***EXPERIMENT RISK ANALYSIS FORM***

If you have any questions, please contact the Safety Group via expsaf@esrf.fr.

The risk analysis must be sent to the Safety Group 2 weeks before the start of your experiment (expsaf@esrf.fr). Late reception of the risk analysis will result in the cancellation of your experiment.

|  |  |  |
| --- | --- | --- |
| **Experimental number*:*** | | **Beamline:** |
| **Main Proposer:** |  | |
| **Title of the experiment:** |  | |

# 1 EXPERIMENT: Identification of modifications made to the proposal

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Have modifications been made to the proposal description?  Yes  No** | | | | | | | | | |
| The Safety Group must immediately be informed of every modification that differ from the original proposal and this at least one month before the start of the experiment (expsaf@esrf.fr). Only minor changes can be made and will be subject to approval. | | | | | | | | | |
| **Does the modification relate to the sample?  Yes  No** | | | | | | | | | |
| (If yes, describe the name, composition and hazard(s) below): | | | | | | | | | |
| Radioactive | Contaminant | | Corrosive  Flammable | | Oxidising  Toxic | | | CMR |  |
| Explosive | Biological | | Gas under Pressure | | Highly reactive or unstable | | | Sensitive to air | |
| **Does the modification involve equipment?  Yes  No** | | | | | | | | | |
| Furnace | | Magnet | | Cryostat | | Cryogenic gas stream | Ultrasounds | | |
| Refrigerator | | Laser  Class | | High pressure | | LED, UV, IR lamp | Others: | | |
| **Does the modification concern the experimental conditions?**  **Yes  No** | | | | | | | | | |
| (If yes, describe which) : | | | | | | | | | |

# 2 Experiment Risk analysis (mandatory)

***Risk analysis:*** The goal is to identify potential safety hazards. For chemical hazard, be specific (e.g., flammability, corrosiveness, reactivity/explosion, acute toxicity or carcinogenicity). List hazard phrases (CLP/1272/2008/EC) and occupational limit values. For biological substances, indicate the risk group, describe the potential pathogenicity, or any sensitising or toxic effect on human health, gene transfer, environmental impact and possible contamination.

***Safety equipment:***Specify any equipment required for safe research or experiments. The Safety Group or laboratory support staff upon approval will provide some safety equipment (gloves, disinfectants, spill kits). Indicate what you will bring with you and what should be provided by the ESRF.

**Users accessing the experimental hutch and laboratories must bring their own lab coats, safety glasses and closed shoes.**

### 2.1 Identification of hazards associated with equipment used at the ESRF and accompanying preventive measures

Your equipment must comply with standards and be in correct operating condition.

| **Equipment used**  *(Yes or No)* | **Hazards** | | **Preventive measures and protective equipment** |
| --- | --- | --- | --- |
| **Gas, liquid and vapour pressure vessels (e.g. autoclave, high pressure cell, vacuum chamber, compressor…):  Yes  No** |  | Projection of fragments or liquid |  |
|  | Gas/vapour leak |
|  | Burns |
|  | Whipping of hoses |
|  | Implosion |
|  | Other |

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment used**  *(Yes or No)* |  | **Hazards** | **Preventive measures and protective equipment** |
| **Furnace  Yes  No** |  | Release of toxic vapours |  |
|  | Thermal burns |
|  | Fire |
|  | Electrical |
|  | Others |
| **Cryostat  Yes  No  and/ or Cryomagnet  Yes  No** |  | Cryogenic burns |  |
|  | Quenching (sudden vaporisation of refrigerated liquid gas with possibility of asphyxiation) |
|  | Electrical |
|  | Asphyxiation |
|  | Harmful effects on human health |
|  | Sudden attraction of metallic objects |
|  | Others |

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment used**  *(Yes or No)* |  | **Hazards** | **Preventive measures and protective equipment** |
| **Ultrasounds  Yes  No** |  | Hearing effects |  |
|  | Other |
| **Other equipment generating magnetic field and/or electromagnetic waves? (induction heater, TIG welding station…)  Yes  No** |  | Electrical |  |
|  | Exposure to non-ionising radiation |
|  | Harmful effects on human health |
|  | Sudden attraction of metallic objects |
|  | Other |
| **Electrochemical cells / battery  Yes  No** |  | Chemical risk | Please describe all chemicals used in section 2.2 |
|  | Electrical |
|  | Other |

| **Equipment used**  *(Yes or No)* | **Hazards** | | **Preventive measures and protective equipment** | |
| --- | --- | --- | --- | --- |
| **Laser  Yes  No** | **For non-ESRF lasers: Users are required to bring laser safety goggles corresponding to the class and wavelength of the laser used. They must be in perfect condition and present in sufficient number. No loan of goggles will be allowed.**  **Please include your alignment procedure.**  **Mandatory signs according to the regulations.** | | | |
| Laser class :      , Wavelength (nm):      , Power  (mW): | | | |
|  | Accidental eye and skin exposure | |  |
|  | Electrical | |
|  | Fire | |
|  | Others | |
| **LED, IR, UV, Hg lamps or fibres  Yes  No** | **For non-ESRF lamps or fibres: users are required to bring their own PPE, which must comply with the regulations** | | | |
|  | Accidental eye and skin exposure | |  |
|  | Contact burns | |
|  | Electrical | |
|  | Others | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment used**  *(Yes or No)* |  | **Hazards** | **Preventive measures and protective equipment** |
| **Micro blower torch  Yes  No** |  | Burns |  |
|  | Fire |
|  | Others |
| **Heating ribbon  Yes  No** |  | Electrical |  |
|  | Burns |
| **Other equipment  Yes  No** |  |  |  |

### 2.2 Identification of chemicals, gases and biologic compounds to be used at the ESRF (mandatory)

* **List all reference**s **and compounds used at the ESRF :**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **CAS Number** | **Quantity**  **(mg or ml)** | **Concentration M/Litre** | **Use** | **Codes of Hazard phrases** |
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* **List all gases to be used at the ESRF:**

For all gases, please contact your Local Contact (at least 8 weeks in advance) to define the gas sizes and concentrations. ESRF Staff will ensure the availability of the cylinders and the follow-up of the order.

| **Type of gas** | **% Gas and diluent** | **Size**  (S01, S05, M10, M20, L50) | **Number of cylinders** | **Continuous flow** | **Gas flow rate (m3/hour)** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | Yes  No |  |
|  |  |  |  | Yes  No |  |
|  |  |  |  | Yes  No |  |
|  |  |  |  | Yes  No |  |
|  |  |  |  | Yes  No |  |
|  | | | | | |
| Comments : | | | | | |

### 2.3 Identification of hazards associated with chemical and biological products and accompanying preventive measures (mandatory)

Describe the specific requirements for handling and storing hazardous chemicals, gases or biological substances in the laboratory, particularly for highly reactive/unstable, highly flammable and corrosive materials. Describe the transport and secondary containment requirements between laboratories and experimental stations or between buildings.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Classification of chemical / gas** | **Name(s)** | **Hazards** | | **Describe preventive measures and protective equipment** |
| explosen170  **Explosive**  **(unstable)**  **Yes  No** |  |  | Explosion (dispersion in the air, incompatibilities, presence of static electricity, impacts, possible friction…) |  |
|  | Spillage |
| flammeen170  **Flammable**  **Yes  No** |  |  | Projection |  |
|  | Fire |
|  | Spillage |
|  | Explosion |
| rondflamen170  **Oxidising**  **Yes  No** |  |  | Fire |  |
|  | Explosion |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Classification of chemical / gas** | **Name(s)** | **Hazards** | | **Describe preventive measures and protective equipment** |
| aciden170  **Corrosive**  **Yes  No** |  |  | Skin or eye burns |  |
|  | Attack of materials |
| skullen170  **Toxic**  **Yes  No** |  |  | Chronic or acute intoxication |  |
| silhoueten1  **CMR**  Carcinogen, Mutagen, Reprotoxic  **Toxic for human**  **Yes  No** |  |  | Serious effects on human health (cause cancer, modifies DNA, harms fertility, harm to foetus) |  |
|  | Skin and respiratory sensitisation |
|  | Specific Target Organ Systemic Toxicity (single and/or repeated exposure) |
| exclamen170  **Harmful, Irritating**  **Yes  No** |  |  | Eyes and skin irritations |  |

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| --- | --- | --- | --- | --- |
| **Classification of chemical / gas** | **Name(s)** | **Hazards** | | **Describe preventive measures and protective equipment** |
| **Nanoparticles**  **Yes  No** |  |  | Toxic health effects |  |
| **Biological samples**  **Yes  No**  **GMO**  **Yes  No** | Risk class:  Licence number:  Date of release: |  | Allergenic |  |
|  | Secondary infection |
|  | Oncogenic |
|  | Toxic |
|  | Cut/Pin prick |
|  | Other |
| RadiationsIonisantes  **Radioactive samples**  **Yes  No** |  |  | Contamination |  |
|  | Irradiation |
|  | Pyrophoric |
|  | Other |

### 2.4 Identification of hazards associated with gases and accompanying preventive measures (mandatory)

| **Gas classification** | **Name(s)** | **Hazards** | | **Describe preventive measures and protective equipment** |
| --- | --- | --- | --- | --- |
| bottleen170  **Compressed gas**  **Yes  No** |  |  | Explosion (due to heat or following a fall) |  |
|  | Asphyxiation |

# 3 Step by step description of the experiment (mandatory)

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| In this section, you must indicate, stage by stage, all the steps of your experiment (preparation, set-up and testing) that you will carry out on site.  For each step you must specify:  1. which of the previously-mentioned equipment/products will be used,  2. the conditions in which the equipment/products will be used (temperature, pressure),  3. the particular risks of the stage,  4. feedback on previous use (incidents which already occurred involving this type of equipment or installation).  The associated preventive measures will appear in the table above (sections 2.1, 2.3 and 2.4).  Pictures may be provided as they are useful to facilitate understanding.  Indicate where on site the handling of toxic, flammable/pyrophoric, corrosive, reactive/unstable, nanomaterials or biological substances will be carried out (check the suitability of the location with your Local Contact).  Identify decontamination measures required during of the experiment. |

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| To be completed by the users: |

# 4 In the event of an emergency

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| Should a problem occur with your samples, equipment, chemicals, processes… during the preparation of your experiment or while it is taking place, indicate what interventions you propose: |
| To be completed by the users: |

IN CASE OF AN ACCIDENT OR INCIDENT AT THE ESRF, PLEASE DIAL 10 FROM A NORMAL TELEPHONE OR PICK UP A RED PHONE. DO NOT HANG UP UNTIL THE PERSON ON THE PHONE TELLS YOU TO DO SO.

IN CASE OF AN EVACUATION, PLEASE SECURE YOUR EXPERIMENT AND THE BEAMLINE BY CLOSING ALL GAS CYLINDERS BEFORE LEAVING AND COMPLY WITH THE SAFETY MESSAGE BROADCASTED OVER THE LOUDSPEAKERS IN THE EXPERIMENTAL HALL.

# 5 Waste management (complete if necessary)

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| If biological and chemical waste is generated, please follow the ESRF waste management rules (contact your Local Contact or the Safety Group (expsaf@esrf.fr)). |

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| Describe (if necessary) the specific disposal procedures and estimate the nature and quantities of waste: |

AT THE END OF YOUR EXPERIMENT, PLEASE LEAVE THE BEAMLINE (CONTROL CABINE, EXPERIMENTAL HUTCH, LAB) CLEAN.

# 6 Transport and Receipt of samples and equipment

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| Package and label your samples in accordance with your carrier's requirements and any other regulatory requirements. **It is Mandatory to consult your Transport Safety Advisor, or contact a certified carrier for the transportation of Dangerous Goods (DHL, FedEx…).**  **Ensure you have included your name, your approved sample list and appropriate Safety Data Sheets (SDS).** |

dd

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| Describe the specific precautions to be implemented for the reception and storage of these samples: |

# 7 Documents which must accompany the file

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| --- |
| Documents and images may be inserted here :  • Pictures (jpg) of the installations and equipment which belong to you  • Compliance certificates for the equipment or documents which prove compliance (lasers, furnace…),  • Documents proving the tests which are carried out (high pressure cells (except Paris-Edinburg and diamond), home-made equipment),  • Training certificate (laser…)… |

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# 8 Safety Group Comments

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| **Safety comments :** |
|  |

***I certify the accuracy of this declaration and its attachments and accept the safety recommendations added to this document.   
I agree to respect the ESRF safety regulations.***

***Local Contact Main Proposer***

***Date:*** ***Date:***

***Signature:*** ***Signature:***