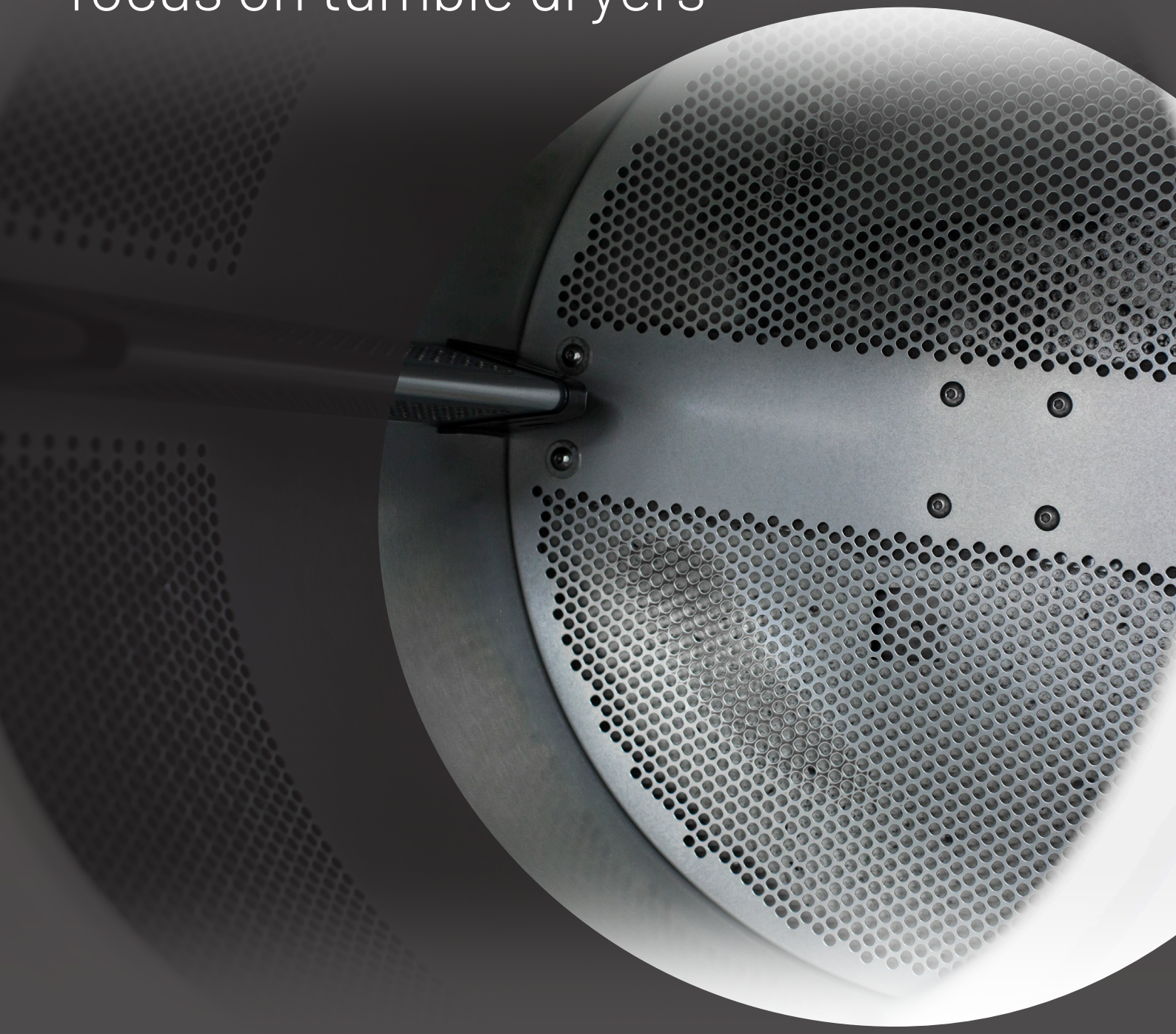
Fire Protection Association

RISCAuthority

Risk control briefing note 4:
Fire safety for laundries with a focus on tumble dryers



RISK INSIGHT, STRATEGY AND CONTROL AUTHORITY

REDUCING INSURABLE RISK THROUGH RESEARCH, ADVICE AND BEST PRACTICE

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1 Introduction

The fire risks associated with tumble dryers are reasonably well publicised due to a number of laundry fires. Furthermore, some well-known tumble dryer manufacturers have issued extensive product recalls or have instigated a programme of repairs. Issues have been caused by poor design that has allowed lint to come into contact with tumble dryer heating elements.

Several factors, either in isolation or in combination, may lead to tumble dryer fires. These include:

- Reduced airflow in the dryer, mainly due to build-up of lint in filters/traps but also from poor venting arrangements. This can cause overheating by considerably slowing down the drying action.
- Insufficient 'cooling cycles' for reducing the temperature of items in the dryer. This will result in higher temperatures of the items being dried and longer periods for the heat to dissipate from the items.
- Inappropriate fabrics or fabrics contaminated with combustible substances (grease, oils, fats). These may ignite spontaneously when exposed to the temperatures generated in a tumble dryer.
- Ignition of accumulated (hot) lint by static sparks, consequent to accumulated static build-up.

** Spontaneous combustion is defined as a type of combustion which occurs by self-heating (increase in temperature due to exothermic internal reactions), which can rapidly accelerate to high temperatures and finally, auto-ignition.*

The risks of spontaneous combustion* of oil-soaked rags, that heat-up slowly to a temperature at which ignition occurs, are well known for machine workshops and automotive garage environments. However, spontaneous combustion can also occur in a laundry environment when hydrocarbon-contaminated materials in tumble dryers are artificially heated, intensifying heat build-up.

The problem occurs if the oily or fatty contaminants have not been sufficiently removed during the wash cycle. There is a growing trend for eco-friendly washing which often means washing at low temperatures without adequate detergents. This can result in contaminants remaining in the materials when they go into the tumble dryer. If the materials are subsequently dried and then left inside the drum for long periods, they can self-ignite. There is also a risk even if materials are removed and then not properly aired and folded and stacked, and even before washing has occurred. Ignition may occur some time after the self-heating process has started.

2 Occupations at risk

Laundries may be commercial businesses in their own right or provide an in-house service within another type of business. Any trade undertaking laundry activities involving the use of tumble dryers is potentially at risk. Those particularly at risk are where items that may be oil-contaminated are laundered. Such trades include pubs and restaurants where clothing and towels come into contact with cooking oils. Other trades such as hotels are at risk where there is cooking but also use of oils in spa treatments. Common fibres such as cotton, nylon, and polyester have auto-ignition temperatures ranging between 250-500°C.

3 Example losses

Here are examples of two incidents which have occurred:

- Large hotel – Fire occurred within a tumble dryer in the hotel's laundry room. Suspected cause was spontaneous combustion of towels from the hotel spa which were contaminated with essential oils and left inside the drum.

- Vocational college – Fire within a tumble dryer in the college laundry. The college teaches hair and beauty and the cause is again believed to be oil-contaminated towels which were left inside the drum overnight.

In both cases the fire was contained to the room itself due to swift detection by staff and a remotely signalling fire alarm. These are not isolated incidents and both losses demonstrate that focused risk control is needed for laundries with tumble dryers.

4 Risk control recommendations

The following are recommended precautions:

- Ensure wash temperatures and detergents are suitable for the optimum removal of oil-based contaminants (the higher the better).
- Do not undertake tumble drying near to the close of business or let cycles run-on out of hours.
- Consider the most suitable positioning of tumble dryers when left operating unattended.
- Implement procedures to maintain a high standard of general housekeeping. Good housekeeping is essential within laundry areas to minimise the opportunity for fires to start and reduce the opportunity for dryer fires to spread to combustibles piled on top or around them.
- Ensure stacks or piles of laundry are well ventilated.
- Allow laundry to complete the cooling cycle in the tumble dryer.
- Remove laundry quickly after a cycle has completed and shake out laundry to ventilate before folding, or place garments on hangers.
- Ensure that all laundry staff are aware of the laundry operation procedures and the checks required. Specifically, ensure laundry staff are adequately trained in the correct use of tumble dryers and good housekeeping practices, and routinely reminded of the importance of storing only fully cooled stock.
- Implement checks for removal of any foreign materials that have been left in the pockets or folds of garments and linens to be laundered.
- Routinely clean tumble dryer filters, remove fluff, lint and debris from dryers and keep them regularly maintained. This should include removal of lint from difficult-to-access voids within tumble dryers during routine servicing.
- Where possible, replace any ignitable cleaning agents with nonflammable materials. Where this cannot be achieved, only keep sufficient flammable liquids in the laundry for the day's usage. Ensure all flammable liquids are stored in proprietary storage cabinets or rooms with suitably selected electrical equipment in accordance with a DSEAR risk assessment.
- Provide fire detection throughout laundry areas.
- Ideally locate laundries in rooms and buildings separated from other areas by a minimum of 1-hour's fire-rated construction or by detachment.
- Consider sprinkler protection for laundry areas, as part of general building sprinkler protection.
- Where laundry chutes are in use, or planned, they should be constructed of noncombustible materials and provide at least 30 minutes' fire resistance. Bends should be avoided and the chute should be fitted with a self-closing shutter or flap to maintain fire resistance. Similarly, the entry flaps or doors on upper floors should be fitted with 'self-closing' hinges and both openings fitted with intumescent strips and cold smoke seals.
- Items containing foam rubber (and similar natural or synthetic rubber materials) should not be dried in a tumble dryer as these materials may ignite on heating.

- Ensure that appropriate preventative maintenance is carried out as per manufacturer recommendations.
- Ensure with routine checks that there is no illicit smoking in laundry areas.
- Ensure that all staff are fully conversant with emergency procedures.

5 Conclusion

Fire hazards, including spontaneous combustion, should be brought to the attention of laundry operators. Suitable, focused fire risk assessments should be carried out, and suitable safe systems of work and physical controls put into place, with reference to the above risk control recommendations. This will minimise the likelihood of fires occurring and mitigate fires when these do unfortunately occur.

6 Further information

- RISCAuthority Risk Control Guide RC58: *Recommendations for Fire Safety in Laundries*.
- Reference: Health & Safety Executive (HSE), *Tumble Dryer Fires in Laundry Rooms*, Offshore Information Sheet No. 3/2009

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