

1.9 Guidance

Impurities and contaminants

This guidance helps you to understand what impurities and contaminants are and why they can matter.

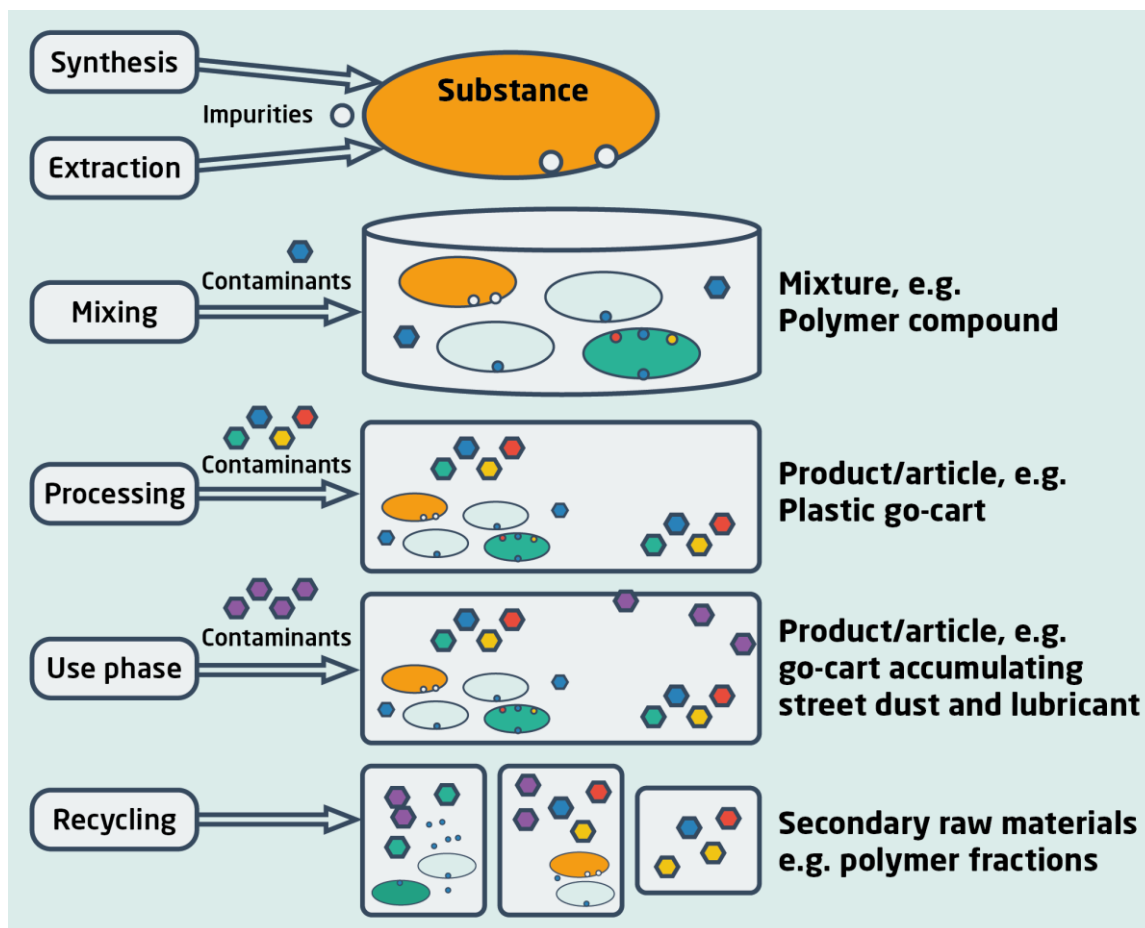
What are impurities and contaminants?

Impurities and contaminants in substances, mixtures or products can hardly be avoided. Along the supply chain, impurities and contaminants from different sources may add up and co-occur in the final product, e.g. a toy.

Impurities co-occur with a substance but are not intended to be there. Impurities may be side-products of a chemical synthesis due to incomplete or diverse reactions. If chemicals are made from natural materials, e.g. latex, there are very many substances in the latex in very low concentrations.

Contaminants may enter the products, i.e. mixtures or articles, at any stage of the life cycle. Potential sources of contaminants are

- (unintended) reactions of substances, e.g. if a material is processed under very hot conditions,
- Residues in processing equipment, e.g. if a plastic compound is extruded, remnants of the material that has been extruded in a previous manufacturing cycle may reside in the machines and be transferred to the product
- processing auxiliaries may remain in the product, such as solvents, lubricants etc.



Once impurities and contaminants enter a material stream or a supply chain, they are passed on to the next lifecycle step and supply chain actor, normally without anyone being aware of them. And at each step, there may be more of them, as the number of chemical substances increases (impurities) and more processing steps are implemented.

Normally, the occurrence of impurities and contaminants does not pose significant problems because:

- Usually, they are contained in products in very low concentrations, i.e. below legal thresholds [#Section 2.1 Guidance how to find](#) or even below levels of detection
- Many of them are not hazardous and those which are, may not cause any concern due to the low concentrations in the product (cf. above).

When and why can impurities and contaminants be a problem?

Confusion about the hazards / classification of a substance

Indeed, some impurities of a substance may be very hazardous and contribute to the overall hazard of a substance. Hazard testing [#Section 1.3 Guidance GHS for](#) is performed with the substance including its impurities. Therefore, one distinct substance will get a certain classification. However, **the same chemical substance** (same CAS number) but **from a different producer may have different impurities**, resulting in **different hazards (and potentially different classification)** being communicated for that same substance. This is confusing!

Lack of information on the occurrence

As impurities and contaminants are not intended to be part of substances, mixtures or articles their **presence in products is mostly unknown and therefore not communicated** [#Section 6.1 Guidance importance of](#) along the supply chain. If these impurities and contaminants are chemicals of concern [# Section 1.1 Guidance understanding SoCs](#), their content may be prohibited by law, or their content be requested to be “below the level of detection” by the customers. **This is problematic because if one doesn’t know if a substance is present as impurity or contaminant, no measures can be taken to prevent the occurrence. If they are identified via a chemical analysis in the final product**, the supplier of that product may be non-compliant or lose a customer.

Example: PFAS in Textiles

PFAS are a group of very hazardous chemicals, amongst others being used to make clothing water repellent. A producer of trousers found PFAS in his products but never used these substances in the production and even prohibited their use to his suppliers. He finally found out that the textile finishing company water-proofed textiles before it processed his trousers and that the PFAS traces were “washed off” the machinery from the previous batch.