









Fire Classes
Extinguishing Agents
Fire Risk Assessment

FIRE CLASSES

	Description	Europe	Australia	U.S.A
	Ordinary combustibles (wood, paper, fabric, refuse)	Class A	Class A	Class A
	Flammable liquids	Class B	Class B	Class B
	Burning gases	Class C	Class C	Class B
	Flammable metals	Class D	Class D	Class D
	Energised electrical equipment	Not classified	Class E	Class C
	Cooking oils and fats	Class F	Class F	Class K

*Check your local country regulations for the correct fire classes. The above information is for guidance only.

FIRE BASICS

THE FIRE TRIANGLE



Each element of the Fire Triangle must be in place for combustion to occur. The fire is extinguished when one of the elements is removed from the reaction. The longer this takes the harder it is to suppress the fire as it transforms from a surface fire to a substance fire.

EXTINGUISHING AGENTS

Each environment is different, so choosing the right agent is critical. BlazeCut systems contain commonly used extinguishing agents known worldwide that suit any need, such as FK5-1-12 fire protection fluid, HFC gaseous agent, foam agent or powder agent.

FK-5-1-12 Clean Agent

FK-5-1-12 agent is a next-generation halon and HFC replacement, designed to address concerns for human safety, performance and the environment. FK-5-1-12 agent is stored as a liquid; however, it turns into gas upon discharge. FK-5-1-12 agent combines the key features of HFC gases with sustainable clean agent protection.

Main features

- Zero ODP (ozone depletion potential)
- A global warming potential of less than one
- A five-day atmospheric lifetime
- A large margin of safety for occupied spaces



Approvals

UL, ULC, FM, LPCB, SSL, VdS, CNPP, KFI, multiple global marine approvals

Application

As a clean agent, FK-5-1-12 leaves no residues and will not affect sensitive electronics and devices. It is an ideal choice for the environment due to significant reduction in greenhouse gas emissions. The agent is suitable for Class A, Class B, Class C and Class E (electrical fires).

Foam Agent

The BlazeCut systems use a high-end foaming agent, which is environmentally friendly and has tremendous extinguishing performance.

Main features

- Environmentally formulated
- Non-corrosive
- 98% organic compounds
- Contains no PFOA or PFOS
- Zero discharge of hazardous chemicals
- Fully biodegradable

Approvals

- UL/ULC Listed Foam Liquid Concentrate
- UL/ULC Listed Wetting Agent
- MPA Dresden Listed
- ICAO Certificate

Application

Recommended for Class A and Class B fires as well as for Class F (kitchen fires) due to its high extinguishing performance and perfect results against re-ignition.



EXTINGUISHING AGENTS

HFC Clean Agent

HFC clean extinguishing agent is a liquefied gas used for volume fire suppression. HFC clean extinguishing agent is discharged as a stream of gas and liquid droplets that penetrate into the fire area, ceasing the combustion process through heat absorption and a chemical interaction. HFC clean extinguishing agent is considered environmentally accepted substitute for Halon extinguishing agents used in the past, which are harmful to the ozone layer.

Main features

- Electrically non-conductive
- Non-corrosive
- Resistant to temperature changes
- Safe for people
- Leaves no residue
- Does not damage equipment, objects or sensitive devices
- Zero ODP (Ozone Depletion Potential)

Types of HFC clean extinguishing agents used

- HFC-227ea

Approvals

- HFC-227ea: UL recognized and FM Approved

Application

HFC clean extinguishing agent is an agent of choice for protection of enclosures where residue may be harmful to the protected sensitive devices. The agent is suitable for Class A (creating flames), Class B, Class C and Class E (electrical fires).



Powder Agent

The BlazeCut systems use a high quality powder extinguishing agent.

Main features

- universal applicatoins
- electrically non-conductive
- non-corrosive
- resistant to temperature changes

Application

Most commonly used and cost-effective extinguishing agent due to its very good extinguishing performance against Class A, Class B, Class C and Class E (electrical fires).

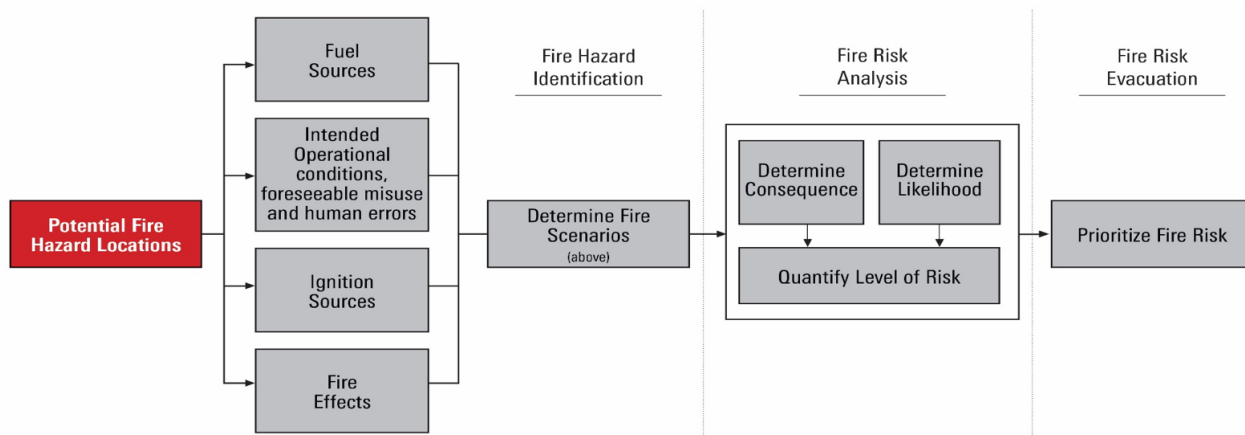


RISK ASSESSMENTS

Overview

The first step before commencing any design, installation or upgrade of a fire suppression system, is to carry out a risk assessment. A Risk Assessment is an essential component of designing any fire suppression system. You need to be aware of exactly what risks need to be covered on any piece of equipment before the best solution can be achieved or the chance of something happening that will have a negative impact on the health or safety of a person and/or equipment may be increased.

A Risk assessment is the best way to identify all possible risks uniquely associated with any type of equipment assessed. Risk assessments involve a detailed and systematic examination of the equipment. The equipment's activity, location and operational system is assessed to identify any hazards.



BlazeCut recommend that the fire risk management process be fully documented for the life of the equipment. Records should be maintained and kept by the Installation Company and by the owner of the equipment. This is to include;

- Hazard identification, risk analysis and risk evaluation.
- Risk reduction methods.
- Consultation.
- Maintenance recommendations.
- Accidents, incidents and safety statistics.
- Monitoring and reviews.

Fire Risk Location, Fuel Sources and Ignition Sources

Fire Risk Locations

When assessing the fire risk location, the operating environment of the equipment should be considered. Particular fire hazard operating environments associated with the equipment include situations where the equipment fire will impact on the environment (for example, forests/bushfires), or the environment will impact on the equipment. Fire hazards associated with the operating environment include the likelihood of combustible dust (for example, coal), combustible gases, timber, confined spaces, oil spills, fuel and waste dumps/depots, tyre storage areas, and temperature.

The fire risk analysis should determine the risks for the following, where applicable:

- Health and safety of the operator and passengers.
- Health and safety of people in the vicinity.
- Property loss.
- Production loss.
- Environmental damage.

Identifying Fuel Sources

When assessing the fire risk location, all fuel sources should be identified, including;

- Primary fuel sources such as flammable liquids and lubricant.
- Materials of construction of the equipment.
- The product being processed or transported.
- The surrounding environment.

The most common oxidizer is air but there are other oxidizers that support combustion, for example, ammonium nitrate.

Identifying Ignition sources

When assessing the fire risk location, all ignition sources should be identified, including but not limited to the following:

- Heat energy: for example, high temperatures and hot surfaces are usually found in the vicinity of internal combustion engines, exhaust systems, pumps, turbochargers, batteries, wiring, switches, electric motors, generators, heat exchangers, bearings and brakes.
- Electrical energy: for example, switch gear, motors, retarders, transformers, batteries, lights, cables, short circuit and electric arc, earth or conductor fault, discharge of static electricity, loose contact and induction heating.
- Mechanical energy: for example, welding and cutting, friction, overheating, impact, grinding.
- Chemical reaction: for example, self-heating, self-ignition and runaway exothermic reaction.

RISK ASSESSMENTS

Risk Assessment Process

The risk assessment should be a structured process as follows. Determine the possible fire scenarios:

- What can happen?
- When and where can it happen?
- Why and how can it happen?

Quantify the risk exposure by determining the likelihood and consequence of the fire scenarios:

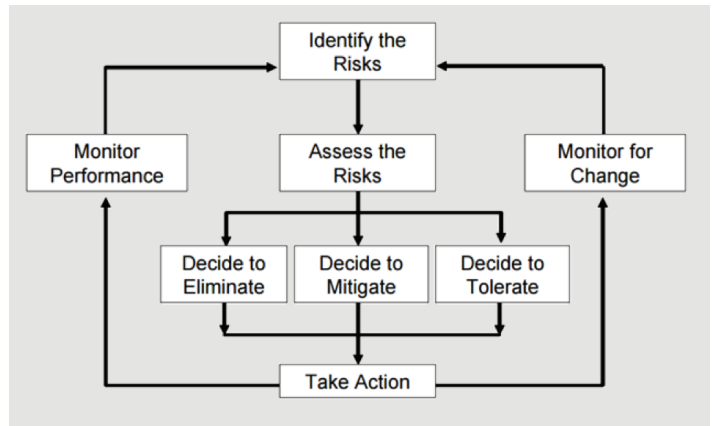
- How likely is this to happen?
- What are the consequences?

Prioritize fire risk:

- What risk needs to be addressed first?

The fire risk management process should be carried out by personnel competent in risk assessment and in consultation with the following person(s) where possible:

- Owner
- Operator
- Maintenance personnel
- Manufacturer's representative
- Supplier
- Hirer
- Insurer
- Specialist fire consultant



Risk Assessment and Control Chart

LIKELIHOOD	CONSEQUENCE			
	CATASTROPHIC	CRITICAL	MARGINAL	NEGLIGIBLE
FREQUENT	20	18	15	5
PROBABLE	19	16	11	4
OCCASIONAL	17	13	8	3
REMOTE	14	12	7	2
IMPROBABLE	10	9	6	1
RISK SCORE	HIGH	MODERATE	LOW	VERY LOW

The Risk assessment process has been simplified by using the BlazeCut's procedures and RAC chart system. The RAC chart breaks down the risk into two key components, the likelihood of an event occurring and the consequence of that event.

The chart should be followed when assessing risk before any installation of a fire suppression system.

FREQUENT	Likely to occur often during the life of an individual item or system, or very often in operation of a large number of similar items.
PROBABLE	Likely to occur several times in the life of an individual item or system, or often in operation of a large number of similar items.
OCCASIONAL	Likely to occur sometimes in the life of an individual item or system, or several times in operation of a large number of similar items.
REMOTE	Unlikely, but possible to occur sometime in the life of an individual item or system, or can be reasonably expected to occur in the life of a large number of similar components.
IMPROBABLE	So unlikely to occur in the individual item or system that it may be assumed not to be experienced, or it may be possible, but unlikely to occur in the life of a large number of similar components.
CATASTROPHIC	Death, loss of system or plant, release to the environment, such that significant public interest or regulatory intervention occurs or reasonably could occur.
CRITICAL	Severe injury, major system damage or other event which causes some loss of production, unplanned localised damage to the environment, effects other areas or could have resulted in catastrophic consequences in different circumstances.
MARGINAL	Minor injury, minor system damage, minor confined and non-damaging environmental exposure, or other event confined to one MRU.
NEGLIGIBLE	Less than above

For more information on BlazeCut Fire Risk Assessments, please contact technical@blazecutgroup.com

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- Indonesia
- Philippines
- Singapore
- Spain
- Sweden
- Thailand
- Turkey
- USA



Quality Assurance

The BlazeCut s.r.o production facility is ISO 9001, ISO 14001 and AQAP 2110 certified.



AQAP
2110

Tested and Approved Products

- CE Approval
- Certificate of Conformity with design documentation
- Performance and technical specification testing in accredited testing institute: Strojírenský zkušební ústav, s.p., Czech Republic



UNECE R107
Approved System

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