



**Fire protection solutions  
for machine tools**

**Safe for certain.**

**minimax**

# RECOGNISING

## RISKS

Machine tools used for metalworking – such as drilling, turning, grinding, milling, etc. – which use inflammable cooling lubricants run the risk of suddenly exploding or catching

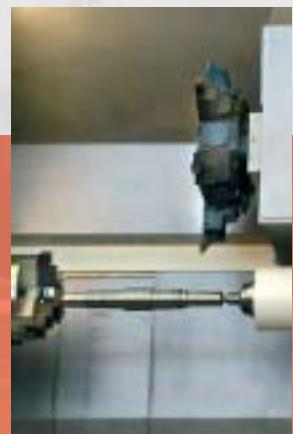
fire. The machining of light metals or their alloys poses an additional fire risk.

### Hazardous machine parts

Protection should be provided for the following hazardous parts of a closed machine tool:

- ▶ working area (drilling, turning, grinding, milling, honing, etc.)
- ▶ between the hydraulic room and the machining slide
- ▶ conveying area (material feed/discharge)
- ▶ exhaust air duct to fire damper or electrostatic filter

When machines are connected to a central suction system or to one another, the scope of protection must be adapted to the circumstances at the place of installation. If necessary, protection can be extended to encompass peripheral areas such as control cabinets, oil regeneration, etc.



### Fire protection solutions

An individually designed fire protection concept including all safety-relevant concerns and considerations is a prerequisite for complete safety. A fire extinguishing system is at the heart of the concept. Minimax provides effective fire protec-

tion solutions for machine tools. These recognise an incipient fire, ensure it is extinguished quickly and automatically, and allow damage and down time to be minimised. They conform to the relevant safety regulations and pass expert inspections.



# SAFETY

## INDIVIDUAL CONCEPTS

Our expert engineers will be delighted to offer their advice in helping you to decide which of the protection concepts developed by Minimax is the right solution for you. In a personal discussion, we will design a tailor-made solution

together with you to suit the requirements of the facility to be protected in terms of size and cladding. This is the Minimax approach to fire protection solutions for machine tools, providing either initial equipment or a retrofit.

Minimax is a pioneer in developing individual fire protection systems which have been tried and tested thousands of times worldwide.



# SYSTEMS

## FIRE ALARM SYSTEMS



When an open fire breaks out, the fire spreads quickly. Usually, detectors which are activated by flames, a heat differential or a preset maximum temperature are installed in

high-risk areas to automatically detect fires at an early stage by monitoring the typical fire characteristics of intensive flame radiation and the development of heat.

Sensible combinations of these detectors are used to guarantee high sensitivity and reliability, and to minimise false alarms.

Break glass push buttons can be used for manual release. As soon as a detector reports fire to the fire detection control panel, the machine control (programmable logic controller) verifies the signal with the fire detection control panel and returns the machine tool to its starting position before switching it off. The fire detection control panel then activates visual and acoustic alarms and the extinguishing system.

Minimax fire protection is designed, manufactured and installed in line with national and international guidelines and norms, guaranteeing quality and ensuring your safety.



## CONTROL FUNCTIONS

### Controlling and disconnecting equipment

A fire can only be extinguished successfully if equipment controls and disconnection are incorporated into the fire protection system, preventing damage to the machine via uncontrolled deactivation.

### Interlock/blocking

A forced interlock of the machine controls is useful. A safety bolt switch interrupts the connection with the extinguishing system when the housing doors (inspection flap, etc.) are opened. This means the machine cannot be activated when the door is open, preventing it from going into operation. In addition, the extinguishing system must be fitted with an automatic blocking device which eliminates personal danger from unintentional activation of the extinguishing system.

### Alarm

An audible alarm is provided to alert machinists. This can be supplemented by visual alarms.

#### Pre-extinguishing sequence example

- Retract machining head (grinding wheel)
- Medium supply and exhaust air off
- Fire dampers and compressed-air solenoid valve closed
- Stop sealing air, shut down machine
- Fire alarm notification to security control panel
- Fault notification to security control panel in the case of system defects

### Explosion pressure relief

The explosion pressure can be limited to a harmless degree by offering relief areas at a very early stage of the possible explosion. So-called pressure relief devices that are mounted in the machine housing are used for this. In the case of an explosion, they provide an opening for pressure and flames to escape. This prevents burst doors, shattered windows or damage to the housing. The escaping blast wave and any flames must be diverted in such a way that machinists are not endangered. The design, location, installation and integration of the relief flaps demand sound expert knowledge and safety guarantees from the manufacturer.

Minimax is certified through and through – from its components, systems and production process to the quality control system and the company itself as a manufacturer of fire protection systems.



# FIRE EXTINGUISHING SYSTEMS

## ARGOTEC® FIRE EXTINGUISHING SYSTEMS

### Argotec® fire extinguishing systems

Argotec® extinguishing systems fight an incipient fire with the gas extinguishants carbon dioxide, argon or nitrogen. In the case of fire, the extinguishing process is activated and controlled automatically.

The piping network with extinguishing nozzles ensures that extinguishant quickly builds up in the protected area, putting the fire out before more extensive damage is done. Once the fire has been tackled successfully, the machine tool can soon be operational again.

Finally, the machine door can

be opened again, the extinguishant gas is released and is safely distributed throughout the vicinity. Simply airing the room allows the extinguishant to escape back into the environment.

The inert gases used extinguish quickly without leaving any residues, are non-conductive and work even in the furthest corner, including grooves and joints, ensuring thorough penetration. Once you have finished extinguishing, you only need to refill the extinguishant. Then the extinguishing system is ready to be used again.

### Argotec® fire extinguishing system with carbon dioxide

Minimax Argotec® inert gas extinguishing technology using carbon dioxide is an ideal fire protection solution for machine tools. The carbon dioxide is stored under high pressure and is quickly piped to the fire, displacing the oxygen needed for a fire. Given the small amount of extinguishant needed and the comparatively large hall volume, even when carbon dioxide is used, it does not usually build up outside the machine to form a concentration that could be hazardous to humans.

### Argotec® fire extinguishing system with argon

When risks arise due to the machining of light metals, the extremely inert gas argon is the only suitable extinguishant. Unlike with the extinguishant gases carbon dioxide and nitrogen, there is no possibility of argon interacting with burning metal.

## Advantages

### ARGOTEC® INERT GAS EXTINGUISHING TECHNOLOGY

- ▶ Fast fire-fighting without extinguishant residues
- ▶ Extinguishant deployed precisely inside the machine tool
- ▶ Minimal down time without impeding the machine's functionality
- ▶ No damage to electrical and electronic equipment
- ▶ Affordable, readily available extinguishant
- ▶ Efficient fire-fighting with carbon dioxide for open machines
- ▶ No notable drop in temperature due to the extinguishant
- ▶ Cost-effective modular system
- ▶ Space-saving compact system/small footprint even when using argon thanks to 300-bar technology
- ▶ Recognised and approved quality
- ▶ Maximum safety – no hazard for humans or the environment



# NG SYSTEMS

## MINIFOG® FINE WATER SPRAY SYSTEMS

Minifog® fine water spray systems can be used to implement economical protection concepts using the minimum amount of water to guarantee maximum safety.

Thanks to its fast response, the extinguishing system quickly puts out the fire of the burning liquid before a metal fire can spread.

### The Minifog® fine water spray system

consists of the extinguishing container, a pressurised cylinder and the piping system with impulse nozzles. The fine water spray nozzles are installed so that they can reach every part

Once a fire has been detected, the propellant is admitted into the extinguishing container, the extinguishing flows through the piping system and is sprayed through the nozzles as a fine mist.

**Minifog® nozzles** need a minimum supply pressure of just 4 bar.

The fine mist multiplies the total surface area of the extinguishing, effectively cooling the source of the fire. As the extinguishing evaporates, it not only uses up a lot of heat, but also stops the supply of oxygen to the source of the fire and is quenching it.

### Minimaxol® F30

The special extinguishing agent Minimaxol F30 is to be recommended for certain flammable substances. During extinguishing, foam with a good flowability is produced which increases its extinguishing properties for flammable liquids. In addition, the foam stops the supply of oxygen to the source of the fire, prevents it from flaring up again, and eliminates the emission of poisonous fumes.

Unlike other systems, galvanised steel piping is sufficient, dramatically cutting costs.

We prefer to design the water supply including the extinguishing agent container as an independent compact unit with the smallest possible dimensions, allowing it to be installed easily in the direct vicinity of the machine tool. Alternatively, it can be connected to an existing extinguishing system.

## Advantages

### MINIFOG® FINE WATER SPRAY EXTINGUISHING TECHNOLOGY

- ▶ Small quantity of extinguishing water needed
- ▶ Normal water quality is sufficient
- ▶ Minimised fire damage and down time
- ▶ No danger for personnel
- ▶ Homogeneous cooling of protected facilities
- ▶ Flue gas cleansing effect
- ▶ Affordable, approved technology
- ▶ Robust technology
- ▶ Extinguishing agent deployed precisely inside the machine tool
- ▶ Small pipe dimensions
- ▶ Cost-effective, space-saving modular system
- ▶ Easy to install – also ideal for retrofitting



# SOLUTIONS

## COMPACT EXTINGUISHING SYSTEMS

### Compact extinguishing systems for equipment protection

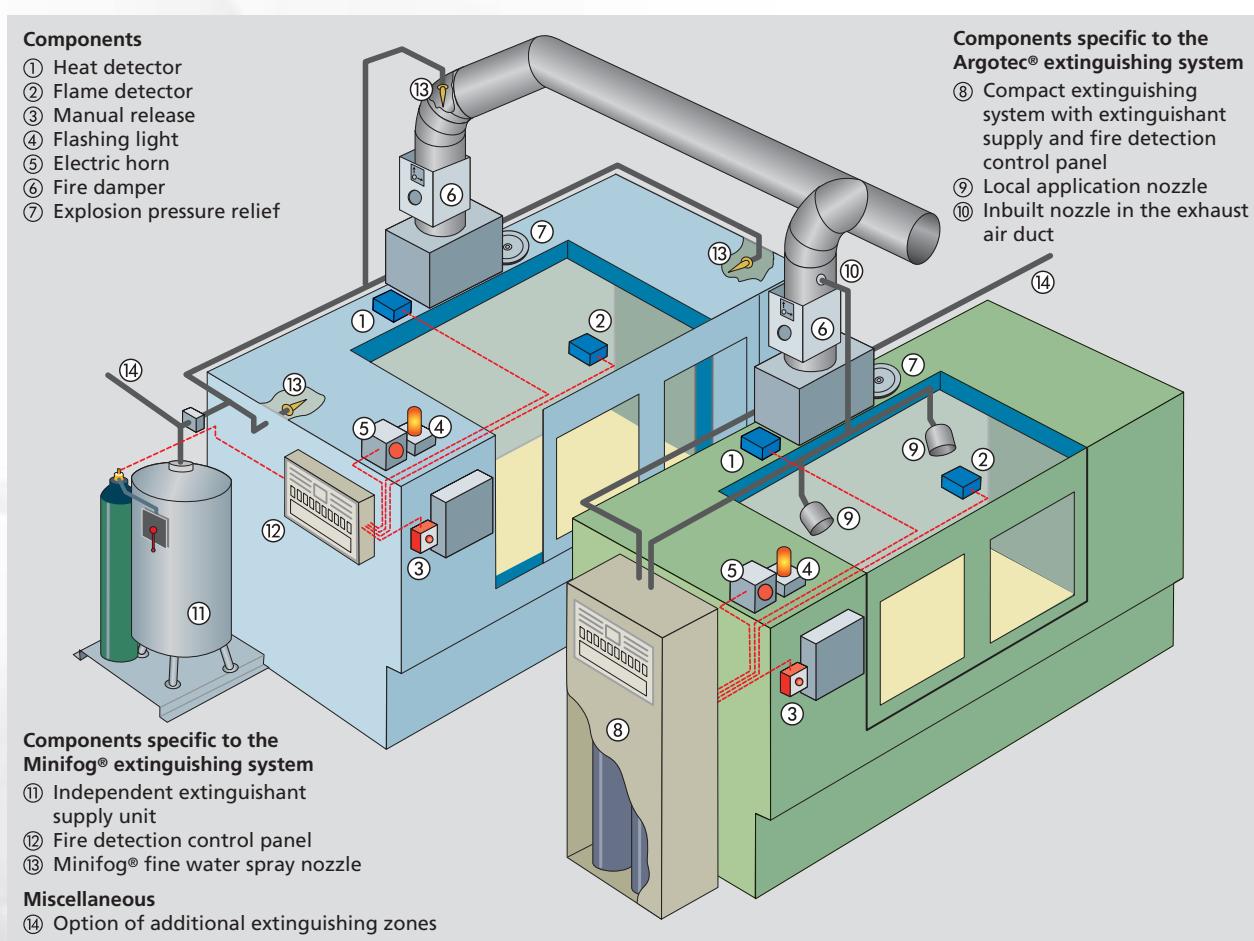
To cater for straightforward fire risks, Argotec® and Mini-fog® extinguishing systems can be installed and used right next to the machine tool in the form of a compact extinguishing

system. They can be connected to the wiring and piping systems quickly using standardised connections.

If the protection task changes, the system can be relocated with no great difficulty.

Compact extinguishing systems

are largely prefabricated and quick and easy to install, making them an interesting alternative to conventional systems in financial terms too.



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