

# Design of the Paper Helicopter

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## 1 Obtaining the Helicopter

The paper helicopter is a widely used example for training in Quality Methodologies. It was first mentioned in [Box(1992)].

A pdf document with a template of the paper helicopter design (see Fig. 1) is located in the folder `doc` of the `SixSigma` package. It can be also obtained with the command `vignette("helicopterInstructions")`.

Print it in A4 paper without adjusting to the paper size to get the correct dimensions.

You can also generate a copy of the pdf document in your working directory with the function `ss.heli()`:

```
> library(SixSigma)
> ss.heli()
```

## 2 Assembling the Helicopter

Follow the instructions in the template (Fig. 2): fold by the continuous lines and cut the discontinuous lines, depending on the prototype you want to build.

The yellow strips are for tape, the green strip is for paper clip. These materials are optional.

## References

[Box(1992)] George Box. Teaching engineers experimental design with a paper helicopter. *Quality Engineering*, 4(3):453–459, 1992.

The diagram shows a paper airplane template with the following dimensions and instructions:

- Wingspan:** The total width of the wings is 19 cm, divided into two 9.5 cm sections (max) and an 8 cm section (std).
- Body Length:** The total length of the body is 12.5 cm, divided into two 6.5 cm sections (min) and an 8 cm section (std).
- Body Width:** The total width of the body is 10 cm, divided into two 4 cm sections (min) and a 6 cm section (max).
- Assembly Instructions:**
  - fold ↑** and **fold ↓** indicate where to fold the wings and the body.
  - cut** indicates where to cut the paper.
  - clip?** indicates where to clip the paper.
  - tag?** indicates where to tag the paper.

A 3D object resembling a stylized letter 'T' or a cross-section of a structure. It has a central vertical stem and two horizontal arms extending outwards. The central stem is primarily blue, with yellow rectangular sections near the top and bottom. The horizontal arms are primarily red, with blue sections near the center. A small green square is located at the very bottom of the central stem. To the right of the object, there is a large black arrow pointing downwards, and below it, a spiral line representing a vortex or a flow pattern.

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