Tel : 01656 470044
Email : info@orbisenvironmental.com
Website : www.orbisenvironmental.com

DSEAR Risk Assessment Template

About This Guide

This guide is here to help you understand *how* a DSEAR Assessment should be completed, what good practice looks like, and how to approach the process with confidence. It will also help you determine when a DSEAR Assessment is required—and when it may not be.

We've also included guidance to help you recognise when conducting your own preliminary assessment is appropriate, and when it's necessary to bring in a specialist. Where external expertise is needed, this guide explains what you should expect from a competent assessor so you can make informed decisions and avoid being left with gaps or uncertainty.

Important Note

While this guide supports you in carrying out an initial quantification of your site's DSEAR risk and forming a preliminary view of that risk, it **is not** intended to replace, replicate, or act as a substitute for a full, suitable, and sufficient DSEAR Risk Assessment or Hazardous Area Classification.

A full assessment must always be completed by a competent, experienced, and knowledgeable DSEAR Risk Assessor with a solid understanding of your site's operations, processes, and risk profile, as well as the relevant regulations and industry guidance referenced throughout this document.

If You Need Help

If you are ever unsure about any aspect of this guide or its recommendations, we're here to help. Please feel free to get in touch at info@orbisenvironmental.com.

Introduction – before you use this document, read this

If this is the first time you have ever heard the term DSEAR, and you have suddenly been tasked with completing an assessment, you are in the right place. The same applies if you have heard of DSEAR but want to understand it properly before deciding whether you can complete a basic version yourself or whether you need a specialist to complete it for you, or ideally with you.

Over the last few years, inspectors, insurance auditors, fire risk assessors, and corporate safety teams have become far more knowledgeable about DSEAR. As a result, many businesses that have operated for years are now being told they need a DSEAR risk assessment and a hazardous area classification exercise.

This increase in scrutiny has led to a surge in low-cost providers and generic templates that appear acceptable at a glance but fall apart when examined in detail.

We are noticing two consistent problems:

1. Assessments that fail to identify hazards properly or miss important risks entirely, which is an obvious safety concern.

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Email : info@orbisenvironmental.com
Website : www.orbisenvironmental.com

2. Assessments that significantly overprotect areas because the assessor does not understand ventilation principles, zone reduction techniques, or the relevant industry benchmarks.

Overprotection often becomes the biggest cost to a business. It can result in:

- unnecessary ATEX equipment
- unnecessary redesign and engineering work
- unnecessary electrical modifications
- unnecessary operational restrictions
- unnecessary disruption and capital cost

These issues are avoidable when assessments are completed by someone who understands the standards and how they apply to real processes.

This guide does not provide a simple form you can just fill in. DSEAR is too technical for that. Instead, this document explains the process, the logic behind each step, and what a competent assessor would look for. If you follow each section and genuinely work through the content, the structure of your report will be close to what a competent DSEAR assessment requires.

Within the Appendix is the Risk Assessment report template – Each section you need to complete to have a suitable DSEAR Risk Assessment.

It will also help you decide:

- whether your site genuinely needs a DSEAR assessment
- whether your existing assessment is suitable or needs correcting
- whether you can complete a basic version yourself
- or whether a specialist should support you, either fully or alongside you

A technically sound DSEAR assessment should:

- quantify ventilation
- benchmark against EI, IGEM, BS EN 60079 and BS EN 378
- define realistic, justified zone sizes
- identify ignition sources
- include a hazardous area classification
- follow the full lifecycle of substances from delivery to disposal
- clearly document controls and technical reasoning

This guide takes you through the core process step by step, so you understand what good looks like and can avoid the common pitfalls that cause unnecessary risk, cost, and disruption.

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Email : info@orbisenvironmental.com
Website : www.orbisenvironmental.com

Step 1 - Do you even need a DSEAR risk assessment?

Before you go any further, the first question to answer is whether a DSEAR assessment is actually required for your site. It can happen that businesses are told they need one when, in reality, their quantities are too small to trigger hazardous area classification.

The Energy Institute (EI) provides widely accepted threshold values that indicate when area classification is normally required:

Location	Gas (normalised to 1 bar)	Liquefied flammable gas	Flammable liquid used above its flash point
Indoors	50 litres	5 litres	25 litres
Outdoors	1,000 litres	100 litres	200 litres

What this means in practice is quite simple:

- Indoors, it takes little to exceed the threshold. A single cylinder of flammable gas, or just a small quantity of solvent or resin, will usually trigger DSEAR requirements.
- Outdoors, ventilation is far better, so the allowable quantities are much higher. One drum of flammable liquid, a small LPG storage area, or a small bulk fuel tank will usually exceed outdoor limits.

But if your volumes are below these EI thresholds, then a full DSEAR risk assessment and hazardous area classification exercise is usually not required.

Instead, you should make sure that your general risk assessment or fire risk assessment clearly covers:

- what substances you use
- the quantities you store
- where they are kept
- how they are handled
- any controls in place for spills, ignition sources, and ventilation

As long as these points are properly documented, this level of assessment is normally sufficient for substances below the EI trigger values.

If your quantities are above the thresholds — or close enough that you are unsure — you should move to the next stage of the process, where each substance is assessed in more detail.

Note for Fire Risk Assessors – this should be a great guide to use to decide if a DSEAR Assessment is needed in your action plan for Fire Risk Assessment.

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Step 2 Identify and quantify every substance that could ignite or explode

Once you know whether your site is likely to fall under DSEAR, the next step is to walk the site and list every substance that could create an explosive or flammable atmosphere. This includes looking at where substances are stored, where they are used, and where they travel between these points.

A common mistake is to only consider the obvious areas. In reality, many sites have hidden risks that only become clear when you physically walk around, open cupboards, check plant rooms, and speak to operators.

Here are the types of substances you should be looking for:

Combustible dusts and powders

Any solid material that becomes a fine dust can be combustible. This includes:

- wood dust from cutting, sanding, or extraction systems
- food ingredients such as sugar, maize, flour, starch, whey, or soya
- plastics, resins, polymers, and rubber processed into fine particles
- metals in dust form (common in machining, polishing, blasting, or finishing)

Some materials are inert and do not present an explosion risk in dust form — for example untreated soil, rock, gravel, or pure salt. But almost everything else with calorific value can form an explosive dust cloud if ground into sufficiently fine particles.

Flammable liquids

Any liquid with a flashpoint below 60°C is considered flammable for DSEAR purposes. Typical examples include:

- solvents, resins, inks, thinners, and paints
- fuels such as petrol, kerosene, and diesel
- small containers stored for maintenance or production
- IBCs used for bulk storage or mixing operations

Even small volumes, when handled above their flashpoint, can fall within DSEAR scope.

Flammable gases

Any gas capable of ignition must be included — and this often gets overlooked. Examples include:

- natural gas entering the building through a meter and pressure regulator
- LPG cylinders used for heating, powering equipment, or maintenance
- hydrogen, acetylene, and other workshop gases

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- refrigerants used in cooling equipment and air conditioning systems (many have flammable characteristics, especially modern low-GWP gases)
- Battery Storage (bulk charging of Powered Trucks or UPS Systems) – Hydrogen can sometimes be released from batteries in fault charge condition

Where gas is stored, piped, or regulated, the equipment itself becomes part of the assessment.

Fuels for standby and safety systems

These are missed surprisingly often:

- kerosene or gas oil for space heating
- diesel tanks for backup generators
- fuel tanks for sprinkler pumps or emergency power systems

Even if they are rarely used, they still require assessment because the fuel is present on site.

Once you compile a full list of substances and where they are used, stored, and transferred, you will have the foundation needed for the next stage: understanding the full *process journey* of each substance from start to finish.

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Step 3 Understand how each substance moves through your site

After you have identified and quantified all substances that could ignite or explode, the next step is to understand how each one is used from start to finish. This is the part most people overlook, and it is why many assessments fail: they list the substance but do not follow its full journey.

A DSEAR assessment must reflect how the substance behaves at every point where it could be released, even briefly.

To do this, walk through the process and document each stage.

How to trace the process flow

For every substance, ask:

1. How does it arrive at the site?
2. Where is it stored before use?
3. How is it moved, decanted, or transferred?
4. Where is it used, mixed, heated, burned, or processed?
5. How is it controlled in normal operation?
6. What equipment or fittings are involved?
7. Where does the substance go once it is used, evaporated, combusted, or disposed of?
8. Are there any spill or Leak protection areas like drains, interceptors, LEV extraction ducting, conveyor belts or screws, Spill kits, Waste bins.

This creates a complete picture of where releases could occur.

Examples to help you map your site

Fuel deliveries (e.g., kerosene for space heating)

For something simple like kerosene:

- it arrives on a tanker
- it is pumped from the tanker through a hose into the storage tank
- the tank stores the fuel above ground or below ground
- it is then supplied either by pump or gravity to a burner or heating system
- once combusted, the substance is no longer present as a flammable atmosphere

Each of these steps must be assessed because each step has a different release potential.

Paint, resin or coatings processes

A typical paint or resin operation looks like this:

- IBCs or drums arrive on site and are stored temporarily

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- they are moved by forklift to a production or mixing area
- pigments or additives are tipped, mixed, or blended
- resins are decanted into smaller containers
- coatings may be sprayed, brushed, dipped, or cured
- once cured, dried, or sealed into packaging, the flammable risk ends

This kind of process has multiple points of exposure, all with different behaviours and ventilation needs.

Gases (including natural gas, LPG, hydrogen, refrigerants)

For gases, the process map usually includes:

- delivery and connection of cylinders (if applicable)
- gas meter and pressure regulator at the building entry point
- downstream pipework
- equipment or appliances using the gas
- any pressure relief or vent points
- end-use combustion or reaction

Any pressure-regulated point (especially the gas meter and regulator) becomes a significant area for assessment because this is where small releases often occur.

Powders and dusts

For solids that generate dust:

- raw material delivery into silos, hoppers, or bags
- tipping, pouring, blending, or conveying
- pneumatic transfer systems
- mixing lines, shredders, grinders, or macerators
- Filtration or sieving
- Blending and Mixing
- Decanting or bagging and scales (often rotary valves)
- extraction systems and filters
- waste handling and removal
- Remember any Explosion vents or Pressure relief points

Even if the main product is coarse (chips, flakes, granules), any fine fraction of dust within it must be assessed.

By mapping the process journey, you understand:

- where releases are possible
- where ventilation is strong or weak
- where ignition sources could interact

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- which parts of the process need hazardous area classification
- where the real risks are, rather than the assumed ones

Once you know the physical journey, you can then focus on ventilation, which is one of the biggest determining factors in zone size and is almost always the most misunderstood element of DSEAR.

Note for Pipework – Every flange connection point that is "Not Welded" often referred to as "nonwelded connection points" will be classified as a possible leak point and thus a zone will apply, so you need to trace all pipework of liquids and gasses.

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Step 4 Assess ventilation (the biggest factor in zone size)

Ventilation is one of the most important parts of a DSEAR assessment because it directly controls how big your hazardous zones will be. Good ventilation keeps zones tight and localised. Poor ventilation makes zones spread across rooms, which is where compliance becomes costly.

To assess ventilation properly, you need to understand two things:

How the substance behaves in air

Different substances move differently:

- natural gas rises
- LPG and many refrigerants sink
- solvent vapours drift depending on heat and airflow
- dusts stay suspended until extracted or settle

This helps you identify where releases are likely to accumulate.

How much air is being replaced

Ventilation effectiveness is measured in air changes per hour (ACH).

Outdoors, you can generally assume around 16 ACH, which is considered high ventilation.

- Indoors, you must calculate ACH using the airflow of extract fans or natural openings compared with the room volume. This gives a measurable benchmark that can be used against standards such as EI guidance, BS EN 60079 and BS EN 378 (for refrigerants).

What you are aiming for

A good DSEAR assessment checks whether ventilation can keep concentrations:

- below 10% of the lower explosion limit (LEL) – often means no significant external hazardous zone
- below 25% LEL – often leads to a zone of negligible extent
- above 25% LEL – requires a defined hazardous zone

These thresholds help determine how far vapours or gas clouds would realistically travel during a release.

Why it matters

Ventilation is often the difference between:

- a small, localised zone measured in centimetres, or
- a large zone that covers an entire room and forces ATEX upgrades to lights, electrical panels, switches, and equipment.

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Improving ventilation is usually the quickest and most cost-effective way to reduce zone size and compliance obligations.

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Step 5 Consider emergency response and preparedness

Once you understand normal operation, the next step is to consider what happens when something goes wrong. A DSEAR assessment must look at foreseeable emergencies such as leaks, spills, equipment failures, or overheating, because these events can temporarily change how a substance behaves and how far a hazardous zone may extend.

How spills or releases behave

Look at where the substance will travel if a container fails or a pipe leaks:

- Will liquids run into drainage channels, gullies, floor drains, bunds, or interceptors?
- Will vapours or gases rise or settle low to the floor?
- Will heavier-than-air gases collect in pits, basements, or trenches?
- Is there a spill capture sump or an interceptor that is designed to receive the substance?

Any drainage channel, bund, interceptor, spill sump, or collection point that could receive a release must be included in the hazardous area classification because concentrations are often highest at these points.

Fire, gas and process alarms

Different hazards require different alarms. For example:

- separate alarms for specific substances (e.g., toxic, or flammable gases)
- gas detection that isolates electrical and mechanical equipment early
- alarms linked to extraction or shutdown systems

The aim is fast, correct response — not just a generic fire alarm.

Explosion relief and suppression

For dust systems this may include:

- explosion relief panels
- suppression systems
- duct isolation
- safe venting routes

These elements must suit the dust and the process handling it.

Spill control and containment

The site must be able to deal with the largest reasonably foreseeable spill:

- for IBC storage, 1,000 litres is a typical benchmark
- bunds, spill pallets, drains and absorbents must have enough capacity

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- redundancy is important in case the first line of containment is overwhelmed

This supports both emergency response and the DSEAR zoning work.

Evacuation and isolation

An emergency may require:

- avoiding vapour clouds (evacuating upwind or via alternative routes)
- isolating valves or emergency pump shutdowns
- turning emergency ventilation on or off depending on the hazard
- clear instructions for operators and supervisors

The actions must genuinely reduce risk.

Example case: ammonia plant

An ammonia refrigeration plant is a good demonstration of emergency arrangements matched to the substance:

- a dedicated emergency extraction system vents ammonia to a safe external point
- a separate ammonia alarm triggers a different evacuation strategy
- wind socks indicate vapour drift and guide the direction of evacuation
- burst caps on pressure relief points provide a visible sign that a relief valve has operated
- emergency plans must consider ammonia's toxicity, not just flammability

This shows how emergency preparedness must reflect the specific hazards of each substance, not just generic fire safety rules.

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Step 6 Hazardous area classification (using benchmarks and real-world conditions)

Once you understand the substances, their movement through the site, the ventilation, and emergency behaviour, you can move into the hazardous area classification (HAC) stage. This is where you define the size, distance and extent of any zones created by normal or abnormal releases.

This part of DSEAR must be based on recognised benchmark standards, not guesswork. The main standards used are:

- Energy Institute (EI) guidance for flammable liquids and vapours
- IGEM SR/25 for natural gas installations
- BS EN 60079-10-1 for gases and vapours
- BS EN 60079-10-2 for dusts
- BS EN 378 for refrigerant systems

These documents provide the technical backbone of hazardous area classification in the UK.

Using published examples – when they apply and when they do not

Most of these standards include appendices and example cases showing typical hazardous zones for common scenarios.
These examples can include:

- flammable liquid tanks
- IBC decanting
- gas pipework and pressure regulation
- vent stacks and relief points
- dust filters and cyclones
- grain handling
- spray booths
- compressors and pump seals

These examples are extremely useful if the conditions on your site match the example exactly. And this is the key problem:

Only about 10% of real sites match the published examples well enough to use them directly.

The other 90% of sites need a more detailed approach, where you:

- use the tables, charts, and formulae in the standards
- examine ventilation versus release rate
- consider the substance behaviour (density, volatility, evaporation, source pressure)
- account for obstructions, temperature, and room geometry
- follow the standard's decision steps to derive the correct zone size

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This is where experience matters. People often copy the “general example” without realising it only applies when the conditions are an exact match. That leads to hazardous zones that are either too small and unsafe, or too large and unnecessarily expensive.

Example: natural gas inside a building

Natural gas entering a facility is a good demonstration of how benchmarks should be used.
For natural gas installations, the recognised standard is:

- IGEM SR/25 – Hazardous area classification for natural gas installations

SR/25 provides detailed tables and criteria based on:

- pipe diameter
- operating pressure
- type of joint
- condition of the installation (good / average / poor)
- whether the installation is indoors or outdoors
- whether ventilation is good, limited or poor
- whether the pressure regulation equipment is enclosed or open
- whether potential points of release are low, medium, or high frequency

If you follow the SR/25 process correctly, the hazardous radius for each part of the installation becomes clear.
For example:

- A small-diameter pipe at low pressure in a well-ventilated area may require no external hazardous zone at all.
- A medium-pressure regulator inside a building with limited ventilation may have a defined zone radius, typically around the regulator and relief points.
- Larger pipes or higher pressures will have proportionally larger zones.

But this only works if the person doing the assessment understands how to apply the criteria. This is where inexperienced assessors often default to copying a diagram from SR/25 without understanding whether it applies. That is how zones become over-applied, overly large, or completely inappropriate.

A note on someone doing their own DSEAR Assessment

Some clients choose to complete the classification tables themselves using the standards, and then ask us to check and confirm their findings. This can work well if they are comfortable navigating the standards and understanding the difference between:

- a true match to an example
- a “near match” that still needs adjustment
- and a scenario that requires a fresh calculation

Most businesses, however, decide that it is safer and more efficient to have the classification completed or verified by a specialist.

If you do want a review of an assessment, we can help - DSEAR Assessment - Health and Safety Consultancy UK - Orbis Environmental and Safety

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Step 7 Physical controls, equipment, and ignition sources

Once the hazardous zones are defined, the assessment must look at the physical controls within those zones. Many assessments stop at identifying the zones but never actually check whether the equipment or behaviours inside those zones are suitable. This is where most real-world issues appear.

Mechanical and electrical equipment

This is one area where problems are extremely common. Every item inside the zone needs to be reviewed — lighting, switches, motors, pumps, fans, mixers, sensors, and any temporary equipment. A typical situation we find is equipment installed by a standard electrician rather than a COMPEX-qualified installer. It may run perfectly, but in the event of failure it could spark, overheat, or provide enough energy to ignite the atmosphere.

Common issues include:

- non-rated lights, switchgear, or fan motors in zoned rooms
- extraction systems with dust build-up around standard motors
- temporary repairs (tape, makeshift joints, improvised wiring)
- mobile phones, battery chargers, or radios being used within the zones

These details matter because the equipment may operate for years without issue, but a fault or abnormal condition is when ignition occurs.

Housekeeping and waste control

Housekeeping has a major influence on ignition risk, especially where dust or vapours are present. Layers of dust on beams, filters, motors, or inside wooden extraction housings can ignite easily if a hot surface or spark occurs. Waste also needs to be stored sensibly so flammable rags, absorbents or solvent containers are not left near ignition sources or in areas where vapour build-up is likely.

Storage arrangements and labelling

Storage should be logical and separated from ignition sources as far as reasonably possible. IBCs, drums, and cylinders must be clearly labelled, and pipework should have directional arrows and substance identification. Incorrect storage combinations or unlabelled containers make emergency control and zoning far more difficult.

Training and Supervision

Even good controls fail if people do not understand what a hazardous area means. There are three main types of training that should be considered:

- operator-level training so staff understand basic ignition controls and what not to bring into a zoned area
- supervisor training so they know how to manage equipment failures, replacements, and day-to-day controls

- responsible-person training for those overseeing DSEAR compliance, permits, inspections and any ATEX-rated equipment

This combination ensures that the controls you rely on are actually used and maintained correctly.

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Step 8 Earthing and bonding

Controlling static electricity is one of the simplest but most important parts of a DSEAR assessment. Any movement of liquids, gases or powders creates friction, and friction creates static. If that static cannot escape, it may discharge as a spark — and inside a hazardous zone, that spark is enough to ignite an atmosphere.

A competent assessment should confirm that:

- all pipework, vessels, ducting, and metal equipment are bonded together
- the entire system has a continuous, low-resistance path to earth
- flexible joints, rubber sleeves, or temporary repairs have bridging bonds fitted
- silos, hoppers, filters, and other large metal equipment are properly earthed

A common issue is a leaking pipe or duct repaired with a rubber boot. Rubber isolates one section from another, allowing static to build up. A simple earth strap across the joint normally fixes it — but it is rarely done unless someone checks for it.

Mobile and temporary equipment

Items that move or are used occasionally (IBCs, tankers, portable pumps, vacuum units) must also be earthed when in use. Clamps must be clean metal-to-metal contact; a clamp attached to paint or rust does nothing.

By the end, you should know whether:

- static has a safe escape route
- any parts of the system are isolated
- any repairs, flexible joints or temporary equipment need corrective bonding

If earthing and bonding are in place, static becomes a very low-risk ignition source. If not, this is usually one of the quickest and easiest improvements a site can make.

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Step 9 Equipment registers and ATEX inspection requirements

Once hazardous zones have been defined and all ignition sources understood, the next step is to identify every piece of mechanical and electrical equipment located within those zones. This becomes the foundation for an ATEX equipment register — a list of all items that must be inspected, maintained and compliant with the zone classification.

Many businesses are surprised to learn that this is not optional.

BS EN 60079-17 requires that all equipment in hazardous areas be formally inspected at set intervals, just like fixed electrical testing. Without an asset register, you cannot meet the inspection requirements.

A hazardous zone only works if the equipment inside it is suitable. One non-rated item — a switch, a fan motor, a sensor, a pump, even a junction box — can undermine the whole zoning strategy. The inspection register ensures that:

- you know exactly what equipment is in each zone
- each item is correctly rated for the zone it sits in
- equipment with a protection concept (e.g., Ex d, Ex e, Ex t, Ex n) remains in safe condition
- nothing gets missed during maintenance, upgrades, or breakdown repairs

This is especially important because equipment is often replaced by someone who does not realise the area is zoned. That is how non-ATEX kit ends up inside hazardous zones.

This information is then used to create your ongoing ATEX inspection schedule.

Inspection frequency

BS EN 60079-17 provides the framework, but in practice:

- most sites have annual inspections
- harsh, corrosive, or outdoor environments may need inspections every 3 or 6 months
- low-risk, stable environments may allow inspection periods to extend to 3 years

Your assessor should recommend a schedule that suits your site conditions, not a generic one.

What you should take away from this step

- a complete list of all equipment inside each hazardous zone
- confirmation of what is compliant, borderline, or non-compliant
- a clear inspection schedule so you can meet your obligations under BS EN 60079-17
- a practical basis for maintenance planning, budgeting and replacement works

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A good equipment register removes guesswork. It gives you confidence that everything inside your hazardous areas has been identified, checked, and managed — and it prevents surprises later when equipment fails or needs replacing.

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Step 10– Final evaluation, industry complexity and bringing it all together

By this stage, you should have a clear understanding of the substances on site, how they behave, the processes they pass through, the ventilation conditions, the potential emergency scenarios, the hazardous zones, the equipment inside those zones and the earthing, bonding and ignition controls in place.

This decisive step is about pulling all of that together into a single, defensible position: What is the actual level of risk, and what needs to be done to manage it?

When a business can complete its own assessment

Some sites are genuinely negligible risk, for example:

- small storage volumes
- substances comfortably below the typical DSEAR thresholds
- simple layouts with only a handful of possible ignition sources
- outdoor installations with naturally excellent ventilation
- processes that do not involve transfer, mixing, heating or agitation

In these cases, a well-structured basic risk assessment — supported by common-sense controls — may be completely sufficient. Many small facilities complete this themselves, then use a specialist simply to sanitycheck their work.

Where complexity increases

However, most real-world sites are more complex than they appear on first inspection. The level of specialist skill required changes dramatically depending on the industry:

- food manufacturing – fine organic dust, explosive powders, variable humidity
- chemical and coatings – mixing, heating, decanting, batch changes, ventilation challenges
- metalworking – metal dusts, mist, extraction reliability
- energy and utilities – natural gas systems, pressure systems, EI/IGEM application
- waste, recycling and biomass – variable dust types, unknown contaminants, fermentation gases
- large cold stores / ammonia plants – toxic gas alarms, extraction design, relief systems, plume behaviour
- fuel storage and pump systems – bunding, tank venting, overfill protection, spill modelling

The legislation is the same — but the *technical approach* is not.
A specialist assessor is often required to apply the correct standards, interpret the tables properly, verify ventilation performance, model zone sizes and identify issues that general health and safety professionals simply are not trained for.

What regulators, insurers and businesses now expect

From our experience, regulators and insurance organisations increasingly expect:

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Email : info@orbisenvironmental.com
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- evidence that ventilation has been quantified
- a clearly defensible hazardous area classification
- correct use of EI, IGEM and BS EN 60079 standards
- a site-specific emergency response strategy
- an equipment register and ongoing ATEX inspection plan
- clear, prioritised actions rather than generic recommendations
- demonstrable competence of the person completing the assessment

A “template-only” assessment rarely meets this standard, which is why poorly produced low-cost assessments often lead to higher long-term costs: oversized zones, unnecessary ATEX equipment, redesign work, and additional inspections.

The final position

Your final DSEAR conclusion should state:

- what substances are present and their key properties
- which processes create the potential for fire or explosion
- the zone sizes and how they were justified
- the equipment or behaviours that could create ignition
- the controls currently in place
- the additional controls that are required
- the inspection and maintenance strategy going forward
- the overall risk position (high, medium, low) and why

If each of the earlier steps has been completed properly, your final position will be clear, evidence-based, and capable of withstanding regulatory or insurance scrutiny.

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DSEAR risk assessment template – final guidance

This closing section gives you a practical structure to follow if you decide to write your own DSEAR risk assessment. If you already have experience using the HSE risk matrix, action-planning methods and the general principles of hazard identification, and if you have worked through each step in this guide carefully, you should be capable of producing a credible assessment for low-risk, low-complexity sites.

If, however, you decide that a specialist is needed, this section becomes your quality benchmark. Any competent assessor should include every item listed in the template below. It is important to check this before commissioning work, because a large proportion of assessments we are asked to "fix" for the same reasons: ventilation has not been measured, hazardous areas have not been properly justified, equipment registers are missing, and key standards such as the Energy Institute, IGEM and BS EN 60079 have not been referenced. When that happens, the work cannot be trusted, and we usually have to start again — which costs the client time and money.

Using the following structure helps ensure that nothing important is missed and that the resulting assessment is technically defensible.

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Appendix 1 - DSEAR risk assessment template

A practical outline for structuring your own assessment — or verifying what a specialist should be delivering.

1. **Introduction and scope**
   What the assessment covers, why it is being done, and which parts of the site are included. Include details of the site, activities, occupancy, types of substances, volumes, description of process where substances are involved.
2. **Site description and operations overview**
   A clear summary of activities, building layout, equipment, and general processes. Include details of operational times, neighbouring sites, additional risks to be considered like vehicles entering zones etc.
3. **Substances and hazardous properties**
   Identification of all flammable gases, liquids, powders and dusts, including flashpoints, LEL values, explosibility data and relevant MSDS information. Include for each substance, the volume in use at each location, the total volume for the site as a whole, the flammable characteristics, LEL / UEL / Flashpoint / LEC etc. This should all be in section 9 of MSDS information. Be careful about dusts and Powders – very often no information is available but there is a hidden comment in MSDS documents saying under certain circumstances this dust can explode – do a ctrl+f search for explode or fire and it should find the hidden details.
4. **Process flow and use of hazardous materials**
   How each substance enters the site, where it moves, where it is transferred, stored, used, heated, mixed, dispensed, or exhausted — from start to finish. Each of these will have point sources of release and will be a Hazardous area on their own so separate each step makes it easier to follow later.
5. **Ventilation assessment and atmospheric behaviour**
   Quantification of air changes, extraction performance, dilution capacity and how vapours or dusts behave in the space. Calculate grill vent sizes and angles, their locations, the size, and volume of the room, and use all of this to determine is there is sufficient ventilation to classify zones or if insufficient, the full room will be a zone.
   Remember LEV and Extraction systems, sometimes they are hazardous areas in their own right – like a wood dust LEV collector that takes dust through ducting, through a filter, collected into bags or bins and expels air to atmosphere.
6. **Emergency scenarios and response planning**
   Spill behaviour, toxic or flammable gas release points, activation of alarms, extraction, shutdowns, evacuation, drainage paths, bunds, and interceptors. Also include details such as calculations for suitable venting or relief in the event of fire such as a tank catching fire and can safely vent to atmosphere instead of over pressurising and exploding.
7. **Hazardous area classification (method and justification)**
   Full explanation of the calculations, EI/IGEM/BS EN standards used, assumptions, tables and data sources applied.

8. **Hazardous zone plans (drawings or descriptions)**
   Scaled drawings or clear verbal descriptions of Zone 0, 1, 2 or Zone 20, 21, 22 areas. You should be able to create (or be given) clear 2D side plan drawings of the hazardous areas at least. You may want this is CAD format to allow alterations and fit into the site plans. In addition, an overhead map of the site, ideally a 2D plan of the site with hazardous areas should also be issued as part of the report, failing this, labelled site map from Google maps as a minimum.
9. **Equipment within zoned areas (asset register summary)**
   A list of all mechanical and electrical equipment inside the zones, including ratings, categories, temperature classes, and compliance status.
10. **Earthing and bonding arrangements**
    The bonding network, continuity readings, flexible joints, tanker earthing, mobile equipment controls. An asset register of Earth bonding should be created and this need inspection regularly.
11. **Ignition source identification and control**
    Electrical, mechanical, static, thermal, human, and operational ignition sources, and how each one is controlled. Identify each of these in each of the hazardous areas identified. They will be common ones for each hazardous area, but all need to be captured even if duplicated. Do not forget some hidden ones like EMF, UHF Radio signals, Lightning strikes, Arson etc.
12. **Risk Assessment and Risk Scoring**
    This section is a typical risk assessment approach. Identify every hazardous Zone, process or area and allocate the risk of fire and or explosion, the existing control measures in place and then the likelihood of a fire or explosion and the consequences. The HSE 5x5 risk matrix is acceptable here.
13. **Training, supervision, and organisational controls**
    What operators, supervisors and responsible persons need to understand and how competence is maintained. Employees need awareness they are in a hazardous area and not to introduce any new ignition sources, supervisors need training on the responsibility of managing people and substances in hazardous areas – it's their area and nobody should work unauthorised in hazardous areas – like a Permit to work. Responsible persons (or in DSEAR Regs called DSEAR Coordinators) also need training to be the go-to person in the event modifications to the workplace need DSEAR attention like new substances, change of process, new mechanical, or electrical equipment in hazardous areas. More on training here – Training Services - Orbis Environmental and Safety
14. **Inspection and maintenance requirements (BS EN 60079-17)**
    The ongoing ATEX inspection schedule, inspection grades, frequencies, and responsibilities. This is almost never fully in place, but we are getting better as industry develops. Every item inside hazardous zones should be recorded and inspected.
15. **Action plan and prioritised recommendations**
    A clear, risk-based action list with timescales and responsible roles.
16. **Final risk evaluation and conclusions**
    A defensible summary showing the overall risk position and demonstrating that the assessment meets legal, technical, and practical expectations.