Unit R109 – Engineering materials, processes and production

Machine processes: moulding

Instructions and answers for teachers

*These instructions should accompany the OCR resource **'Machine processes: moulding'** activity which supports OCR Cambridge Nationals in Engineering.*

The Activity:

This resource comprises of 1 task.

This activity offers an opportunity for English skills development.

Associated materials:

'Machine processes: moulding' activity sheet

Suggested timings:

Task 1: 1 hour

Learning outcome 2 – Understand engineering processes and their application

Task 1

In this activity learners have been tasked to research and explain a range of different moulding processes and to state typical products produced using each process. The moulding processes are:

- Vacuum forming
- Injection moulding
- Blow moulding
- Rotational moulding
- Compression moulding

Learners may tabulate their findings, or present them in alternative forms such as a PowerPoint presentation or poster.

The table on the following page summarises how each moulding process works along with typical products manufactured using the process. Learners may describe each process in greater detail, and may find alternative products.

Learners have been supplied with internet video links showing each process in operation, and a link to the British Plastics Federation (BPF) website's 'Plastipedia': http://www.bpf.co.uk/Plastipedia/Default.aspx

This website explains each process in detail and includes animations of each operation. Learners may use alternative information sources in their research.

Alternatively, the teacher might undertake this activity as a classroom-based session.

Moulding type	Internet video	How it works	Typical products
vacuum forming	https://www.youtube.com/watch?v=1GRLq13-uTA	• Mould produced of shape to be created in plastic • Plastic sheet held in frame above mould • Plastic sheet heated • Mould raised to heated plastic (or heated sheet pulled down over mould) • Vacuum applied to form shape	• Bath and shower trays • Yoghurt pots • Sandwich boxes • Refrigerator liners
injection moulding	https://www.youtube.com/watch?v=_ibXqOihtC8	• Plastic granules heated in injection unit until molten • Injection unit forces molten plastic into mould. • When cooled – mould opens and component(s) ejected	• Power tool housings • Telephone handsets • DVDs • Washing up bowls

Moulding type	Internet video	How it works	Typical products
blow moulding	https://www.youtube.com/watch?v=T01i_vp2mJE	• Similar to injection moulding • Preform component made around hollow core • Preform inserted into second mould (blow station) • Air pressure applied to hollow core to form final component	• Bottles and jars • Plastic containers
rotational moulding	https://www.youtube.com/watch?v=VPLaUzMh3Rw	• Quantity of polymer placed in open mould • Mould heated • Mould rotated about 2 axis to distribute polymer on inside surface of mould • Mould cooled to set polymer • Mould opened and item removed	• Rainwater tanks • Fuel tanks • Traffic cones • Canoes

Moulding type	Internet video	How it works	Typical products
compression moulding	https://www.youtube.com/watch?v=IDVyaaxic9U	• Mould is heated • A 'slug' or piece of plastic is placed into lower mould and warmed up • When warmed up, upper mould is forced down (compressed) onto lower mould • Plastic is compressed into shape of mould • Upper mould moves upwards and component removed	• Buttons • Electronic device cases • Car parts