

# Design Considerations for a Tumble Dryer

**This case study describes a product design review undertaken on behalf of a tumble dryer manufacturer. Various cost and environmental saving opportunities were identified. Based on an estimated 100,000 unit sales per annum, savings were estimated to be:**

- ~ £9,100 per annum
- ~ 20.9 tonnes of CO<sub>2</sub>e per annum
- ~ 7 tonnes of material per annum

## The Tumble Dryer

The product considered was a tumble dryer retailing in the UK under £200 including VAT, with a 1 year manufacturer's warranty. It has two heat settings and a timer function, and is specifically designed for low noise and light-weighted for easy manoeuvrability.

## Key Opportunities Summary

During the product design review, the following key areas were identified as best practice:

- Increase recycled content in polymers;
- Prevent vibration during use;
- Secure internal wiring and connectors;
- Maintain airflow through the drum; and
- Ensure polymers are marked to facilitate segregation for recycling.

These opportunities are described in detail within this case study.

## Recycled Content for Polymers

All polymer components allow a maximum of 25% regrind within the polymer blend, which is good practice for reducing production waste. Introducing recycled polymers made from post-consumer waste could also be considered for non-customer facing parts where the colour and finish are of lower importance.

There are a number of internal components inside tumble dryers that have no cosmetic requirements, such as the door fixings. These virgin polymers could potentially be substituted for those with recycled content to lessen the environmental impact and close the recycling loop.

This opportunity has identified significant carbon savings across numerous other electrical products.

### Preventing Vibration During Use

Vibration is a common problem with washing machines and tumble dryers due to the nature of operation. This is usually caused by areas of panelling loosening over time which can vibrate and cause additional noise.

The back panel should also be well secured with screws and vibration deadening material added if necessary.

### Securing Internal Wiring and Connectors

Internal wiring and connector blocks should be securely fixed to the chassis by either a cable tie or metal clip or routed in a way to prevent movement as this could lead to potential disconnection of the leads during use resulting in product failure. This should be considered at the design stage as the addition of clips or fixings creates increases the component count and therefore increased impact on the environment.

### Maintaining Temperature and Airflow Through the Drum

The airflow through the drum is determined by the speed of rotation, the volume and shape of the drum and the boreholes. The distance the warm air covers on its way through the laundry has been maximized to ensure optimal humidity transfer by positioning the drum's air inlet diagonally opposite to the air exhaust which is located at the bottom of the drum.

Insulation around the drum is also recommended to reduce heat loss and reduce the energy required to maintain its temperature. This could enable the manufacturer to achieve a higher energy rating.

### Polymer Marking

Clearly marking polymers is good practice to facilitate segregation for recycling at end of life, and should be common practice across all plastic components.

### Design Reviews and Buying specifications

Having undertaken 16 product design reviews WRAP are building on this work by developing [buying and specification guidelines](#) that will improve the durability of electrical products.

For further information, email: [Clare.Ollerenshaw@wrap.org.uk](mailto:Clare.Ollerenshaw@wrap.org.uk)

While we have tried to make sure this information sheet is accurate, we cannot accept responsibility or be held legally responsible for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. This material is copyrighted. You can copy it free of charge as long as the material is accurate and not used in a misleading context. You must identify the source of the material and acknowledge our copyright. You must not use material to endorse or suggest we have endorsed a commercial product or service. For more details please see our terms and conditions on our website at [www.wrap.org.uk](http://www.wrap.org.uk)

---

#### Waste & Resources Action Programme

The Old Academy  
21 Horse Fair  
Banbury, Oxon  
OX16 0AH

Tel: 01295 819 900  
Fax: 01295 819 911  
E-mail: [info@wrap.org.uk](mailto:info@wrap.org.uk)

Helpline freephone  
0808 100 2040

[www.wrap.org.uk/electrical](http://www.wrap.org.uk/electrical)

