



Examiner's Report

Principal Examiner Feedback

Summer 2018

Pearson Edexcel GCE Advanced Subsidiary
In D&T: Resistant Material (6RM02/01)

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Introduction

Being a re-sit paper the cohort sitting this examination is vastly reduced. Many candidates showed good knowledge across the whole specification, and scored well on what are some quite probing questions. Very few questions were left blank which is also pleasing to see as it indicates good coverage of the specification. Many good examples of essay plans were seen helping candidates structure their responses to the extended writing questions. Having said this, there remains a minority whose result is significantly affected by poor exam technique, rather than lack of knowledge. Some samples of this have been included in this report in an attempt to continue to stress the importance of this topic.

Q1(a). The polymer being looked for here is Acrylic. Around 70% of candidates correctly identified this. The most common incorrect response was 'thermoforming', although a wide range of incorrect polymers were also seen.

Q1(b). Two hazards arising from the use of VOC were being looked for. The large majority of candidates correctly identified that fumes presented a health hazard, or identified symptoms arising from exposure to the fumes. Few candidates gave a second different hazard (flammable), but rather just gave a second different symptom of the same hazard.

Q1(c). Candidates showed a good knowledge of the factors that need to be considered when selecting adhesives, with most candidates correctly identifying three or more factors as to why PVA or contact adhesive would be selected. The most common responses seen were drying time, cost and whether it needed to be waterproof. Around 10% of candidates achieved all 5 marks, and all responses across the mark scheme were seen frequently.

Q2(a). Polypropylene was the polymer being looked for from which DVD cases are made, as other polymers do not have the necessary resistance to fatigue needed for the integral hinge. Around 20% of candidates correctly identified this polymer.

Q2(b). The majority of candidates were able to access marks for this question, although many struggled to score well. Four mechanical properties of the DVD case polymer were asked for. Toughness and strength were given as examples of mechanical properties in the question stem, which helped some candidates to correctly focus their responses. Malleability / flexibility was the common correct response. Many candidates then diverged into non-mechanical properties, such as lightweight or colour issues. Candidates also lost marks for repeating responses using different words such as 'malleable' and 'easily bent'. A significant number also used the exemplar responses in the stem, again often using different words for strength and toughness, such as rigid and impact resistance. Centres are

encouraged to ensure candidates can clearly differentiate mechanical properties, from wider properties.

Q2(c). Candidates were asked to describe three functional quality control tests that would be carried out on the finished DVD cases. The key word here is **functional**. Most candidates were well able to identify two tests to check that the DVD cases functioned, such as checking that the hinge didn't split, or that the clips held / releases a DVD effectively. Common incorrect responses focussed on visual checks rather than functional, such as checking for miss-formings or colour variance.

Q3(a). This question required candidates to draw a snap head rivet, fitted in place, and flush on one side. The large majority were able to show good knowledge of the shape of a snap head, although very few sketched a correct countersunk, or counter bored, head on the other side. The most common error showed a thin flattened head, which was not flush.

Q3(b). Most candidates were able to pick up a number of marks on this question, although only a small minority scored the full 4 marks: for two explained advantages of pop rivets over snap head rivets. The most popular response concerned only needing access to one side, which showed good knowledge by candidates of how pop rivets are fitted. The most common incorrect response seen was that pop rivets are stronger. Candidates also need to check whether answers are explained. Many missed marks, either by giving a different unrelated point as an explanation, or by repeating the same point using different words; for example, pop rivets are quicker to fit so they do not take as long.

Q3(c). The majority of candidates scored three, or more, of the possible five marks available for this question on cam followers, indicating a good knowledge of this part of the specification. Common correct answers for the roller follower, over the knife follower, were less friction / heat generated, and that they cannot follow internal corners of a cam profile. The most common source of lost marks was repeated responses where candidates stated an advantages of the roller follower, then repeated this as a disadvantage of the knife follower. Although this may ensure that the point is being made clearly, candidates need to be aware that this will only gain a single mark; and sufficient points need to be made, up to at least the number of marks available.

Q4(a). Most candidates only achieved a single mark on this question, which required them to identify PPE needed during a casting operation. The stem excluded head gear, gauntlets and an apron from the answer pool, and required candidates to identify three further items. The most common correct response was safety boots. Many candidates gave gloves, presumably as they were unfamiliar with the term gauntlets. Goggles was also commonly seen which was

not accepted as the head gear in the stem will have included a full face visor. About 5% of candidates successfully scored the full 3 marks. This could be suggestive of an insufficient knowledge of technical terminology (gloves / gauntlets), or a concerning lack of engagement with the importance of PPE.

Q4(b). It was pleasing to see most candidates achieving high scores on this question with many achieving 4 or 5 marks, out of the 6 available. Common correct responses focussed on die casting being quicker, more intricate, and cheaper for long runs than sand casting. Points were generally explained effectively; although again some lost marks by repeating the same point using different words, or jumping to an unrelated issue as an explanation. A common answer that was not accepted was that die casting produced 'higher quality' mouldings. This was seen as too vague, as it could have related to mouldings having a better quality of surface finish, being more intricate, or being moulded more consistently, all of which are in the mark scheme as separate points.

Q5(a). Candidates were asked to state six properties of stainless steel which make it suitable for the swimming pool ladder shown, other than strength and durability. Most candidates successfully scored 3 or 4 marks, with about 15% reaching 5 or 6. The most common errors were candidates repeating the two examples in the stem (strength and durability) or using different words for them. For example, tensile strength, rigidity and 'will not bend' were all taken as strength, and so were not awarded. 'Corrosion resistant' was the most popular correct response, but phrases like 'will not rust' 'stain resistant' and 'water resistant' were all treated as making the same or similar point, so were not accepted.

Q5(b). This question required candidates to evaluate what the effects on a business might be when their product had achieved BSI compliance. Most candidates were able to access this question, with the majority scoring up to 4 of the 8 marks available. A minority of candidates gave more detailed evaluations with about 5% reaching 7+ marks. Frequently seen correct responses focussed on improved reputation, positive effect of motivating staff, and the additional costs of quality checks and testing. A common error was candidates focussing on changes to the product, rather than effects on the business, or diverging into effects of TQM (total quality management) on the business, which is outside the remit of the question.

Q6(a). A short question, which asked candidates to identify the 'smart' property associated with colour change as a consequence of exposure to UV light. Slightly more than 50% of the cohort correctly identified 'photochromic'. The most common incorrect response was 'thermochromic'.

Q6(b). Candidates showed good knowledge of electroluminescent panels in response to this question, which relates to its use in a watch. Lower ability

candidates picked up marks for superficial responses relating to panels being cheap, durable, and available in a range of colours. More able candidates were able to pick up further marks through demonstrating more detailed knowledge, such as wide viewing angle, no glare, and can be produced in any flat shape. The most common incorrect responses related to candidates confusing the EL panel with the LCD display, and to the panels giving a bright, powerful light.

Q7. This final question on the paper also differentiated well. Most candidates were able to score some marks, for responses that focussed on continuous production systems being able to produce large quantities of products, being highly automated, and being expensive to set up. The more detailed responses scored 8+, of the 10 marks available, using insightful points. For example: realising that continuous production would only be used where demand is not expected to change in the near future; that systems are inflexible; and that economies of scale increase potential profits. Common responses, which did not achieve marks, related to continuous production produces high quality products, as quality is not related to production scale, and repeats of the points given in the question stem.

Summary

Many examples of quality answers, with good use of exam technique, were seen in these exam scripts. Most candidates gained some, if not strong marks, on the longer questions. On-going concerns relate to candidates repeating answers already stated in the question stems, not adequately explaining responses where questions require them to, and candidates diverging away from the question focus. Overall, based on candidates responses to this paper, centres should focus on the following:

- Many candidates will still benefit from reading questions more carefully and underlining important words.
- Candidates should have a clear understanding of the different command words, so that they can focus their responses appropriately.
- When questions require multiple responses, candidates must ensure that each point made is different knowledge, not the same or similar knowledge in different words, which will be classed as repetition.
- Candidates must have a sound understanding of the differences between mechanical, functional, and aesthetic properties.
- With the longer essay type questions candidates are encouraged to use the top few lines of the answer space to generate a small plan of the points they intend to make. This will help to focus answers and prevent repetition.