OCR
RECOGNISING ACHIEVEMENT

GCSE

Applied Engineering (Double Award)
Applied Manufacturing (Double Award)

General Certificate of Secondary Education **GCSE 1492**
General Certificate of Secondary Education **GCSE 1496**

Combined Mark Schemes And Report on the Units

January 2006

1492/1496/MS/R/06J

Oxford Cambridge and RSA Examinations

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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MARK SCHEMES FOR THE UNITS

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Mark Scheme 4868/4880
January 2006

Question	Response	Mark

1	• **Reward Product/Benefit if sector incorrect.**
	• **Look at response as whole in first instance**
	
	1 mark in each cell for appropriate entry. Should follow down
	eg:
	Metal alloys:
	• engineering fabrication
	  • Car wheel
	  ▪ high strength to weight ratio
	  ▪ customer appeal - attractive appearance.
	Plastics:
	• biological and chemical
	  • Polypropylene shampoo bottle top
	  • hinge can be moulded in
	  • ease of colour matching.
	CAD:
	• textiles and clothing
	  • shirt design
	  • can see 3D representation of finished product onscreen as develop design
	  • CAD will automatically generate cutting patterns for range of sizes required.
		4
		
		4
		
		4

2		6
	Suggested marking system: • **Look for any links to Systems and Control and mark *<u>in</u>*correct** • **Look for the three "Materials" being correct** • **Reward reminder for ICT**	
(a)	One mark for each link correctly made (top to bottom): Modern materials ICT ICT - Modern materials Modern materials ICT	2
(b)	1 mark for each **different** specific example For example: <u>ICT:</u> Internet, laser/bubblejet/dotmatrix printers (mark is **not** for printer but technology, photo editing software, Satellite/GPS, Digital, Plasma, Infra-red	2 2
	<u>Modern materials:</u> Alloys, Shape memory alloys, smart materials, Plastics, Composites, Smart foods: Benecol, Anti-oxidents, modified enzymes, probiotic yoghurts/drinks, TVP, Quorn, Tofu. Smart Textiles: Thermochomic inks, Photochromic threads/fabrics/beads, Smart Skins, sanitised Frabrics, breathable fabrics	
	<u>Systems and control</u> Temperature control system, process controls, freezing tunnels, coin checkers, traffic lights, ABS (braking), controlled conveyors, washing machine programmers.	

3

- **Take care that stages are: Assembly – Finishing – Packaging and <u>not</u> crossovers**
- **Not despatch**

a, b & c = 2 marks for each activity relevant to product and stage
1 for product related
1 for stage of production

Examples of 2 mark responses:

	stage of production	toy scooter	Steak Pie
a	assembly	manually fitting tyres to wheels	Add filling until right weight
		attaching rear wheels to axle and tightening fixing nut.	Add tops: water round rim, pressed to seal by machine
b	finishing	spray painting lead free finish – red framework.	Spray glaze tops
		Attach adhesive stickers	Freeze in tunnel to -7C
c	packaging	place scooter into recess in recycled card tray,	Wrap in food grade film
		place into card outer carton, add safety instructions and guarantee documents, lid on, secure tabs, tamper tape across end panels.	Add labels showing product details ingredients, weight and sell by date

2

2

2

2

2

2

4

- **Systems and Control is a challenging area**
- **Robotics is assumed as *part of Systems and Control***
- **Do not reward maintenance costs in part a**

a

1 mark for each relevant cost stated e.g.

Time researching what to buy	Removing old equipment
Buying equipment	Modifying existing equipment
Installing system	Lost production during changeover
Training/retraining staff	Redundancies

4

b

2 marks for each feasible saving described e.g.:

- Employ fewer staff – less wages
- save energy by improving efficiency
- reduced reject rate – reprocessing costs
- product quality improved – less cost dealing with
- problems
- accept 'increased revenue from…..'

6

c

2 marks for each feasible benefit.

- Improved product quality enhances company reputation
- Customisation
- Customer (seasonal) demand
- Automatic correction / peace of mind etc.
- Increased market share
- Speed/efficiency of changing product
- Fewer staffing issues reference hazardous areas

4

5

Indicate: "T" for technology used
"M" for Material or components used
"S" for Structure
"Moulded is too generic for reward

1 mark for each point covered relevant to each section (do not award twice for same point e.g. switch and polypropylene something else but be flexible across areas.)
2 marks for points with expansion on purpose, justification or use.
Materials should be specific (NOT Plastic or Metal)
Components should be named (rather than generic terms),
How used could, for example, involve structure, purpose or quality.
For example from the golf club shown in the question:

Centre of gravity modelled using CAD	Technology (+ how used) (2)
Powder coating gives smooth red/black finish	Technology (1)
CNC machined clubface: better strike area	Technology/structure (+ how used) (2)
Plasma welded face (TIG welding can give an uneven bead)	Technology/structure(+just) (2)
Titanium cast body: light and strong	Material (+ how used) (2)
Cartridge to adjust club head weight (for different players)	Structure (+ just) (2)
Carbon fibre composite shaft (for flexibility and strength)	Material (+ how used) (2)
Carbon composite top to reduce weight	Material (+ how used) (2)
General layout sketch	Structure (1)

Technologies	4
Materials	6
Structure	4

6

- **Reward "How product changed even if Technological development is incorrect**
- **Look for three definite points for the three marks**
- **Points must be factually correct.**
- **Care on "dated" technologies i.e. Wood v steel for making boats**
- **Micro-Technology or words to this effect is valid**

1 mark for a technological development, 3 marks for each description of how a characteristic of the stated product has changed.

Product	Technological development	How the product has changed
Golf Club shaft	Composite materials	The shaft of the golf club used to be made from steel. This has been replaced by lightweight carbon fibre composite. Clubs can be produced with different amounts of flexibility.
Wines	pesticides	Consistency and better yield - helps ensure grape harvest not spoiled
Wines (no mark for product)	environmental control systems	ensure consistent quality by controlling the fermentation process
Sportswear	Textile technology	allows breathability for comfort and close fit for aerodynamics.
Telephones	Microprocessors	allow modern handsets to store numbers , or incorporate answering machines etc (1 mark only for have more features)

Any 3 x 4 marks

7	**3 marks for each benefit explained (i.e. benefit and how achieved). Must be benefits of using an integrated system, for example compared with automation of individual stages.** **1 mark for simple statement/part answer e.g. 'CAD/CAM makes products better quality' or 'reduces product development time'** **+1 for benefit explanation 'less paper transfer of information as production progresses'** **+1 for benefit which refers to <u>shared data</u> (i.e. showing understanding of integration) e.g. CAD/CAM <u>linked</u> together so don't make mistakes.** **<u>N.B. Award third mark only if understanding of linked/sharing shown</u>** • reduce product development time because concurrent engineering is possible • reduce product development time because CAD designs are sent directly to CAM • Financial savings can be made • centrally held data means less paper transfer of information as production progresses • use materials/people/machinery more efficiently because production planning is automated • maintain a competitive edge in the marketplace because products can be modified readily by amending CAD files. • order tracking possible throughout process (eg through barcoding of product batches) • fewer people chasing progress/ meeting to exchange information between departments • machine downtime for routine maintenance is more easily scheduled into system, reducing idle time • all components ordered to match production plan JIT production facilitated, reduces stick costs • production plan can be amended to meet changes in ordering (eg sudden large order) • production can be readily switched between products if problems occur at any stage. • One production line can make a range of product specs (e.g. Nissan cars made to order) (4 benefits x 3 marks)	12

8

Both (a) and (b) discussion. Award 6 marks:

- P for relevant Point/Issue x 3
- R for relevance x2
- E for a specific example supporting their answer.

2 x 6

a

Availability of products:
accept broad interpretation eg from the point of view of globalisation, ranges of products, improved transport links.

Internet sales	Can order new products from across the world	Games available before released in UK
stock control automatic re-ordering	ensures suppliers have stock	
Large companies have outlets worldwide	Their products now available to worldwide customers	
Modern manufacturing methods allow increased customisation of products	Increases range available	Car made with features as ordered

b

Markets for products: not simply marketing, but can be reaching new markets
Accept broad interpretation eg from point of view of communication, localisation of products, globalisation

- P for relevant Point/Issue x 3
- R for relevance x 2
- E for example

Write letter in body of text where appropriate

Internet sales	Markets for products where manufacturer has no local outlets/ Can promote and sell products across the world	
Large companies have outlets worldwide	Their products now available to wider range of people	
Products can be modified by changing production program	To suit different groups of people Or different areas	Coke formula is not as sweet in France as in UK. Fridge controls suit local conditions.

	High quality products available at lower prices/economies of scale	Increased affordability to new groups of people	Mobile phones used to be a luxury.	
	Embedded systems programmed to give different product features for different models	Can target markets closely	Dishwashers with ten programmes have same basic shell, mechanical parts, wiring and controls as those with 3.	

Report on the Units
January 2006

Chief Examiner's Report

4866 Design & Graphical Communication – Engineering
4867 Engineered Products – Engineering
4878 Designing Products for Manufacture – Manufacturing
4879 Manufactured Products - Manufacturing
4868 4880 Application of Technology – Engineering and Manufacturing

General Comments

The performance of candidates varied with a clear correlation evident between performance and attendance on INSET events.

Clear evidence points to the fact that where candidates have undertaken visits to Engineering and Manufacturing establishments they are more able to address the assessment criteria in the portfolio units and respond to questions in Unit 3.

Centres are advised to look carefully at the content of the individual Principle Examiners and Moderators reports which have specific details about candidate's performances in the January 2006 examination.

4868 4880: Application of Technology (1492, 1496)

General Comments

The majority of candidates attempted all of the questions and a significant number gained marks throughout the paper. There was some evidence of good time management by a number of candidates. It was pleasing to note that there was clear evidence of candidate first hand experiences of industrial visits and industrial links.

Candidates would, however, benefit from more carefully preparation covering the following areas of the specification:

- knowledge and understanding of modern materials and technologies and the associated wider ramifications of the use of these materials;
- technological understanding of the 'Real World' Engineering and Manufacturing and its application;
- knowledge of and the application of Systems and Control;
- knowledge of and the application of CIE or CIM; and
- detailed knowledge and understanding of robotics and other engineering and manufacturing technology

Comments on Individual Questions

1 An accessible question with 3 marks being available for a correct suggestion of an appropriate sector. A further 3 marks for an appropriate product which used the technology were available. Candidates were positively rewarded even if the product had no connection with the sector suggested. This positive marking resulted in the majority of candidates gaining 4 or 5 marks.

The benefits of using the technology was less well answered reflecting a shallow understanding by many candidates. Whilst this is the first question on the paper and as such targeted at the lower ability range, unqualified responses such as cheap, strong or easy to mould were not rewarded.

The most popular answers were:
Metal alloys: Automotive sector and car wheels as the product. The most popular benefit being an 'aesthetic improvement' and an alloys non-rusting property.

2 a This question was generally confidently answered with the full range of marks being awarded. A number of candidates gained the full 6 marks.
Candidates should not expect a systematic approach to this type of question. (i.e. there are six technologies and three areas and so there must be two technologies for each of the areas)

b This question was less well answered but some excellent knowledge and understanding was demonstrated by a small number of candidates. The most popular technologies associated with ICT were the internet and spreadsheets.
Such materials as Kevlar, GRP, modified enzymes etc. were pleasing to see from a good number of candidates.
The systems and control appeared to be the most difficult aspect to this question with many candidates suggesting CIE or CIM having 'lifted' the information from the

stem of question 7 and failing to understand that they themselves are systems and not technologies.

The full range of marks were awarded for this part of the question with the poorer responses being the 'technologies' from part (a) being copied directly into the table. Clearly a number of candidates had failed to read the question and respond to the emboldened '**different** technologies' in the stem of the question.

3 a A number of candidates didn't understand the different stages of 'making' a product, or understand the concept of 'investigations'.

In many instances the choice of product contributed to the poor performance of a number of candidates. For example an 'automobile' being assembled and finished was a good choice for only part of the question

8.2.3 in the Engineering and Manufacturing Specifications the stages of making in the 'What you need to learn' section are clearly stated. It is important that candidates know when assembly is complete and when finishing begins and also when packaging is completed prior to despatch, (despatch not being part of this particular question).

There were a number of excellent responses with candidates clearly having had appropriate experiences and being able to recall and apply them.

Bland statements such as 'parts are assembled' or 'bits are fixed together' are not sufficiently detailed to gain marks.

4 The full range of marks were awarded for this question.
General lack of understanding of systems and control was evident. Many candidates believe that 'robotics' is the only Engineering or Manufacturing system and even then they lack good understanding of it.

a A number of clear explanations of the needs for retaining existing staff, the potential loss of some staff and the ramifications of redundancy payments by others were seen.
The initial costs of machines, software and technical expertise along with installation time and downtime were all good answers but only from a few candidates.

b The stem of the question was asking for 'ways a company can save money'. Many candidates missed this point completely and provided different advantages to companies, and in some cases disadvantages without reflectling on cost savings.

There was some evidence of clear understanding by a number of candidates, with more efficiency reflected by less waste, fewer rejects, JIT not tying up capital or storage space which are all cost savers for a company using systems and control during their making activities.

c A number of candidates struggled with providing benefits.
Good answers included improved product quality leading to improved company image and subsequent market share.

5 The full range of marks were awarded for this question.

There was, overall a significant improvement in candidate responses to this question. The selection of an appropriate product is most important. A small number of candidates used the Exemplar Product printed within the question, which of course gained no marks.

Some of the better examples of selected products were mobile phones, iPods, automobiles and some very good textile products such as shin pads. Other sports equipment provided candidates with a sufficiently complex product to successfully analyse in terms of appropriate technologies, materials and structure.

The best responses followed the structure of the question closely with candidates categorising their information which was directly related to products. These candidates had clearly undertaken quality product analysis activity in their centres.

It was noted, however, with some concern, that a significant number of candidates had misused the exemplar material from the revision guide which was issued at Inset Training sessions. Candidates clearly had memorised and then regurgitated the information verbatim from the revision guide, which was not relevant to the actual question. This is seen as very poor practice and must be discouraged. The purpose of the revision guide, and indeed the exemplar questions in the examination papers is to present opportunities for teachers to engage their students in appropriate learning activities.

The general standard to sketches showed an improvement on the June 2005. The practice of an essay style response was evident in a number of instances. Overall it was felt that this type of response tended to restrict many candidates.

6 A generally well answered question with a good number of candidates gaining high marks. The structure of the question helped many candidates to formulate their answers but with a significant number following the printed example.
A full range of products and technological developments were covered by candidates. Overall responses and rewards followed a similar pattern. If candidates had covered the specification content they were able to gain marks with relative ease.

7 The concept and understanding of CIE and CIM is lacking significantly by candidates in many centres. It is crucial that candidates have knowledge of the differences between Systems and Control and its incorporation into CIE/CIM. These are challenging areas of study for candidates and, as with other areas of the specification, visits and links with industry go some way in giving candidates appropriate opportunities for learning.

A number of candidates had clearly been taught and had experience of CIE/CIM and gained high marks. However, a significant number of candidates had only limited knowledge and understanding of robotics. Despite this very narrow perspective candidates did gain marks for appropriate observations.

8 The reprinting of the instructions of how to respond to a 'Discuss' style question have made a significant difference to the quality of candidate responses to question 8.
This question required a wider understanding of the implications of modern technology, materials and systems.

Centres are advised, in order to help candidates with discuss type questions, to involve candidates in discussion of familiar topics with an engineering or manufacturing bias.
When candidates understood the meaning of 'product availability' and 'markets for products' (paragraph five of 8.2.2 of the specification) they were able to respond with confidence.
There was evidence of some quality coverage of the specification which brought quality responses and thus high marks.

1492: GCSE Engineering (Double Award)

Principal Moderator's Report

This was only the second time that the examination had been offered in January. Once again Centres are to be congratulated on the way that they applied the assessment grid when allocating marks to candidates. Numbering pages throughout the portfolio and logging the location of evidence on the Unit Recording Sheet did help the moderation process.

The presentation of candidates work was generally good and it was appreciated that when portfolios had been bound securely together they included a cover sheet. Problems arose when sheets were not separated but were presented in a single wallet per section. It was also appreciated when Centres presented work that answered the assessment grids without any unnecessary padding.

When using the assessment grids to assess candidate's work it is important that work is given the credit it deserves for the particular statement in the grid, however, centres must take care that they do not award duplicate marks from another statement for the same piece of work. Separate evidence must be seen in each candidate's portfolio for every statement in the assessment grids. Continued good practice saw a number of candidates clearly dividing their work up into five clearly marked sections.

The use of writing frames and other sheets prepared by the school continue to be a problem as it is felt that they can restrict candidates from gaining the higher mark range.

General Comments.

Although the total number of entries for the January 2006 session is significantly smaller than for the June 2005 session it is encouraging to note that there are new Centres using this session to enter candidates.

A number of Centres, both new and existing, are still unsure of the correct procedure for submitting the MS1 and corresponding CSF forms to the moderator. Guidance on the submission of the correct paperwork is sent to Centres before each Examination Session and is also available from the OCR website, www.ocr.org.uk, - publications + materials tab within the Engineering homepage.

The overall standard of portfolio evidence presented by candidates entered for this January 2006 session was similar to that of the June 2005 session although there was evidence of more quality work.

A number of Centres are still demonstrating a lack of knowledge of the specification content. The Portfolios are the assessable components of the Engineering Double Award course. The specification outlines all the areas of study and experience candidates should encounter in their course to enable them to compile a thorough portfolio. Without these experiences and taught elements of the specification, candidates' portfolios will, by default, be limited in appropriate technical content.

All centres are reminded that this examination is a **Double Award GCSE** and that Units 1, 2 and 3 have equal weighting. It must be recognised that the quality, and to some extent the quantity of the portfolio evidence should be appropriate. Some Centres have failed to understand this relationship.

The Centres are further reminded that whilst practical activity is essential for all candidates in Unit 2, there are no awardable marks for the outcome.

Some centres have not used, or fully utilised the guidance that has been produced in the Assessment Guidance Document. It was clearly evident that where centres have taught to and applied the advice contained within the assessment guidance document, they were consistently more accurate with their portfolio assessment.

For a detailed explanation of the requirements of the specification for Unit 1 and Unit 2 assessment grids, centres are reminded that the Assessment Guidance Document, and the current version of the Specification for 1492 GCSE Engineering (Double Award), are available from the OCR website.

Centres are also reminded of a series of In-Service training events provided by OCR at various locations throughout the Autumn Term, details of which are also available on the OCR website.

UNIT 1: Design and Graphical Communication.

For this unit the candidate has to effectively take on the role of a 'Design Engineer' to solve a problem posed by a design brief supplied by a client. This client should be actively involved in the initial stages of the design process whilst formulating a specification and possible solutions to the design brief. A number of centres lack understanding of the true purpose of Unit 1.

In working towards a solution the candidate must consider all the necessary requirements of the assessment criteria, and should effectively produce a final design that will be 'sold' to the client by means of a presentation of information and evidence gathered together during the production of the portfolio.

The portfolio produced by the candidate should contain all relevant evidence leading to the culmination of the final design solution, with informed decisions explained. Reasoned judgements with appropriate justification are then required by candidates to enable the award of the higher marks.

Centres are reminded that the portfolio is the means of assessing the candidate's capability for this unit, and the evidence presented, by whichever methods are appropriate from those listed in the specification, should reflect this.

UNIT 2: Engineered Product.

To fully satisfy the requirements of the specification for Unit 2 the candidate should effectively take on the role of a 'Production Engineer'. This will involve them in the complete planning and production of a product, the full details of which have been supplied by the Centre. As with Unit 1, some Centres lack understanding of the true purpose of Unit 2 and the evidence submitted in the candidate's portfolios reflects this.

Candidates must consider all the necessary requirements of the assessment criteria for Unit 2 when producing their portfolios. During the manufacture of the product they should continually evaluate their chosen engineering processes and quality procedures in order to determine whether improvements or alterations would be necessary for the commercial production of that product.

Again, as with Unit 1, the portfolio is the method of assessing the candidate's capabilities for Unit 2. It should therefore contain all the relevant evidence, presented clearly and concisely.

4878, 4879: Manufacturing (1496)

General Comments

This was only the second time that the examination had been offered in January. Once again Centres are to be congratulated on the way that they applied the assessment grid when allocating marks to candidates. Numbering pages throughout the portfolio and logging the location of evidence on the Unit Recording Sheet did help the moderation process.

The presentation of candidates work was generally good and it was appreciated that when portfolios had been bound securely together they included a cover sheet. Problems arose when sheets were not separated but were presented in a single wallet per section. It was also appreciated when Centres presented work that answered the assessment grids without any unnecessary padding. When the assessment grids had been applied and evidence had been identified there were very few problems in confirming marks awarded by the Centre.

When using the assessment grids to assess candidate's work it is important that work is given the credit it deserves for the particular statement in the grid, however, centres must take care that they do not award duplicate marks from another statement for the same piece of work. Separate evidence must be seen in each candidate's portfolio for every statement in the assessment grids. Continued good practice saw candidates clearly dividing their work up into five clearly marked sections.

The use of writing frames and other sheets prepared by the school continue to be a problem as it is felt that they can restrict candidates from gaining the higher mark range.

In Unit 4878 some centres are still having problems distinguishing between the client and the end user. The theme of this unit is that the candidate is working as a designer to a clients design brief. Research should be carried out but the findings need to be presented to the client. Good practice shows that candidates who use an identified client gain more marks in section A and section D, as they are able to use customer feedback to produce ideas and can then receive valuable feedback when presenting ideas. It should be noted that the product that is designed should be capable of being batch produced. In section E consideration is needed to outline how the product could be made in quantity. Evidence was lacking in several centres as to identifying ways that the product would be manufactured in 'real world' situations.

Centres should note that the acceptable method of submitting evidence electronically is only through the use of power point. This must be presented on a CD.

Unit 4878 Designing Products for Manufacture.

Strand A

Good practice in this area identified a customer/client who set a design brief for candidates to investigate. A specification was produced from the brief but this was developed further, later in the section, after appropriate research work had been carried out and the findings reported back to the client. The identification of a suitable client continues to be a problem. Candidates should note that in this unit they are acting as a Designer and their customer/client is the person who is employing them to carry out the work; the customer in this case is not necessarily the end user. In order to gain the higher range of marks the candidate must justify their detailed design specification.

Evidence is needed in this section of the design folder to show:

- **A design specification from the given CUSTOMER design brief.**
- **Collect RELEVANT research material based on the brief that can be developed in section B.**
- **Use customer feedback to develop and justify a final detailed specification.**

Strand B

Candidates continue to answer b1 well but in several cases they fail to refer to their specification as required in b2. A final design is often presented however in order to gain high marks candidates must justify their selection. In this section more use should be made of annotation to explain ideas rather than adding titles or just labelling key features.

Evidence is needed in this section of the design folder to show:

- **A range of ideas that will answer the design specification.**
- **Comment on the ideas to highlight good and bad points NOT just labels.**
- **Select and justify a final idea, carefully explaining how this decision was made**.

Strand C

Health & Safety and Quality Control issues in this section should relate to the candidates product and not be presented only as general descriptions. Quality control procedures should be highlighted and explained for each stage of manufacture. To gain marks in the final box of this section it is important that candidates evaluate quality control procedures.

Evidence is needed in this section of the design folder to show:

- **Health and safety issues that arise in making the product identified in Section B NOT general H&S issues but specific ones to the project.**
- **Quality control procedures that would be carried out at each stage of manufacture of the final product should be identified and explained. Once again these procedures should be relevant to the final design in Section B NOT general QC checks.**

Strand D

The work in this section should be a development of the work seen in Section B. In this section the final idea should be presented to the client. Candidates used a variety of methods to present and explain their product to the client. Several candidates recorded the views of the client following the presentation and identified further improvements to their product. Without such interaction it is difficult for candidates to achieve high marks in this section.

Evidence is needed in this section of the design folder to show:

- **Ways of presenting the idea to the client/customer. These should be a development from Section B and should be separate to Section B.**
- **The ideas should be explained and customer feedback may also be included.**
- **Presentation of the work can follow a variety of forms including mood boards, modelling, quality drawings, use of ICT and/or the use of a variety of drawing packages.**

Section E

In general the work in this section mainly focussed on the stages associated to the manufacturing of the product as a single item and the quality assurances associated with that procedure. Where real world manufacturing was considered it tended to be in general terms and not related to the product designed by the candidate.

Evidence is needed in this section of the design folder to show:

- **The manufacturing processes that would be used to produce the product in quantity.**
- **Explanation of what quality assurance processes would be carried out in the manufacture of the product.**
- **How the product would be produced in quantity in the "Real World" This section should be relevant to the product presented in Section D and NOT an explanation of general manufacturing processes**.

Unit 4879 Manufactured Products.

In this Unit Candidates are expected to work as a team and use a production plan in order to produce a batch of items, several Centres appeared to have used time designing the products to be manufactured. If this approach is used in the Centre the work is not required for moderation purposes and should not be included in the folder.

Strand A

Very few candidates described a manufacturing process as required in A1, many used a production plan as the start to this unit. Evidence should be given to show how the plan has been developed to include manufacturing processes and quality control procedures. Many candidates failed to fully evaluate production plans therefore preventing access to marks available in the higher range of this section.

Evidence is needed in this section of the design folder to show:

- **The description of a Manufacturing process.**
- **A production plan that identifies the stages manufacture of the selected product AND quality control checks that will be carried out at EACH stage.**
- **A paragraph that evaluates the production plan.**

Strand B

Candidates are expected in this section to describe the importance of using production plans; little evidence of this was seen from the majority of candidates entered. Team roles were allocated by candidates but once again little justification was evident in many folders as to why individuals had been given the task to be carried out.

Evidence is needed in this section of the design folder to show:

- **A statement that says why it is important to produce an accurate production plan AND why it is important to meet the product specification.**
- **Include a schedule of manufacture as part of the plan or as a separate item. Include time allocations for each stage.**

- **Identify team members and allocate roles to them in the production plan, EXPLAIN why particular roles were allocated to individuals.**
- **Evaluate the production plan and state how it could be improved in order for it to be more** efficient

Strand C

Health and Safety issues were identified but far too often it was only in general terms. Candidates who gained higher marks did relate Health and Safety issues to their product and used them when carrying out the manufacturing schedule. It is presumed that in the vast majority of cases quality control tests would have been used, however, it is vital in order to access the marks allocated that evidence of these tests is recorded in the portfolio. To be awarded high marks in this section candidates were expected to evaluate their planning and scheduling and justify how it could be improved to encompass total quality management and appropriate safety systems.

Evidence is needed in this section of the design folder to show:

- **Health and Safety issues relevant to the product have been considered NOT just H&S in general terms.**
- **How quality control tests have been carried out (photographs may help).**
- **How work was carried out with due regard to H&S issues (photographs may help NOT witness statements).**
- **An justification of how production planning could be improved to allow TQM to take place.**

Strand D

Evidence is required in this section as to teamwork has been effective. Candidates should reflect on good teamwork and how the structure of the team allowed manufacturing to take place. There was very little evidence in the portfolios that candidates had reflected on how the manufacturing team could be used in a more effective way to improve the production of their product. Similarly candidates failed to detail what improvements could be made to the product as a result of buying in components.

Evidence is needed in this section of the design folder to:

- **Explain what is meant by the term good teamwork.**
- **Identify effective teamwork during all production stages.**
- **Explain how the team could be more effective when producing the batch of products.**
- **Explain how improvements could be made to the production of the product by buying in components or ingredients.**

Strand E

The vast majority of candidates were able to identify tools and equipment that they had used in order to manufacture their product, but failed to detail why these were appropriate. Many candidates did not explain how tools, equipment and processes would be modified if their products were to be produced in Real World manufacturing.

Evidence is needed in this section of the design folder to show:

- **A batch of products that have been produced by a team of students (photographs would be most helpful).**
- **Description of how the product was made outlining tools and equipment used (photographs may once again be helpful).**

- **Explanation of why the tools and equipment were appropriate to the tasks, as well as highlighting what tools or equipment may have been more appropriate.**
- **How <u>their product</u> would be manufactured in the real world in quantity. This section should be relevant to the product produced and NOT an explanation of general manufacturing processes.**

General Certificate of Secondary Education Manufacturing (Double Award) 1496
Jan 2006 Assessment Session

Unit Threshold Marks

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	u
4878	Raw	50	45	40	35	30	24	19	14	9	0
	UMS	100	90	80	70	60	50	40	30	20	0
4879	Raw	50	45	40	35	30	24	19	14	9	0
	UMS	100	90	80	70	60	50	40	30	20	0
4880	Raw	100	77	67	57	47	40	34	28	22	0
	UMS	100	90	80	70	60	50	40	30	20	0

Entry Information

Unit	Total Entry
4878	120
4879	92
4880	560

Specification Aggregation Results

GRADE	A*A*	AA	BB	CC	DD	EE	FF	GG	UU
UMS	270	240	210	180	150	120	90	60	0
Cum %	0.00	0.00	0.00	50	100	100	100	100	100

30 candidates aggregated this session

General Certificate of Secondary Education Engineering (Double Award) 1492
Jan 2006 Assessment Session

Unit Threshold Marks

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	u
4868	Raw	50	46	40	34	29	23	18	13	8	0
	UMS	100	90	80	70	60	50	40	30	20	0
4867	Raw	50	45	40	35	30	24	18	13	8	0
	UMS	100	90	80	70	60	50	40	30	20	0
4868	Raw	100	77	67	57	47	40	34	28	22	0
	UMS	100	90	80	70	60	50	40	30	20	0

Entry Information

Unit	Total Entry
4878	162
4879	147
4880	677

Specification Aggregation Results

GRADE	A*A*	AA	BB	CC	DD	EE	FF	GG	UU
UMS	270	240	210	180	150	120	90	60	0
Cum %	0.00	0.00	0.00	10	25	90	100	100	100

43 candidates aggregated this session

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