FOR KRAV CERTIFIED COMPANIES



PACKAGING GUIDE

Step by Step Towards Environmentally Friendly Packaging

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Packaging Guide - Step by Step Towards Environmentally Friendly Packaging
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WELCOME TO THE KRAV PACKAGING GUIDE!

This is a guide to help you navigate using KRAV's packaging standards. The purpose is to simplify and clarify the work towards using environmentally friendly packaging that complies with the KRAV standards.

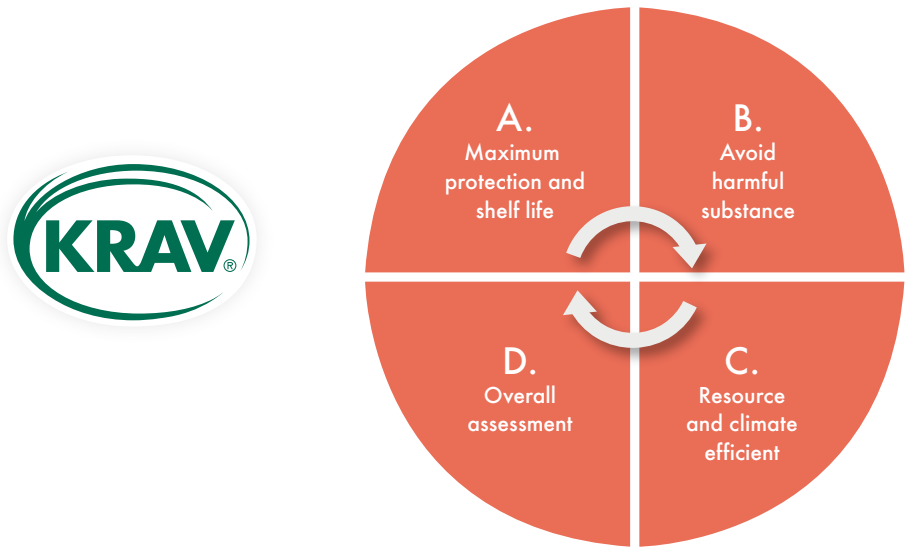
The KRAV standards for packaging are found in section 3.5 of the KRAV Standards. In addition, there are some other individual standards that may affect your choice of packaging.

During the annual audit, the certification body assesses if your company has complied with the KRAV Standards for packaging.

ORGANIZATION OF THE GUIDE

The guide is organized as shown in the graphic below. The light red arrows describe the basic requirements for all food packaging, regardless of whether or not a product is KRAV-labelled.

The green circle is based on the standards made by KRAV that exceed legal requirements. Each of the four parts of the circle is described in a separate section of the guide.





STARTING POINT: COMPLY WITH THE LAW

This section does not attempt to give a comprehensive description of the legislation regarding food packaging which is especially vast. We have chosen to describe some key points which all companies are required to comply with. If you are familiar with the legal requirements, you can skip this part of the guide.

A prerequisite is that packaging complies with all the general requirements that society and the industry place on the package in question.





The EU Directive 94/62/EC on packaging and packaging waste is a comprehensive regulatory framework intended to reduce the environmental impact of packaging and facilitate free trade without national packaging regulations. The directive specifies both design requirements for packaging and recycling requirements:

- **Design requirements** specify that packaging must be made so that the volume and weight are limited to the minimum required to ensure the necessary levels of safety and hygiene. The content of hazardous substances in the packaging must also be minimized and maximum levels are provided for some heavy metals.
- **The recycling requirement** specifies that used packaging must be collected and recycled.

In Sweden, the packaging directive has been introduced via the Regulation on Producer Responsibility for Packaging (SFS 2018:1462). The regulation specifies, among other things, goals for recycling for different types of materials.

CEN-Standards: According to the packaging directive, the essential requirements for a package are considered to be met for packaging that complies with the following six harmonised standards:

STANDARD	APPLIES TO	EXTENT
SS-EN 13427	Requirements for the use of European Standards in the field of packaging and packaging waste.	User guide for the standards
SS-EN 13428	Requirements specific to manufacturing and composition aimed towards preventing packaging waste.	Specifies how to evaluate whether packaging consists of the minimum amount of materials and how to minimize hazardous substances.
SS-EN 13429	Reuse.	Specifies criteria for packaging-considered to be reusable.
SS-EN 13430	Requirements for packaging recoverable through reuse of materials.	Specifies criteria for packaging that will be recycled through reuse of materials.
SS-EN 13431	Requirements for packaging recoverable through energy recovery, including specification of minimum inferior calorific value.	Specifies criteria for packaging that will be recycled through energy recovery.
SS-EN 13432	Requirements for packaging recoverable through composting and biodegradation. Test schedule and evaluation criteria for the final acceptance of packaging.	Specifies criteria for packaging that will be recycled through composting and biodegradation.

Compliance with the standards is one way to show that packaging complies with the law, but implementation of the standards is voluntary. The supervisory authority can carry out a more in-depth analysis of producers who do not comply with the standards to see if packaging complies with the essential requirements of the directive.



Food related packaging laws are found primarily in various EU regulations, which amongst other things include general standards for materials and products that come into contact with food, specific standards for e.g. polymers, as well as standards for producer responsibility for packaging.

LAWS THAT APPLY TO ALL FOOD PACKAGING:

» Regulation (EC) 1935/2004	on materials and articles intended to come into contact with food.
» Regulation (EC) 2023/2006	on good manufacturing practices for materials and products intended to come into contact with food.

LAWS THAT APPLY TO SPECIFIC MATERIALS THAT COME INTO CONTACT WITH FOOD:

» EC Regulation 10/2011	on plastic materials and products.
» EC Regulation 450/2009	on active and intelligent materials and products.
» EC Regulation 282/2008	on recycled plastic materials and plastic products.
» Directive 2007/42/EC	on materials and products made of regenerated cellulose film.
» Directive 84/500/EC	on ceramic materials.

One of the laws that should always be applied and where the application should be validated by packaging suppliers is the **Regulation on Good Manufacturing Practices** (EC) 2023/2006 (GMP Regulation). It applies to all stages, including manufacturing, processing and distribution of materials and products intended to come into contact with food.

In Regulation (EC) 10/2011 (the so-called plastics regulation) there is a list of substances permitted for use in plastic materials that are intended to come into contact with food.

For materials and products made of plastic, ceramics, regenerated cellulose as well as active and intelligent materials and products, there are specific laws that amongst other things regulate migration, migration tests and documentation.



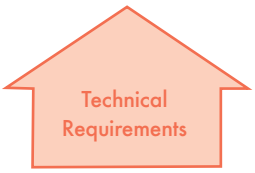
DECLARATION OF COMPLIANCE (DOC)

Materials and products made of plastic, ceramics, regenerated cellulose as well as active and intelligent materials and products must be accompanied by a declaration of compliance (DoC). The document must show that the materials and products comply with applicable laws. It must also show under what conditions and for which foods the materials or products can be used.

The documentation (DoC) must be present in each marketing stage except for the retail stage. The retail sector is covered by Article 15 in regulation 1935/2004, which deals with how materials and products intended to come into contact with food must be labelled. Those who produce the final packaging must receive all information from previous stages that is required in order to make a DoC. The exception does not apply to ceramic materials, where the written documentation must also be present at the retail stage.

In all the specific laws for materials and products intended for coming into contact with food, there is a description of what a declaration of compliance (DoC) must include.

» *Read more on the Swedish National Food Agency website about materials in contact with food (in Swedish only)*



In addition to the legal requirements for packaging based on food safety, there are also a number of requirements to ensure that packaging functions in the existing transport logistics. There are for example stability requirements for the material and packaging.



There is also legislation covering marketing of products. There is detailed legislation especially for food that regulates what claims can be made and what information must be provided on packaging.

» *There is more information about this on the Swedish National Food Agency website (in Swedish only).*

COMPLYING WITH THE KRAV STANDARDS

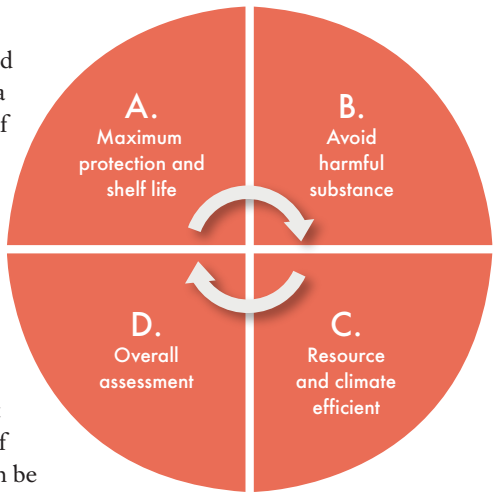
Thus, for those wanting to KRAV-label a product, in addition to the laws that apply, compliance with the KRAV standards on packaging is also required. The KRAV standards involve more stringent requirements, for example with regard to hazardous chemicals, and also signify that your company can clearly show how it works systematically to environmentally optimize packaging in general. The legislation on producer responsibility has a high level of ambition in theory, but its implementation is often unclear and difficult to verify. One of KRAV's ambitions is therefore to clearly specify what good and bad decisions are when choosing packaging.

There are three basic aspects that packaging must meet. It must:

A) function well and efficiently protect and preserve the product.
B) be as free as possible from substances that can harm human health or the environment.
C) be resource and climate-efficient.

Constituent materials must have as little environmental impact as possible and be recyclable. The material must be used in a resource-efficient manner, and packaging must also support the most energy efficient transport solution possible.

Of course, choice of packaging options is also an economic and technical issue. Availability of options and the ability to scale a packaging system up or down is important. Therefore, some of the standards are specific (such as bans on certain substances and materials) while others are more general and require a full assessment of the whole packaging system.



D) Overall Assessment of A and C

There can be conflicting goals between A (maximum protection and shelf life) and C (resource and climate efficient). An example is that the weight of a package must be minimized but at the same time the shelf life of the product must be as good as possible. By making a overall assessment of the packaging's function and materials an optimal solution can be achieved.

The packaging guide therefore also contains part D where you make an overall assessment of your packaging solution. The standards for harmful substances (B) are however specific, and cannot be included in the overall assessment.

WORKING WITH CONTINUAL IMPROVEMENT

Packaging development is progressing rapidly, which means that new technical solutions and materials become available. It is therefore important for KRAV-certified companies to continually evaluate opportunities for improving and refining packaging solutions from a health and environmental perspective. This means that you must repeatedly explore opportunities for further improvements and implement them where possible.

An audit to check if your packaging complies with the KRAV standards is done by an auditor from a certification body as part of the annual audit.

PACKAGING ACCORDING TO THE KRAV STANDARDS 2019-20

A
Maximum protection and shelf life

3.5.1 and 16.6.4 Resource-efficient Packaging
The main purpose of packaging is to protect and preserve the product. You must therefore choose or design packaging so that food, feed or production aids reach final consumers without unnecessary loss of quality, and so that waste is minimized at every stage.

C
Resource and climate efficient

3.5.1 and 16.6.4 Resource-efficient Packaging (continued)
In addition, packaging should be as resource-efficient and as climate neutral as possible by taking the following into account:

- use as little material as possible
- use renewable packaging material
- use recycled material when possible
- make sure packaging can be reused or recycled in existing systems
- make sure packaging favours energy efficient methods of transportation
- make sure that packaging is easy for consumers to empty and sort.

During inspections, you must be able to show that this has been done.

B
Avoid harmful substances

3.5.2 and 16.6.5 Avoid Substances and Materials that are Harmful for Human Health and the Environment

You must strive towards using toxin-free substances and materials in your KRAV-certified products. This is especially important for the part of the packaging that comes into contact with food, feed or production aids.

You must check to determine whether any of the SIN substances in Appendix 3 are present in your packaging, and if so, make a plan to phase them out. The standard applies only to primary packaging.

3.5.3 and 16.6.6 Ban on Bisphenol A
Bisphenol A must not be used intentionally in packaging for KRAV-certified products packaged after 1 January 2018. The standard applies only to primary packaging.

3.5.4 and 16.6.7 Ban on PVC and Other Chlorine-based Plastics
PVC (polyvinyl chloride) and other chlorine-based plastics must not be used in packaging for KRAV-certified products packaged after 1 January 2018. The standard applies only to primary packaging.

PVC is however permissible in lid seals as well as metal sealants in those cases where you can show that alternative solutions cannot guarantee the shelf life or quality of the food in question. A condition is that you are working on a phase-out plan.

3.5.5 and 16.6.8 No Preservatives or Disinfectants
Packaging must not be treated with preservatives or disinfectants. Disinfection with the help of hydrogen peroxide is however permitted.

3.3.6 and 16.6.9 Use of Nanomaterials and Nanotechnology is Prohibited
Use of technologically produced nanomaterials in KRAV-certified production, including packaging and other surfaces where the product comes into contact with food is prohibited.

A PROVIDE FOOD WITH OPTIMAL PROTECTION

The main purpose of packaging is to protect and preserve the product. You must therefore choose or design packaging so that food, feed or production aids reach final consumers without unnecessary loss of quality, and so that waste is minimized at every stage.

From KRAV standards 3.5.1 and 16.6.4

The fundamental purpose of food packaging is to protect and preserve the product. To achieve this, both the choice of material and design are important. Other factors are the size of the packaging and how the packaging makes it easier to handle the product.

A1. INCREASED SHELF LIFE IN UNOPENED PACKAGING

For many, but far from all foods, it is essential that packaging provides an as effective barrier as possible against oxygen, contaminants and moisture. Here it is important to select appropriate packaging material with the right barrier properties.

For foods that are not organic, preservatives are often used to combat harmful microorganisms such as mould bacteria, for example. KRAV permits very few preservatives and only those that are well-tried. At the same time, this means that food can be more susceptible to attack by microorganisms, and to improve shelf life, packaging can be designed so that microorganisms are prevented from coming into contact with the product. For unopened packaging, this means most importantly that there is strong barrier protection. Once opened, it is important that packaging can be efficiently reclosed and that the product is refrigerated.

Another common way to protect food is to enclose it in a modified atmosphere. Carbon dioxide, oxygen and nitrogen are used as protective gases in packaging to prevent chemical, microbial and enzymatic degradation. These packaging gases are regarded as food additives, and are permitted according to the KRAV standards. Their purpose is to preserve and extend the shelf life of sensitive food products. Products in the retail sector that can be packaged in a modified atmosphere are, for example, bread and bakery products for baking at home, fresh pasta and prepared meals, delicatessen products, sliced cheese, sliced fruit and fresh meat products.

The fundamental purpose of food packaging is to protect and preserve the product. To achieve this, both the choice of material and design are important.

For some food, for example fresh meat, vacuum packaging can be an alternative to modified atmosphere. It provides a longer shelf life and more tender meat.

CONSIDER:

- if the barrier properties are an important factor in maintaining food quality. In that case you must consider what the most appropriate choice of material is based on documented barrier properties.
- if shelf life is a sensitive factor. In that case modified atmosphere can be an alternative, but also consider other options, such as for example the possibility/appropriateness of vacuum packaging the product.

A2. INCREASED SHELF LIFE IN OPENED PACKAGING

How can packaging influence how food is used? A good part of wastage occurs with the final user, and has a lot to do with packaging. Difficult to empty packaging means that some of the product ends up as waste instead of being eaten. This type of food wastage especially takes place in households.

It is also very important for consumers to be well informed of the factors that influence shelf life. Consumers need to be able to store products in the correct manner, ensuring that refrigerated products are not left in a warm environment, etc.

ENSURE:

- that packaging is **easy to reclose**. This normally increases the shelf life of the product after it is opened.
- that lids and caps can be put on without difficulty, and plastic packaging can be provided with a resealable strip or tape.

CONSIDER:

- **portion packaging** frozen food, or otherwise making it easy to thaw out a small part of the frozen food. Portion packaged food can also be a good option for some refrigerated products. Even though this can mean an increase in the amount of packaging materials, this can be outweighed by the advantage of maintaining the shelf life of unopened/unthawed food.
- how the packaging via **text and images** can inform consumers about the most effective way to handle a product in order to extend shelf life.
- how consumers can be provided with tips for handling and **using the leftovers** produced in connection with food preparation. Such information can, for example, be provided on the packaging and/or by referring to the company's website.

A3. EFFECTIVE EMPTYING OF THE PACKAGING

Many packages are very difficult for consumers to empty completely. Calculations show that about 10% of the yogurt in a common gable top package is left in the carton when it is thrown away. It is therefore important that a package is designed so that it is simple and easy for consumers to empty out the food.

CONSIDER:

- how to completely avoid packaging that is difficult to empty, for example those with narrow openings. Alternatively, ensure that packaging for viscous foods **can easily be flattened** before being discarded.
- using **non-stick-additives** that make it easier for the contents to slip off the surfaces of the package. However, such additives must not affect either the final recycling of the packaging or the packaged product.
- making it easier for consumers to **completely empty packaging**. This can be done by opening the packaging with the help of a tear strip or scissors. Always take into consideration that consumers can be injured if the method is not risk-free.

B AVOID HARMFUL SUBSTANCES

You must strive towards using substances and materials in packaging for your KRAV-certified products that are toxin-free. This is especially important for the part of the packaging that comes into contact with the food, feed or production aid.

From KRAV standards 3.5.2 and 16.6.5

KRAV-certified products are produced with great regard for nature, without artificial fertiliser and chemical pesticides. It is therefore reasonable that the packaging of a KRAV-labelled product also meets strict environmental and health requirements. By placing stricter demands on packaging than the legislation, KRAV wants to work together with KRAV-certified companies to drive development towards more sustainable packaging.

Legislation defines materials that can be used in contact with food, "food contact materials" (FCM), but the KRAV standards are stricter. The list of prohibited substances is longer and also takes into consideration impacts on the external environment, such as emission of pollutants in connection with the manufacture or waste management of packaging materials.

NOTE: the KRAV standards apply to the whole package, not only the material that comes into direct contact with the food.

Primary packaging is the packaging that encloses the product, unlike secondary packaging that encloses a number of primary packages. Tertiary packaging is transport packaging, such as a pallet or crate.

If recycled material is used in packaging, it is important that contaminants that may be present from previous use are not permitted to come into contact with the food. In such cases it may be necessary to provide the package with a so-called **functional barrier** that prevents any chemicals that may be present in recycled paper, recycled plastics and inks from spreading to the packaged food.

LEARN ABOUT THE CHEMICALS INCLUDED

The information provided by packaging suppliers is often very limited. Suppliers like to refer to company confidentiality and are reluctant to provide the complete contents of products. Large companies can often, via confidentiality agreements, obtain access to a complete list of chemicals, while smaller companies may be forced to rely on guarantees from the supplier that packaging complies with legal requirements.

Often, neither the packaging manufacturer/supplier has a clear picture of the contents of the material. This is especially the case for complex materials that are in turn purchased from material manufacturers. As well, all materials contain a variety of contaminants formed during the manufacturing process or that are already present in the raw material. It is difficult to obtain information about such "not intentionally added substances" (NIAS). Therefore, the KRAV standards apply only to **intentionally added substances**.

NOTE: For plastic food packaging, Regulation (EC) 10/2011 on plastics provides special direction allowing the presence of only those substances included in an annex. For some of them there are threshold limits as to the allowable amounts in materials, or limitations on how much is allowed to migrate into the food. The packaging manufacturer/supplier must be able to verify that they comply with the regulations by issuing a "declaration of compliance". The KRAV's standards however go farther than the legislation.

SELF-DECLARATION FROM SUPPLIERS OF PACKAGING MATERIALS

Identifying chemicals in packaging can thus be a major challenge. At the same time, KRAV sets standards for a large number of substances that should be avoided. So how can you resolve this?

In order to make it easier for you to get relevant information about your packaging, KRAV has developed a template that can be sent to packaging suppliers. The template makes it easier for the packaging supplier to provide you with the right information. If the supplier is not willing to provide such information, there may be an alternative supplier who is more open with the information.

The self-declaration is available on the KRAV website at **www.krav.se/forpackningar**

Once you have received information about the material, proceed with steps B1 to B4 below to determine if the packaging is in compliance with the KRAV standards regarding chemicals.

B1. AVOID SIN SUBSTANCES

You must check to determine if any of the SIN substances in Appendix 3 are present in your packaging, and in that case make a phase-out plan. The standard only applies to primary packaging.

From KRAV standards 3.5.2 and 16.6.5

- **What are SIN Substances?**

The SIN (Substitute It Now!) List is based on the same criteria for Substances of Very High Concern (SVHC) that the EU has agreed on in the chemicals regulation REACH.1 The criteria include substances that are carcinogenic, mutagenic, and reprotoxic or hormone disturbing. Substances classified as toxic, persistent and bioaccumulative are also included. (For more information, see **www.sinlist.org**)

The SIN List is a database of about 1000 substances (as of January 2020) that the International Chemical Secretariat (ChemSec) has developed as a reference list of substances which should be regarded as unacceptable. The founders of ChemSec are the Swedish Society for Nature Conservation, WWF, Friends of the Earth, and Nature and Youth Sweden. Of all the substances on the SIN List, about 60 are categorised as "food contact materials," and are thus of interest for packaging.

Among the groups of substances on the list are phthalates, heavy metals, tin compounds and bisphenol compounds.

- **Why does KRAV use the SIN List?**

One of the biggest challenges is that many chemicals have been inadequately investigated and therefore can be dangerous without being officially classified as such. In order to take into

consideration a wide range of suspected health and environmental risks at an early stage, KRAV has chosen to use the SIN List. It has also been developed with the help of independent researchers in toxicology and is used in many other contexts where the intention is to take a broader approach to the problems associated with chemicals.

[1] The EU has also made a list of substances that meet the criteria for substances of very high concern and therefore must only be used in exceptional cases. The EU list (the so-called candidate list) is however much shorter - ca. 180 substances as of the autumn of 2017).

• Where in packaging can SIN Substances be Found?

Of the about 1000 SIN substances there are in practice few, about 60, that are regarded as possibly being present in packaging material intended to come in contact with food. Examples of SIN substances that may be present are phthalates in plastics.

Printing inks and plastics are materials where SIN-substances are more likely to occur (see the table).

Material	Numbers of subtances	SIN Substances
printing inks	988	32
coatings	682	7
paper/cardboard	610	13
colouring agents	76	0
cork/wood	60	3
plastics	861	28

Sources: ChemSec and European Food Safety Authority (EFSA).

• What SIN Substances Must be Checked For?

The SIN substances that must be included in the survey are given in Appendix 3 of the KRAV standards. The appendix indicates which packaging materials can be expected to contain a certain SIN substance, but all substances must be checked for regardless of material. Only intentionally added SIN substances should be included.

• How do I Check For SIN Substances?

that were used during the manufacturing. In order to make it easier, we have developed the form "**Self-declaration from Suppliers of Packaging Materials**," where the list of the SIN substances to be checked for are included.

The form "Self-declaration from Suppliers of Packaging Materials" is available on the KRAV website at **www.krav.se/forpackningar**

• What do I do if there are SIN Substances in My Packaging?

In that case, you must set up a phase-out plan for SIN substances. To begin with, you should investigate the possibility of replacing packaging materials or completely changing the packaging solution.

The phase-out plan must show the efforts you have made to find solutions free from SIN substances that work for the food in question, and what further efforts you plan to make. You must work actively with the plan by updating it when required, but at least once a year.

A template for a phase-out plan for SIN substances is available on the KRAV website at **www.krav.se/forpackningar** (in Swedish and English).

B2. BAN ON BISPHENOL A

Bisphenol A must not have intentionally been used in packaging for KRAV-certified products packaged after 1 January 2018.

From KRAV standards3.5.3 and 16.6.6



- **Why has KRAV Introduced a Ban on Bisphenol A?**

Bisphenol A (BPA) is a substance that is suspected to be hormone-disturbing and that can affect reproduction, as well as increase the risk of certain forms of cancer even at low levels. Since January 2017, Bisphenol A is included on the EU candidate list of particularly hazardous substances. This means, among other things, that consumers have the right upon request to receive information within 45 days about whether a product contains more than 0.1 percent of Bisphenol A.

- **Where can Bisphenol A be Found?**

Bisphenol A is common as a liner in cans used for food, beer cans and metal tubes, but can also be present in lid seals.

- **What does KRAV Mean by "Intentional Use"?**

Many hazardous chemicals, especially those that are difficult to break down and bioaccumulative, occur almost everywhere in nature. They are found in water, soil and in small amounts in different materials extracted from nature. Therefore, they often occur as contamination in packaging materials, and thus avoiding them is not always possible. Intentionally adding them to different materials is something completely different and means that significantly higher levels occur.

- **How can I Tell if Packaging Contains Bisphenol A ?**

Begin by asking the packaging supplier if Bisphenol A has been used during the manufacturing of the material. If any part of the packaging contains plastic material, you should ask for a certificate from the supplier confirming that Bisphenol A has not been used intentionally. Note that metal as well as cardboard packaging often contains plastic liners.

- **What Happens if there is still Bisphenol A in Packaging after 1 January 2018?**

Products packaged in packaging containing Bisphenol A after 1 January 2018 must not be sold as KRAV-labelled. Products that were packaged before 1 January 2018 may be sold until the supply runs out.

NOTE: Several of the alternatives to Bisphenol A are similar compounds, e.g. Bisphenol F and Bisphenol S. Since these are also on the SIN List, you cannot use them to replace Bisphenol A.

B3. DO NOT USE CHLORINE-BASED PLASTICS

PVC (polyvinyl chloride) and other chlorine-based plastics must not be used in packaging for KRAV-certified products after 1 January 2018.

PVC is however permitted in lid seals as well as in metal sealants in those cases where you can show that alternative solutions cannot guarantee the shelf life or quality of the food in question. A condition is that you are working on a phase-out plan.

From KRAV standards 3.5.4 and 16.6.7

• Why does KRAV Prohibit Chlorine-based Plastics?

Chlorine-based plastics cause a variety of emissions dangerous to health and the environment both in the manufacturing and in the waste stage. PVC-polymer, for example, consists of 57% chlorine. In that context, chlorine forms toxic and persistent organochlorines. Further, a higher percentage of harmful additives are used in plastics with chlorine compared to most other polymers. One example is types of softening agents which have been shown to have adverse properties.

For a long time KRAV has had as a goal the complete avoidance of PVC and other chlorinated materials. Starting in January 2018, the goal will be changed to a requirement. Such materials will thus be completely prohibited in packaging, with the exception of lid seals and metal sealants.

• Where can Chlorine-based Plastics be Found?

Chlorine-based plastics used in the context of food are primarily PVC and PVDC. PVC used to be a very common plastic in packaging, but has for the most part been voluntarily phased out by the industry for environmental reasons. PVC is however still common in the stretch/shrink film used in manual packaging of, for example, delicatessen products and cheeses in shops. Another area is in plastics that let in a certain amount of moisture, which is important in the packaging of certain ”wet” fresh food, such as some fruits and vegetables. PVC is also present in some seals between the glass and lid in bottles and cans, and in metal sealants.

PVDC has replaced PVC in some of these applications, especially stretch film.

• How do I tell if Packaging Contains Chlorine-based Plastics?

You start by asking your packaging supplier if any part of the primary packaging contains PVC/ chlorine-based plastics. You then request a certificate from the supplier to verify that the packaging does not contain chlorine-based plastics.

• What Happens if I still have PVC in my Packaging after 1 January 2018?

Products packaged in packaging containing chlorine-based plastics after 1 January 2018 must not be sold as KRAV- labelled. Products that were packaged before 1 January 2018 may be sold until the supply runs out.

The ban does not apply if you meet the criteria for exemptions for lid seals and metal sealants.

• Why is there a Special Exemption for PVC in Lid Seals and Metal Sealants?

Though notification of the ban on PVC was given in the 2015 KRAV standards, not all companies have found a solution without PVC that works for all types of food. As well, many foods have a long shelf life, which means that testing of new packaging materials needs to be done over a long period of time to ensure the quality of the food.

• What is an Approved Phase-out Plan for PVC in Lid Seals and Metal Sealants?

The phase-out plan must show the efforts you have made to find solutions free from PVC that work for the food in question, and what further efforts you plan to make. You must work actively with the plan and update it when required, but at least once a year, until you have found a solution.

A template for a phase-out plan for PVC in lid seals/metal sealants is available on the KRAV website at **www.krav.se/forpackningar** (in Swedish and English).

B4. NO PRESERVATIVE OR DISINFECTANTS

Packaging must not be treated with preservatives or disinfectants. Disinfection with the help of hydrogen peroxide is however permitted.

From KRAV standards 3.5.5 and 16.6.8

• Why does KRAV Prohibit Preservatives and Disinfectants?

Preservatives and disinfectants are toxic substances that can contaminate food. One reason to use preservatives in packaging can be to prevent bacterial growth in case the package is handled improperly, for example exposed to moisture. If the packaging chain is faultless, such substances are not usually required.

• How do I Know if Packaging Contains Preservatives?

You should always ask your supplier if preservatives are used. If materials are used that can contain preservatives or disinfectants, your should request a certificate from the manufacturer to ensure that you comply with the standard.

• Why does KRAV Permit Hydrogen Peroxide?

Hydrogen peroxide is an effective disinfectant that may be needed in some situations. The substance consists of hydrogen and oxygen and breaks down to harmless substances during use. KRAV has thus chosen to permit it.

B5. NO NANOMATERIALS

You must not use engineered nanomaterials in KRAV-certified production and processing, including packaging and other surfaces that the product may come into contact with.

From KRAV standards 3.3.6 and16.6.9

• What are Nanomaterials?

Nanomaterials can be either completely new chemical structures or already well-known chemical structures but in a smaller size. Due to their small size nanomaterials can have completely different properties and functions. Nanotechnology involves the creation and use of these small structures

The main feature of the EU definition of nanomaterials is that the material must be between 1 and 100 nanometres in at least one dimension.

• Where can Nanomaterials be Found?

Within the packaging industry nanomaterials are used, for amongst other reasons, to improve mechanical properties, such as to enhance barrier effects, to increase UV protection, or to reduce material thickness and thus consumption of materials. Some examples are:

- A nano layer on packages of potato chips, confectioneries and baked goods.
- Nanoparticles of silicon can be used to affect the permeability of various gases, for example oxygen.
- Titanium dioxide for protection against UV light.
- Nano-coated inner surface in PET bottles for beer and fruit juices.
- Nano sensors that sense product deterioration.
- Biocides (mainly nanosilver), which protect food from bacteria and fungi.

Naturally occurring nanoparticles of clay is used to increase the stability of materials such as for example bioplastics.

• Why does KRAV Prohibit Engineered Nanomaterials?

It is not clear what risks are associated with the use of nanomaterials in various applications. However, research has found that nanoparticles are more mobile than other contaminants and accumulate in water, soil or air. In addition, nanoparticles penetrate freely through cell walls and can accumulate in human blood and fatty tissue. The mobility and leaching of nanostructures in waste management and recycling is also not clear. With reference to the precautionary principle, KRAV has for the present chosen to prohibit nanomaterials in direct contact with food.

• What is Considered a Engineered Nanomaterial?

The term means that the ban applies to intentionally manufactured materials and substances, as opposed to nanomaterials that occur naturally, as for example nano clays.

C RESOURCE AND CLIMATE EFFICIENT PACKAGING

"… packaging should be as resource efficient and as climate neutral as possible by taking the following into account:

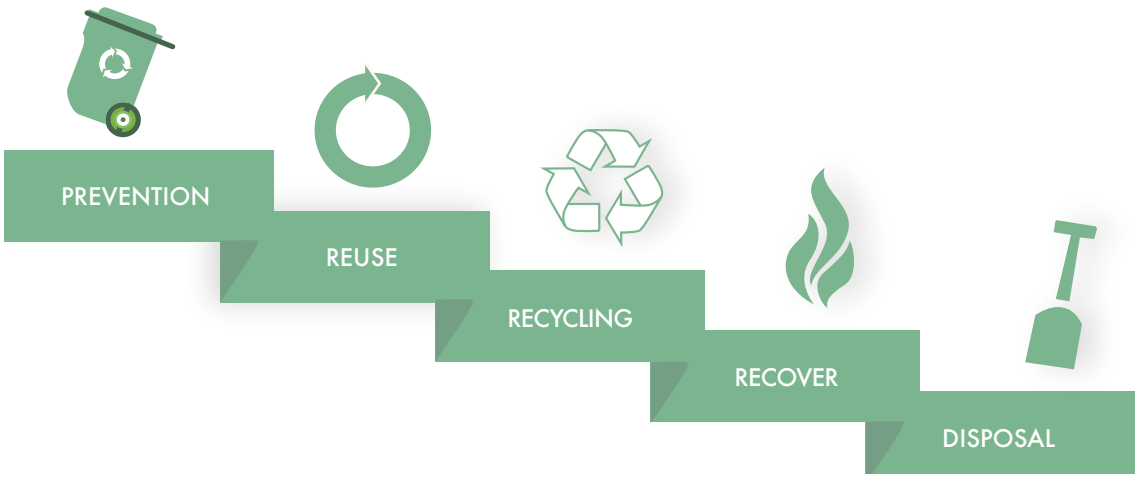
- using as little material as possible,
- using renewable packaging material,
- using recycled material when possible,
- making sure packaging can be reused or recycled in existing systems,
- making sure packaging favours energy efficient methods of transportation,
- making sure it is easy for consumers to empty and sort packaging.

From KRAV standards 3.5.1 and 16.6.4

Development of the most resource and climate efficient packaging possible requires that all parts of the chain be taken into account, from raw materials in the product to production and distribution of the packaging and then use and recycling. Design of the packaging is the basis for the whole chain.

KRAV-certified companies must try to achieve input materials that are recyclable and that have as minimal an environmental impact as possible. Use of materials must be as resource-efficient as possible, and the package must also be able to contribute to an energy-efficient transport solution.

This means that the so-called waste hierarchy must be implemented.



The waste hierarchy shows the order in which different methods should be used to treat waste and is based on EU directives. To achieve the best possible effect, it is important to look at the whole packaging system, i.e. primary, secondary and tertiary packaging. A change in one part of the

packaging chain can have both positive and negative effects in another part. This means that different choices and trade-offs need to be made between various factors when packaging is designed and developed.

The choices made should however not counteract the objective of optimum product protection. No matter how innovative and environmentally sound a packaging solution is, it should not lead to a deterioration in food quality or safety.

Following are instructions and advice about how KRAV-certified companies should work to achieve a packaging solution that is as resource and climate-efficient as possible.

C1. USE AS LITTLE MATERIAL AS POSSIBLE

Minimizing the amount of materials used helps to reduce both the environmental and climate impact of packaging. There is of course a critical level for how much the amount of material can be reduced without affecting other aspects of the packaging's function or other parts of the packaging chain. It is therefore important to find a balance between other functions that also must be met. For example, a material which is more suitable for recycling can in some cases be preferable, even though the packaging itself becomes heavier. For further discussion about such trade-offs see section D.

ENSURE:

- that all parts of the packaging are really needed and fulfil a function.
- that **double walls**/layers are not present in the packaging unless they are needed for special protection or insulation.
- that **empty spaces and hollow areas** between the food and the packaging is minimized as this leads to a reduced need for packaging materials for protection and padding.

CONSIDER:

- if shrink film, glue, tape, or primary, secondary and tertiary packaging can be eliminated or replaced by lighter materials.
- reducing the **thickness and weight** of input materials. Ask the supplier if the material is available in another design or a thinner alternative.
- **printing information directly on the primary packaging** which reduces the need for materials for labels and additional information sheets.

C2. USE RENEWABLE PACKAGING MATERIALS

Increasing the share of renewable (bio-based) materials is an important step towards achieving more environmentally sound packaging. Research and development is constantly moving forward in this area and new materials are being developed and used. Using these materials increases the demand for renewable raw materials which stimulates further development and use. As well, the possibilities for recycling packaging/materials is increasing in general (but not always).

Examples of renewable materials are paper and cardboard. They also have the advantage of being generally easy to recycle.

Bio-based plastics: Rapid development of new materials and alternatives is taking place in this area. Examples are bio-based plastics made of the renewable raw materials corn, sugar cane or cellulose, instead of fossil-based raw materials. Some bioplastics can however cause problems during the production as well as at the waste stage. For example, some bio-based plastics can interfere with recycling of other materials. Some biopolymers are biodegradable, which is often emphasized as an advantage. At the same time, when packaging materials are recycled, biodegradability can be a problem.

This makes it important to ask which bio-based materials are appropriate

ENSURE:

- That the raw materials used in bio-based materials are grown and produced in a **sustainable manner** and according to basic ILO conventions.
- That cellulose used for packaging originates from **sustainable forestry**. Where possible, require documentation according or equivalent to the Forest Stewardship Council (FSC) certification system for responsible and sustainable forestry.

CONSIDER:

- **measures to increase the portion of renewable materials** (for example paper, cardboard or bio-based plastic) in packaging/the packaging chain.
- asking your supplier **which new materials are available**. Development goes quickly.

C3. USE RECYCLED MATERIALS WHEN POSSIBLE

From a purely technical perspective, most things can be recycled, but it isn't always environmentally, qualitatively or financially justifiable. Recycled materials can be used both as components in packaging materials and as laminates. The practicability and benefits of recycling can vary for different materials. Use of recycled material can mean that packaging weighs somewhat more, as recycled material sometimes lacks the same high quality properties as virgin material and thus a larger amount is required.

There are far-reaching legal restrictions surrounding the use of recycled materials that come into direct contact with food. Paper and plastic present special risks. Recycled fibres from paper and cardboard can contain residues of mineral oils, inks, adhesives, solvents, etc.

TIP: EC Regulation 282/2008 contains legislation on recycled plastic materials in contact with food. Directive 2007/42/EC contains legislation on materials of regenerated cellulose fi m in contact with food.

ENSURE:

- that you have a declaration of compliance from your packaging suppliers showing that the packaging materials comply with legislation regarding materials in contact with food.
- that recycled material is not used for fatty or aqueous foods, since there is a risk that it contains contaminants from, for example, ink.

CONSIDER:

- if it is possible to equip packaging with a so-called functional barrier. These prevent chemicals that can be found in recycled paper, recycled plastics and inks from spreading into food.
- how great the portion of recycled material it is possible to use. Weigh together the technical/quality requirements with the possibility of using recycled materials.

C4. REUSE OR CHOOSE RECYCLABLE PACKAGING

Including design requirements for reuse and recycling when developing packaging means trying to design packaging that has less of an environmental impact throughout its life cycle.

Reuse of packaging is today relatively uncommon and is actually used mostly for 33 cl glass bottles. KRAV would like to see an increased development of packaging that can be reused, since reusable packaging reduces the need for resources for materials, manufacturing and recycling. We thus want more people to consider these options.

Standard SS-EN 13429 provides criteria for packaging considered to be reusable. To achieve this, packaging must be constructed to be used several times and there must be a system and an intention to reuse the packaging.

Material recycling: It must be possible to recycle a package in existing systems. It must not be too complex in terms of construction or material composition. If it contains too many different materials, it can be more difficult or more or less impossible to recycle.

Criteria for packaging recoverable by material recycling are outlined in standard SS-EN 13430. These requirements cover packaging design, manufacture, use, recycling by the end-user and collection/ sorting. The standard ensures that packaging design facilitates recycling, that these properties are maintained during use, and that the recycling process works.

TIP: Criteria for packaging recoverable by material recycling are found in standard SS-EN 13430.

ADVICE AND INSTRUCTIONS TO FACILITATE RECYCLING

GENERAL:

- Use homogeneous materials.
- Materials in packaging must be easy to separate.
- Labels should be easy to remove (facilitated by attachment using water-soluble glue).

METALS

- Avoid composites with iron since they complicate sorting (for example metal cans with aluminium casing).

GLASS

- Never use black coloured glass. Black is impossible to distinguish with optical recognition in conjunction with sorting at glassworks. Black glass becomes waste that is not recycled.
- As a first choice, use the standard colours white, green or brown.

PAPER AND CARDBOARD

- Do not use binding agents or colour pigments that are hazardous to health or the environment and that contaminate recycled material.

PLASTIC

- Choose types of plastic that have a recycling potential. Types of plastic used mainly for packaging are LD-polyethylene, polypropylene, HD-polyethylene and PET. There is good technology for recycling these and sufficient volume for efficient sorting.
- Avoid combinations of different plastic polymers.
- If combinations are unavoidable, materials with different densities should be used.
- Fillers that change the density of the plastic should be avoided.
- Colourless plastics have the most extensive recycling potential.
- If coloured plastic is used, avoid dark colours as they are difficult to detect in current automated sorting and risk being rejected.
- Composites of polyolefins with PET separate poorly and should be avoided.
- Avoid metal closing systems as they are difficult to remove in recycling systems and can even lead to the plastic being discarded.
- Avoid foreign material on labels. Use of the same plastic in labels and packaging facilitates sorting for recycling. Paper labels in particular can lead to serious recycling problems as fibres can be transferred to the plastic.
- Glue labels sparingly with the right glue (water-soluble or hot-melt adhesives are easiest to remove).

Voluntary labelling of plastic materials - *Code 07 indicates ”other plastic”.

C5. FAVOUR AN ENERGY EFFICIENT TRANSPORT SOLUTION

Package weight and design affects the transport work required and the resulting impact on the climate. Heavy material and unnecessarily excessive packaging result in a greater climate impact than lighter and less material. The volume of packaging is also important since transport is more often limited by volume than by weight.

ENSURE

- that packaging is volume optimized. Shapes such as cubes and cuboids can be more efficiently packed (with more product per volume transport space) than for example a cylindrical shape.
- application of a holistic perspective to primary and secondary packaging to achieve an as energy efficient transport as possible, so that the choices made don't sub-optimise each other.

Examples of energy-efficient packaging are so-called aseptic liquid cartons. They can be used for the same solutions as conventional tin cans, but their climate impact is half as great as tin cans. They are delivered to the filler in rolls and are therefore less bulky during transport than cans. Their rectangular shape also facilitates efficient transport solutions compared to cylinder-shaped tins.

C6. FACILITATE EMPTYING AND SORTING

Even potentially recyclable packaging can end up in the wrong place in waste management if it is too complicated to recycle. Even here the complexity of the packaging makes a difference. Too many input materials makes packaging difficult to recycle. Packaging perceived as "sticky" is often thrown away improperly, since it takes substantial additional work for consumers to clean it. This illustrates the importance of design for efficient and simple emptying of packaging.

THIS FACILITATES EMPTYING OF PACKAGING:

- easy to open.
- wide neck on the packaging.
- non-stick additives that make it easier for the contents to slip off the surfaces of the package. However such additives must not affect either the packaged product or final recycling of the packaging.

THIS FACILITATES SORTING:

- labelling packaging with recycling recommendations.
- packaging that is easy to clean and empty.
- packaging that is easy to compact after use.
- clear information to the consumer about how the packaging should be sorted.

Information om källsortering på förpackningen

The Swedish Packaging and Newspaper Collection Service (Förpacknings- och Tidningsinsamlingen AB, FTI) makes the following recommendations:

> Preferably use the same words and expressions in the sorting instructions printed on the packaging as those used at collection locations. In other words, avoid terms such as hard plastic, iron or aluminium, which can contribute to confusion.

For more information:

For more tips on labelling to facilitate sorting of packaging , see the FTI website: **www.ftiab.se**.

D OVERALL ASSESSMENT FOR OPTIMAL PACKAGING

The fourth step in the optimisation work is to make an overall assessment of the requirement for best possible protection and shelf life for the product (A) and the requirement for resource and climate- efficiency (C). A prerequisite is that the KRAV standards on avoiding harmful substances can be complied with at the same time.

Examples of trade-offs between A and C:

- Have measures to extend the shelf life in opened packaging (for example packaging that can be resealed) made it difficult for consumers to sort the waste? In that case, can the risk of less re cycling be justified by gains in reduced food wastage? In that case, are alternative solutions available to make the packaging resealable without complicating recycling?
- Have measures to increase the shelf life of the product caused an increase in the amount of packaging material? In that case, can the increased material consumption be justified through the gain in reduced waste in shops?
- What is desirable for the shelf life of unopened packaging (in time and/or freshness depending on the type of product)? How does this affect the amount of material in the packaging? How much can the amount of material be reduced without shelf life falling below an acceptable level?

NOTES:

PACKAGING GUIDE

Step by Step Towards Environmentally Friendly Packaging

This is a guide to help KRAV-certified companies navigate using the KRAV packaging standards. The purpose is to simplify and clarify the work towards using environmentally friendly packaging.

The standards for packaging are in section 3.5 and 16.6 of the KRAV Standards. In Chapter 20 there are standards outlining how information on the packaging should be designed and how the KRAV-label should be used.

During the annual audit, the certification body assesses if your company has complied with the KRAV packaging standards.

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