**INTRODUCTION**

Fire work is work involving open flames, heat or sparks− e.g. welding, burning, cutting, soldering, thawing, hot gluing, hot riveting, thermal spraying, flame heating, flame straightening, flame hardening and resistance heating.

If not properly controlled, fire work is a major cause of industrial fires. The hot slag from a welding flame can ignite combustible materials at a distance of 11 m (35 ft.) around the work site and smoldering fires can develop unnoticed over a long period of time. Although relevant safety measures are well known, loss experience shows that they are bypassed out of convenience. In order to effectively counter the acute risk of fire during fire work, it is therefore necessary to introduce a formal approval procedure for fire-hazardous work. Non-compliance with the specified safety measures should be punished with contractual or disciplinary consequences as well as the immediate withdrawal of the permit.

The greatest danger comes from fire work that is carried out outside of designated work areas. Fire work carried out by contractors who are unfamiliar with the structural and operational conditions and who often work unsupervised represents a particular potential for damage.

If fire work− e.g. as part of larger projects− has to be carried out routinely over a longer period of time outside designated work areas, these areas should be temporarily defined as work areas for work involving fire hazards and prepared accordingly. The safety precautions in these special work areas should go beyond the following specifications. In particular, safety distances greater than 11 m should be maintained or adequate structural partitions created. The areas should also be checked daily.

**OPERATING INSTRUCTIONS FOR FIRE WORK**

**Area of application**

These operating instructions apply to all employees as well as to **external companies** that carry out welding, cutting and similar work. Only welding and cutting work (or similar fire work) carried out as part of **maintenance or repair work** on machines, mechanical systems or equipment is covered by these operating instructions.

In this respect, external companies must be made aware of these operating instructions before the work is carried out.

This **does not include** the work to be carried out on the housing and riser pipe welding machines or the workstation in the pressure regulator assembly, where fitting parts are heated with a burner or dispensing systems are soldered (hard soldering).

**Hazards for people and the environment**

Welding work produces fumes and ozone, which can cause damage to health if inhaled over a long period of time. The hazard potential is largely determined by the type and quantity of welding consumables and the exposure time. Welding work on high-alloy workpieces (e.g. chrome), on metallic coatings (e.g. lead, cadmium, zinc) or on workpieces with paint, plastic coatings or contamination from oils, greases or solvent residues is particularly hazardous to health.

Other hazards associated with electric welding are electric current and ultraviolet and infrared radiation.

**Protective measures and rules of conduct**

**Eye protection**: Welding shield, do not look into the welding area without eye protection.

**Hand protection**: leather gloves with long cuffs

**Body protection**: flame-retardant protective suit, leather apron if necessary

**Foot protection**: High protective shoes or half-high protective shoes with gaiters.

**Hearing protection**: earplugs or ear muffs in noisy areas

**Hygiene**: Apply a suitable skin protection product (with UV protection if necessary) before starting work, wash hands with water and skin cleanser when interrupting work, then rub in skin care cream. Eating, drinking and storing food on the

Workplace is prohibited.

**Handling**:

Do not inhale vapors and fumes. Ensure adequate ventilation, use extraction equipment, always direct welding fume extraction towards the welding point, if necessary adjust the extraction funnel.

When using protective shields, keep the distance between the mouth or nose and the lower edge of the shield and the chest as small as possible and the distance between the arc and the protective shield as large as possible. Always remove coatings and soiling in the weld seam area before welding. Dry workpieces carefully after cleaning.

To protect against the passage of electric current, the welder must be insulated by protective clothing (protective gloves, protective shoes, protective suit or apron) or by additional covers or underlays (e.g. rubber mats).

**Fire protection**:

Remove flammable objects from the work area or cover them.

Keep fire extinguishing equipment close to the work area. Only carry out welding work on containers for flammable liquids after they have been emptied and completely filled with water (or nitrogen, carbon dioxide if necessary).

**Behavior in the event of faults**

The electrical cables and the electrode holder or welding gun must be checked regularly. Parts with damaged or missing insulation must be taken out of service immediately. All faults, changes or similar must be reported immediately to the nearest supervisor

**Behavior in case of accidents; first aid**

* In the event of an accident, please remember not only to rescue the injured person and provide first aid (stop bleeding, immobilize injured limbs, combat shock), but also to secure the accident site.
* Consult an emergency doctor if you expect to be unable to work due to the injury (**emergency number: 0-112**).
* Report any accident immediately to your supervisor or their representative.
* Make sure that records are kept of every first aid treatment, e.g. in a first aid book

**Maintenance, repair and disposal**

Maintenance and repair work may only be carried out by authorized, qualified personnel.

**Permit**

For all welding and cutting work (or similar fire work) that is carried out as part of **maintenance or repair work** on machines, mechanical systems or equipment, a permit (release certificate) must be submitted to the supervisor in accordance with the attached sample. The supervisor must check compliance with the safety measures listed there and inspect the work area himself.

**Security measures**

If approval is being considered, the necessary safety measures and their feasibility should be determined on the basis of a checklist during a site inspection. If one of the following security measures is necessary but cannot be implemented, clearance should not be granted.

* Flammable materials must be removed within a radius of 11 m or secured with suitable means.
* Wall and floor openings must be sealed with suitable means.
* Fire alarm system is in operation.
* Work equipment used for fire work is in proper condition.
* Fire extinguishers and fire hoses are available in working order.
* A fire watch is available to monitor the work area from the start of the work until at least 1 hour after completion of the work.

Safety measures may include draining, cleaning and inerting tanks and piping systems for flammable liquids or gases. When working in or on tanks and pipelines, gas concentration tests may also be necessary. Furthermore, a general cleaning of dust deposits, the removal of flammable materials from the danger zone or their covering with special extinguishing blankets and the wetting of floors and walls with water should be carried out. Particular attention should be paid to flammable building elements and insulating materials. In multi-storey buildings, floor and ceiling openings should also be properly sealed to prevent sparks from flying to other floors.

Before starting work, the work equipment and in particular valves, pressure reducers, safety devices to prevent gas backflow and flame transmission and gas hoses should be checked. Gas cylinders should be transported and set up in a suitable trolley or secured with chains.

Hoses should be protected against being driven over or damaged in any other way.

In addition to the provision of fire extinguishers, fire hoses (wall hydrants) should also be laid out.

Work involving a fire hazard should always be carried out by two people - the person carrying out the work and a fire watch, whereby the fire watch should always be provided by the client and not by an external company. The fire watch must also be provided during breaks and after work hours.

**Completion of work**

After completion of the work, the fire watch should continue to check the work area for at least 1 hour. Only then should the permit form be returned to the person responsible for approval for filing, whereby the times for the end of work and the end of the fire watch should be documented and confirmed by signature. Proper completion should also be confirmed by the person responsible for approval with a signature.

**Non-compliance or infringement**

Failure to comply with or contravention of these operating instructions will inevitably result in consequences under labor law. In the event of serious misconduct, this may also result in termination of the employment relationship.

**PERMISSION FOR**

**FIRE WORK**

**Royal & SunAlliance - Global Consulting**

**If one of the following points applies, no release may take place:**

* Fire work can be carried out in another safe place.
* There are alternative, secure fastening and cutting methods.
* Fire work should be carried out in a defined prohibited zone.

**If approval is granted, the following fields must be completed:**

|  |  |
| --- | --- |
| **Executor** | **Work area** |
| **Job description** |
| **Date** | **Start** | **End** |

**The person responsible for approval should check compliance with the safety measures listed below and inspect the work area himself:**

* Flammable materials must be removed within a radius of 11 m (35 ft.)
* Floor and ceiling openings are sealed with suitable materials.
* Extinguishing systems and fire alarm systems are in operation
* \_\_ Work equipment is in proper condition.
* Fire extinguishers and fire hoses are ready.
* A fire watch is available (trained employee).
* The work area is checked until 1 hour after completion of the work.

***Mark non-applicable points with "NA".***

**The work area defined above has been inspected. All prescribed safety measures are in place. Approval is granted:**

|  |  |
| --- | --- |
| **Signature** | **Function** |
| **Date** | **Time** |

**The person carrying out the work should document and sign off the end of the work and the end of the fire watch:**

|  |  |
| --- | --- |
| **End of work** | **End of the fire watch** |
| **Signature** |

**The approval certificate should be returned to the person responsible for approval after completion of the work:**

|  |  |
| --- | --- |
| **Signature** | **Function** |
| **Date** | **Time** |

ATTENTION FIRE WORK