



Queensland code of practice

Close proximity fireworks

March 2017

Acknowledgements

This code of practice was compiled by the Queensland Department of Natural Resources and Mines following consultation with relevant parties, including:

- licensed fireworks contractors
- licensed fireworks operators
- Queensland Fire and Emergency Services
- other regulatory bodies.

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1. Introduction

1.1 Background

Close proximity fireworks differ from other fireworks because they are intentionally designed for use before a proximate audience. Until recently, close proximity displays were almost exclusively conducted indoors, but now also include the use of specially produced pyrotechnics in stadium events such as those used during major sporting matches and entertainment performances.

Close proximity fireworks are also referred to as indoor fireworks and close proximity pyrotechnics. Unlike outdoor fireworks, which must only be used outdoors, close proximity fireworks may be used either in close proximity settings (indoor or stadium) or as part of a standard outdoor fireworks display. The increased use of close proximity fireworks in regular outdoor displays may in fact help to reduce impacts on communities, particularly noise.

Apart from sparklers and a few other unrestricted fireworks, the possession and use of all fireworks—including close proximity fireworks—by the general public is prohibited in Queensland. Only properly trained and appropriately authorised people are permitted to handle fireworks used in displays.

The indoor use of close proximity fireworks, and in some cases the wrongful indoor use of outdoor display fireworks, has led to a number of tragedies around the world at indoor venues such as nightclubs. Over 600 people lost their lives in 5 such cases where fireworks led to fires at The Station Nightclub in Rhode Island, US (2003), the Sentika Pub in Bangkok, Thailand (New Year's Eve 2008), The Lame Horse Nightclub in Perm, Russia (2009), the Kiss Nightclub in Santa Maria, Brazil (2013) and the Colectiv Nightclub in Bucharest, Romania (2015). Close proximity fireworks practitioners are encouraged to study these and other historic cases, as they are likely to provide useful input to their own risk management processes.

Indoor close proximity fireworks displays can, however, be conducted safely if the product and venue selection, training and hazard mitigation controls are effective.

This code of practice covers the principles of safe handling and use of close proximity fireworks, and it is hoped that compliance with this code will ensure a high standard of safety for the public and the close proximity fireworks industry.

This code also addresses the security requirements expected for close proximity fireworks. Close proximity fireworks are classed as security sensitive explosives in Queensland.

1.2 Application

This code applies to the control of all close proximity fireworks (including strings of firecrackers and products designed for use at outdoor venues) intended for entertainment or recreational purposes in Queensland, and describes the measures people must take to minimise risk under the *Explosives Act 1999*.

Close proximity fireworks are those products designed and manufactured for safe use with minimal separation between the pyrotechnics and the performers, and using adequate safety distances from spectators. Most close proximity fireworks must be electrically initiated and are designed to produce consistent pyrotechnic effects with a high degree of reliability. Strings of firecrackers may still be hand-fired.

This code does **not** apply to:

- unrestricted toy fireworks available to the general public (such as sparklers and party poppers)
- outdoor fireworks used at public displays (such as ground cakes and aerial shells) by licensed outdoor fireworks operators
- special effects manufactured from pyrotechnics, high explosives and other substances such as fuel and cork dust used by licensed special effects technicians
- non-explosive special effects such as LPG (liquefied petroleum gas) flares, carbon dioxide confetti cannons or air-operated special effects.

1.3 Approach

The duty to minimise risk and the performance requirements of this code form the foundation for a risk management approach to achieve safe outcomes.

This code addresses the training, knowledge and skills required by persons involved with close proximity fireworks. High standards of safety, a commitment to follow legislative requirements and a responsible attitude are essential to minimise risk.

The emphasis is on identifying hazards and then developing and implementing control measures that, wherever possible:

- eliminate the hazards associated with close proximity fireworks
or
- substitute for safer products or equipment
or
- isolate people from the hazards.

Where elimination or isolation is not possible, activities should be planned and controlled through engineering and/or administrative means in accordance with the hierarchy of controls (see Figure 1.1).

For further information on risk management, refer to the current Standards Australia *AS/NZS ISO 31000:2009: Risk management—principles and guidelines*.

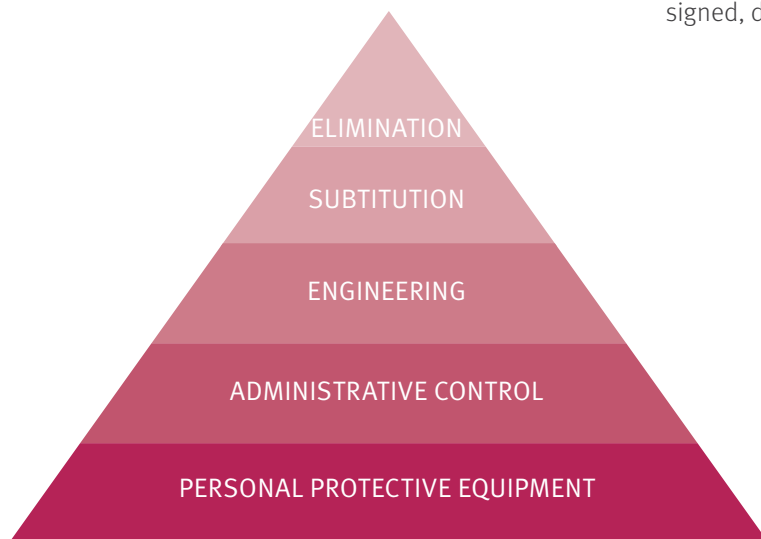


Figure 1.1: The five-level hierarchy of controls (the most effective controls at the top)

1.4 Alternative safety measures

This code sets minimum requirements that should provide an acceptable level of risk. Under some circumstances it may be possible to operate using alternative safety measures if allowed under legislation. Alternative safety measures must achieve a level of risk that is equal to or less than the level of risk achieved by the systems, methods or procedures provided for under this code. This code is not intended to exclude other safety measures, and allows the use of other practices that afford at least equivalent safety outcomes (which have been determined by fireworks contractors with close proximity endorsement through a risk assessment process). Licensed fireworks operators must then implement practices in accordance with the documented outcome.

An alternative safety measure must be documented and presented to an Inspector of Explosives (Department of Natural Resources and Mines) upon request. Persons undertaking risk assessments to support alternative safety measures must be competent in conducting risk assessments, and have significant knowledge of explosives and their properties as well as the proposed application.

By using an alternative safety measure instead of this code, the defence against possible prosecution relies on the alternative safety measure. Therefore, original alternative safety measures and associated supporting documentation (such as risk assessments) must be signed, dated and retained by the fireworks contractor.

2. Legislative requirements

2.1 Overview

Note

The **Explosives Act 1999** regulates the handling of explosives in Queensland and provides for the safety of people and property from the misuse of explosives. The Act aims to ensure the safe handling of explosives and that only those people with a legitimate purpose and who are appropriate have access to explosives. It places a duty of care on employers, employees and all people, including members of the public.

The *Explosives Act 1999* imposes a duty of care obligation on all people doing an act involving explosives to minimise risk involved with explosives. The Act requires a person who is engaged in activities involving close proximity fireworks to take reasonable measures to minimise the risk to any person's safety, health or property. The Act gives force to the Explosives Regulation 2003 and a number of standards and codes including:

- *AS 2187.1—1998 Australian standard: explosives—storage, transport and use—part 1: storage*
- *Australian code for the transport of explosives by road and rail: third edition*
- *Queensland code of practice: control of outdoor fireworks displays*
- *Queensland code of practice: close proximity fireworks* (this code). This code of practice will be enforced by condition of licence until given force in legislation.

Note

The Act is supported by the **Explosives Regulation 2003**. It is essential to also understand and comply with this legislation and adopt a risk management approach using all relevant codes and standards. The Regulation is enforceable and breaches may result in directions to cease operations and undertake remedial action, licence suspension or cancellation, or prosecution.

This **code of practice** will be adopted in the Explosives Regulation and all licence holders and their employees must comply with this code and all other legislation when using close proximity fireworks.

While this code is primarily focused on the requirements under the *Explosives Act 1999*, other legislation may apply, including the:

- *Fire and Emergency Services Act 1990* (Qld)
- *Local Government Act 2009* (Qld)
- *Work Health and Safety Act 2011* (Qld)
- *Civil Aviation Act 1988* (Cwlth).

Note

Although it is generally good practice to refer to the latest versions of Australian and other standards, this code of practice may deliberately reference specific versions.

2.2 Responsible people

2.2.1 People directly associated with close proximity fireworks displays

Key people directly associated with a close proximity fireworks display include the:

- venue owner and/or operator
- display host or event organiser
- licensed fireworks contractor (with close proximity endorsement)
- licensed fireworks operator (with close proximity endorsement)
- fireworks operator's assistants
- event production staff
- theatrical/musical performers
- audience.

Appendix 1 describes the responsibilities for people directly associated with close proximity fireworks displays.

2.2.2 General

Responsibilities are not limited to those covered in this code. There is an overriding general duty of care for anybody coming into contact with close proximity fireworks to minimise risk, including, but not limited to:

- protecting the health and safety of themselves and other people
- being an appropriate person (having relevant experience and expertise, suitable character, mental and physical health)
- ensuring people are not under the influence of alcohol, illicit drugs or medication that significantly affects a person's performance
- controlling ignition sources within the vicinity of fireworks at all times
- not engaging in inappropriate behaviour
- having the appropriate competencies and training to perform duties
- preventing unauthorised persons accessing close proximity fireworks
- following the rules and adopting high safety and security standards.

A person is in breach of the *Explosives Act 1999* if they direct or permit another person to undertake activities that are in contravention of the Explosives Regulation 2003 or this code. For example, a display host must not direct or allow a licensed operator to conduct a display when it is not safe to do so.

All people with access to close proximity fireworks, including fireworks operator's assistants, must be suitably trained and be under the direct supervision of a qualified and licensed fireworks operator endorsed for close proximity fireworks.

2.2.3 Other people involved with close proximity fireworks

As well as the people listed in Section 2.2.2, a duty to minimise risk also applies to people engaged in the:

- design and construction of close proximity fireworks
- import of close proximity fireworks
- purchase of close proximity fireworks
- sale or supply of close proximity fireworks
- storage of close proximity fireworks
- transport of close proximity fireworks
- testing of close proximity fireworks products.

2.3 Licensing

Close proximity displays must only be conducted by a fireworks operator who is endorsed for close proximity fireworks and is working for a fireworks contractor who is endorsed for close proximity fireworks.

2.3.1 Fireworks operator licence (close proximity)

Only individuals may apply for a fireworks operator licence with endorsement for close proximity. Application forms are available online at www.business.qld.gov.au.

This licence type is subject to conditions and only authorises the possession and use of close proximity fireworks belonging to the fireworks contractor for whom the fireworks operator is conducting the display. It also authorises the storage and transport, to the limits stated in the Explosives Regulation 2003, of these close proximity fireworks.

Note

In Queensland, a fireworks operator (close proximity) cannot purchase fireworks themselves unless they are also the holder of a fireworks contractor licence (close proximity).

2.3.2 Fireworks contractor licence (close proximity)

The holder of a fireworks contractor licence must either:

- be a fireworks operator (close proximity) in the case of an individual
or
- directly employ the holder of a fireworks operator licence (close proximity) in the case of a corporation—this person provides technical expertise to the licence holder.

Note

In Queensland, only holders of a fireworks contractor licence (close proximity) may purchase close proximity fireworks from recognised fireworks sellers for use in close proximity displays.

2.3.3 Interstate licences

Interstate close proximity fireworks licence holders may apply under mutual recognition for a Queensland licence.

2.3.4 Assessment of competence

Close proximity fireworks training courses based on the national competency units were not available in Queensland at the time of publication of this code, but may be available in other states.

Until such time that a close proximity training course is available in Queensland, individuals from Queensland wishing to be licensed for close proximity activities are required to undertake a knowledge and skills assessment conducted by the Explosives Inspectorate (Department of Natural Resources and Mines). Interested parties should contact their nearest regional departmental office to arrange an interview.

For further information on licensing, visit www.dnrm.qld.gov.au.

2.4 Notifications

2.4.1 Explosives Inspectorate

The fireworks contractor must give notice (in the approved *Fireworks display notification* form available on the Department of Natural Resources and Mines website at www.dnrm.qld.gov.au) to an Inspector of Explosives at least seven (7) days prior to any close proximity fireworks display being conducted. In extenuating circumstances contractors may apply for a relaxation of this requirement, but the application must be accompanied by sound justification. Late notice is not to result in lesser safety requirements.

2.4.2 Landholders

Permission from the landowner, property/venue owner or occupier is required before a close proximity fireworks display can be conducted. For public locations, this may require local government approval.

2.4.3 Queensland Fire and Emergency Services

In accordance with legislative requirements, the fireworks contractor must notify the local Queensland Fire and Emergency Services (QFES) representative in writing prior to conducting a close proximity fireworks display. The notification must include the:

- name of the fireworks contractor (including licence number)
- name of the fireworks operator (including licence number)
- details of the close proximity fireworks to be used
- time and date of the display
- location of the display
- name of the display or its purpose
- name of the display host.

Upon receipt of the notification, QFES may get involved with the fire risk assessment and planning for the display. QFES may impose conditions for the display or stop the display from proceeding.

2.5 Outdoor use of close proximity fireworks

Close proximity fireworks can be used in outdoor fireworks displays by persons not otherwise endorsed for close proximity fireworks. However, if close proximity fireworks are used in conjunction with outdoor display fireworks, they must be used in accordance with the *Queensland code of practice: control of outdoor fireworks displays* (outdoor code of practice). The minimum clearance distance required will depend on the default minimum clearance distance of the close proximity fireworks as stated in the technical data sheet, or the minimum default clearance distance of 35 m as stated in the outdoor code of practice, whichever is greater.

If close proximity fireworks are included in an outdoor display conducted by a fireworks operator who is authorised to conduct close proximity fireworks displays, the minimum clearance distance for the close proximity fireworks will apply only to the close proximity fireworks. All outdoor fireworks products must be used as per the minimum clearance distance stated in the technical data sheet, or the default minimum clearance distance stated in the outdoor code of practice, whichever is greater.

3. Supply, storage and transport of close proximity fireworks

3.1 Supply of close proximity fireworks

Only the holder of a licence to sell explosives, or their approved employee, may sell or supply close proximity fireworks to a licensed fireworks contractor with close proximity endorsement. A fireworks operator, although endorsed to conduct close proximity displays, cannot purchase fireworks, but can possess fireworks on behalf of a fireworks contractor when conducting displays for that contractor in accordance with their security plan and safety management system.

Close proximity fireworks must be tested and supplied with current safety and technical information, including a safety data sheet and technical data sheet.

The licensed fireworks contractor may only provide close proximity fireworks to licensed fireworks operators for the purpose of conducting displays under the contractor's safety management system. Only fireworks operators and fireworks operator's assistants who are authorised in the contractor's security plan are able to use the fireworks. A fireworks contractor must not supply fireworks to others unless they have a licence to sell explosives.

3.2 Licensing exemptions for storage

A licence is generally required for the storage of explosives. However, the storage of limited quantities of close proximity fireworks by licensed fireworks contractors, and by fireworks operators immediately prior to or immediately after a notified display, is exempt from additional licensing requirements provided usual security and safety measures are in place (e.g. effective security plan in place and control of keys) until fireworks products are returned to an appropriate storage facility.

3.2.1 Exempt storage by licensed operators

The holder of a licence to use close proximity fireworks does not require an additional licence to store explosives for the quantities of close proximity fireworks exempted in accordance with section 44 of the *Explosives Act 1999*, schedule 4 of the *Explosives Regulation 2003* and as listed in Table 3.1.

Table 3.1: Exempt storage for licensed operators

Hazard division	Maximum quantity gross weight
1.2, 1.3	50 kg
1.4	250 kg

The fireworks must be stored in a container that:

- is clearly labelled with 'FIREWORKS/PYROTECHNICS' on the outside and the name and address of the fireworks contractor on the inside
- is made of, or lined with, a material other than a ferrous metal
- can be closed and locked
- for quantities greater than 5 kg gross weight, has a sign stating 'keep fire away' or otherwise prohibiting sources of ignition
- is labelled with a class label if contents are over 60 kg
- when closed,
 - protects the explosive from the weather and contamination, and sources of ignition
 - does not allow the explosive to escape or leak from it
- when locked, prevents removal of, or access to, the explosive by unauthorised people.

3.3 Transport requirements

The *Australian code for the transport of explosives by road and rail: third edition* (Australian explosives code) applies to the transport of close proximity fireworks in any quantity.

Holders of a fireworks contractor or fireworks operator licence, endorsed for close proximity displays, are exempt from the requirement to hold a licence to transport explosives when transporting quantities of risk categories 1 and 2 (as per the Australian explosives code) for the purpose of conducting close proximity displays.

When fireworks are being transported to a fireworks display, a completed and submitted *Fireworks display notification* form is acceptable as an alternative to the shipping document required by the Australian explosives code. The completed *Fireworks display notification* form used for this purpose must be consistent with the fireworks being transported.

4. Use of close proximity fireworks

4.1 Introduction

This chapter provides guidance on the safe use of close proximity fireworks at displays conducted in Queensland.

4.2 Planning

4.2.1 Risk management

The risks associated with the use of close proximity fireworks will vary depending on the product selection and the environment in which they are used. A risk assessment must be undertaken to ensure that any display will be conducted at an acceptable level of risk, taking into account all the features and equipment at the venue. The matters highlighted for consideration below should be assessed for risk and suitable procedures developed and incorporated in the fireworks contractor safety management system in accordance with *AS 4804:2001 Occupational health and safety management systems—general guidelines on principles, systems and supporting techniques*:

- manufacturer's recommendations on setting up and using the fireworks
- firing points and clearance distances of the fireworks to the audience, performers, stage hands, licensed operator and licensed operator's assistants
- malfunctioning fireworks, human error and audience behaviour
- effective ventilation to manage expected heat, smoke and toxic gases produced by the fireworks
- risk of an uncontrolled fire leading to the rapid generation of heat, toxic gases and smoke
- risk of trapping people indoors during a fire due to mobbing and crushing at exits, increasing the risk of suffocation from toxic gases and smoke
- awareness training of high risk performers such as fire breathers, gymnasts and trapeze artists
- displays involving trained animals require animal handlers and should only be conducted at large indoor venues (e.g. a circus) or outdoors
- personal protective equipment (including hearing protection, safety glasses, flameproof clothing, respiratory protection and fire retardant sprays) for the licensed operator, licensed operator's assistants and performers

- acceptable levels of exposure to hazards such as smoke, toxic gases and noise under health and safety guidelines
- risk of emergency equipment not working and personnel not responding when required
- risk of bushfire when close proximity fireworks are used at outdoor venues, including at outdoor fireworks displays
- close proximity fireworks should be appropriately secured at all times in accordance with the procedures and security plan.

4.2.2 Emergency planning

The display host and the licensed fireworks contractor must have a documented emergency plan in place prior to the display. The emergency plan should include details of:

- the objectives of the plan, including the definition of an emergency
- the roles, responsibilities and functions of all key stakeholders (including display host, licensed fireworks contractor, licensed fireworks operator, fireworks operator's assistants, performers, first aid and firefighting duties)
- hazards and types of emergencies that may arise from those hazards (e.g. audience panic resulting from an uncontrolled fire)
- plans for evacuation, firefighting and off-site emergency responders
- emergency procedures for the types of emergencies that may arise
- emergency equipment identified in emergency procedures
- training and education of staff and other stakeholders regarding the emergency plan and emergency procedures
- activation of the emergency plan and termination of the emergency
- reporting incidents to the Explosives Inspectorate (Department of Natural Resources and Mines).

4.2.3 Emergency procedures

Emergency procedures should address emergency scenarios such as:

- the outbreak of an unintended fire
- the hazardous functioning, or malfunction of fireworks
- uncontrolled members of the audience
- an injury or medical emergency caused by fireworks that involves the fireworks operator, fireworks operator's assistant or a member of the audience
- any other credible scenarios identified during the risk management process.

Prior to the display, checks are to be conducted to ensure all designated exits are visible, unobstructed, unlocked and can function as an effective means of escape in an emergency.

4.2.4 Fire prevention

The risks associated with fire should be included in any risk assessment conducted prior to a display. The inclusion of specialist consultants and/or Queensland Fire and Emergency Services representatives should be considered. The fire risk assessment must be conducted using risk management principles, in accordance with Standards Australia *AS/NZS ISO 31000:2009 Risk management—principles and guidelines*.

The following measures must be included for indoor displays:

- Flammable materials on and around close proximity fireworks products must be kept to a minimum. As part of the risk assessment process, altering the set or using safer devices (e.g. confetti launchers) should be considered.
- All materials near close proximity fireworks should be checked for combustibility and, if necessary, either treated with retardant to ensure fire resistance or protected by a suitable barrier with good insulating properties.
- As a guide, the clearance distance to combustible materials such as props and curtains must, as a minimum, meet the fireworks manufacturer's recommended clearance distances or a minimum default of twice the fallout radius. Fireworks operators should consider increased safety margins if products are to be fired close to combustible materials, or people including performers or audiences.

- A risk assessment must be conducted to determine the minimum clearance height required for ceilings and any structures directly above fireworks. This should reference the firing height of the fireworks effects as stated in the technical data sheet and confirmed during test firings of products in a controlled environment.
- The effects of wind (if close proximity fireworks are used outdoors) or forced ventilation (e.g. fans) should be taken into consideration when planning set-up and calculating minimum clearance distances. Similarly, altering the firing angle of fireworks needs to be considered.
- Appropriate firefighting equipment must be readily accessible while close proximity fireworks are being loaded, prepared, fired and removed. Personnel who have received training in the effective use of firefighting equipment must be present during such times.
- During the display, suitable firefighting equipment must be located in positions that are readily available to extinguish any resultant fires from the use of close proximity fireworks, but positioned sufficiently far away from fireworks products.

Note

Be aware that water fire extinguishers can create an electrical hazard if used near live electrical equipment.

- Close proximity fireworks must be kept well clear of naked flames, lights and other heat sources. Smoking is prohibited when handling close proximity fireworks, and audiences must be kept away when outdoors or otherwise in accordance with the manufacturer's instructions.
- When close proximity fireworks are used outdoors, considerable care needs to be taken to ensure the fireworks do not cause a bushfire. This risk should also be considered during any risk assessment.

4.2.5 Smoke control

When close proximity fireworks are fired, the selection of fireworks products, combined with consideration of the location and amount of natural and/or artificial ventilation, should ensure the quantity of smoke developed is controlled so it does not:

- endanger human respiration, including irritation to people with respiratory disorders
- obscure the visibility of exit signs or paths of egress
- detract from the entertainment objectives (e.g. smoke-filled stadium)

- obscure the view of the licensed operator or their assistants, who are in direct communication with the operator
- unintentionally initiate smoke alarms or sprinkler systems
- otherwise endanger people or property.

Queensland Fire and Emergency Services (QFES) recommends that fire detection and life safety systems are never isolated during close proximity fireworks displays. However, when using certain types of close proximity fireworks products indoors, fireworks contractors may consider it necessary to isolate essential elements of the fire safety system, such as smoke detectors or other fire detection systems, or to disengage air-conditioning systems.

The following steps must be followed before isolating any life safety systems:

- Ensure that such isolation is allowable for the class of building as per the Building Code of Australia.
- If isolation is allowable, conduct a fire risk assessment (if appropriate) with the assistance of a specialist consultant and/or QFES.
- Advise QFES of the plan to manage fire safety issues before isolation or shutdown of essential elements of the fire safety system.
- Obtain approval of the facility owner or their agent, noting that insurance implications may need to be considered.
- Provide a person for the period of isolation or disengagement, who is capable of directing the operation of all fire detection and life safety systems installed at the facility, and who can immediately notify emergency responders if necessary.

QFES should be advised of the level of smoke likely to be generated by the close proximity fireworks display. This will depend on the number and types of products used and the size of the venue.

Fireworks contractors and operators should consider conducting testing at the venue prior to an event to ensure they fully understand the effects of the close proximity fireworks when fired.

If appropriate, consideration should be given to forewarning patrons about the possible effects of the close proximity fireworks (including noise, smoke and visual impact) prior to the display commencing.

If essential elements of the fire detection and other safety systems have been isolated or shutdown during the display, they must be reinstated immediately after each period of isolation.

4.3 Set-up

4.3.1 Product selection

Only commercially manufactured close proximity fireworks may be used. Close proximity fireworks must be supplied with instructions for use, including their performance characteristics (e.g. duration and size of effect, debris spread and noise/decibels).

Close proximity fireworks must only be purchased from people licensed to sell explosives, and the seller must supply the purchaser with product safety documentation as required (safety data sheet/technical data sheet). Neither a fireworks contractor (close proximity) licence nor a fireworks operator (close proximity) licence allows for the manufacture or modification of any fireworks products.

Note

It is illegal for any person to manufacture their own close proximity fireworks without a licence to manufacture explosives or other appropriate authority. This also applies to mixing part A and B flash powder mixes.

Outdoor display fireworks must not be used as close proximity fireworks and must not be used indoors, as they are neither designed nor intended for this purpose.

4.3.2 Ignition sources

Close proximity fireworks must be kept at least 5 m from uncontrolled ignition sources at all times. If the manufacturer recommends a greater distance, then that greater distance applies. Examples of uncontrolled ignition sources may include cigarettes, pilot lights, mobile phones and electrical devices.

4.3.3 Noise control

If appropriate and practical, neighbours should be notified that a close proximity display is planned, particularly if close proximity items are used at outdoor venues where noise is typically more of an issue. The number of people affected by noise depends on the location, nature and time of the display. The operator can reduce noise by excluding loud items, increasing distances and shielding fireworks. Firing fewer items or reducing the firing rate can also reduce noise.

4.3.4 Clearance to the audience

The clearance distance imposed for a close proximity display must be in accordance with the material data sheet/technical data sheet for the products utilised, but must never be less than 2 m. The following factors must be considered when selecting products and determining clearance distances:

- clearance to the audience may have to be increased beyond 2 m to meet manufacturer's instructions or exceed twice the fallout radius, whichever is greater
- location of potential ignition sources (such as smokers at outdoor venues)
- effects of forced ventilation or wind
- effects of height and angled fireworks
- health and safety considerations for noise, smoke and gases.

The fireworks operator should determine whether the exposure of people to hazards (including smoke, toxic gases, irritants and noise), as well as the duration of the exposure to these hazards, is at acceptable levels for exposure under health and safety exposure standards for the actual conditions (including the amount of ventilation) that will exist during the display.

Personal protective equipment requirements for the operator, assistants and performers must be determined by a risk assessment. In the risk assessment, consideration must also be given to the flammability of the costume materials of performers and others exposed to the effects of the fireworks. The Explosives Inspectorate (Department of Natural Resources and Mines) recommends—as a minimum—eye protection, hearing protection and long-sleeved apparel.

Manufacturer's instructions must be followed, and fireworks must not be tampered with or modified contrary to manufacturer's instructions. Depending on circumstances, it may be necessary to cordon off or delineate an area to ensure the audience does not encroach on the exclusion zone.

Close proximity products must be appropriately secured to stands or trusses, and must be positioned appropriately and their location marked or made known during inductions so performers know where they are located.

The licensed fireworks operator is responsible for the handling, storage, security and firing of all fireworks at the display venue, from the time the fireworks are delivered to site until they are used or removed. All close proximity fireworks must be kept in a suitably constructed container, except when set up for display (see Section 3.2).

In order to ensure control of the direction of sparks or smoke, fireworks must be properly supported or seated in holders or pods. They must not be fired while sitting unsecured on the ground, and pods must be used for all fireworks designed for use with pods. Pods, holders and other securing methods must not unnecessarily confine the fireworks so that debris/shrapnel is created in the unlikely event of a malfunction. Fireworks must be placed where they will not be inadvertently disturbed during the performance.

Standard operating procedures incorporating the above principles must be prepared prior to the display. See Appendix 2 for guidance on procedures.

4.4 Initiation equipment

Direct use of battery or mains power is not permitted for firing close proximity fireworks. Electrical firing units must be appropriately designed and fabricated by a competent person. They must include a locking mechanism that can render the exploder inoperable, and be designed so that a two-step manual action is required for firing.

Electrical firing units must be capable of being rendered inoperable by a locking key that the licensed operator keeps in their possession.

Electrical firing units with built-in circuit testers must be designed to limit the test current to 50 mA or 20 per cent of the no-fire current of the electric match used, whichever is smaller.

Multimeters, such as volt-ohm meters, must not be used for testing electric matches unless the maximum current delivery potential has been measured and found to meet these requirements.

4.5 Conducting the display

Once the display is set up, the fireworks operator must ensure all safety measures have been implemented, and then conduct a final check of equipment and the positioning of close proximity fireworks. The operator must also ensure that anyone involved with the display has been briefed about their role before the display starts.

For displays where the fireworks operator cannot see all of the fireworks products from the firing point, the operator must appoint one or more assistants to ensure:

- all close proximity fireworks have functioned correctly
- all performers are in their correct position at the right time
- no hazards are created by the close proximity fireworks (especially fire).

With the exception of strings of crackers, all other close proximity fireworks must always be electrically initiated using electrical firing units meeting the requirements in Section 4.4.

The licensed operator and their assistants may have to work with the stage manager or performers using cues and signals, but the operator still remains in full control of the display. If an observer detects an unsafe situation, they must notify the person firing the display immediately through direct communication. The person firing the display must stop the display and only recommence when safe to do so. If the situation gets out of control, the licensed operator must initiate the emergency response plan.

After the display, the operator must ensure the electrical firing unit has been turned off and is isolated from all power sources before proceeding with other post-display activities. All cables connecting the electrical firing unit to electric fuseheads must be disconnected or disarmed.

It may not be possible to conduct a thorough inspection immediately after the display because the stage may still be in use. However, the licensed operator should determine that no burning material remains so the stage activity can continue in safety. During the display, operators should note the position of any misfired products to be handled in post-display activities in accordance with their misfire procedure.

4.6 Post-display activities

An inspection must be conducted by a competent person as soon as the display is over to ensure no unfired fireworks remain and there are no other hazards. The licensed operator may then declare the area safe.

If the licensed operator deems an area to still be unsafe (e.g. due to unfired live products or misfires), the operator must ensure that such items are made safe before any other work is started. The licensed operator must clean up and declare the area free from close proximity fireworks before control of the site is returned to the display host and stage others can carry out their work.

Unfired fireworks must be disposed of in accordance with the fireworks contractor's standard procedures (see Appendix 3).

The fireworks operator must submit a *Fireworks post-display notification* form within seven (7) days of the display, ensuring all details of any explosive incidents or malfunctions involving close proximity fireworks are reported to the Chief Inspector of Explosives (Department of Natural Resources and Mines) as soon as practicable. The product supplier is also to be informed by the fireworks operator or fireworks contractor whenever a faulty product is suspected or identified.

Appendix 1: Responsibilities

Obligations of responsible persons involved with close proximity fireworks.

Table A1.1: Fireworks display host responsibilities

Fireworks display host	
Topic	Obligation
Insurance	Ensure there is appropriate insurance coverage for the fireworks display
Personnel—authorisation	Select a suitably authorised fireworks contractor who provides an appropriately authorised fireworks operator for the fireworks display

Table A1.2: Fireworks contractor responsibilities

Fireworks contractor	
Topic	Obligation
General	Work in accordance with this code and relevant legislation
	Take any reasonable and necessary course of action to ensure no-one is exposed to an unacceptable level of risk
Notifications/approvals	Notify the local community or spectators of the close proximity display as appropriate
	Comply with statutory notification requirements prior to and following the close proximity display
Site—safety and security	Select a safe and suitable site/venue for the close proximity fireworks display relevant to the types of close proximity fireworks to be included in the display
	Ensure the security measures for the close proximity fireworks display are adequate (including crowd control measures for the site/venue and briefing performers, cast and crew)
Safety and health management system	Have a safety and health management system in place for the fireworks operator and fireworks operator's assistants
	Provide details of procedures, practices and other documentation under the safety management system to the fireworks operator
	Ensure the fireworks operator and fireworks operator's assistants are competent and trained in the requirements of the safety management system
	Provide safety equipment
Appropriateness of employees	Ensure fireworks operators and other relevant employees are appropriate persons to have access to explosives including having received adequate training in the hazards associated with the handling of fireworks
Quality/safety of fireworks	Ensure close proximity fireworks used in a fireworks display have been tested
	Provide a copy of safety data sheet/technical data sheet for the close proximity fireworks to be used to the fireworks operator conducting a close proximity display on the contractor's behalf
Conduct of close proximity display	Respond appropriately to changing conditions during the close proximity fireworks display, including stopping the display if required
Incidents	Ensure incidents associated with the display are reported to the Explosives Inspectorate (Department of Natural Resources and Mines) immediately by phone and followed up in writing
	Provide appropriate emergency planning, including first aid, fire extinguishers and ready access to the site



Table A1.3: Fireworks operator responsibilities

Fireworks operator	
Topic	Obligation
General	Work in accordance with this code and relevant legislation
	Take any reasonable and necessary course of action to ensure that no-one is exposed to an unacceptable level of risk
	Report any non-compliance to the fireworks contractor
Notifications/approvals	Ensure, if appropriate, that the local community has been notified of the close proximity display and report back to the fireworks contractor
	Ensure all relevant authorities have been notified of the display within stipulated timeframes
Site—safety and security	Select a safe and suitable site/venue for the close proximity fireworks display relevant to the types of close proximity fireworks to be included in the display
	Ensure the security of close proximity fireworks at the site
	Ensure the security measures for the fireworks display are adequate and that spectators are aware of those requirements
Safety management system	Work in accordance with the fireworks contractor's (close proximity) safety management system and other instructions
	Provide appropriate emergency planning, including first aid, fire extinguishers and ready access to and from the site or venue
	Use safety equipment
Personnel—supervision/ training	Ensure the fireworks operator's assistants and other personnel are trained and competent
	Effectively supervise all assistants and performers
Documentation/records	Provide appropriate documentation
	Keep appropriate records
Conduct of display	Respond appropriately to changing conditions during the fireworks display, including stopping a display if directed or if the conditions are unsafe (such as unsuitable weather conditions for clearance distances or the failure of spectators to follow directions)
Incidents	Ensure incidents or product malfunctions associated with the display are reported to the fireworks contractor to enable reporting to the Explosives Inspectorate (Department of Natural Resources and Mines) and/or to the fireworks supplier—any serious incidents must be immediately reported to the Explosives Inspectorate

Table A1.4: Fireworks operator's assistant responsibilities

Fireworks operator's assistant	
Topic	Obligation
General	Take any reasonable and necessary course of action to ensure no-one is exposed to an unacceptable level of risk
	Undertake only those activities in which the fireworks operator's assistants have been trained and for which the assistants are competent
Safety management system	Comply with the practices and procedures that apply to the fireworks operator's assistant (which are part of the safety management system for the fireworks contractor) under the direction of the fireworks operator
	Wear suitable personal protective clothing and other safety equipment
Incidents	Report any incident and any other matters that may lead to an incident to the fireworks operator or other designated supervisor

Table A1.5: Spectator public responsibilities

Spectator public	
Topic	Obligation
Display area	Keep well clear of the close proximity display area or venue during set up of the display, after the display has been set up, before the display is fired, during the firing of the display and after the display until the area has been cleared by the fireworks operator
Directions	Follow directions and any signage relating to the close proximity fireworks display provided by the display host, fireworks operator, security personnel and other authorised personnel
Incidents	Report incidents to the fireworks operator, display host or their agents, or the Explosives Inspectorate (Department of Natural Resources and Mines)

Table A1.6: Responsibilities of persons designing and constructing close proximity fireworks

Persons responsible for design and construction of close proximity fireworks	
Topic	Obligation
General	Ensure the close proximity fireworks are designed, constructed and in a condition that is safe for storage, handling, transport and use
Information	Ensure appropriate information about the safe storage, handling, transport and use (including disposal) of the fireworks is provided—information is appropriate if the information clearly and correctly identifies the fireworks and states the precautions to be taken for, and the hazards associated with, the storage, handling, transport, use and disposal of the fireworks
Classification, packaging, marking and labelling	Ensure the fireworks are properly classified, packed in approved packages and containers, and properly marked and labelled in accordance with relevant codes and standards

Table A1.7: Responsibilities of persons designing, constructing and manufacturing fireworks equipment

Persons responsible for design, construction and manufacture of fireworks equipment	
Topic	Obligation
General	Ensure the fireworks equipment is designed, constructed and manufactured so that, when used properly, the risk of harm to people and property from the use of the equipment in combination with fireworks products is at an acceptable level
Information	Ensure all reasonable steps are taken to ensure that appropriate information about the safe use of the fireworks equipment is available to the user of the equipment, including information about the maintenance necessary for the safe use of the fireworks equipment—information may be appropriate if the information states the use for which the equipment was designed and tested, and any conditions that must be complied with if the equipment is to be used safely so that the risk of harm to people and property is at an acceptable level (including ongoing inspection and testing requirements and acceptance criteria for continued serviceability)
Quality	Ensure the quality of the fireworks equipment is designed and manufactured to be fit for purpose. It must be maintained in serviceable condition. Testing of equipment must not be undertaken at a fireworks display

Table A1.8: Responsibilities of persons purchasing close proximity fireworks

Persons purchasing close proximity fireworks	
Topic	Obligation
Authorisation	Being authorised for the categories, types and sizes of close proximity fireworks purchased for the purpose of conducting a close proximity display
Information	Ensure all necessary current and appropriate safety data sheet/technical data sheet performance information is obtained from sellers for all close proximity fireworks purchased
Quality and safety	Ensure there is appropriate certification for product safety and quality of all the close proximity fireworks being purchased
Security	As far as practicable, ensure the ongoing security of the close proximity fireworks purchased

Table A1.9: Responsibilities of persons selling/supplying close proximity fireworks

Persons responsible for sale/supply of close proximity fireworks	
Topic	Obligation
Authorisation	Ensure all reasonable steps are taken to only supply the types of close proximity fireworks for which the purchaser is appropriately authorised to conduct a close proximity display
Information/communication/ accounting for product	Ensure all reasonable steps are taken to ensure the current and appropriate safety and performance information for the safe use of the close proximity fireworks is available to the fireworks contractor
	Provide current safety and technical information (including a safety data sheet and technical data sheet)
	When a supplier becomes aware of a hazard or defect that may create an unacceptable level of risk to users, ensure all reasonable steps are taken to inform all purchasers of close proximity fireworks of the nature of the hazard or defect and its significance, and any controls to manage the risk
Quality management system	Operate in accordance with a recognised quality management system
	Ensure the safety, performance and quality of the close proximity fireworks supplied
Classification, packaging, marking and labelling	Ensure close proximity fireworks offered or consigned for transport are close proximity fireworks and are properly classified, identified, labelled, packaged and stowed prior to transport
Incidents	Report incidents involving the seller's/supplier's close proximity fireworks to the Explosives Inspectorate (Department of Natural Resources and Mines)

Table A1.10: Responsibilities of persons selling/supplying close proximity fireworks equipment

Persons responsible for sale/supply of close proximity fireworks equipment	
Topic	Obligation
Information/communication	Ensure reasonable steps are taken to provide appropriate information on the safe use and maintenance of close proximity fireworks equipment
	When a seller or supplier becomes aware of a hazard or defect that may create an unacceptable level of risk to users of the close proximity equipment, ensure all reasonable steps are taken to inform the purchaser of the close proximity equipment about the nature of the hazard or defect and its significance, and any modifications or controls that have been developed to eliminate or correct the hazard or defect or manage the risk

Table A1.11: Responsibilities of persons storing close proximity fireworks

Persons responsible for storage of close proximity fireworks	
Topic	Obligation
General	Ensure the storage system is designed, constructed, installed and located so that, when used properly, risk is at an acceptable level and the risks to people and property from a potential explosives incident are minimised
Safety management system	Ensure a documented safety management system is implemented with documented procedures
Security/accountability for product	Ensure security measures are in place to reasonably prevent access to the close proximity fireworks by unauthorised people
Identification of hazards	Ensure hazards associated with the storage of close proximity fireworks are—to the extent of the current state of knowledge about the hazard—identified and recorded

Table A1.12: Responsibilities of persons transporting close proximity fireworks

Persons responsible for transport of close proximity fireworks	
Topic	Obligation
General/product accountability	Ensure the risk to people and property from the transport of close proximity fireworks is at an acceptable level
	Ensure close proximity fireworks are in a condition that is safe and secure for transport
	Ensure products are only passed to people authorised to receive them
Personnel—authorisation and competency	Ensure any person transporting close proximity fireworks is competent and authorised

Table A1.13: Responsibilities of persons consigning close proximity fireworks for transport

Persons responsible for consignment of close proximity fireworks for transport	
Topic	Obligation
General	Ensure the close proximity fireworks are in a condition that is safe for transport
Classification, packaging, marking and labelling	Ensure the close proximity fireworks are properly classified, identified, labelled, packaged and stowed prior to transport



Appendix 2: Standard operating procedures

Standard operating procedures must be prepared by licensed contractors and adopted by all personnel. The table below outlines the main elements in chronological order that should be considered for incorporation in a fireworks contractor's safety management system for close proximity displays. The list is adapted from schedule 3 of the Explosives Regulation 2003.

Table A2.1: Standard operating procedures for close proximity displays (in chronological order)

Venue inspection	Inspect the venue prior to the day of the display
Contractor/operators should:	
<ul style="list-style-type: none">• confirm the property/venue owner and occupier approve the intended display• obtain the standard emergency plan for the venue from the display host• perform a general risk assessment of the venue following the requirements in Section 4.2• decide on a layout with adequate separation from the audience• decide on suitable items to be fired• notify the Explosives Inspectorate (Department of Natural Resources and Mines) and the Queensland Fire and Emergency Services (QFES) of any display• confirm indemnity insurance is current and sufficient.	
Site plan	Prepare a site plan
Contractor/operators should:	
<ul style="list-style-type: none">• identify structural hazards and include them on a site plan drawn to scale• choose a good location for setting up and firing• identify all emergency exits.	
Indoor venue fire prevention	If automatic fire suppression systems and smoke alarms must be deactivated during the display, conduct a risk assessment and, if appropriate, involve QFES in planning
Contractor/operators should:	
<ul style="list-style-type: none">• meet the fire prevention requirements of Section 4.2, including firefighting equipment• liaise with QFES and, if appropriate, submit a formal fire risk assessment to QFES.	
Outdoor venue fire prevention	Perform a bushfire risk assessment for the venue
Operators should:	
<ul style="list-style-type: none">• follow any QFES requirements that apply• be aware of local weather patterns• have appropriate firefighting equipment on standby• exclude combustible materials within 5 m of fireworks or a greater distance if stated by the manufacturer.	

Emergency plan

Prepare an integrated emergency plan using the venue emergency plan provided by the display host

Operators should ensure:

- an emergency plan is prepared according to Section 4.2
- evacuation procedures are appropriate for the size of the expected audience
- the emergency plan is disseminated to all stakeholders
- emergency procedures and equipment are available.

Transport

Transport fireworks to the venue in a compliant manner

Operators should ensure fireworks are transported to the venue:

- in accordance with the Explosives Regulation 2003
- by a competent and authorised driver
- in a way that meets the requirements of the *Australian code for the transport of explosives by road and rail: third edition*.

Venue arrival

Operators should ensure:

- the public is separated from the set-up area
- the set-up area is secured with a clearly defined border
- competent staff are guarding the perimeter.

Unload equipment

Unload hardware before the fireworks

Operators should ensure the first aid kit and fire extinguishers are unloaded first, followed by relevant tools and securing devices.

Set up equipment

Once unloaded, set up hardware securely

Operators should ensure hardware is securely set up in the correct position.

Outdoor displays may require additional firefighting equipment.

Unload fireworks

Operators should ensure:

- the site remains secure
- nobody at the venue is smoking within 5 m of fireworks
- all items are in good order and do not appear to be damaged
- all items are appropriate for the set-up area
- operators are wearing appropriate personal protective equipment and natural fibre clothing or certified fire-retardant clothing
- inventory control is maintained.

Set up fireworks

Set up fireworks in their correct positions

Operators should ensure:

- the prepared layout design is followed
- assistants point devices away from themselves and others as much as possible
- all wiring is shunted until hook-up
- all fireworks are properly secured
- assistants are aware of their responsibilities and follow standard operating procedures
- all products are set up in accordance with the Explosives Regulation 2003.

Remove obstacles

After the fireworks have been set up securely, remove all unnecessary tools, equipment and rubbish

Operators should ensure:

- all combustible rubbish is removed
- unused fireworks are returned to the vehicle or secure storage
- all unnecessary tools are put away, leaving only the equipment needed to initiate the display and fix any faults that may arise during testing.

Roll out cables

Operators should ensure firing cables are:

- shunted
- connected firmly so they do not come loose during the display
- not tangled or wrapped around fireworks
- not a trip hazard.

Set up firing box

After the cables have been connected to the fireworks, set up the firing box

Operators should ensure:

- they have sole possession of the firing box key
- the firing box switch is in the OFF position
- they have a clear view of the site and its perimeter from the firing position
- the perimeter is extended at this time, if required.

Circuit testing

Once the firing position has been set up and the firing box checked, conduct continuity tests on the circuits

Operators should ensure:

- all assistants are aware that testing is about to commence
- shunted cables are untwisted and attached correctly to the firing box
- testing is verbally announced followed by a 3-second count before turning on the test current
- faults are written down
- the system is turned off and all cables are re-shunted
- faults are corrected.

These steps must be repeated until there are no faults.

Once testing is finished, all cables must be re-shunted.

Final moments

Operators and assistants must be fully alert

Operators should ensure:

- the area is still secure
- firing cables are plugged into the firing box
- a final continuity check is performed (if a fault is present it is too late and the item must be left out of the display)
- they are aware of the wind direction and speed, and the effect on the display (for outdoor venues)
- they are aware of the location of fire extinguishers.

Display time

Operators and assistants must be in control of the display

Operators should ensure:

- they are aware of the location of their assistants and the fireworks
- they are aware of the position of the audience
- fireworks are initiated properly and deliberately
- initiation follows the planned firing order
- in the case of a potential incident, the display is stopped and any problem corrected
- any misfires are noted for handling later
- in the case of an actual incident, the display is stopped and any problem corrected
- in the case of an unexpected fire, the display is stopped and assistants are sent to fight the fire
- if there is a fire that cannot be controlled, the emergency plan is activated
- in the case of a security breach, firing is stopped until the problem is corrected.

Cooling off

Consideration should be given to providing an adequate cooling-off period

Operators should ensure:

- the cooling-off period is adhered to
- operators are sent to check for any misfires
- the area is kept secure.

Check for misfires

Operators should ensure:

- personal protective equipment is worn when handling misfires
- a check is carried out for misfires
- misfires are handled in accordance with manufacturer's recommendations contained in the material data sheet/ technical data sheet and the contractor's safety management system.

Clean-up

Operators should ensure all equipment is packed away, and all rubbish is removed from the venue and surrounding areas.

Post-display

Operators should ensure any incidents are reported to the Chief Inspector of Explosives (Department of Natural Resources and Mines) and investigated, and assistants are debriefed following any irregularities.

Any fireworks malfunctions must be reported to the Chief Inspector of Explosives and the product supplier.

Appendix 3: Disposal of unwanted close proximity fireworks

Unwanted close proximity fireworks may include:

- malfunctioning batches of fireworks identified during testing or during firing at a display
- fireworks that have exceeded their shelf life or are damaged
- unfired product, including misfires left over from a display
- abandoned close proximity fireworks discovered on public land.

Close proximity fireworks require safe disposal so they no longer pose a risk. They must not be thrown into rubbish bins for disposal.

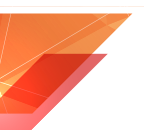
Manufacturer's instructions should be followed when disposing of close proximity fireworks. Safety data sheets and technical data sheets should be available from the manufacturer or supplier. If this information is not available, the supplier of the fireworks should be contacted for disposal advice.

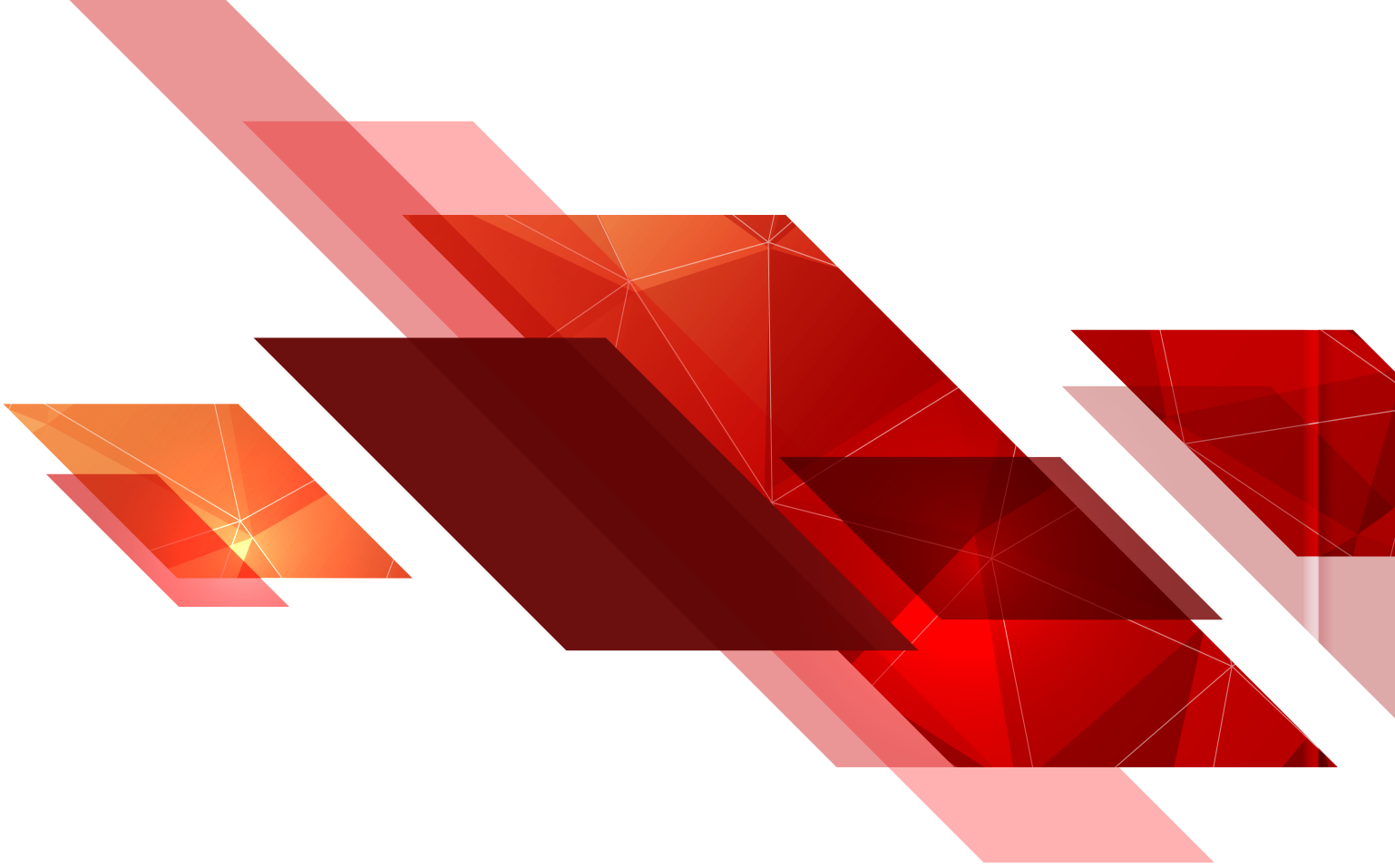
After a display, the licensed operator may store unused close proximity fireworks at their residence in permitted quantities (listed in Table 3.1) before taking them elsewhere for disposal at the earliest opportunity.

The quantity and types of fireworks fired or disposed of must be recorded for stock reconciliation purposes.

Glossary

Close proximity fireworks	Pyrotechnic articles assigned to compatibility group G that are specifically designed for use in close proximity to performers, audiences and structures; typically used indoors (e.g. stage or studio for theatre, concert, film and television productions) but may also be used outdoors; products include comets, gerbs, fountains, flash pots, fireballs, mines, flame and smoke effects involving pyrotechnics
Display host	A person who employs or otherwise engages a fireworks contractor to organise the fireworks display for them
Fireworks contractor	A person (natural person or company) licensed by the Explosives Inspectorate (Department of Natural Resources and Mines) to buy fireworks and engage with display hosts to conduct fireworks displays (including close proximity displays if appropriately endorsed)
Fireworks operator	A person licensed by the Explosives Inspectorate (Department of Natural Resources and Mines) to conduct fireworks displays (including close proximity displays if appropriately endorsed) in accordance with the safety management system of the fireworks contractor for whom they work
Malfunction	The failure of an explosives article or explosive to function in an expected or satisfactory manner
Misfire	A fireworks product or part of a fireworks product that has failed to explode or ignite
Property/venue owner	The owner of the property at which the close proximity display is conducted
Safety management system	A system for managing safety that sets out the safety objectives, the systems and procedures to achieve the safety objectives, the performance standards to be met and the means to maintain these standards





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