- (c)
- (i) Responses to this question varied widely. Candidates only stated the use of a drop test. Many were able to give a vague description of a basic drop test and were awarded appropriate marks. Higher level responses were detailed with candidates able to specify criteria for tests i.e. Adjusting height, consistent weight, use of a tube or rails to guide weight etc.
  - (ii) Responses to this question varied widely. Most candidates were able to identify using a target market to assess the product and analysing the information they gained and were awarded marks accordingly. Many were able to state the use of a questionnaire and using the specification as guide for finding information. Few candidates were able to state and justify a method of questioning the target market i.e. open word choice questions.
- (d) This question was generally answered well, However, responses did lack the detail required at AS level. Almost all successful responses referred to the use of Reverse engineering or deconstruction as a suitable research strategy in general, but few responses identified, in detail, the information that could be obtained from these strategies. Some responses identified the use of professional questionnaires and interviews. Very few responses described the type of information that required to be obtained and the relevance to developing the new speaker.

### Summary of key points

- Candidates should be advised to read the question carefully in order to ensure that all elements are understood and are also included in their response.
- There were a number of examples where the responses throughout were not detailed enough to gain the higher level of marks.
- Well-planned and structured responses score well. These responses contain clear, and specific details relating to the question. They also show accuracy in terms of spelling, punctuation and grammar. A number of candidates' responses require more structure and planning in order to organize information clearly and coherently and attain higher marks.
- Question 5 responses varied considerably; responses generally require more structure and planning, whilst ensuring that ALL elements of the question are covered. Centres are reminded that this type of question requires an essay style response. Majority of candidates were able to identify a design classic but very few if any really discussed the key elements of a design classic.

- Centres should continue to advise candidates to use the mark allocation indicated at the end of each question to guide the depth of response required and manage time effectively.
- Centres should also be advised to remind candidates that answers could be amplified with detailed labelled sketches and/or diagrams where appropriate; many of the answers were unfortunately brief with a few words and simple sketches not allowing the candidate to fully explain the response and display the depth of knowledge required at this AS level.

**FASHION AND TEXTILES**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**  
**UNITS 2 AND UNIT 4**

**General Comments**

This year sees the first full award of the new GCE A level qualification in Fashion and Textiles. The cohort at both levels is small when compared to Product Design however the course has been well received by the few centres who are running it.

Most centres appeared to have taken the advice on board that was given out following the first AS qualification in 2018 and have established a sound foundation for the successful delivery of this course at both AS and A level. In general terms, the iterative process is understood, and evidence of testing and modelling has shown some improvement. Centres have embraced the changes to the assessment criteria and more importantly applied it fairly.

An area for further consideration would be recognising the difference and level of demand expected at AS when compared to A level. Given the time available at AS to complete the NEA, effectively two terms and the 20% weighting in the final A level award, it might be advisable for some AS candidates to consider scaling down their projects to suit these facts. The demands and requirements at A level are such that there should be clear difference and progression between the two levels.

Design folios were generally well organised with most candidates adopting an informal sketchbook to record the iterative design journey and a more formal portfolio for technical details. This approach lends itself well to fashion and textiles candidates and allows them freedom to express their ideas in a range of creative styles.

**Comments on individual questions/sections**

**Identifying and investigating design possibilities**

The assessment criteria clearly demands that candidates explore a number of contexts initially in order to identify a broad range of design possibilities. These are not to be confused with a design brief that should only be arrived at following analysis of the context/problems and some early research. In most cases research was wide ranging and supported candidates in their decision making. It is advisable however that more detailed research continues alongside the generation and development of design ideas – one part informing/impacting on the other. For example, research into materials should occur alongside testing and modelling of processes and techniques. This would lead to more informed decisions being made and an altogether much better understanding of the materials and product requirements. Research into materials should not appear as a separate fact-finding mission with no real purpose. Another area for improvement would be the identification of and engagement with a ‘real’ client. On-going dialogue with the user would become more accessible, would support candidates as their ideas develop and whilst testing their ideas and final prototype.

At A level the same approaches outlined above apply but research should be more comprehensive and detailed. Candidates are also expected to present a project management plan which is not to be confused with a sequence for manufacture which forms part of assessment strand (d). Approaches and effectiveness of this latter requirement varied but overall is an area for development.

### **Developing a design brief and specification**

At both AS and A level, the final design brief should only be arrived at following the exploration of a range of possible design opportunities and analysis of research and investigation. In some cases, it was difficult to see how the final brief had been arrived at. An open-minded approach, avoiding idea fixation until other possibilities have been explored is advised.

Quality of specifications varied but most candidates offered a range of appropriate criterion. At A level there needs to be clear progression in terms of detail from AS level. Measurable criteria were often considered superficial and needs further refinement. As with the brief, in a minority of cases it was difficult to ascertain where some criterion came from. Specifications are working documents and should be referred to throughout the iterative process.

### **Generating and developing design ideas**

Sketchbooks were well used to record initial ideas and development iterations. Most candidates presented clear evidence of testing and trialling of ideas from decorative techniques to construction processes. At A level this is however expected to be more in-depth and progressive. In a few centres there was excellent use of full-scale toiles that fully supported the development of the prototype and thoroughly tested its fitness for purposes prior to manufacture. In some centres the specification had been used to support decision making and the development of the product, though this again is an area for further development. Centres should note that social, moral and ethical factors also need due consideration where appropriate with the addition of environmental factors, sustainability and cost at A level.

Most candidates presented their final idea alongside the technical details in a formal portfolio, although level of detail varied. In a manufacturing specification product should be visually represented as a technical line drawing or fashion 'flat' displaying all seams, topstitching, components and any other design details along with all appropriate views. All critical measurements should be included with sufficient details for a third party to realise the same. At A level recommendations for different scales of production are required, this was not always evident.

### **Manufacturing a prototype**

Candidates presented sequences for manufacture that included consideration of time however consideration for end testing was not always evident. Note that the sequence should be pre-emptive and sufficiently detailed for a 3<sup>rd</sup> party to realise the same. Overall products were well made at both AS and A level with clear consideration of appropriate materials, components and manufacturing processes. Products represented finished prototypes and were considered fit for purpose. In a few cases attention to detail in the quality of construction both externally and internally could be further refined. Note that 'quality' in a fashion and textiles products requires the internal finish to be of an equal standard to that of the external finish. In a few centres, some candidates had manufactured products that were of an exceptionally high standard, with many innovative and creative details.

## **Analysing and evaluating design decisions and prototypes**

Most candidates had included reflective commentary as an on-going process throughout their iterative journey. Moving forward, some might find full engagement with a 'real' client more beneficial as potential issues could be highlighted and resolved earlier on in the process.

Summative evaluations were generally well written, considered the design brief and specification, took into account views of users and referenced end testing. More robust specification criteria would support candidates better particularly with reference to measurable criteria. End testing, through wearer or user trials is essential in gauging the success or otherwise of a product. This should be evidence based so photographic images of testing in situ are recommended. This is an area for further development at both AS and A level. A Level candidates are also required to consider developing/improving their product in order to meet the needs, wants and values of users throughout its life cycle. Again, this was not always evident.

Many candidates had produced highly creative and imaginative work, clearly seen throughout their design journey through iterations with very high levels of skill evident in their final prototypes; those candidates should be commended for their efforts. That said, fashion by definition often pushes boundaries in terms of innovation or people's perception. With this thought in mind and although not a set requirement of the NEA, it would be interesting to see the latest technology being embraced by fashion and textiles candidates in an innovative and imaginative way. Integrated wearable electronics perhaps, or the use of 3D printers which have been fully embraced in Product Design, much less so in Fashion and Textiles. Something to consider for the future which will build on the achievements of the current cohorts.

## **Summary of key points**

Candidates must:

- Explore several contexts initially, to identify a broad range of design possibilities.
- Presented their final idea alongside the technical details in a formal portfolio.
- Note that 'quality' in a fashion and textiles products requires the internal finish to be of an equal standard to that of the external finish.

# **DESIGN AND TECHNOLOGY: ENGINEERING DESIGN AND PRODUCT DESIGN**

## **General Certificate of Education (New)**

**Summer 2019**

### **Advanced Subsidiary/Advanced**

#### **UNIT 2**

#### **General Comments**

This is the second year of the new specification, and on the whole was well received by centres across Wales. Some of the recommendations from last year had been implemented resulting in some innovative and interesting outcomes being evident. All centres must remember that for this subject specification the NEA needs to follow an iterative design process, where the candidate themselves can almost determine the direction of the project. In general, the majority of centres applied the assessment criteria consistently and fairly, but close scrutiny is required to the mark bands if high or full marks are to be awarded.

#### **Comments on individual questions/sections**

##### **Identifying design possibilities**

The assessment criteria clearly demands that candidates identify a broad range of problems/opportunities to clearly inform the development of possible design briefs. This was not the case in all centres. In some centres candidates appeared to only identify one problem and one design brief. Care is needed here to ensure that access to the higher mark bands is possible, because with only one area focused in on, access to the higher bands is limited. Candidates must be encouraged to undertake wide ranging research and investigation into a number of possibilities. Candidates need to be encouraged to use a variety of different design strategies during this section.

##### **Developing a design brief and specification**

There should be clear evidence within the project showing how the design brief and design specification has been arrived at, and a thorough understanding and requirements of the task ahead. Many centres produced design specifications with sufficient details required, but not all. The design specification needs to be specific and detailed and include a range of objective and measurable criteria. The design specification needs to direct and inform the designer whilst developing the design. Care is needed not to produce superficial specification points which do not contain measurable criterion and lack any depth. It must be remembered that specifications are working documents and should be referred to throughout the iterative process.

##### **Generating and developing design ideas**

Some candidates had fully embraced the iterative design approach with some exceptionally high-quality work being produced throughout this section. This is where thorough use of relevant modelling and testing of ideas, driven by the design specification can support decision making and move the project forward. Those candidates who had done this extensively gained valuable information and feedback prior to making their final prototype. Research of different findings and possibilities can also be included here, to aid once again with the iterative design process.

Centres need to continue to encourage candidates to develop this iterative process as much as possible and to always remember to record their findings in some way. Saying that, not all candidates work should follow exactly the same format, as the project should be driven by their findings. Most candidates presented their final idea alongside the technical details in a formal portfolio, although the level of detail varied. Products should be visually represented using 3D and 2D hand drawn drawings or CAD drawing/s and technical drawings e.g. orthographic drawings to include all the required measurements and details required. It must be remembered that the drawings should include all the sufficient details for a third party who is unfamiliar with the project to produce the product.

### **Making a prototype**

It must be remembered that evidence of a logical sequence and achievable timeline for the stages of production is required in this section if higher mark band marks are to be awarded. Some excellent making skills were witnessed but the standards of manufacture varied greatly as did the application of the assessment criteria. If top mark band marks are to be awarded the product needs to be a high-quality functioning prototype, displaying very good attention to detail with a quality finish. Of all the work moderated this year, this was the area which was on the whole generously marked and consideration to the quality of the final prototype must be looked at for next year and to enable it to meet the mark band descriptors clearly. Some centres may also want to put a size limit on their AS projects, to help the candidates manage their time and project much better. Very large projects for AS most definitely makes it more difficult most of the time for the candidate to achieve a high-quality functional outcome.

### **Evaluating a prototype's fitness for purpose**

Great care is needed here if high marks are awarded to ensure that the work covers all the requirements as stated in the assessment criteria. Most candidates had included reflective commentary as an on-going process throughout their projects. This is very important and can be commended but the amount of detail of the ongoing evaluation could be enhanced to communicate the journey of the product. The establishment of a 'real' client during the development of the identification and specification section of the project would be more beneficial as potential issues could be highlighted and resolved earlier on in the process.

This client could then also be very useful for possible end user testing and final product views and opinions. Summative evaluations were generally well written, and considered the design brief and specification, and took into account views of users and referenced end testing. A quality design specification with good measurable qualitative and quantitative criteria enables the candidates to produce a more meaningful final summative evaluation. More end user trailing, and testing needs to be encouraged and then to communicate the further developments required to better meet the functional and/or aesthetic needs of the product. For this to happen care is needed to ensure that the candidates complete their prototypes in good time to allow the time for a comprehensive evaluation of the product to take place.

## Summary of key points

Candidates must:

- Identify a broad range of problems/opportunities to clearly inform the development of possible design briefs.
- There should be clear evidence within the project showing how the design brief and design specification has been arrived at.
- Centres need to continue to encourage candidates to develop this iterative process as much as possible and to always remember to record their findings in some way.
- If top mark band marks are to be awarded the product needs to be a high-quality functioning prototype, displaying very good attention to detail with a quality finish.
- Do more end user trailing, and testing needs should be encouraged.



**ENGINEERING DESIGN**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**  
**UNIT 3**

**General Comments**

The first entry through this new specification remains a very small specialist cohort very comparable with legacy Systems & Control candidates. There are several centres who historically offer this type of course and a progression from GCSE. Hopefully, as time unfolds, more candidates will undertake this STEM based qualification which provides a specialist and exciting opportunity to develop new and existing skills and knowledge, very specific to those required for many careers in the coming years. With such small numbers, it is difficult to establish statistical patterns, as outcomes generally depend of the centre and quality of the candidates.

**Comments on individual questions/sections**

- Q.1** The vast majority of candidates scored 7 or 8 marks here. Clearly most candidates had experience of working with a pcb drill and disc sander, and the 5 step risk assessment proved very accessible.
- Q.2** This question was generally well answered by most. BSi was quite well understood, with most candidates gaining the marks for (i) and (ii). Some repeating in (iii) limited marks as candidates made the same point twice for the advantages to consumers. This was worth 4 marks, but some candidates failed to access all of the marks available here.
- Q.3** This proved very accessible with all candidates gaining relatively high marks, around half gaining double figures here. The context was one which was very familiar, with candidates giving clear understanding of wireless app-controlled devices. Again, (c) proved slightly more complex due to multiple advantages, some candidates repeated similar answers, or failed to access the second 2 marks response. Part (d) was quite challenging and searching and this was a common area for candidates to achieve limited marks.
- Q.4** The major barrier to accessing high marks in this question was the information in the stem. This is clearly a pre-production prototype, and most candidates missed this fact. Lots of responses in (a) referred to batch production, some even mass production due to the numbers that would be in demand. The major failing was reading the information and processing it. Part (b) was very well answered, with plenty of depth in knowledge and analysis with reference to the two-product pictured. Part (c) reflected reasonably good knowledge and understanding of bought-in parts and the impact this has on the manufacturing of products. Responses for (d) were also of a generally high standard with detailed explanations of customer support and after sales services.

- Q5.** This was probably the most difficult question within the examination paper. Very few candidates scored higher than half marks here. The vast majority gained some marks in (i) by describing how the infra-red signal from the remote handset triggers the gates to close. The smoothing capacitor labelled C1 was not well understood. Part (iii) was disappointing, where very few candidates could present an accurate sketch of a relay switch with the correct conventions and connections.
- Q6.** This was quite accessible, and performance here was quite good in the main. There is a slight concern with candidates not fully reading the stem of the question in conjunction with studying the images of the context. This could be easily improved for future examinations, and easy marks could be accessed. Some candidates named appropriate polymers for the chassis of the vehicle, such as foamex, correx or polycarbonate, but many named acrylic, which due to its weight and structure would not be the most appropriate material. This suggests a lack of analysis rather than a lack of knowledge.  
Part (iii) reflected a good understanding of injection moulding, and the 3 marks available here were very accessible to most.
- Q7.** This proved very accessible with many achieving ten or more marks, demonstrating good levels of understanding. Part (a) was completed well by most and offered clear block diagrams for the illuminating arm band, and understood how this would help the designer. The children's play frame was well analysed by most and candidates generally scored well in (i) by identifying two parts of the frame that would experience bending forces. Part (ii) was slightly more challenging requiring candidates to understand the A frame structure and how Part B forms a truss. Sometimes, the length and depth of response restricted marks here. Extending the swing beam in (iii) proved more difficult and either candidates produced very good responses and scored well or tended to struggle and score no marks.
- Q8.** The vast majority scored high marks in this question making this very accessible, with the exception of one or two who seemed to struggle. Part (a) was well answered by most, with clear understanding of CAD and its benefits during the development of electronic systems. The performance in part (b) varied depending on the understanding of commercial production. The 8 marks available here are large mark tariffs and responses need to be constructed accordingly.
- Q9.** This question (a) was interpreted by some as being directly related to the Mini. The image and context is about design classics, and candidates could respond in general terms, or use other iconic designs as exemplars. Again, 4 marks required some depth and breadth in order to establish what makes a design classic. In part (b), historical influences from traditional or 'older' products can be traced to current products. This proved quite challenging for some, and more practise on this type of question would help in future.
- Q10.** This received a range of responses from candidates. As previously mentioned, the importance of reading and digesting questions along with understanding images and supporting information is critical in allowing access to the marks available. The composite decking is an emerging and increasingly popular material for sustainability reasons. There are many benefits from using this decking, and candidates need to ensure they display the breadth and depth of their knowledge here. Some gained 10 marks, others 2 or 3, which reflects very differing levels of performance, probably not as a result of ability, but more as a result of failing to provide a concise and well-planned response. This is another area that could be easily improved for most candidates, with practising extended response type questions related to specific products and features.

### **Summary of key points**

- Candidates should be advised to read the question carefully to ensure that all elements are understood and are also included in their response.
- There were a few examples where the responses throughout were not detailed enough to gain the higher level of marks.

**FASHION AND TEXTILES**  
**General Certificate of Education (New)**

**Summer 2019**

**Advanced Subsidiary/Advanced**

**UNIT 3**

**General Comments**

This current academic year sees the first full award of the new GCE A level qualification in Fashion and Textiles. The 2019 cohort are the first candidates to sit the unit 3 written examination which is worth 50% of the A level, but 30% of the overall qualification when combined with the AS result and unit 4 NEA. The number of entries is low when compared to Product Design.

Questions were drawn from a broad cross section of topics listed in the full course specification. The style and demand of questions varied but effectively tested candidates' ability to demonstrate knowledge, understanding and skills acquired over the two-year period of study at GCE level. The style and structure of the questions meant that the paper was accessible to candidates who attempted all questions, with no obvious questions causing any concerns. Centres are however advised that each question is set in a context which either includes a picture of a product or an outline scenario is stated. Candidates should be encouraged to carefully consider the context of the question before attempting an answer. Overlong responses often stray away from the context of the question, do not answer the question and consequently do not gain credit.

Most centres deliver a well-balanced course covering the full specification content which adequately prepares candidates for the non-exam assessment (NEA) and the theoretical aspect of the examination. This approach ensures candidates gain the greatest success. However, some centres still allocate too much time to the NEA where performance outweighs that of the examination. Given the 50:50 weighting this needs to be addressed.

**Comments on individual questions/sections**

- Q 1.** Candidates demonstrated good subject knowledge; overall the question was answered well and considered accessible to all, with most achieving high or even full marks.
- (a)** Most candidates understood that a metal zip fastener is more robust and would compare more favourably with the weight of the denim fabric and purpose of the bag.
  - (b)** Almost all candidates were able to suggest suitable properties of coated canvas which would make it suitable for the ruck sack. Responses referred to the 'coating' making the fabric waterproof and canvas is a strong fabric.
  - (c)** Most candidates offered viable suggestions to adjust the straps on the rucksack however some omitted the name of the component that would allow their suggestion to function. Quality of sketching and clarity of explanations varied considerably and let some candidates down as their suggestions were difficult to interpret.

**Q.2** The responses to this question varied. As has been the case at GCSE level for many years specific subject knowledge relating to materials is generally considered weak. For a few candidates this was clearly still the case.

(a) As aesthetics are a key consideration for products in the fashion and textile industry it was surprising that some answers failed to grasp the importance of this when referring to the design of the sports shirt. At GCE level it would be reasonable to expect all candidates to gain full marks for such a low tariff question!

(b) A minority of candidates demonstrated very clear and detailed knowledge and understanding of the materials used in the manufacture of the sports shirt and were awarded accordingly. There was sufficient detail in the question stem to support candidates, however many failed to capitalise on this and gave superficial answers that did not gain much credit. (*Note: link to material resources at the end of this report*).

**Q.3** Overall the responses to this question were disappointing. The question relied on candidates having some understanding of recent developments in fully integrated technology within textile fabrics – soft switches that rely on conductive threads in order to function or components parts that are sufficiently small or flexible enough to be embedded in textile products. Few candidates understood this consequently answers were often weak and superficial.

(a) Most candidates demonstrated some understanding relating to technology-push and the reinvention of products but failed to grasp that this product is only possible because of the developments in conductive fibres and associated technology. Few candidates were awarded full marks.

(b) Most candidates described the thread as being able to transfer energy to light the LED and some recognised the battery as the energy source. Very few candidates referred to the thread as being conductive. A minority of candidates thought the thread was a tacking stitch totally missing the point of the question!

(c) Overall this question was disappointing however most candidates suggested batch as being the most suitable scale of production along with a simple reason and were at least given credit for that. Candidates could have considered it is a seasonal product, it is also aimed at children, both have lower demand and there is an integrated GPS tracking system which would require specialist workers and would currently be unrealistic for mass production. The GPS system may also have limited appeal. The candidates who considered most of the points listed gained the highest marks.

**Q.4** Candidate responses were variable mostly down to lack of clarity in the written content or quite simply lack of knowledge. Some candidates still refer to CAD/CAM as being easier or quicker but do not elaborate any further thus missing out on marks. At A level, candidates are expected to demonstrate a clear, detailed and very specific body of knowledge in order to gain credit.

(a) Most candidates explained in superficial terms how CAD is used to create an original design and CAM is used to manufacture it. Very few went into a sufficient level of specific detail to be awarded full marks for this question.

- (b) Responses for this part question were an improvement on part (a). Most candidates were awarded half marks for stating two benefits however if answers are not sufficiently detailed full marks cannot be awarded. A simple response for example: *'All motifs will be of an identical standard and quality'* whereas a detailed response worthy of two marks would be *'all the stitched motifs will be exactly the same quality and standard, which is not possible by any other method of manufacture.'* Very few candidates gained full marks for this question.
- (c) Most candidates had some understanding of a design right, but some confused this with a trademark or a patent. Although there are clearly some similar aspects to other IPs a design right relates to the physical appearance of a product or part product. It relates to its appearance or the way it looks in terms of line, contours, colours, shape and texture. Few candidates fully explained this.

**Q.5** This question proved quite challenging and was not accessible to most candidates. At GCE level candidates are expected to know how the structure of a fibre gives it its unique properties and show understanding of the terminology as used in this question.

- (a) Responses varied but most candidates gained some marks either through their notes and/or diagrams. A cross section of the fibre should show protein bundles which absorb moisture from between the scales on the surface of the fibres – hydrophilic. The natural oil (lanolin) on the surface of the scales of the wool fibre, repel water – hydrophobic. Full marks were rarely awarded.
- (b) Very few candidates understood how the twists when spinning fibres affect the finished yarn. Quite simply the more twists the stronger the fibre and vice versa, leading to different end uses for the finished yarn. Only a minority of candidates were awarded full marks.

**Q.6** Overall the responses to this question were good with most candidates scoring reasonable high marks. Candidates should however be reminded that each part question requires a different answer. Repeating the same answer in both parts will not gain additional credit. Candidates need to plan their answers carefully to avoid repetition.

- (a) It was pleasing to see that most candidates were able to explain why bamboo is a suitable fibre for the active wear clothing particularly as this is a relatively new fibre to the textile industry. Most answers stated it is absorbent and feels good next to the skin. More technical responses such as it is non-irritating, hypo-allergenic or its ability to perform in all conditions i.e. thermo-control were rarely seen.
- (b) This is an example where candidates need to read and consider the question more carefully. This question focussed on environmental factors and not the individual properties of either fibre. Candidates who adopted the latter approach missed out on marks. In short, the question was about the growing conditions for bamboo putting far less of strain on the environment than cotton does. Bamboo for example does not need masses of water, grows on slopes, does not need pesticides to boost crops and has the same yield as cotton but in 10% of land area. Candidates who referenced some of the above gained higher marks.

**Q.7** Responses varied for this question with some parts clearly more accessible than others.

- (a)** Where candidates understood what a facing is, how it is constructed and attached, full marks were often awarded. Some candidates however did not appear to be familiar with the term 'facing' but made an attempt at answering, a few did not attempt this question. Facings are commonly used in fashion and textiles products and candidates are expected to know these terms and have some understanding of their construction.
- (b)** This question was answered quite well with most candidates achieving at least half marks for a full explanation of including a lining. Some candidates however assumed the lining on the skirt would be sewn into the hem. This would not be feasible on this type of dress. This assumption also impacted on marks awarded for the next question.
- (c)** On a circular skirt such as the one shown on the special occasion dress only the narrowest of hems is possible – a rolled hem for example or a narrow gauge overlock and turned up. Any other depths of hem would not allow for a smooth finish. Most candidates understood this and were awarded marks accordingly. Some candidates suggested a binding and were given some credit as it would be feasible on a curved edge. It would not however be suitable on a special occasion dress such as the one shown.

**Q.8** Responses varied for this question depending on candidate subject knowledge and ability to express themselves with clarity.

- (a)** Most candidates demonstrated some understanding of the role of fashion forecasters in predicting future trends and were awarded marks accordingly. Where candidates failed to capitalise on the available marks was in describing the wider aspects of their role. Some did not appear familiar with the term.
- (b)** Answers to this question varied. Most candidates understood the term 'bespoke' and were able to describe a few characteristics associated with bespoke clothing. A few offered some comparisons to ready to wear collections and although not strictly required in the answer, were credited accordingly. Where some candidates failed to gain marks was in fully justifying the additional costs to the customer for example: a personalised design, fit and product, additional costs to manufacture for skilled workers, hand sewn details, more luxurious fabrics and intricate detailing, all adding to the cost. Points made were not always fully explained consequently full marks were rarely awarded.

**Q.9** This question was disappointing with only a few candidates achieving full marks. This question also addresses AO3 where candidates need to show evidence of appraisal or making judgements in their responses. Some answers tended to be descriptive consequently full marks could not be awarded.

The role of the BSI was understood by most candidates. This question however was specifically about the role of the BSI in relation to furnishing materials. Some candidates made references to the Lionmark or safety relating to children's clothing and although the information given was technically correct these facts did not answer the question.

The candidates who reference the Furniture and Furnishings (Fire safety) regulations and/or referenced more appropriate standards in furnishing materials gained the most marks.

- Q.10** Overall this question was the most accessible on the paper. Many candidates demonstrated very clear and detailed subject knowledge and expressed themselves with clarity with clear evidence of logical chains of reasoning in the second of the two AO3 questions.

Globalisation and its impact on the environment is clearly understood as well as the impact of fast fashion. Recent media coverage of fast fashion and environmental issues surrounding the textile industry has no doubt made an impact on candidates' knowledge and understanding strengthening their ability to answer this question. Many candidates were awarded full marks. That said candidates should be mindful that over long responses that stray away from the main focus of the question do not necessarily yield higher marks. Some candidates seem to think fast fashion is always cheap, poor quality and is likely to fall apart. This is too generalised a statement when not fully explained, is not necessarily true therefore does not gain credit. Low prices however do benefit consumers which most candidates recognised. Candidates should also be aware that the UK for example once had a thriving fashion and textile manufacturing industry. Globalisation and the demand for lower prices from consumers facilitated its decline leading to loss of employment for many UK workers.

Quality of written communication which was assessed in this question was mostly considered good.

### Summary of key points

- This report should be read alongside the 2019 unit 3 paper and mark scheme. Centres are reminded of the item level data available on the WJEC secure website when they reflect on their candidates' performance. Item level data sets out the candidates' performance in this year's paper at a national level as well as centre/individual candidate performance. Feedback on candidate performance for the 2019 paper will also be discussed in the forthcoming CPD sessions planned for the autumn 2019.
- I hope that the feedback I have provided in this report will enable centres to reflect on the strategies and advice given to their candidates as they prepare for the 2020 examination.
- Resources that support the GCE Fashion and Textiles course are available on the WJEC website:  
<https://resources.wjec.co.uk/Pages/ResourceSingle.aspx?rlid=2633>  
<https://resources.wjec.co.uk/Pages/ResourceSingle.aspx?rlid=2627>



**PRODUCT DESIGN**  
**General Certificate of Education (New)**  
**Summer 2019**  
**Advanced Subsidiary/Advanced**  
**UNIT 3**

**General Comments**

The paper was well received by candidates and most candidates answered all questions on the paper. Considering this was the first A-Level paper for this new qualification candidates clearly developed their knowledge and understanding from the AS unit 1 paper. Candidate's use of terminology and technical language together with knowledge of materials, design influences and manufacturing processes was good, with a number of scripts demonstrating this in their responses.

**Comments on individual questions/sections**

- Q.1 (a)** This question was well answered. Candidates were able to identify the correct manufacturing process and suitable polymer for the product. Where the question was answered wrong many candidates identified injection moulding instead of blow moulding. It is pleasing to see that candidates are starting to develop their understanding of specific polymers.
- (b)** Many candidates identified the key benefits of both the polymer and process, however where candidates received lower marks, they only made reference to either one or the other. Candidates were awarded credit if the answers related to the question even if they answered part (a) of the question incorrectly.
- Q.2 (a)** It was clear from the number of correct answers that this topic was delivered by the majority of centres. Some candidates failed to identify the last stage of the life cycle as obsolescence.
- (b)** Overall, candidates gave the main key extension strategies however, some lacked in detail and were not described fully to achieve the higher marks. On occasions, candidates would refer to other products rather than the car amplifying the importance to read the question carefully.
- Q.3 (a)** Many responses referred to the anthropometrics not ergonomics and it is clear that candidates did not understand the difference. Many candidates talked about a chair, however within the image there was no chair. The few well-answered responses referred to the workflow, sounds and additional hand scanners that could be used to aid the user's efficiency. Most common ergonomic answers focused on the relationship between the product and the user or stating the product needs to be comfortable for the user to use safely.
- (b)** The question clearly showed a large number of candidates understood and knew about anthropometrics and this was linked to the products in the question stem.

On occasion candidates only referred to the chair or desk and not both, resulting in them only being able to access four of the eight marks available. It was pleasing to see that some candidates labelled the diagram to help explain their responses.

- Q.4 (a)** The best responses provided clear understanding of galvanising as a protective process. Many responses identified zinc being a main material in the process however, many did not explain the process of adding heat to galvanise the steel chassis.
- (b)** Many candidates that answered this question were awarded marks in the mid-mark band. In the vast majority of answers, candidates talked about the benefits of different types of finishes for both the handle and trowel part of the garden tool, but more explanation could have been added to gain the higher marks. A range of responses were given for the handle as some candidates identified it as being manufactured from wood and polymers. If the finish was appropriate for the materials, credit was given.
- Q.5 (a)** This question was answered very well with nearly all candidates showing their knowledge of the importance and benefits of CAD. A range of advantages were given and candidates linked the answer to the context of the scooter effectively.
- (b)** In the minority of cases the issue with this question was that, candidates continued to describe the use of CAD instead of linking it to pre-production prototyping. On occasions candidates didn't refer to the manufacturer enough, again amplifying the importance to read the question carefully.
- Q.6 (a)** The responses received were generally good and candidates described features of the benefits of standardised bought-in components. The candidates who scored well provided good understanding and evaluated the use of JIT. The main response was to reduce costs however weaker responses only described this and didn't exemplify the benefits to be able to meet the evaluate command word in the question. Candidates are reminded that they need to make sure they read the question carefully to tailor their answer to the benefits for the manufacturer not the consumer.
- Q.7 (a)** This question was generally well answered. Most common advantages were the strength to weight ratio resulting in a lighter tennis racket. Where candidates explained how this benefits the user, they received the higher marks. The majority of candidates also identified the ability to withstand shock and some referred to the aesthetics qualities.
- (b)** The level of responses on this question were not as strong as 7(a). The main issue when candidates answered this question was that they referred to the lens of the spectacles and not the frames as stated in the question. Where candidates answered the question effectively, they identified SMA nitinol and described its use to be beneficial to the consumer.
- (c)** This question was generally well answered. Most common advantages were the strength to weight ratio resulting in a lighter bicycle. Where candidates explained how this benefits the user, they received the higher marks. In some cases, answers were too generic, and they identified the aluminium alloys as being cheaper.

- Q.8 (a)** The main concern with this question was that responses invariably did not differentiate between the two areas in that Quality Assurance ensures quality in the process and Quality Control identifies defects in products before release. The better responses were able to provide some differences between the two and identified the use of standards such as BSI within their response to enable high quality products.
- (b)** Many candidates that answered this question were awarded marks in the mid-mark band. On occasions, candidates merely repeated themselves from part (a), where the higher mark responses made good reference to both the consumer and manufacturer. The main responses included the safety concerns for the consumer along with the brand reputation for the manufacturer.
- Q.9 (a)** Candidates who attempted this question were able to describe the term indicating their understanding of the topic. It was clear to see that if the candidate didn't understand market segmentation, they were not able to gain the higher marks as they just discussed target markets. The higher responses made good use of examples where candidates linked their answer to a product and making good reference to traits such as age, gender, religion and target market interests.
- Q.10 (a)** Candidate responses to this question were hugely varied due to the open nature of this question.

The higher band responses made good analysis of a range of James Dyson's products and referenced how these have influenced other companies, design trends and similar competitor products. Where candidates referred to aesthetics, technological developments, environmental impact the response flowed better and there was more structure to the answer.

There was clear indication that candidates are familiar with James Dyson as a designer, however on too many occasions those students who were awarded lower marks offered a generic response not analysing more than one product and only concentrated on the cyclone Hoover or personal details that did not link to design influences.

It would be beneficial if centres could teach candidates how to answer in a structured approach-using introduction, main points followed by a conclusion.

### Summary of key points

- There is a clear indication that the longer style responses generally require more structure and planning, as many candidates failed to clearly cover all requirements of the questions to gain the higher banding marks. Where candidates successfully applied their knowledge and understanding to the given context, they were able to access the higher mark bands within questions.
- Many candidates are able to link key terms, however some continue to use key terms throughout the paper without applying these to the specific question.

- Some candidates made good use of planning notes to structure their responses and this is something that should be encouraged by centres during delivery of the course.
- Centres should continue to advise candidates to use the mark allocation indicated at the end of each question to guide the depth of response required.

# **DESIGN AND TECHNOLOGY: ENGINEERING DESIGN AND PRODUCT DESIGN**

## **General Certificate of Education (New)**

**Summer 2019**

### **Advanced Subsidiary/Advanced**

#### **UNIT 4**

#### **General Comments**

Following on from last year's introduction of the new AS specification, the new A Level Unit 4 has been well received and interpreted on the whole by centres across Wales. Centres have generally adopted the new changes, applied the new mark scheme and have identified additional requirements needed by Unit 4. Moving forward, consideration to the following comments and recommendations should be made.

#### **Comments on individual questions/sections**

Centres need to continue ensuring that candidates explore and analyse a range of project possibilities. These project possibilities could come under a range of contextual situations or could be under one context. There are still some centres directing candidates in certain briefs or context. The candidates must choose and develop their own briefs and it is not expected that whole samples show the same contexts. The aim of the iterative process is to allow the students to consider a range problems and briefs based on analysis of client requirements, research and deconstructing existing products and problems. At A level it is also expected that candidates demonstrate a clear and logical plan or sequence for the development of their project. Furthermore, specifications will also demonstrate that they are working documents and contain some evaluative comments and ongoing iteration throughout the process.

Design folios again were generally well laid out with good examples of the iterative process being followed by many centres. This was evident in A3 folios and some good use of sketch books. Centres should continue to encourage candidates to model, develop and iterate as much as possible. These models, tests, concepts could take on the form of a physical model or a 3D CAD model. Sketch books must also continue to be developed and encouraged as an iterative working tool, marks for good use of sketch books should be rewarded in the generating and developing ideas section. At A level greater reference to the implications of the design and its impact on social, moral and sustainability issues should be evident.

Product solutions and prototypes across many centres were appropriate however, centres should consider the timing and marks allocated to their prototype. As with the AS, consideration on the marks allocated to products is proportionally less than in the previous marking scheme. However, products should still represent a finished functioning product. When centres are making concept models, the products, regardless of function must look and feel like a real product. Quality of finish remains important. Please also note, only the finished prototype/s can have marks awarded in this section. Marks cannot be awarded for models and test pieces these are rewarded in 'generating and developing design ideas'.

Along with the finished prototypes centres should ensure that the logical sequence and timeline completed should be in a pre-emptive context.

Centres should also ensure that flow charts and manufacturing plans contain sufficient detail, considering the '3<sup>rd</sup> party' aspect. Moderators are seeing Gantt charts as a means of planning the manufacturing; although this is an acceptable method, a simple coloured box on a chart is meaningless unless it is reinforced with realistic detail including reference to H&S, QC and timings that reflect the true manufacturing process.

Evaluations as with the previous specification were generally well written. However, centres need to ensure that far greater time and emphasis is placed at A level on evidencing, testing and user trials. Consideration here should also be made to how the product could better meet the needs of the user throughout its life cycle. Modifications should be fully realised in annotated sketches or CAD presentations.

### Summary of key points

- A range of problems must be identified by the candidate not prescribed by the centre.
- The problems could come from one in-depth context or a range of different contexts could be considered.
- Encourage more modelling and testing of concepts to aid the iterative process. Including CAD modelling.
- Continue to develop the use of sketch books as an iteration tool.
- The journey candidates have followed should be clear throughout the folio and sketch book.
- Concepts and prototypes of designs made can only have marks awarded in the 'generating and developing ideas' section.
- The final concepts and prototype should **look and feel** like a real product. Finish is important. Could the product be taken to an investor?
- Logical sequences should be pre-emptive and should be sufficient for a 3<sup>rd</sup> party to make the product.
- Evaluations should contain end testing and user trials with clear suggestions of possible modifications to the product.



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