

What's the difference between risk & hazard?

Are **risk** and **hazard** synonyms? When does a hazard become a risk? How can risks be minimised and avoided? These two terms are often used to describe the same or similar things, but this isn't entirely accurate as risk and hazard relate to **very distinct concepts**. Not all hazards represent a risk; it is **exposure** which makes all the difference.



HAZARD

The innate property that enables something to cause harm

A hazardous object or condition has a built-in ability to cause harm. Examples include an icy road, uneven pavements, machinery, noise, wild animals and UV radiation from the sun.

These situations have the ability to cause harm: slips, trips, falls, or even sunburns. But will they? Just because something can cause harm doesn't mean it will. When preventive measures are taken, such as using the right shoes, protective gear or tyre pressure, risks can be minimised or avoided.



“A hazard can exist without being dangerous if it's controlled.”

EXPOSURE

Extent to which a recipient is subjected/exposed to a hazard

Exposure is a necessary condition for a hazard to become a risk. If people or the environment are exposed to a hazardous substance above a safe level, the odds of harm increase.

We all need some sunlight to stay healthy, but excessive exposure poses a risk. This can be minimised by sunscreen or sunglasses. Many food additives have a safe limit, known as the acceptable daily intake, set by scientific authorities. If exposure stays within this limit, there is no risk. Even occasional exceedances may not pose a risk because safety factors are built in.

Low exposure

High exposure

SAFE

CAUTION

RISK

RISK

The likelihood that harm will actually occur

For a hazardous object or situation to become a risk, there must be exposure.

A wild and dangerous animal will always represent a hazard, but as long as it remains properly caged, it will not represent a risk.

We live surrounded by hazards and constantly perform risk assessments in our daily decisions – crossing the road, choosing food, or travelling. Some hazards cannot be avoided entirely. Life is risk!



**RISK =
HAZARD x EXPOSURE**

RISKS AND HAZARDS IN CHEMICALS

The fact that a chemical is deemed hazardous does not necessarily mean there is a risk.

Its built-in ability to cause harm classifies it as hazardous, but if it is handled safely and under controlled conditions, it is safe for use. Frequency and amount of exposure are key to determining the level of risk.

Risk assessments determine safe limits of exposure, known as **Acceptable Daily Intake (ADI)**, **Tolerable Daily Intake (TDI)** or **Derived No Effect Level (DNEL – REACH terminology)**.

Even going above this limit occasionally does not mean there is a risk, as large safety factors are incorporated.

“All things are poison, and nothing is without poison; the dose determines the poison.”

— Paracelsus (1493–1541)