Don’t Fear DSEAR

Let us help you use it to your advantage

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The Gin Guild

What We Will Cover:

The Dangerous Substances and Explosive Atmospheres Regulations 2002

- *Introduction to DSEAR*
- *What we hear a lot!*
- *DSEAR Company Policy and why it's the most pieces in the puzzle*
    - *What will talk about:*
        - *Risk Assessments*
        - *Area classification*
        - *Ignition Sources*
        - *Arrangements For Accidents and Emergencies*
        - *Information and Training*
- *Normalisation Of Deviations*
- *Look at incidents in other industries and what you can take from them*

Introduction

The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002 came into force on 9th December 2002.

- *DSEAR implements the requirements of two European Directives*
  - *Chemical Agents Directive (CAD);*
  - *Explosive Atmospheres Directive (ATEX 137).*

- *concerned with protection against risks from fire, explosion and similar events arising from dangerous substances*

- *From June 2015 DSEAR also covers gases under pressure and substances that are corrosive to metals.*

- *It includes flammable substances with a flashpoint of up to 60 °C due to the CLP regulations.*

What we hear a lot

- ***It doesn't apply to us.***
  - *It applies to all distilleries handling flammable materials regardless of your size.*
  - *Implementing a policy early much like a business plan can help a process grow safely to meet the business needs of the distillery.*

- ***We have never had a fire or explosion.***
  - *This has contributed to incidents across other industries, which we will look at in this presentation.*

- ***We need it for insurance***
  - *You need it for safety, and you are effectively paying for the information the insurance company use against you when something happens*

DSEAR Policy

- *Sets standards of behaviour, conduct and performance for employees.*
- *This provides guidance to managers for how they are to conduct themselves and the standards they will be held to.*
- *assist a company in meeting its obligations at law.*
- *Let's employees know where they can turn to for help.*
- *it can help your process grow and meet the demands of the business.*

DSEAR Policy

How do we ensure operations with the potential to form explosive atmospheres are made as safe as is reasonably practicable?

1. *DSEAR Risk assessments*

DSEAR Risk Assessment

*The **hazard** is the flammable substance (ethanol)*

*The industry **risk** from the substance is:*

- *Boiling Liquid Expanding Vapour Explosion (BLEVE)*
- *Vapour Cloud detonation (faster than the speed of sound)*
- *deflagration combustion(slower than the speed of sound)*
- *Pool From the spread and ignition of ethanol.*
- *Flash fires from the ignition of vapour/air mixture from ethanol handled above Flashpoint.*

DSEAR Risk Assessment

*To **reduce** the risk, to ALARP we can use the hierarchy of controls.*

- *Eliminate*
- *Reduce*
- *Engineering Controls*
- *Administrative Controls*
- *Mitigation*

DSEAR Risk Assessment

- *Can I do It myself? Yes, and for small micro-distilleries, I recommend using guidance from the HSE-approved codes of practice!*
- *It should be part of the manufacturer's documentation for small to medium Stills with mass-produced stills.*
- *For large bespoke distilleries, it's all part of the design process and should be part of the handover documentation.*

DSEAR Risk Assessment

5. Risk assessment and safety precautions

danger	Safety precautions
fire-/explosions risk	avoidance of ignition source.
	No parts reaching 330°C during normal operation. (ignition temperature minus 70°C safety margin).
	Heating element cases are sealed as they are filled with Polyurethane to make them ignition spark safe. Max. Temperature 120°C.
	Agitator motor relates to cluster T4 with max. Surface temperature of 135°C.
	Distillery control panel mounted as tight case.
	Distillery stays closed during normal operation. Pre-shot gases can be dissipated to the outside of the building.
	After the CIP cleaning process no alcoholic vapors remain in the distillery.
	Cooling water temperature control with automatic heating switch off.
electromagnetic hazards	Distillery is made out of conductive material.

Müller GmbH Brennereianlagen declares that all electrical equipment is suitable for use on pot still **COMPACT III with** as long as the following requirements are maintained:

- Components are protected from overvoltage.
- Surrounding Temperature does not exceed + 50°C.
- Liquid spillage on electrical components can be minimized. (All components fulfil minimum IP64 Standards)
- Only original spare parts are being installed.
- The distillery got a regular air exchange.

Müller GmbH
Brennereianlagen
77704 Oberkirch-Tiergarten
Tel. 0 78 02 / 9 35 50

Date: 01/02/2020 in Oberkirch – Tiergarten

DSEAR Policy

How do we ensure operations with the potential to form explosive atmospheres are made as safe as is reasonably practicable?

1. *DSEAR Risk assessments*
2. *Hazardous Area Classification*

Area Classification

- *Please remember that an area classification, assesses the process for release in normal operation and foreseeable abnormal situations.*
- *There could also be an onus on you from the manufacturer to provide certain criteria.*
- *Although all standards share the same format regarding zoning they are, not all suitable to use.*
- *BSEN 60079-10-1 States, " For mass-produced equipment that can be deployed in a range of different situations, such equipment may be subject to a generic hazardous area classification with relevant instructions*
- *Area classification reports should be accompanied by plan and elevation drawings of the hazardous areas as a recommendation.*

Area Classification

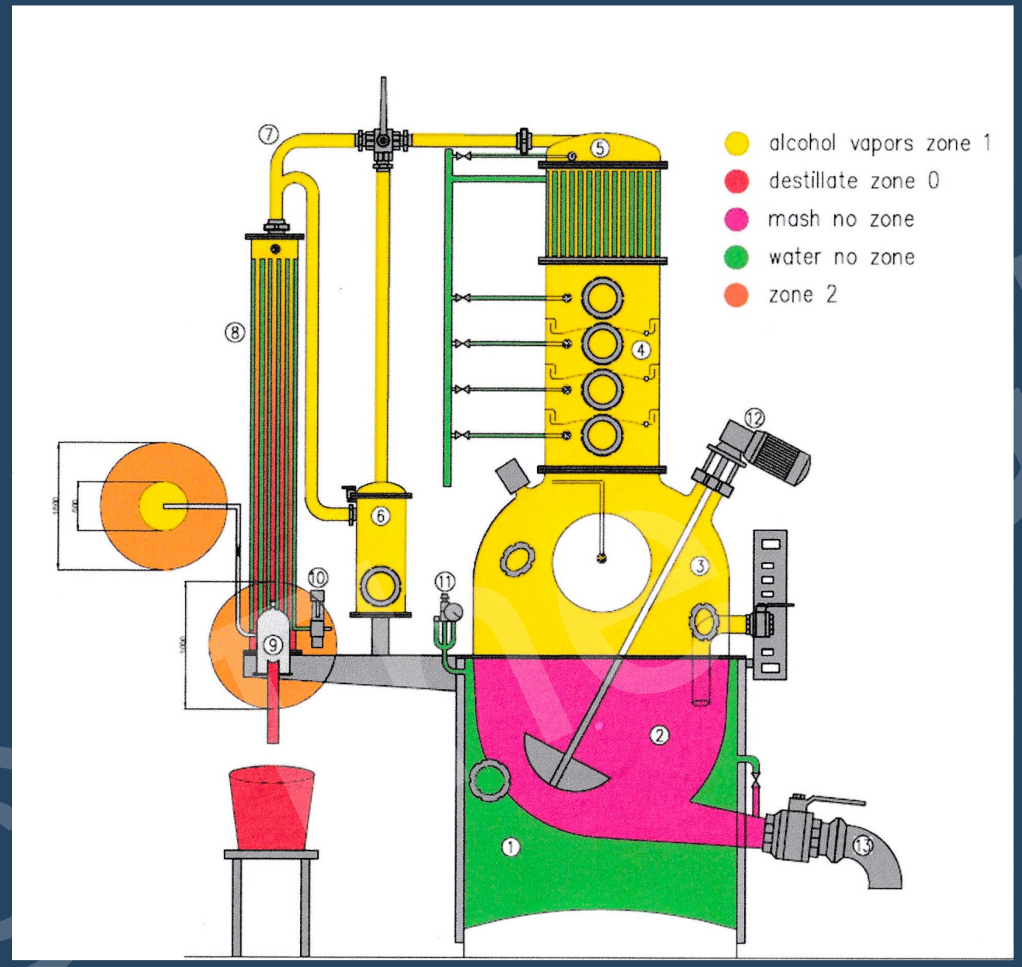
Zone 0 – an area in which an explosive gas atmosphere is present continuously or for long periods,

Zone 1 – an area in which an explosive gas atmosphere is likely to occur occasionally in normal operation.

Zone 2 – An area in which an explosive gas atmosphere is not likely to occur in normal operation but, if it does occur, will exist for a short period only

Area Classification

Example of Manufactures Documentation



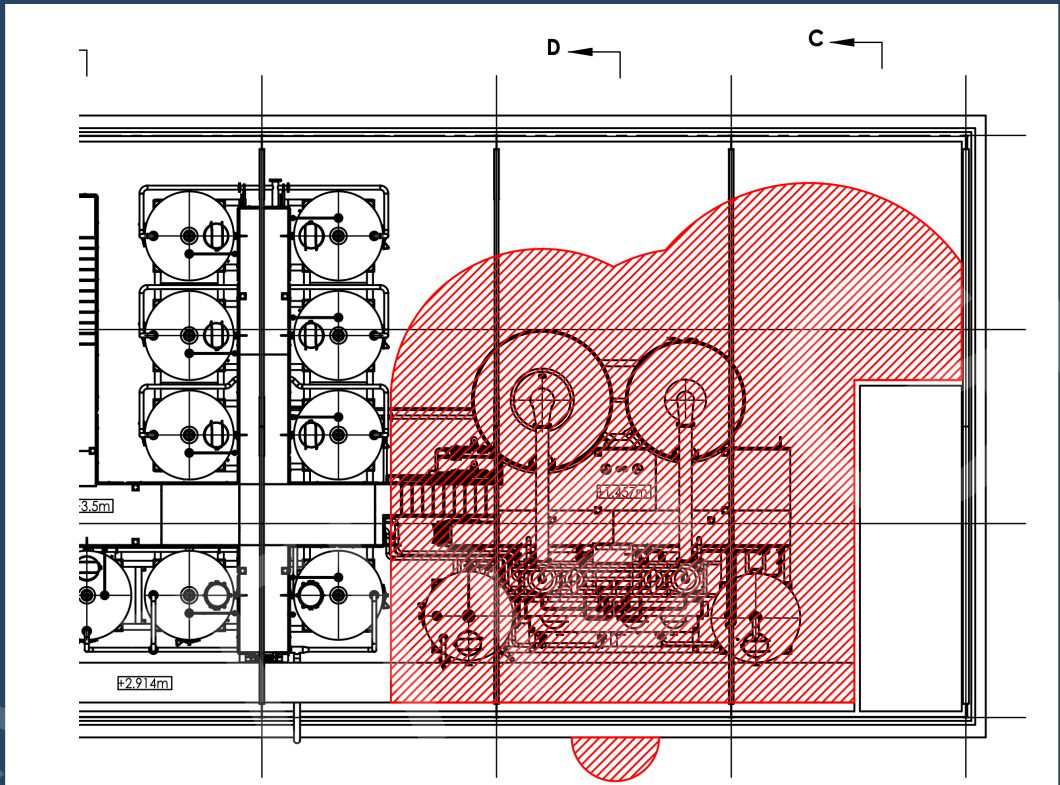
4. Distillery zones

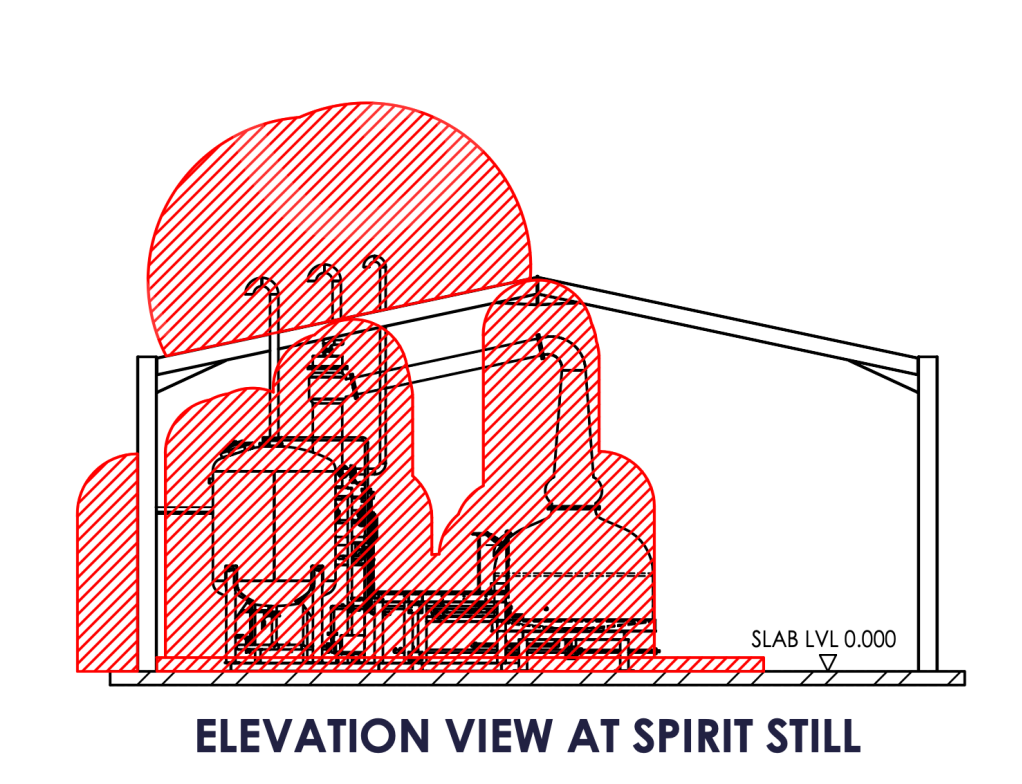
Corresponing coloring can be found in the technical distillery sketch by the appendix

Distillery part	Zone	Reason for zone allocation
Pot with hat, column and ghost pipes	1	During distillation the higher explosion border is reached. Only during start and end of the distillation process an explosable alcohol-air concentration could be reached.
condenser	0	Due to the condensing alcohol steam and its high alcohol concentration a explosable atmospherich can be reached during distillation.
Collecting area (bucket)	0	The bucket can contain a flamable concentraion of alcohol.
Surrounding the distillery area	**Zone**	**Reason for zone allocation**
Pot still	No zone	• Pot Still is tecnically permanent tight • Ventilation to the outside should be installed • Technical ventilation
Close-up range around the condenser spout	2	Rapid decline of alcohol concentration by natural and technical ventilation.
Close-up range around the condenser exhaust	1 (0,5m around the exhaust)	during start and end of the distillation process a explosive alcohol-air concentration could be reached.
	2 (from 1m around the exhaust)	Rapid decline of alcohol concentration by natural and technical ventilation.

Area Classification

Plan and Elevation views





DSEAR Policy

How do we ensure operations with the potential to form explosive atmospheres are made as safe as is reasonably practicable?

1. *DSEAR Risk assessments*
2. *Hazardous Area Classification*
3. *Ignition Sources*

Ignition Sources

At a minimum, you should consider the following

- *Heat;*
  - *Remove/exclude if possible*
  - *Atex Certified if required*
- *Electrical;*
  - *Remove/exclude if possible*
  - *Atex Certified if required*
  - *Keep all equipment at the same potential to eliminate static*
- *Mechanical;*
  - *Remove/exclude if possible*
  - *Atex Certified if required*
  - *Keep all equipment at the same potential to eliminate static*
- *Chemical.*
  - *Store non-compatible substances separately.*
  - *Using both industry guidance and MSDS*

Atex Certified Equipment

ATEX equipment is designed and certified to be used in potentially explosive environments, ensuring safety and reliability.

- *initial inspection of all electrical equipment, systems and installations before they are brought into service.*
- *periodic inspection of all electrical equipment, systems and installations carried out on a 3-year cycle*
- *All mobile equipment should be inspected on a yearly basis*
- *inspection activity shall be sufficiently independent of the installation/maintenance team.*

Atex Certified Equipment

Costly mistakes go undetected

Atex Certified Equipment

Poor installation of equipment

DSEAR Policy

How do we ensure operations with the potential to form explosive atmospheres are made as safe as is reasonably practicable?

1. *DSEAR Risk assessments*
2. *Hazardous Area Classification*
3. *Ignition Sources*
4. *Arrangements for Accidents, Incidents and Emergencies*
5. *Information and training*

Arrangements for Accidents, Incidents and Emergencies

- *everyone knows what to do in the event of an emergency.*
- *quick and efficiently respond to emergencies.*
- *helps to minimize damage to the company's assets and reputation.*
- *can lead to increased productivity and a better working environment overall.*
- *Emergency procedures don't have to be long, but they do need to be clear and concise.*

Information and training

- *helps improve the knowledge and skills of employees to match the various changes in the industry.*
- *By providing accurate information and training, individuals can learn how to identify potential hazards*
- *helps to prevent accidents and injuries.*
- *promotes the right culture and company standards.*
- *Helps prevent Normalisation of deviance*

Normalisation of deviance

The term refers to the change that takes place over a period of time when people gradually stray from established standards without negative consequences until that lower standard becomes the norm.

Buncefield -2005

A low-lying cloud of heavy, flammable vapour accumulated and spread out for about 250m in all directions around the tank, releasing 250.000 litres of fuel, which found an ignition source

Buncefield -2005

The conclusion of the inquiry.

- The process safety controls on safety critical operations were not maintained to the highest standard;
- senior managers did not apply effective control;
- effective auditing & monitoring of systems were not in place.
- The high levels of confidence that they completely understood flammable risks were not justified. Such attitudes are always dangerous

Halifax-2021

A worker had been decanting heptane from a metal drum into a plastic bulk container.

The splash filling of Heptane generated a static charge creating a spark which caused an explosion during the decanting process. Flammable material then spread

Halifax -2021

The conclusion of the inquiry.

- Unsafe process of decanting despite well known industry guidance
- Uncontrolled spread of fire due to lack of containment.
- Poor Practice of storing cardboard nearby allowed the fire to spread significantly.
- A lack of training and supervision.

Thank you!

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