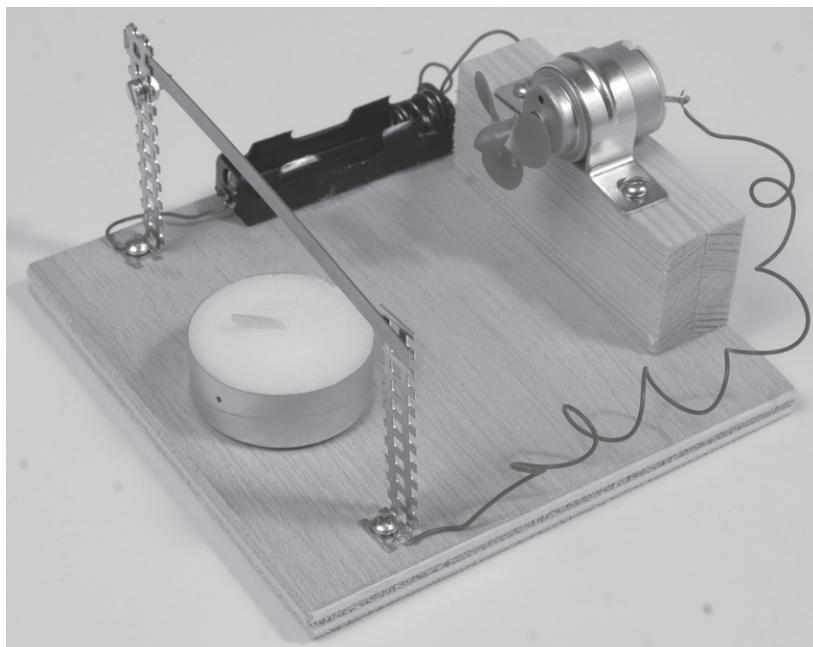


# OPITEC

## Hobbyfix

**107.920**

### *Bi-metal fan*



#### **Please Note**

The OPITEC range of projects is not intended as play toys for young children. They are teaching aids for young people learning the skills of Craft, Design and Technology. These projects should only be undertaken and tested with the guidance of a fully qualified adult. The finished projects are not suitable to give to children under 3 years old. Some parts can be swallowed. Danger of suffocation!

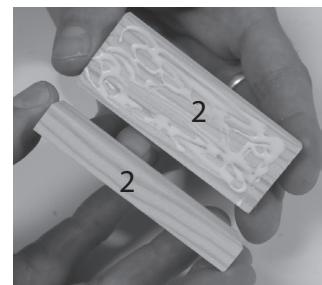
#### **Necessary tools:**

Edding pen, (pencil) ruler  
 Side cutters  
 Combination pliers  
 Screwdriver  
 All purpose glue

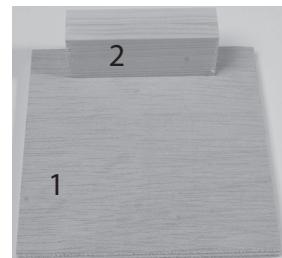
<b>In pack</b>				
	<b>Quantity</b>	<b>Size( mm)</b>	<b>Description</b>	<b>Part no.</b>
Plywood	1	8x120x120	Base	1
Wood strip	2	10x30x75	Motor block	2
Motor	1	Ø 21		3
Motor fixing	1	21	Motorhalter	4
Screws	2	3x16		5
Holed metal	1	0,5x10x150	Contact, holder	6
Machine screw	1	M3x8		7
Nut	1	M3		8
Screws	2	2,9x9,5		9
Thermo bi- metal	1	ca. 100	Contact	10
Battery holder	1		Mignon	11
Cable	1	0,5/0,9x500	Kabel	12
Propellor( ships)	1			13
Candle	1		Heat source	14

# Instructions

1. Glue the wood strips (2) 10x30x75mm together as shown



2. Glue the motor block (2) on to the base (1)

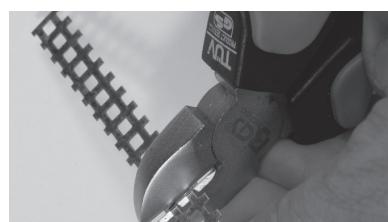


3. Mount the motor (3) using the metal U clip (4) Screw the clip in place in the middle of the motor block.

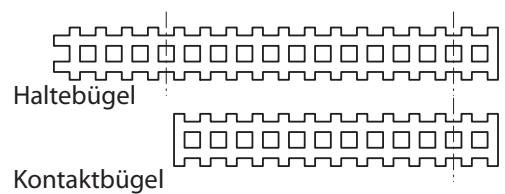
**Note:** Use a holemaker first before inserting the screws !



4. Cut off a length from the holed metal square strip (6) 12 holes long



5. Now mark a line through the middle of the 2nd and 13th holes as shown in the diagram



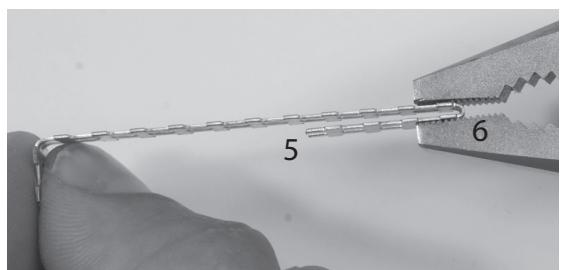
6. Bend the middle of the 2nd hole with pliers up at 90 degrees.



7. Now bend the strip over at 180 degrees on the 13th hole mark.

**Note:**

both of the bends must be on the same side of the strip



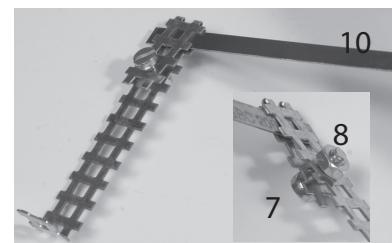
E107920#1

# Instructions

8. Clamp the bi-metal strip (10) under the 180 bends of the square holed metal strip  
And fix the machine screw (7) and nut (8).

**Note:**

The print on the bi-metal strip should face inwards)!

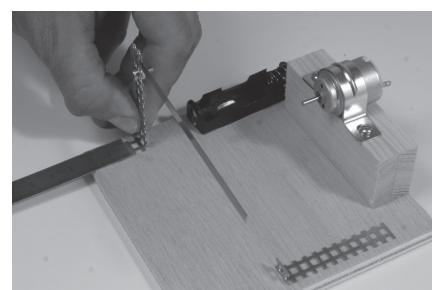


9. Glue the battery holder (11) on the base with an all purpose glue

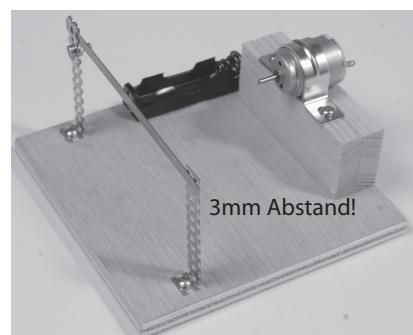


10. Screw the bi-metal holder on the base ,5mm from the edge 20mm in from the end of the base using a screw (9)

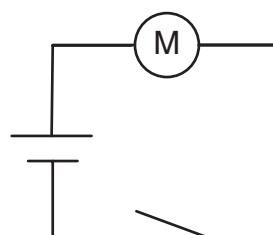
**Note:** Use a hole make before inserting the screw!



11. Screw on the contact bracket – with a screw (9)  
Leave a 3mm gap between the bracket and the strip



12. Cut from the cable (12) the following lengths  
50,150,300mm  
Strip 10mm insulation from the end of each length  
Wire the battery holder and holed metal brackets with the motor as shown in the diagram.



13. Testing:  
Insert a 1.5 volt battery in the holder- Press the bi-metal strip against the holed metal bracket – the motor should run. If not check the wiring.

14. Slide the propellor on to the motor shaft.  
Light a candle under the bi-metal strip. The strip will bend and make contact with the bracket completing the motor circuit. The motor and fan cools the strip and the contact breaks as the bi-metal strip moves. Then the process starts all over again.

**Note:**

The propeller must only cool the metal strip and not blow out the candle.  
If this is not the case swap over the connections on the motor.

