

Day 2 – Fire



Version 1.4.2



The Questions You Want Answered Today:

1:

2:

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5:

A

Section 4

Categorisation of Fires

Observe smoke and fire types to predict contamination.

Some fires, but not all, can be categorised in the following way:

Fast Burn - Small simple particles.

Slow Burn - Large complex particles, more staining, odour.

What Burnt? - Plastics, protein, natural materials, manmade materials?

What are the ramifications of different types of fires?



- **Slow burning fires**

- An example of a typical slow burning fire is an incident when the mains incoming electrical supply is overloaded or has a poor connection.
- Gradually the surrounding materials start to smoulder and burn.
- These fires start slowly and as they are often in cupboards where the supply of oxygen is restricted.
- The smoke produced will contain a **higher proportion of aerosols** and these will often find a way to get into building cavities by following the cable runs.
- This can be a problem as **odour** can be difficult to treat in the inaccessible places.
- To the untrained eye these types of fire residues **look minor**, with less obvious light brown staining.



- **Fast burning fires**

- Fast burning fires, such as a kitchen fat fire, can produce huge amounts of **dry black residues**.
- To the untrained eye these types of fire residues look severe, with very obvious heavy deposits.
- However, in some cases these deposits can be simply removed as they leave a dry residue.
- Remember these deposits are light and **can float in the air and so re-deposit on areas already cleaned**.
- For this reason, it is important to organise environmental controls, such as **air scrubbers, and to start work by vacuuming of ALL surfaces**.
- The high pressure of these fires means that the residues can travel to the furthest extent of the property, into wardrobes and cupboards. Covering all of the structure and contents



○ **Successful removal of fire residues depends on two factors:**

- The characteristics of the residues.
- The nature of the surface that retains it.

B

Section 4

Protein Fires

- Protein fires do not always involve ignition.
- They produce yellow/light brown residues that are relatively hard to see.
- These incidents produce a semi-transparent film of condensed protein and/or amino acids, which results in the most challenging odour removal and other restoration problems
- Typically, if meat is heated and decomposes then vapours are released which will condense on adjacent surfaces.
- These fires are very difficult to deal with, as the contamination is usually not clearly visible.
- The most successful approach is to start in the worst affected room (usually the kitchen) and strip it of all contents that may contain odour, clean the structure, and then re-assess.
- You will usually find that you can reduce the odour eventually in this first room and any remaining odour in adjacent rooms will then need attention.
 - Contents items that are likely to attract and hold onto protein odours are paper and plastic food packaging, plastic kitchenware, food items that have been exposed and other “natural products within the property”, wools, cottons etc
- You might hope that painted surfaces will respond to cleaning. However, emulsion paint can sometimes become impregnated with this unpleasant odour, and redecoration may be essential. Wallpaper so affected will also normally have to be stripped.
- It will be hard to identify the final scope of work on the first visit.
 - The residue is hard to see, and because of odour drift from one area to



another it will not be easy to identify the full scope on the first visit.

Staining potential of fire residues

- This staining will usually have formed during the fire. In some cases, you will notice that it becomes **harder or even impossible to remove as time passes**.
- Prompt action to remove the residue may make your job easier and the results more successful.

C

Section 4

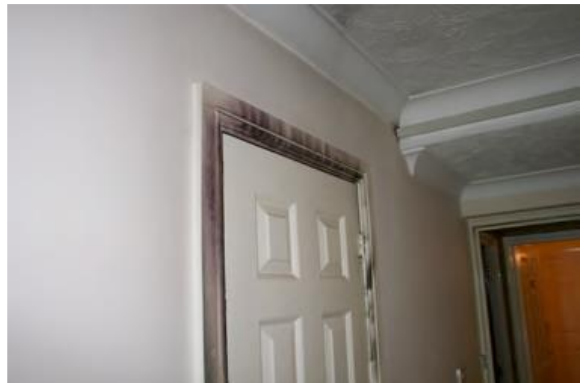
Predictable Behaviour of Smoke

Smoke Behaviour is affected by:

- Temperature of smoke.
- Temperature of surrounding areas.
- Existing patterns of air flow.
- General arrangement of the space and its contents.
- Ionisation of smoke particles

Typical contamination points in a building are:

- Doorways.
- Enclosed spaces.
- Exterior surfaces.
- Horizontal surfaces
- Areas where convection occurs.



High & Low Pressure Movement

- The laws of physics dictate that gases move from high to low pressure areas in an attempt to reach equilibrium.
- When **hot, high pressure smoke** enters a room the smoke can be sucked into the lower pressure, cooler environment of drawers or cupboards.
- This is why contamination within drawers and cupboards is often greater than customers expect to see.



The Importance of the Heat Gradient

- Hot gases rise and this applies to smoke as well.
- You may already have noticed that fire residues are heavier in the upper parts of rooms.
- You may often see a **line around the walls**, and above this line the contamination is heavy, below it can almost seem as if there is no contamination.
- You need to take this into account when you are making decisions. For example, when looking at books in a **tall bookcase**, make sure you look at each shelf individually as the lower the shelf the less contamination there will be.
- Taking this detailed approach will make sure that your restoration is more successful.



Soot Particles can be Ionised

- Smoke particles tend to be ionised but plastic polymers produce more strongly ionised particles than natural materials such as wood & paper.
- When plastic polymers and rubber, and sometimes fuel oil, burn, they can produce a large amount of charged particles. These charged particles, also known as ionised particles, will become attached to surfaces with the opposite charge. Surfaces with identical charge will repel them.
- This explains why nail heads, which were invisible before the incident, can attract a disproportionate amount of soot and the optical illusion this creates can make it appear that the nail heads are protruding. This is not the case, just that they are disproportionately contaminated because of electrostatic attraction. There is an electrostatic attraction of charged soot to the nail.

D

Section 4

Triage Assessment for Water Damage in Fire Situations

- You will normally find that you have **limited resources available** in the first hours dealing with an incident therefore your actions need to be **prioritised**.
- You can prioritise by carrying out a triage immediately following your risk assessment.
- Water damage following a fire is often overlooked. Three sources of water:
 1. Extinguishment water.
 2. Damage to Main Services.
 3. Water Vapour.
- By carrying out a triage assessment you will identify the items that need your urgent attention.
- Your triage assessment will identify three categories of items:
 1. **At Risk of Secondary Damage – these items require urgent attention.**
 2. **Beyond Economic Restoration (BER) – these are a lower priority as these items are already ruined.**
 3. **No Risk of Secondary Damage – these do not need urgent attention, and should be attended to after the urgent items have been dealt with.**



You will see that if you carry out a triage assessment you will more easily see what to do first, what is most urgent.

Applying the triage process to water damage

- One of the key benefits you deliver to your customers is that you are able to take prompt action to minimise secondary damage. To make sure you can deliver on this you need to prioritise the work you do in the first hours or days on site.
- In order to correctly identify items at risk you will need to use your moisture measuring equipment to enable you to decide the full extent of water penetration.

Some points to consider:

- **Water trapped behind panelling or boarding** – investigate any areas where you think water may have become trapped behind.
- Panelling or pipe boxing – these are the
- areas where mould could quickly grow.
- **Water trapped in floor insulation or voids**
- consider how the floor is constructed – does it have insulation, and could water be trapped there?
- Water trapped **behind or beneath impermeable surfaces** – such as vinyl.
- wallpaper or tiling.



When there are **carpet grippers** it's possible for water to track around the edge of a room between carpet grippers and the wall. If this occurs it could lead to a section of saturated carpet on the far side of the room which could remain undiscovered if your survey, with moisture meters, was not thorough.

E

Section 4

Basic Triage Assessments in simple Fire Damage situations

First carry out and act on the risk assessment and deal with safety matters.

To make a triage assessment you need to **walk through the entire affected property** to make a visual categorisation of the fire type.

- Firstly - **The Items at Risk** - note anything that is at risk of secondary damage.
 - These items will require your urgent attention.
 - Examples will be **metallic fittings, electronic and electrical items, wet items, plastic finishes such as on appliances and UPVC windows.**
- Secondly - **The Items Not Restorable** - note the items that are beyond economic restoration.
 - These do not require urgent attention as they are already ruined.
- Thirdly – **The Items Restorable** - note items that you expect to be restorable and will not suffer from further damage.
- Finally, start to **take action** with items that would otherwise suffer from secondary damage.



- A person who is not familiar with fire damage may spend the first hours clearing total loss debris – usually this is not the best approach even though, to the customer, it could seem the better option.
- Spending time on this at the start of a job could deflect resources from mitigation of secondary damage elsewhere.
- However also consider that one difficulty with fire damage is that the debris can be rich in **hydrochloric acid**. If you measure high chloride levels on metal it could then make debris removal a higher priority action. This is because the hydrochloric acid is being released, potentially re-contaminating your work.



- The same principle can apply to odours. You may in some circumstances need to protect your initial work from these sources of re-contamination by odour off-gassing from debris.

Of course, you must make sure that any urgent action you take is **cost effective** – some items may be at risk of further damage but have a low replacement value.

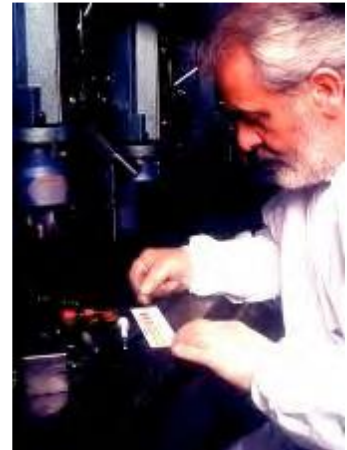
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Section 5

Corrosive Nature of some Fire Residues

Some fire residues contain acids and are corrosive, as these will cause rusting/oxidation damage to metals.

- Some materials produce huge amounts of acids when they burn.
- Some materials don't produce any acids when they burn.
- So please remember – not all fire residues contain acids – testing for chloride levels can help decide if there is a corrosion risk.
- PVC produces large amounts of contaminated residue, chlorides released during melting and burning react to form hydrochloric acid, this can settle on surfaces causing staining and corrosion.
- Remember PVC is not only in doors and windows, cable sheathing, TV casing, refrigerator linings can all contain PVC (poly vinyl chloride)
-



Damage Potential for Electronic electronics are particularly vulnerable to damage from the acidic residues.

The damage to electronics can be from:

- Corrosion.
- Residues that conduct electricity, causing short circuits.

If you know that valuable electronics are at risk you can prevent damage by:

- Reducing the relative humidity (RH) in the property to around 40% which will start to slow corrosion.
- You may find that tenting equipment at risk and introducing dry air will enable lower RH values to be maintained, as it can be hard to reduce the RH in the whole of a damaged building.

- Remember that below 30% RH there will be an increased risk of static electricity, causing damage to electronic components.
- Protecting circuits from moisture with a water dispersant coating – specialist knowledge required.
- Prompt decontamination – specialist knowledge required.



Computers can contain data that might be worth more than the hardware and the owner may need a specialist data recovery service if they don't have adequate backup. If insurers are involved, check carefully to ensure the cost of data retrieval is covered.

Damage potential for PVC and plastic laminates

- Both PVC and plastic laminates can become stained by strong acid residues.
- If strong acid residues are suspected, then make sure that all these items are cleaned promptly to remove the damaging residues.
- Don't wait until there is obvious staining as this can make restoration much harder or even impossible.
- This includes many plastic-finish baths, shower panels and kitchen units. The staining and discolouration may become irreversible.
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Corrosive actions on steel

- Industrial steel framed buildings are at risk of ongoing secondary damage when high levels of acidic residues are detected after a fire.
- Hydrochloric acid is persistently corrosive and will continue to erode metal for some time following the incident unless promptly neutralised.
- The metal used in cladding is only a few millimetres in thickness and may exhibit signs of pinhole corrosion some months after the event.
- Prompt actions to lower the relative humidity and detailed cleaning, with an appropriate neutraliser, are essential to prevent such deterioration.

B

Section 5

Remove Fire Residues

Fire residues can contaminate everything, and we are asked if it can be removed along with the odours that are produced.

Damage Management technicians play an important part in reducing the environmental impact of fire damage events by successfully restoring contents, which reduces the amount that goes to landfill, or by re-cycling. As long as our customers have their items returned to pre-incident condition, we are able to demonstrate a very cost-effective solution.

The key elements to successful fire damage restoration

- The most important starting point is to roughly classify the fire and the type of residue we have to deal with.
- Take careful note of how loose the residue is, and if the odour is strong and persistent.
- As you will already know some loose fire residues can look dark and may indeed be a heavy thick layer, but even in these cases they can be relatively easy to remove. Other residues are more difficult.
- Note whether the odour is persistent. Ask yourself, “Has it been a smouldering fire, starved of oxygen?” These fires typically produce wet greasy odours and a type of staining which is hard to remove.

The importance of the triage process for contents

All contents items should be carefully considered for restoration. To be able to make this assessment you need to have an idea of the replacement cost. In some cases, you will need to check with the owner or seek specialist advice. An example is with collectibles, where the market value can be much higher than expected.



- Your chances of restoring contents items will be greater if you make an initial triage assessment to identify any items that are at risk of secondary damage.
- Take prompt action with these items to prevent this damage and increase your success.
- During this inspection note the different levels of contamination and the effect this may have on the restorability of the items affected. For example, note that books on the upper shelves of a bookcase may be far more heavily contaminated than those on the lower shelves. They need to be assessed and dealt with separately.
- Remember that books can often be restored completely, CDs and DVDs may need opening up and the cases cleaned or replaced (the cases are inexpensive) and the discs washed.
- Remember that soft toys can usually be laundered, and that ultrasonic cleaning can make cost effective the cleaning of small items that would otherwise be uneconomic.
- Being skilled and able to remove fire residues from a wide variety of contents items is an essential part of our offering to our customers. Simply listing and dumping general contents is not in our long-term interest. It is our responsibility, if we are involved in fire damage restoration, to ensure that our service includes a wide range of competencies in removing fire residues.

C

Section 5

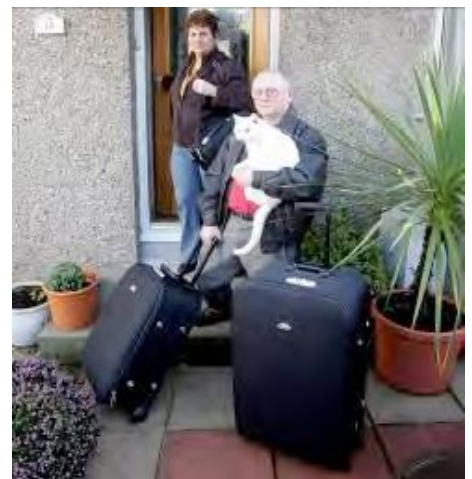
Business Interruption [BI] and Alternative Accommodation [AA]

When planning your work in the first few hours, it's also important for you to be aware of the insurer's potential responsibility for Business Interruption, Alternative Accommodation and other costs.

- Insurers are often responsible for alternative accommodation costs and business interruption costs.
- When you make a decision to carry out some damage limitation work to prevent an item being ruined, you need to also consider the implications of your actions on these other potential costs. For example, if you decide to dry a clean water affected carpet on site, but the only way you have of doing this would result in the business closing for a few days, you would need to look at the whole picture and ask, what would be the cost of business closure for this work.

Reducing Alternative Accommodation and Business Interruption expenses in a cost-effective way

- In a domestic property you may choose to prioritise action that will enable the property to continue to be used.
 - For example, you could take action to improve the **air quality by ventilation and air scrubbing**, and/or focus on making the kitchen, bedroom and bathroom available for use. This could take a higher priority than some damage limitation on low value items.



- Similarly, with a commercial property, you will also need to consider whether out of hours working, with its potentially higher cost, can be justified. Consider, as well, if you could help the business by taking action that will allow it to remain partially open.

Taking thoughtful and cooperative action to enable property owners to continue to use their buildings is an essential part of your work.

The value of test processing

The last thing you want to happen is to carry out a large amount of work and for this to be rejected by the owner. It is perfectly possible to remove fire residues successfully from a wide range of materials, and in many cases you will be able to predict the result in advance. However, if you have any doubts then test process a small sample and make sure the result is satisfactory before proceeding with the whole batch.



D

Section 5

Smoke Odour

Smoke odour elimination is not a precise science

- Everyone's **sense of smell is individual**, with wide variation between us. Whilst it is claimed women tend to have a more sensitive nose than men, both men's and women's sense of smell varies widely.
- Odours are partially linked to our memory and emotions, and in particular, the smell of fire can **trigger strong emotions**. This will especially be the case with a person who has experienced fear during a fire incident.
- Individuals vary in how they experience odour



Smoke odours cannot be measured

- There is **no instrument** that can measure the air specifically for the level of a smoke odour.
 - Smoke odours are made up of many complex chemicals. When you sense an odour, you are reacting to a gas, or a mixture of gases in the air, or tiny particles containing chemicals.
- You can measure the amount of a gas in the air but this says nothing about how much it smells. Some human noses can detect even minute amounts of some gases.
- Defining when you have successfully treated an odour is difficult, as odour perception will vary.
- If the property has been freshly ventilated this means that there will be less gas in the air for you to react to. This may change when it is again closed up.

Odours are a subjective experience

Many odours can be reduced or eliminated

- Remember – in the hours after a fire many odours are present as gases and these can **quickly disperse**.
- However, with some incidents, this **odour persists** and is not removed with ventilation alone.
- Techniques are available for reducing or eliminating the persistent smoke odours.
- While some odours are extremely persistent and may not be treatable in some materials.
- Typical problem odour fires are ones where combustion has been slowed by **oxygen starvation**. With these fires, the burning is less complete and more complicated chemicals are formed, some of which are highly odorous.
- **Protein fires** are also problematical and require special treatment because there is very little visible residue. These incidents produce a semi-transparent film of condensed protein and/or amino acids, which is one of the more challenging odour problems.

E

Section 5

Odour Reduction or Elimination

A persistent odour indicates an odour source or reservoir

- After the initial ventilation following a fire, any odour that is present will be a gas given off from some contaminated material. This is sometimes called 'off-gassing'.
 - If off-gassing is taking place then there must be a **source of contaminated material** from which the gas is being released.
- You will find it helpful in searching to eliminate odour to look for the source of the odour, and the material that is contaminated.
- Fogging is often part of an odour treatment programme

Four principles of smoke odour removal

- **Source removal** – these procedures involve the physical removal of fire residues and their odours. Examples of source removal include: demolition, vacuuming, washing, abrasive resurfacing, hot water extraction, scraping & removal of the affected contents. Odorous particles may be removed from ambient air by filtration, absorption & air exchange.
 - **Advantages** – removal of fire residues is permanent and minimises any environmental burden. The appearance of the surface is unchanged.
 - **Disadvantages** – residues are not always accessible, time constraints or cost factors may make source removal impractical.
- **Application of oxidisers** – oxidisers react with fire residues to eliminate their odours. Oxidisers may be applied in gaseous form (ozone) or in liquid mist, sprays or additives to cleaning solutions (hydrogen peroxide). They may be used to supplement source removal procedures.
 - **Advantages** – may provide swift, effective abatement of fire odours



- **Disadvantages** – not all fire residues respond to oxidation; oxidisers are bleaches and may be corrosive, or add new odours.
- **Use of counteractants** - a wide variety of products add scents, and other materials, formulated to modify fire odours of their perception. Odour counteractants are produced in solid, granular, gel & liquid form. They may be placed directly in odour areas, as well as sprayed, atomised or added to cleaning solutions.
 - **Advantages** – counteractants may resolve odour situations where source removal, or other processes are not feasible.
 - **Disadvantages** – may not be permanent. Their own scent may persist or leave residual odours.
- **Sealers or Encapsulants** – these are adhesives or coatings that block transmission of odour from fire residues. They are formulated from water extendable resins, latex or shellac, dissolved in water or in volatile solvents. They may be applied brush, roller or sprayer.
 - **Advantages** – sealers, or encapsulants, sometimes resolve odour problems that other procedures cannot handle, and also serve as a primer for paints.
 - **Disadvantages** – solvent odours may affect sensitive individuals and only temporarily mask smoke odours that later return. Sealers may change the appearance of unfinished framing & may prevent the application of other odour removal processes.
- **Musty odours indicate mould growth (past or present)**
- If you detect a musty odour you are reacting to off-gassing from mould, either alive or dead. A musty smell indicates the presence of mould.
- These musty odours are a natural product of mould or fungi.

Knowledge Review 2

Q1. Why does hot smoke force its way into the interiors of cupboards & appliances?

- A. Because there are always gaps & it just drifts in.
- B. It only goes in if there are large openings.
- C. The insides of these items are at normal room pressure. The hot smoke is at much higher pressure so it forces itself into these interiors.

Q2. What is the advantage of making a triage assessment at the very start of a job?

- A. It saves time at the beginning.
- B. It brings more order & control at the beginning of a job.
- C. It enables the contractor to charge more for the total job.

Q3. Some fire residues are very acidic. What effect could this have on the contents of a property?

- A. Only metal items would be damaged, with possible corrosion.
- B. Most homes have very few things that would be harmed by acid residues.
- C. Some plastic items may become stained and corrosion may also occur to metal items.

Q4. How can you tell if fire residues are acidic?

- A. It can be tested for
- B. You have to guess at this based on damage you observe happening.
- C. You can tell by the colour of the soot if it is acidic or not.

Q5. Why is it a good idea to remove all acidic fire residues from UPVC windows and kitchen plastic laminate surfaces?

- A. To improve the appearance of the property.
- B. To reduce the chances of staining that delay may cause.
- C. To satisfy the owners needs.

Q6. The restoration technician is focused mainly on:

- A. Preventing primary damage.
- B. Preventing malicious damage.
- C. Preventing secondary damage

Q7. Which two of the following are examples of primary damage?

- A. Burnt roofing timbers.
- B. Corrosion from acidic residues.
- C. Mould growth following flooding.
- D. Heat damaged or wet electrical wiring.
- E. The yellowing of UPVC windows some days after a fire.

Q8. Which two of the following are correct? Triage enables you to:

- A. Prioritise your work with a view to limiting secondary damage.
- B. Categorise contents into three groups, At Risk of Secondary Damage, Beyond Economic Restoration (BER) Restorable but not in need of urgent attention.
- C. Establish a system of work involving three people.

Q9. The primary benefit of carrying out a triage assessment is:

- A. That you will immediately identify the results of primary damage.
- B. That you can identify all restorable items.
- C. That you can proceed in the most cost effective and ordered way to limit secondary damage.

Q10. Which of the following lists identifies three different categories of fire that you are likely to commonly encounter?

- A. 1) Fast burning. 2) Oxygen rich. 3) Low odour.
- B. 1) Slow burning. 2) Oxygen starved. 3) High odour.
- C. 1) Protein fires. 2) Oxygen rich [fast burning]. 3) Oxygen starved [slow burning].

Q11. It is essential to be able to categorise fires because:

- A. It will demonstrate your knowledge of the subject to others.
- B. Knowing which category of fire you are facing will enable you to employ the most effective restoration procedures.
- C. You will need to use less chemicals during structural restoration.

Q12. Which of the following correctly describes the characteristics of an oxygen starved (slow burning) fire?

- A. Small simple particles, easily removed, few aerosols, low odour.
- B. Very obnoxious smell, few visible residues, severe odour retention problems.
- C. Incomplete combustion, large complex particles difficult to remove, strong evidence of aerosols, high odour.

Q13. Which of the following correctly describes the characteristics of a protein fire?

- A. Very simple particles, easily removed, few aerosols, low odour.
- B. Very obnoxious smell, few visible residues, severe odour retention problems.
- C. Incomplete combustion, large complex particles difficult to remove, strong evidence of aerosols, high odour.

Q14. Which of the following correctly describes the characteristics of an oxygen rich (fast burning) fire?

- A. Small simple particles, easily removed, few aerosols, low odour.
- B. Very obnoxious smell, few visible residues, severe odour retention problems.
- C. Incomplete combustion, large complex particles difficult to remove, strong evidence of aerosols, high odour.

Q15. Which of these statements is incorrect?

- A. The drier the residues the easier they are to clean.
- B. The wetter the residues the easier they are to clean.
- C. The most immediately detectable indication of a protein fire is an obnoxious smell.

Q16. Protein fires often present a severe challenge to the restoration technician. Which of the following describes this problem?

- A. Prominent greasy streaky stains down the walls requiring wet cleaning and possible stain blocking to remediate.
- B. A very persistent and unpleasant odour that is strongly attached to structure and contents.
- C. Heavy deposits of loose black soot particles, easily removed by careful use of a HEPA filter vacuum.

Q17. Factors that have influenced the movement of smoke and deposition of fire residues throughout an affected structure can be identified. Do you agree?

- A. No.
- B. Sometimes.
- C. Yes.

Q18. Factors influencing smoke travel through a building are:

- A. Size, shape, age, colour, location of the building.
- B. The weather at the time of the fire, the wind speed, the building location, the height above sea level the materials that burnt.
- C. The temperature of the smoke, the temperature of the surrounding areas, the existing patterns of airflow, the arrangement of the space and its contents.
- D. None of the above.

Q19. As it moves through the building smoke, which is at high pressure, is attracted to areas of lower pressure - in an attempt to achieve equilibrium. Which of the following would smoke not be attracted toward?

- A. Exterior walls especially those containing windows.
- B. The interiors of enclosed spaces such as cupboards, wardrobes, and drawers.
- C. The seat of the fire.

Q20. The correct word to describe such air movement is:

- A. Conversion.
- B. Convection.
- C. Contravention.

Q21. If some electrical circuits are affected following an incident:

- A. The power company's fuse must be removed.
- B. The affected circuits can be isolated by a competent person switching off the appropriate circuit breaker at the distribution board or removing the fused link, leaving the remaining circuits available for use.
- C. The meter will have to be read.

Q22. Which of the following is correct? Three-phase electrical supplies:

- A. Require three separate distribution boards.
- B. Are often found on domestic premises
- C. Supply high power for commercial use and present a greater potential hazard.

Q23. Temporary power supplies:

- A. Usually consist of lots of separate trailing sockets.
- B. Are plugged into the nearest socket to the meter.
- C. Can be installed by anyone.
- D. Contain a safety circuit and sockets mounted on a single board and are wired directly into the meter.

Q24. What important calculation should be made prior to requesting a temporary supply?

- A. The size of the incoming mains cable
- B. The total power requirement of the equipment you propose to run from it
- C. The height at which the board should be from the floor
- D. The length of time the supply is needed for

Q25. Which of these precautions should you observe when using an extension lead to supply electrical equipment?

- A. Make sure that only the amount of cable you need is unwound.
- B. Route the cable with care, taping down to avoid it becoming a trip hazard.
- C. Unwind the cable completely to prevent overheating.
- D. Ensure that equipment plugged into the lead does not exceed its stated capacity.

Q26. The three recommended methods of reducing the presence of lingering smoke contamination are:

- A.1) Ventilation to the outside if safe to do so. 2) Air scrubbing.
3) Air washing.
- B. 1) Thorough washing of the structure and contents. 2) Forced air ventilation. 3) Wearing PPE.
- C. 1) Air brushing. 2) Low pressure water spray. 3) Fogging with peroxides.

Q27. The decontamination of loose dry soot is best accomplished by use of:

- A. A high volume air mover.
- B. An air scrubber
- C. A HEPA filter vacuum.

Q28. Masking or sealing in odours is:

- A. Best practice.
- B. Not usually a permanent solution.
- C. Favoured because it offers a quick and cheap solution to odour problems.

Q29. Which two of the following are true?

- A. Sometimes women have a keener sense of smell than men.
- B. Everyone's sense of smell is the same.
- C. Odours can be precisely measured.
- D. Because odours are impossible to measure and therefore impossible to define, it is sometimes very difficult to say decisively that they have been successfully treated.

Q30. Which of the following fire types may present problems with odour retention?

- A. Protein fires and oxygen rich fires.
- B. Protein fires and oxygen deficient fires.
- C. Oxygen rich and oxygen deficient fires.

Q31. Slow burning fires tend to be highly odorous because:

- A. Incomplete combustion leads to the formation of complex chemicals many of which are highly odorous.
- B. Slow burning fires produce complex aerosols and slow moving smoke that is easily absorbed into structure and contents.
- D. Both of the above.

Q32. Which of the following is correct? If you continue to smell an odour following the initial ventilation after a fire:

- A. You are probably imagining it.
- B. Contaminated material must be present acting as an odour reservoir and off-gassing is taking place.
- C. Some buildings always smell odd.

Q33. The presence of mould is often revealed by:

- A. A strong acrid smell.
- B. A very unpleasant, foul decaying smell.
- C. A musty smell.

Q34. Invisible or inaccessible odour sources may be treated successfully by which of the following methods?

- A. Fogging with a suitable chemical via a thermal fogger.
- B. Releasing smoke pellets.
- C. Spraying with chlorine bleach.

Answers to Knowledge Review 2

1.C	15.B	29.A D
2.B	16.B	30.B
C.C	17.C	31.D
D.A	18.C	32. B
5.B	19.C	33.C
6.C	20.B	34.A
7.A D	21.B	
8.A B	22.C	
9. C	23.D	
10.C	24.B	
11.B	25.B C D	
12.C	26.A	
13.B	27.C	
14.A	28.B	

Further Information

The passage of time and the effect on contents and structure

Within minutes

Acid soot residues cause plastics to yellow, small appliances located near the source of combustion discolour, highly porous materials [marble] discolour permanently.

Within hours

Acid residues stain grout in bathrooms; fibreglass bath fixtures yellow, metals tarnish, counter tops may yellow, finishes on kitchen appliances, particularly refrigerators, that extend into the heat line will yellow, furniture finishes may discolour.

Within days

In time, acid residues cause painted walls to discolour permanently; metal corrodes, p, and rusts; wood furniture requires refinishing; linoleum requires refinishing or replacement; clothing becomes soot stained; upholstery stains permanently.

Within weeks

Durable carpet fibres may discolour permanently; silver plate is corroded permanently; glass, crystal, china may require replacement due to severe etching and pitting caused by prolonged exposure to acid soot residues.

Metal framed building components may be affected, and metal cladding and roofing sheets may suffer pin hole corrosion .

Restoration costs escalate significantly!

DAMAGE MANAGEMENT INCIDENT Overview

