

Materials & components

As a minimum, candidates should study Paper/Card and one other material area.

| Paper/card - When working with paper/card materials candidates should: | |
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| | be able to identify common papers such as layout, cartridge, tracing, grid, card, corrugated card, duplex board, solid white board, foam core board; |
| | understand the different properties and uses of such materials both as a media for communication and as a material for manufacturing products such as packaging; |
| | understand the availability of common components e.g. to fasten, seal, hang, pour, join, bind, index; |
| | understand that many paper based boards are laminated to other materials and that the composition can be adjusted to create different properties for specific purposes e.g. foil-backed for food packaging; |
| | understand the stock forms for paper/card materials i.e. size, thickness, weight and colour; |
| | have a basic understanding of the source of pulp and the primary processes involved in conversion to workable materials. |

In addition to paper and card you will also study timber based materials and plastics in more detail.

| Timber based materials - When working with timber based materials candidates should: | |
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| | be able to identify common timbers such as pine, mahogany, teak, ash, beech used in the manufacture of products |
| | be able to identify common manufactured boards i.e. MDF, plywood, chipboard, blockboard, hardboard; |
| | understand the different properties and uses of such materials within commercial products; |
| | understand that many timber-based materials are manufactured therefore the composition can be adjusted to create different properties for specific purposes; |
| | understand the stock forms for timber based materials i.e. rough sawn, PSE, sheet sizes and mouldings; |
| | have a basic understanding of the source of timber and the primary processes involved in conversion to workable materials. |
| Plastics - When working with plastic materials candidates should: | |
| | be able to identify common thermoplastics i.e. high impact polystyrene, expanded polystyrene, acrylic, acetate, HDPE, PVC, PET; |
| | be able to identify common thermosetting plastics i.e. GRP, Epoxy resin, UF, MF; |
| | understand the difference between thermoplastics and thermosetting plastics; |
| | understand the ways in which plastics can be formed, especially with regard to consumer products, i.e. vacuum forming, injection moulding, blow moulding, line bending, compression moulding, extrusion; |
| | understand that most plastics are synthetic and that the composition can be adjusted to create different properties for specific purposes e.g. increase rigidity, reduce weight, insulation; |
| | understand the stock forms for plastic materials i.e. sheet, rod, powder, granules, foam; |
| | have a basic understanding of the source of plastics and the primary processes involved |

There are other materials areas that are included in the specification. You do not need to study these but you should be aware that they will appear in the exam paper: ferrous and non ferrous metals; ceramics; textiles; food; electronic and control components.

| Manipulating and Combining Materials - Candidates should learn: | |
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| | how materials can be combined and processed in order to create more useful, or desirable, properties; |
| | how these properties are utilised in industrial contexts; |
| | how a range of materials are prepared for manufacture, allowing for waste and fine finishing; |
| | about a variety of self-finishing and applied-finishing processes, and appreciate their importance for aesthetic and functional reasons; |
| | that to achieve the optimum use of materials and components, account needs to be taken of the complex inter-relationships between materials, form and manufacturing processes; |
| | how pre-manufactured standard components are used to improve the effectiveness of the manufacturing process and be able to identify a small range appropriate to the material areas studied. |
| New materials - Candidates should: | |
| | <ul style="list-style-type: none"> • have a knowledge and understanding that the development of new and smart materials are allowing designers to meet a variety of user needs in new and exciting ways e.g. <ul style="list-style-type: none"> — Precious Metal Clays (PMC) used in jewellery manufacture, — corn starch polymers used in packaging, — thermochromic pigments used for thermal warning patches — shape memory alloys — Quantum Tunnelling Composite (QTC) used to incorporate electronics into textiles, • have an awareness of the importance of the development of nanomaterials and integrated electronics in the area of Design and Technology. |