

RISK ASSESSMENT

within Gas Appliance Regulation EU/2016/426

Why preparing risk assessment documentation for GAR

To issue GAR certificate, it needs a new test report, which is covering at least:

- a) The GAR essential requirements (**Annex I**)
 - b) The **state of the art** (current standards, if applicable)
 - c) Manufacturers documentation on **risk assessment**
- (see GAR, ER 1.2, 1.3 / OJ 26.07.2016 – 2016/C 272/39 “blue guide”)
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See EU/2016/426 (GAR), **Annex I, “Essential Requirements”**:

- 1.2. The manufacturer is under an obligation to analyse the risks in order to identify those which apply to his appliance or fitting. He shall then design and construct it taking into account its risk assessment.
- 1.3. In selecting the most appropriate solutions, the manufacturer shall apply the principles set out below, in the following order:
 - (a) **eliminate** or reduce risks as far as possible (inherently safe design and construction);
 - (b) take the necessary **protection** measures in relation to risks that cannot be eliminated;
 - (c) **inform** users of the residual risks due to any shortcomings of the protection measures adopted and indicate whether any particular precautions are required.

See EU/2016/426 (GAR), **Annex III**,
“CONFORMITY ASSESSMENT PROCEDURES ”:

1.3.1. The application shall include the following:

.....

- c) the **technical documentation**. The technical documentation shall make it possible to assess the appliance's or fitting's conformity with the applicable requirements of this Regulation and shall include an **adequate analysis and assessment of the risk(s)**.

The technical documentation shall specify the applicable requirements and cover, as far as relevant for the assessment, the design, manufacture and operation of the appliance or the fitting.

1.4. The notified body shall:

For the appliance or the fitting:

1.4.1. **examine** the **technical documentation** and supporting evidence to assess the adequacy of the technical design of the appliance or the fitting.

....

1.5. The notified body shall draw up an **evaluation report** that records the activities undertaken in accordance with point 1.4 and their outcomes.

Preparing the risk assessment documentation for GAR

The risk assessment shall be focused on the Essential Requirements of the GAR, Annex I.

For the elaboration the following guide may be helpful:

- The **risks addressed by the GAR** shall be covered
- Covering the requirements of a **standard only may not be sufficient** to cover a risk assessment according to the GAR
- Specific risks **covered by a measure of the** relevant **fulfilled standard** (state of the art) are seen as to be covered

In standards generally relevant for “risk assessment” usually terms as “**cause**”, “**hazard**” and “**harm**” are used. These terms may be used to demonstrate covered risks e.g. in an appropriate table.

Clue points for elaboration of such table may be find as well in e.g.:

ISO Guide 51 or ISO 12100

The Gas Appliances Directive - Advisory Committee **GADAC**

elaborated a document with hints: “Document GAD-AC N 519E v2”

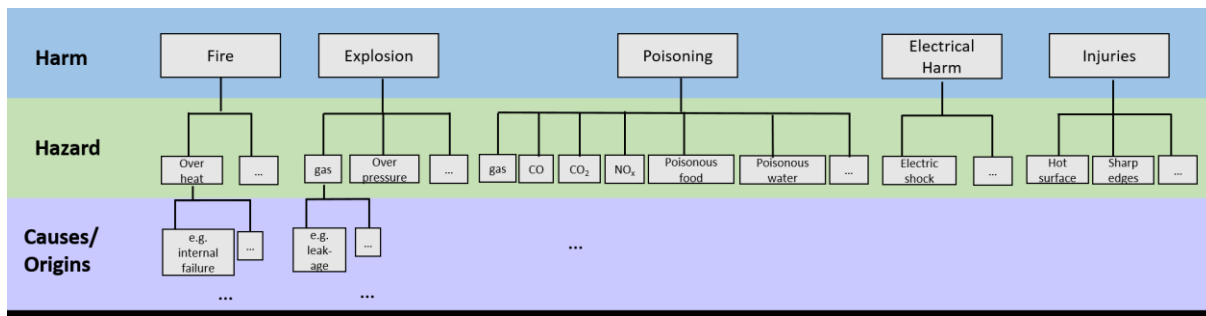
GADAC identified the following risks as related to the GAR:

I: Safety:

- Explosion (gas or steam),
- Fire,
- Hot surface temperatures,
- Poisoning (combustion gases, water and food),
- Suffocation.

II: Health of persons and domestic animals:

- Long term exposure to substances harmful to health



Existing technical requirements which incorporates a method for Risk Analysis (e.g. such as EN 15502 / EN 14459) can be used as the basis of the risk analyses to cover the safety risk.

When designing and constructing the appliance, and when drafting the instructions, the manufacturer shall envisage not only the intended use of the appliance, but also the reasonably foreseeable use (as stated in GAR, Annex I, ER 1.4).

Example risk assessment table

Harm	Hazard	Cause	risk reduction measure			Comment	Standard Clause	ER GAR
			e	p	i			

e: eliminate (e.g. construction); p: protection, i: inform

Examples for harm:

- Fire
- Explosion
- Poisoning/Suffocation
- Electric harm
- Injury

Examples for hazard:

- Over temperature (surface, domestic water)
- Unburned gas
- Flue gas spillage
- Poison food
- Poison water
- Gas leakage
- Electric shock
- sparks
- Sharp edges
- ...

Examples for Cause:

- Fail of safety device
- Fail of regulating device (e.g. fitting)
- Fail of control device
- Over load
- Exceeded temperature (inside/external)
- Exceeded pressure (gas supply)
- Over voltage
- Operator failure
- Ageing (components)
- pollution
- leakage
- Inappropriate Installation (room too small, walls too near...)
- Wrong marking of handles, Knobs
- Unintended access to manufacturers adjustments
- EMC phenomena
- Ignition fail
- Incomplete combustion (flame lift, ...)
- External fire
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Examples for measure:

- Fitting / component according to EN xxx:20xx (certificate)
- Not applicable, because ...
- Excluded by construction
- Covered by testing according to ENxxx:20xx, Clause x.y
- Warnings, instructions, ...

Examples of specific risks

- Non supervised flame may lead to unburned gas, which may lead to explosion.
- The risk reduction measure may be use of a burner control according to EN298.
- This may not cover automatically all risks, if e.g. a burner control is specified correctly according to EN298 (ambient temperature 0..60°C), but location of the control in the appliance provides micro environment with higher ambient temperature.
- How is the resulting risk (hazard → harm) reduced then?
- Fitting is conform to relevant component standard, but mirco environment does not fit, supplied pressure is exceeded, variation of supply voltage wider than expected
- Electronic gas air ratio control (s. EN 15502-x)
- Reasonable foreseeable use of caravan heating appliance with thermoelectric safety device, when gas bottle gets empty and is replaced immediately, but the operation is not manually stopped by turning of the thermoelectric device. Then gas may be released unburned and ignited again by the user.
- No requirements on hygienic topic for potable water in the gas related standard