

## **FIRE EXTINGUISHERS**

### **SOME PRACTICAL COMMONSENSE COMMENTS ON THEIR USE**

The instruction normally provided by FENZ to ‘not worry about the fire and evacuate the building’ is very sensible advice.

When a PCBU is writing up a Health and Safety Plan, evacuation is the easiest statement to include. If, however, the organisation management intends staff to fight fires no matter how small the fire, the plan needs to be written with considerable care. There is some inherent potential liability on the PCBU in the event of an unintended outcome where the fire damage is exacerbated or where injuries or death result from that action.

The problem is that perceptions of fire size, extinguisher type and capability, and handler expertise are entirely subjective. What seems to be to be a conflagration to one person appears to another as something that can be extinguished with ease. Both perceptions can be wrong – possibly with fatal consequences.

The more training and experience a person has, the more realistic the expectation. The problem for most people is the frequency and duration of training. A training course five years ago where, if lucky, 3-4 extinguishers were used by a participant on a demonstration fire in the open air for a total time of approximately 2.5 minutes is not enough, no matter how enjoyable the course was.

A plan that states that trained staff may, or are expected, to extinguish ‘small fires’ is problematic in terms of liability. Far better to say that an extinguisher may be used if needed to evacuate the building safely and that the PCBU has no expectation that fires should be fought.

The above statement is all very well but when jobs, facilities or critical research are on the line, the pressure to ‘have a go’ is very real. Fire safety literature indicates that people involved in fires do not panic but make reasoned (if hasty) decisions based on available information and level of experience. The less information available to the senses and the less experience the person has, the more chance of an unfortunate outcome.

Typical clothing is not suitable for fighting fires which is both a good and bad thing. Good in that it provides no thermal protection, so the instinct is to back away and evacuate before the environment becomes untenable. Bad in that it provides no thermal protection, the safety factor that may allow a safe evacuation without getting burnt.

In any setting fires involving Class 2.1.1 flammable gases and 3.1 flammable liquids can be complicated by the presence of other hazardous substances – high pressure, liquefiable or cryogenic gases, oxidising gases, liquids or solids, organic peroxides, corrosives, toxics or eco-toxics, even radioactive substances.

With good inventory control and management, minimal quantities will be exposed and with the larger quantities and the seriously nasty stored in compliant purpose designed and built facilities protected from fire.

If the building is on fire and 'well involved' evacuation is the only logical action; best to evacuate upwind to an alternate evacuation point due to combustion product toxicity.

Tackling fires in their very early stages is fine (though the perception of small as I indicated above is an issue). I can understand why one would want to try. But they are not worth putting life at risk to save if the fire is 'larger than an office rubbish bin' – the usually accepted though often inappropriate visual size indicator.

Why have extinguishers at all? They are legally required, not by the Building legislation but by the Health and Safety at Work (Hazardous Substance) Regulations 2017. There is a requirement to have fire extinguishers available if the quantities are above the trigger limit levels in Schedule 4 of the regulations – in very general terms quantity triggers range from 50 to 500 litres / kg but are also triggered by different chemical classifications.

The previous HSNO regulations required the extinguisher to be within 30 metres of the storage facility. The requirement now in Regulation 5.4 is that they shall be clearly visible and readily accessible.

WorkSafe NZ gives the advice that the suitability and number of extinguishers provided should be evaluated annually or whenever the quantities of hazardous substances held change significantly.

Regulation 5.5 requires extinguishers specified as to number and location, and to meet a classification and capability rating of 30B in accordance with AS/NZS1850:2009.

**Dry powder** extinguishers meet 30B and will kill a fire very quickly but do not have the ability to drop the temperature – if there is anything that remains which is above the auto-ignition temperature of the product that has been burning then the flammable vapour (which is what has been burning) will flash over again – often with some violence.

The problem with Dry Powder is that the extinguishant is hygroscopic, abrasive and corrosive. If used on a small fire the damage caused to electronic and expensive equipment will be catastrophic, probably out of all proportion to any useful effect.

Probably though the extinguisher of choice to effect a quick evacuation in an extreme emergency due to its quick 'knock down' ability.

It is important that where there is high value instrumentation the choice of fire extinguisher should be compatible with the instruments.

**AFFF** - Aqueous Film Forming Foam (alcohol resistant foam is specified for ethanol) extinguishers again meeting 30B are easier and safer to use and are indicated for flammable liquid / solid fires and for any fire involving an oxidiser. They do drop the temperature and can be relied on not to flash back as violently as a Dry Powder. They are heavy, not easy to run with.

**CO<sub>2</sub>** extinguishers do not meet the capability requirement but despite their serious lack of extinguishing ability even in competent hands are probably the only type recommended for a very small fires. Can be used on electronic equipment, though it should be remembered that if the power is switched off, electrical wiring and insulation is self-extinguishing anyway - it is usually the power supply that is causing the fire to keep burning.

CO<sub>2</sub> can only be placed in a facility if the number of 30B extinguishers available is in excess of the numbers required (if required) but they may be the one to go to out of choice for a localised fire that is unlikely to spread.

**Fire Blankets:** These are great, drape them over whatever is burning on a bench, in a fume cupboard, on the floor. Turn the power or the gas off to any affected appliance. Call FENZ and wait, preferably outside the room at least away from any toxic fumes, gases or smoke.

Any extinguisher must be within its test date. If not and is used (and fails for whatever reason, even improper use) then the insurance claim is called into question. Best to forget it is there and evacuate to call FENZ on 111.

If an extinguisher is used by a staff member against a health and safety directive to evacuate and not use extinguishers, there is an element of liability on that staff member in the event of an unintended outcome where the fire damage is exacerbated or injuries or death result from that action.

The main question is whether to use it or not. If you do 'have a go' make sure the egress door is always at your back, so you can turn and run if it gets out of control. Remember all smoke is toxic, carbon monoxide from a fire is odourless and invisible, any fire produces temperatures ten times what human skin can tolerate for more than a fraction of a second, and ordinary clothing provides little protection. **GO.**