

Explosion Protection Document for Gas Extraction Systems

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1. Background, basis: „ATEX“ Regulation on Industrial Safety

What stands behind ATEX: ATmosphere EXplosible – explosible atmosphere

Four letterstwo comprehensive directives

ATEX 100a is known to the industrial sector, and is now entitled ATEX 95, better known as 94/9/EC Directive dated March 23rd 1994

Since very recently, this decree applies both to electrical and non-electrical components in Europe.

ATEX 137 (118), better known as the 1999/92/EC Directive dated December 16th 1999: „On minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres”. In Article (9) is written:” ... the employer is to draw up an explosion protection document, or set of documents, which satisfies the minimum requirements ... “

2. Action for the owner / operator the sides

In other words: The operator exactly the owner (employer) of a landfill has to write a document with his own safety standards on side – especially for the gas extraction system: Beginning at the gas wells over all the pipe works, manifold stations, condensate shafts, booster station, flares until CHP – units / gas engines. Further more the owner has to describe the normal operation of the whole gas extraction system, the O&M – works and the failure which can happen. The classification (zoning - hazardous places) and the protection of the equipment and the instructions for the operators can be different in this three ways of operation.

Obligations:

- Prevention of the formation and ignition of an explosive atmosphere
Measures: regular inspections, measurements and optimization
and
- Statistical probabilities (probability and duration of the occurrence of an explosive atmosphere, probability of the existence, activation and effect of ignition sources, including electrostatic discharges)

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Measures: regular inspections, measurements, optimization and the prevention of the existence of ignition sources in accordance with DIN EN 1127-1 and

- The degree of the effect to be anticipated

Measures: the respective plant components are accommodated in separate and closed buildings and do not belong to the permanent work area of the personnel involved

Further more: The landfill gas plant must be secured against unauthorized entry.

And : All buildings must be provided with the respective safety signs e.g. “EX”

Ternary (three component) diagram, atmospheric

For the explosion area methane / air / CO₂-N₂ - mixture

Acc. to Tabasaran / Rettenberger (UBA – Forschungsbericht 12/1982, Nr. 10302207 Teil1)

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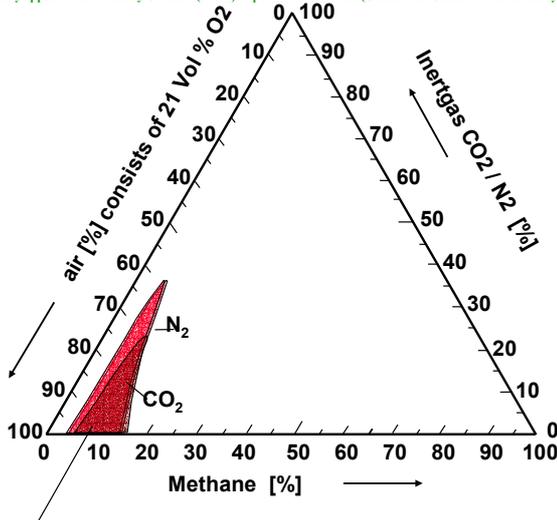
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Biogas, sewage gas and landfill gas technology:

• Consultation, planning, projecting

• Training of operating personnel

• Expert services (among other things in accordance with § 29a BImSchG (Federal Immission Control Act) and a publicly appointed and Publicly Certified (sworn) Expert at the IHK Kiel (Chamber of Commerce and Industry)



Explosion area : Exceeding of 11,6 Vol % oxygen
and
between 4,4* (5)** Vol % methane (100 % LEL) and 15
(16,5) Vol % methane (100 % HEL)

* IEC 60079-20 and PTB ** EN 50054

3. Finally

This means that the operator of a gas plant is thus enabled, on the experience gained with his own enterprise on which he may exert influence by carrying out maintenance works, inspections, optimisations etc., „to assess and act in a safety-related manner“ in view of and within the scope of the explosion protection document (risk analysis).

And those who are scared....rely on „expertise“.

And this is what remains in the end: more independence and creative potentialities regarding internal regulations. „Define“ the zones here and then employ tools for these zones in accordance with 94/9/EC!