Tongs and Clips

Objectives

Students will develop their D&T capability by designing and making an original product of good quality that satisfies the requirements of the design brief.

By the end of the assignment, students will know that:

- Shapes can be formed by bending
- Thermoplastics soften and may be bent and formed when heated
- Thermoplastics remain bent / deformed after cooling
- A strip heater / line bender is used to heat thermoplastic sheet materials along a straight line
- An oven is used to heat whole pieces of thermoplastic sheet
- Jigs and formers may be used to aid bending and forming thermoplastics
- Jigs may be used to hold heated thermoplastics after line bending
- Hot parts of strip heaters, ovens and heated plastics will burn skin so:
  - risk assessments of the hazards should be carried out
  - safe working practices should be adopted.

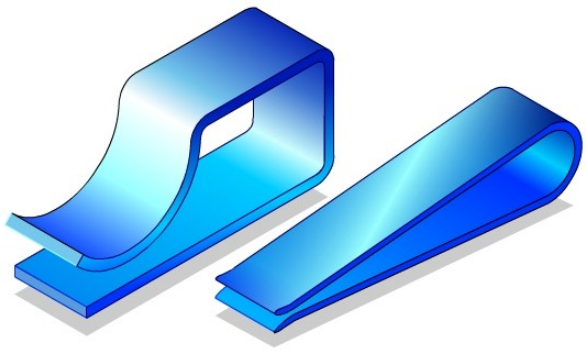
Success criteria

Each student:

- Has designed and made an original product that satisfies the given design brief and specification
- Has prepared at least one sheet of designs that are drawn neatly and where appropriate, show measurements, colour and other important information
- Has used tools safely and has strived to achieve quality in marking out, cutting, shaping, finishing and joining their chosen materials
- Knows that thermoplastics can be softened by heating
- Knows that line benders are used to heat (relatively) narrow areas of thermoplastic sheet materials
- Knows that an oven is used to heat whole pieces of thermoplastic sheet materials
- Knows that thermoplastics soften and can be bent and formed when heated and become rigid again when cooled.
- Knows that jigs may be used to:
  - aid bending thermoplastics
  - hold heated thermoplastics after line bending until the plastic is cool
- Has assessed the risks associated with working with strip heaters and hot thermoplastics and has worked safely throughout the assignment
- Shows evidence of having evaluated his/her work.
- Has presented her/his designs and prototype tong or clip to the panel of experts, (the class).

Tongs and Clips

Situation (imaginary)



A manufacture of plastic products wishes to broaden the range of office and school stationary that they produce.

They want to offer a new range of plastic tongs and clips that can be used on notice boards, clip boards, science and technology departments, etc.

Design brief

1. Identify where tongs and clips are used, e.g. lifting metals from an acid bath, lifting circuit boards from ferric chloride, using tongs for pasta and salads in Food Technology lessons, clipping notices on boards, clipping table cloths to tables.
2. Analyse at least one tong or clip already on the market, noting how it was made, how it works, how easy it is to use and how it could be improved.
3. Identify a situation that would be improved by the use of a special tong or clip.
4. Design and make a prototype plastic tong or clip for your chosen situation.
5. Give a presentation of your designs and your prototype tong or clip to the panel of experts (your class).

Specification

Your prototype tong or clip must:

- do what it is intended to do
- match your design
- look attractive and eye catching – look better than the competition
- be robust enough to stand rough treatment, i.e. must not break easily
- be safe to use

What you must do

- Analyse the design brief and specification and pick out the essential requirements.
- Analyse a clip or tong as described in the design brief.
- Use notes and sketches to illustrate designs for a clip or tong that meet the requirements of the design brief and specification.
- Develop your best idea into a final design. Your design should have sufficient detail so that it could be made by someone other than yourself.
- Prepare a cutting list of the materials that are required to make your product.
- Prepare a Risk Assessment of the hazards involved with making and using your product.
- Make a jig that will enable the plastic sheet to be bent accurately and to be held until cool.
- Make your design.
- Evaluate the final product, e.g.:
  - how good the design looks
  - how well the design works
  - discover what others think about your product.
- Work safely and complete the assignment on time.
- Present your designs and your prototype to the panel.