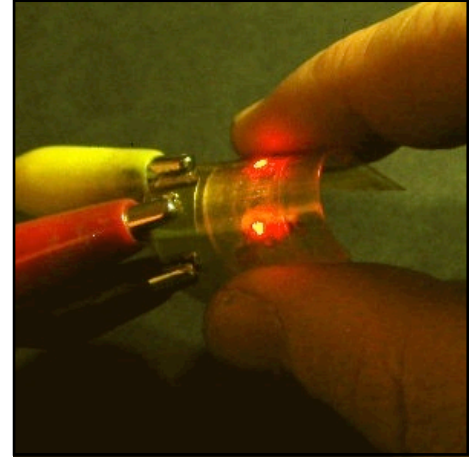


## Red Diamond™ 620s Flexible-OLED Science Kit Product Data Sheet

Version 2

Flexible organic light emitting diodes (OLEDs) are one example of the next generation of electronics that comes under the heading of Printed Electronics.

This organic light emitting diode (OLED) science kit enables businesses and educators to manufacture working proof-of-principle flexible OLEDs. Users can experiment with OLED chemistry, physical structure and control electronics.



### Benefits Of Flexible-OLED Science Kit

1. Make a working flexible-OLED device in under one hour
2. No expensive, specialist equipment necessary
3. Does not require an ultra-clean environment
4. Experiment with OLED device structure
5. Demonstrate properties of OLED's individual layers
6. Evaluate control electronics
7. Technical support to get kit working and to develop applications
8. 3.6Vdc, 1mA operation for a luminosity of 500cd/m<sup>2</sup>

### How The OLED Science Kit Works

OLEDs are multi-layered light emissive devices that operate of a low applied voltage, typically 3-12Vdc. In an OLED's simplest form it is three layer and their most complex, there are five, or more layers.

The OLED in this kit is a four layer device: anode, hole transport layer (HTL), Red Diamond™ emissive layer, cathode. The layers are sandwiched between a plastic substrate and an encapsulation layer. Oxygen and water vapour will slowly migrate through the substrate, degrading the device's performance.

The anode is indium tin oxide (ITO), that has been pre-deposited onto a PET plastic substrate. The HTL and emissive layers are spin-coated onto the ITO. By altering the spin-coating speed, the thickness of the layers can be altered from 100-500nm. On top of the emissive layer, the cathode is deposited. There are few choices available for the cathode, since it must be a material with a low work-function. A cathode metal in liquid form is provided in the kit.

Once made, the OLED device will work instantly. The better the manufacturing quality control is (cleanliness), the better the device will be and the longer it will last.

## OLED Science Kit Contents

Part	Description
OLED emissive layer fluid	Orange colour light emissive OLED layer
OLED hole-transport fluid	Blue colour fluid
2 x ITO substrate	Pre-coated indium tin oxide on 75 x 25 mm plastic substrate
Cathode liquid metal	Low work-function metal for the cathode
Cathode deposition layer-set	Layer-set to give OLED a desired shape and to deposit cathode metal.
Gloves	To be worn when manufacturing devices (not for use in a clean-room)
Pipettes	Used to draw the OLED fluids onto the substrate
OLED electronic driver	OLED driver for controlling OLED
Instruction manual	Explanation and instruction manual for OLED manufacture

## Possible Investigations Using The Flexible-OLED Science Kit

1. Vary the spin coater speed to observe the effect on the OLED
2. Omit the HTL layer to make a simpler OLED
3. Make different sized OLEDs
4. Measure the power per unit area of OLED
5. Compare OLED versus LED technologies:
  - A. Power
  - B. Emissive bandwidth
  - C. Light intensity
  - D. Viewing angle

# POLYMERTRONICS

## Polymertronics' Expertise

Polymertronics' products are designed to be out-of-the-box and simple to use. The product range is for businesses and educators who want to understand OLED technology and to develop products for market:

1. Flexible, rigid and inkjet printable OLED Science Kits for experimenting with OLEDs
2. Ultraviolet curing expertise and equipment for printable electronics
3. Electronic drivers for optimizing OLED performance
4. Solid state lighting development products and expertise
5. Full product development capability for applications
6. *Center-Point* for finding resources and answers to queries

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Note<sub>1</sub> : Polymertronics reserves the right to amend this product's specification and/or look of the product without updating this data sheet.

Note<sub>2</sub> : Polymertronics is a subsidiary of E<sup>2</sup>M Technology Limited, United Kingdom.

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