HAZARDOUS WASTE IDENTIFICATION GUIDE

ANNEX 4-1

EXAMPLE FOR THE CLASSIFICATION OF PACKAGING WASTE

This Annex provides an example of the identification and classification of a nominally empty packaging of alkyd outdoor paints containing anti-corrosion pigments and intended for metal roofing, rainwater pipes, gutters, railings, and steel structures, which are available at the online shop in Lithuania. The information used in the example on paints from the safety data sheet (SDS) that is publicly available on the internet[1]; the packaging and paint residue levels are fictional, and they should not be directly referenced; the gross weight of the packaging and residues to be assessed must be determined on a case-by-case basis. Note that the amount of residual material (1, 2, 5 or 10%) does not automatically indicate that the packaging is nominally empty. In practice, nominally empty packaging must, in particular, comply with the definition applicable to it:

> The **'nominally empty' packaging** means packaging that has been properly emptied ('free of trickles' such as leftover powder, sludge and drops; brush clean, spatula clean), except for unavoidable residues, without applying additional measures (such as heating). The packaging is considered to have been properly emptied if in the case of a renewed attempt of emptying, such as inverting the packaging no longer drops or solid remains are released.

Minimum weight of individual, completely empty packaging (as determined by weight assessment), in kg:	1.50	**A**
Gross weight of packaging and residues (as determined by weight assessment), in kg:	1.65	**B**
Weight of residues in individual packaging (as determined by weight assessment), in kg:	0.15	**C = B-A**
Identification of residues (name of the original content, whether it is unchanged, etc., if relevant):	Alkyd paints 1	

Chemical composition of residues (based on the paint SDS):

2.2 Label elements

Hazard pictograms :

[1] https://tikkurila.lt/kiekvienam/produktai/panssarimaali.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification Regulation (EC) No. 1272/2008 [CLP]	Notes
hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics	REACH #: 01-2119463258-33 EC: 919-857-5 CAS: -	≥25 - ≤50	Flam. Liq. 3, H226 STOT SE 3, H336 Asp. Tox. 1, H304 EUH066	H,P
trizinc bis(orthophosphate)	REACH #: 01-2119485044-40 EC: 231-944-3 CAS: 7779-90-0 Index: 030-011-00-6	≤3	Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1)	-
zinc oxide	REACH #: 01-2119463881-32 EC: 215-222-5 CAS: 1314-13-2 Index: 030-013-00-7	≤3	Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1)	-
2-ethylhexanoic acid, zirconium salt	REACH #: 01-2119979088-21 EC: 245-018-1 CAS: 22464-99-9	≤0.3	Repr. 2, H361d **See Section 16 for the full text of the H statements declared above.**	-

Hazardous substance	Hazard statement code(s) (based on the SDS)	Percentage of hazardous substance in residues (D) (based on the SDS)	Weight of substance, in kg **(E = C x D/100), kg**	Concentration of substance in waste, % (E*100/B), %	Concentration limit (based on Annex 8 of the Guide)	Concentration limit (individual or total) (based on Annex 8 of the Guide)
Hydrocarbons, C9 to C11, n-alkanes, isoalkanes, cyclic, <2% arom.	H226	≥25-≤50	0.075	–	–	-
	H336[2]		-	-	-	-
	H304		0.075	4.55	≥10%	Sum
	EUH066[3]		-	-	-	-
Trizinc bis(orthophosphate)	H400	≤3	0.0045	0.27	≥ 25%	individual substances or sum of all substances
	H410		0.0045	0.27	≥ 0.25%	individual substances or sum of all substances
Zinc oxide	H400	≤3	0.0045	0.27	≥ 25%	individual substances or sum of all substances
	H410		0.0045	0.27	≥ 0.25%	individual substances or sum of all substances
2-ethylhexanoic acid, zirconium salt	H361	≤0.3	0.00045	0.027	≥ 3.0%	individual

[2] Hazard statement not related to hazardous properties (HP) of the waste.

[3] Hazard statement not related to hazardous properties (HP) of the waste.

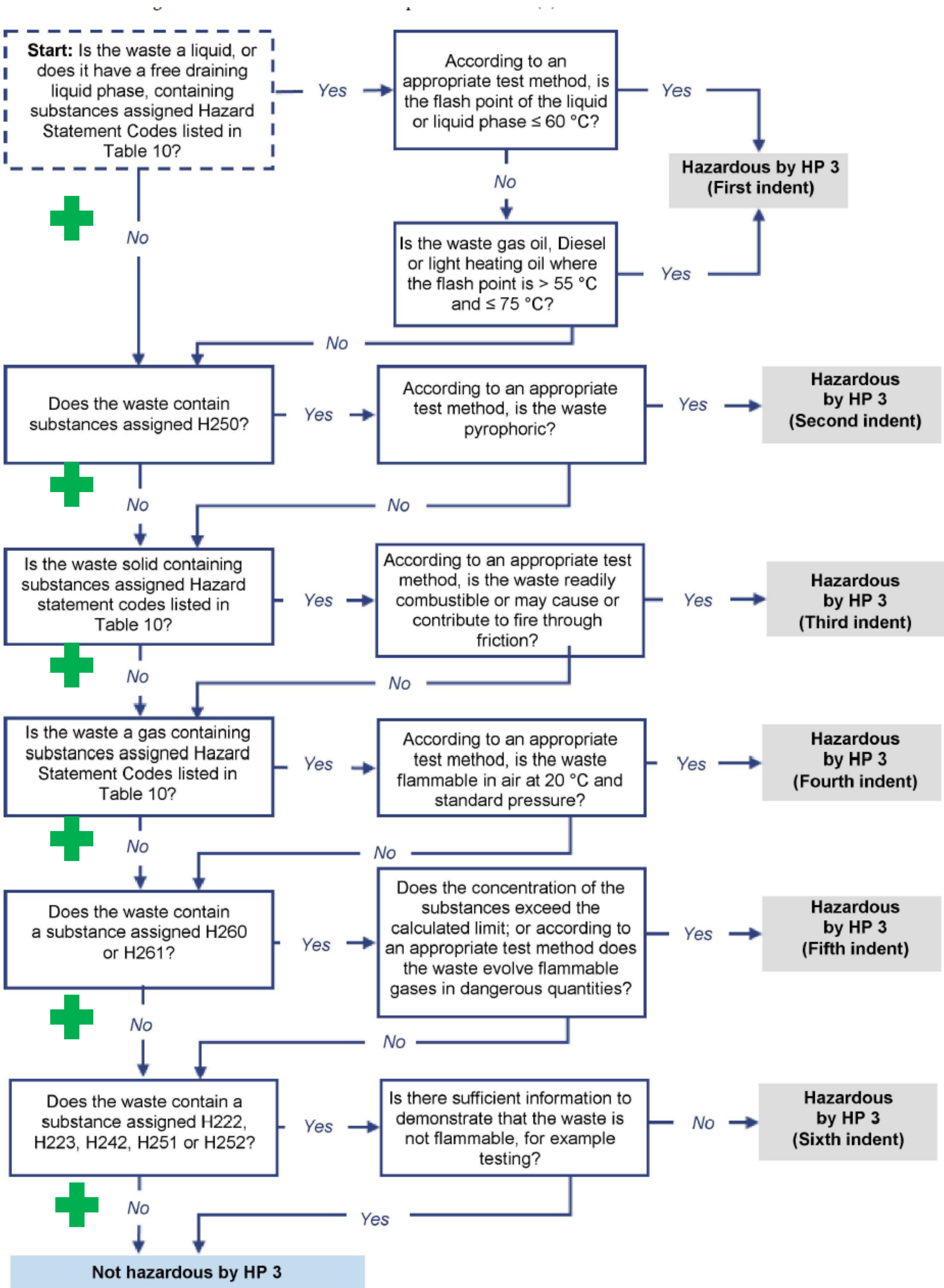
In accordance with Annex III to the WFD, only substances with concentrations in waste above the cut-off value (threshold) are to be included in the assessment for certain hazardous properties. Annex 8 to the Guide also states: *'The following cut-off values apply to the assessment: for H411, H412, H413: 1 %; for H411, H412, H413: 1%. An individual substance present at a concentration below the cut off, for a hazard statement code assigned to it, is not included in the sum of the concentrations for that hazard class and category code'.* Thus, in the case under analysis, all substances presented in the table are further assessed, as concentrations of hazardous substances with hazard statement codes H400 and H410 present in the waste exceed the cut-off value (0.27% > 0.1%).

Since the hazard statements H400 and H410 are characterised by several components of the hazardous substance and their concentration limits are summed (assessed as a sum), the gross weight of the substances is calculated:

H400 $E_{total} = E_{\text{trizinc bis(orthophosphate)}} + E_{\text{zinc oxide}} = 0.0045 + 0.0045 =$

H410 $E_{total} = E_{\text{trizinc bis(orthophosphate)}} + E_{\text{zinc oxide}} = 0.0045 + 0.0045 =$

<u>Assessment of H226.</u> According to Annex 8 to the Guide 'Specific approaches to determine hazard properties (HP 1 to HP 15)', substances assigned the hazard statement H226 are associated with the hazardous property HP 3 'flammable'. Waste containing such substances is assessed based on test methods, where appropriate and proportionate. In practice, the methods used to test the flammability of empty packaging are considered disproportionate and inappropriate, and the method used to assess the property HP3 is applied, as illustrated in Fig. 9 of Annex 8 to the Guide:



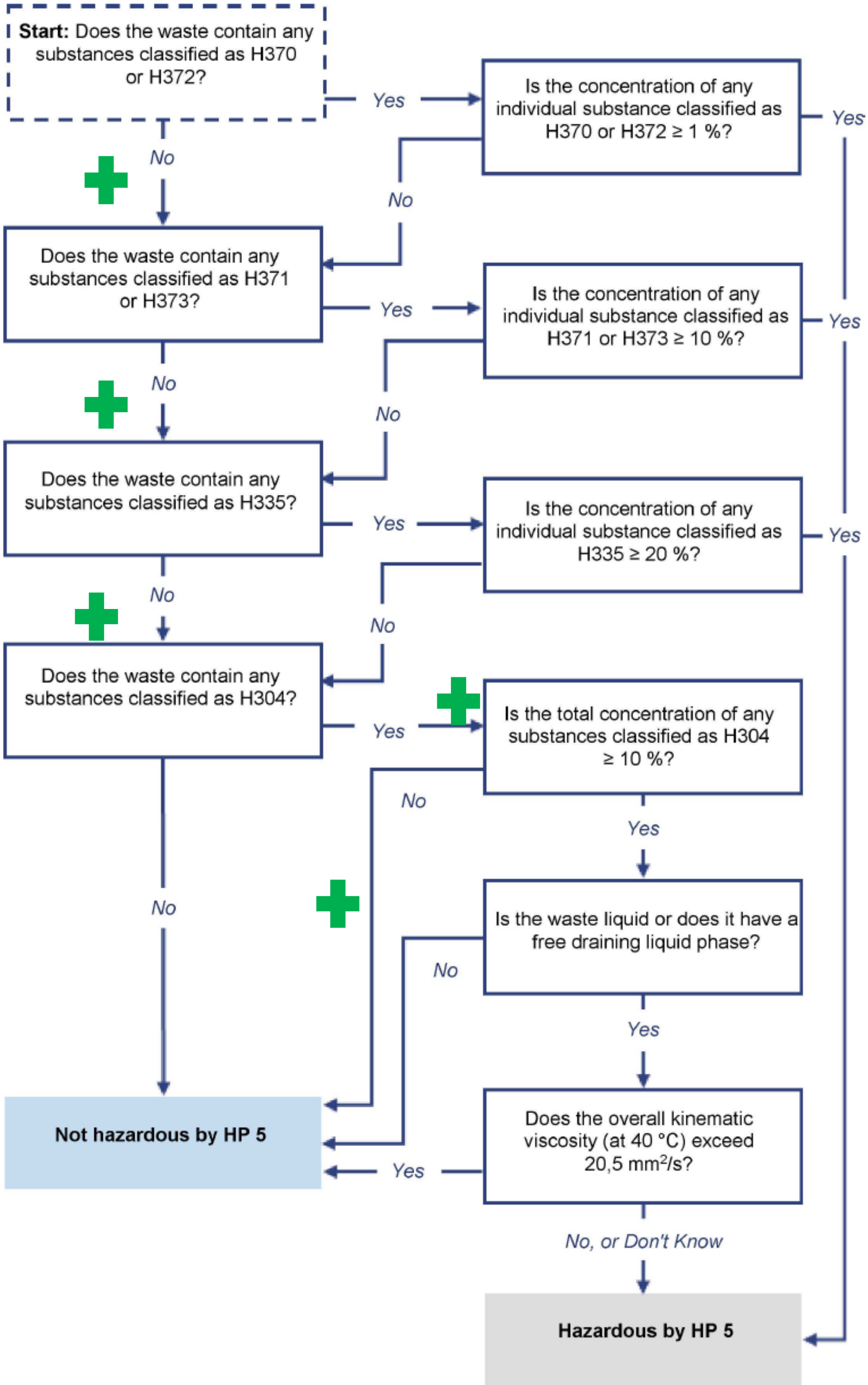
The assessment has shown that the waste analysed is non-hazardous by HP 3.

Assessment of H304. Substances assigned the hazard statement H304 are associated with the hazardous property HP 5 ‘Specific Target Organ Toxicity (STOT) / Aspiration Toxicity’. The Guide indicates that *‘when a waste contains one or more substances classified as Asp. Tox. 1* *(particularly, in case of H304) and the sum of those substances exceeds or equals the concentration limit, the waste shall be classified as hazardous by HP 5 only where the overall kinematic viscosity (at 40 °C) does not exceed 20,5 mm2/s'*. In our case, information on the kinematic viscosity is not available and more than one residue component is not assigned the code H304; therefore, we are conducting an assessment according to the method for determining HP 5, as shown in Fig. 11. The property HP5 is determined by the concentration of the residue in the waste; therefore, we calculate the content of a specific component of the substance in the nominally empty package as follows:

E(in packaging) = E_{total}*100/B, %

H304: $E_{(packaging)}$ = 0.075 * 100/1.65 = 4.55% – this quantity of the residual component to which H304 belongs is in the nominally empty packaging.

We proceed with the assessment of the property HP 5 according to the method for determining HP 5, as shown in Fig. 11 in Annex 8 to the Guide:



The assessment has shown that the waste analysed is non-hazardous by HP 5.

Assessment of H400 and H410. H400 and H410 are associated with the hazardous property HP 14 'Ecotoxic'. Annex 8 to the Guide states that:

'*Waste which fulfils any of the conditions listed below should be classified as hazardous by HP 14:*

— *waste which contains one or more substances classified as aquatic acute assigned the hazard statement code **H400** in accordance with Regulation (EC) No 1272/2008 and the sum of the concentrations of those substances equals or **exceeds the concentration limit of 25%**. A cut-off value of 0,1 % shall apply to such substances, [Σ c (H400) ≥ 25%];*

— *waste which contains one or more substances classified as aquatic chronic 1, 2 or 3 assigned to the hazard statement code(s) **H410**, H411 or H412 in accordance with Regulation (EC) No 1272/2008, and the sum of the concentrations of all substances classified as aquatic chronic 1 (**H410**) multiplied by 100 added to the sum of the concentrations of all substances classified as aquatic chronic 2 (H411) multiplied by 10 added to the sum of the concentrations of all substances classified as aquatic chronic 3 (H412) equals or exceeds the concentration limit of 25%. A cut-off value of 0.1% applies to substances classified as **H410** and a cut-off value of 1% applies to substances classified as H411 or H412. [100 × Σc (H410) + 10 × Σc (H411) + Σc (H412) ≥ 25%];'*

The property HP14 is determined by the concentration of the residue in the waste; therefore, we calculate the content of a specific component H400 and H410 present of the substance in the nominally empty package as follows:

$E_{(\text{in packaging})} = E_{\text{total}} * 100/B$, %

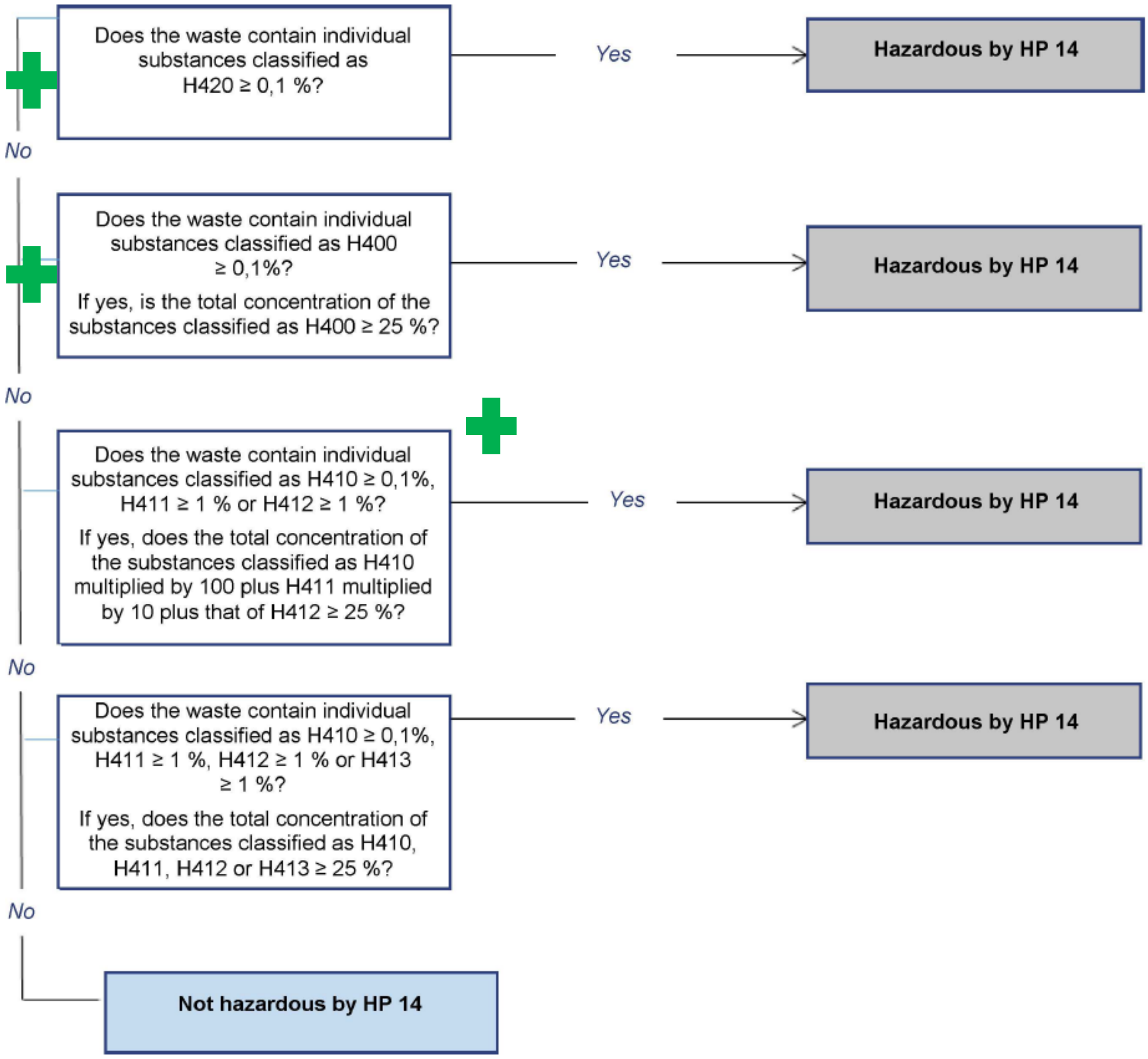
H400: $E_{(\text{packaging})} = 0.009 * 100/1.65 = 0.55\%$ – this quantity of the residual component to which H400 belongs is in the nominally empty packaging. The component is evaluated because its content in the packaging exceeds the cut-off value of 0.1%. As seen from the calculations, the concentration of the H400 sum components is below the set concentration limit of 25%.

H410: $E_{(\text{packaging})} = 0.009 * 100/1.65 = 0.55\%$ – this quantity of the residual component to which H410 belongs is in the nominally empty packaging. The component is evaluated because its content in the packaging exceeds the cut-off value of 0.1%. We recalculate the concentration of a component according to the formula:

*[100 × Σc (H410) + 10 × Σc (H411) + Σc (H412)] = 100 * 0.55% + 10 * 0 + 0 = 55%, i.e. ≥ 25%*

As seen from calculations of residue component concentrations, packaging waste is classified as hazardous waste according to HP 14, since the packaging contains residues of substances multiplied by 100 (55%) above the specified concentration limit (25%).

This is also illustrated in the process (diagram) related to the assessment of HP 14 according to Fig. 19 of Annex 8 to the Guide:



There is no need to assess the residual for the hazard statement H361, as the residual under assessment is already hazardous by HP 14. However, for the sake of clarity, we will also complete the assessment of the remaining component of the substance that has been assigned H361.

Assessment of H361. H361 is associated with the hazardous property HP 10 'Toxic for reproduction'. Annex 8 to the Guide states:

'When a waste contains a substance classified by one of the seven hazard class and category codes and hazard statement codes shown in Table 7 [see Table 18 of this document], and one or more of the concentration limits in the table is exceeded or equalled, the waste is classified as hazardous by assigning HP 10. When more than one substance classified as toxic for reproduction is present in a waste, an individual substance must be present at or above the concentration limit for the waste to be classified as hazardous by HP 10.

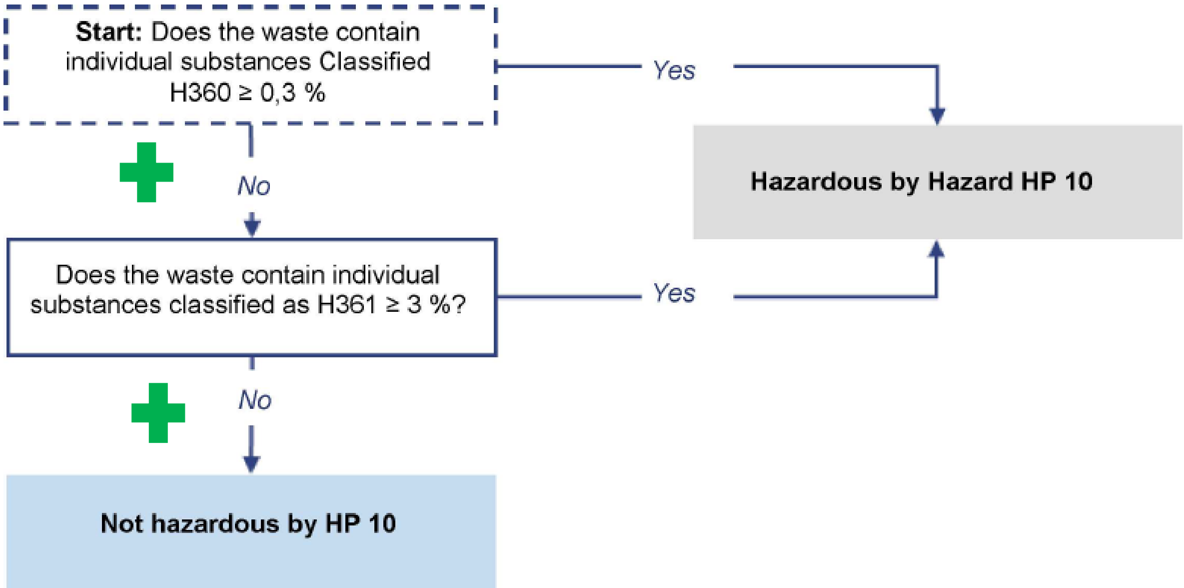
The concentration limit for substances with H361 is ≥ 3.0%.

The property HP 10 is determined by the concentration of the residue in the waste; therefore, we calculate the content of a specific component of the substance in the nominally empty package as follows:

$E_{(in\ packaging)} = E_{total} * 100/B$, %

H361: E(packaging) = 0.00045 * 100/1.65 = 0.03% – this quantity of the residual component to which H361 belongs is in the nominally empty packaging. It does not exceed the set concentration limit, and the waste is non-hazardous according to HP 10.

We proceed with the assessment of the property HP 10 according to the method for determining HP 10, as shown in Fig. 15 in Annex 8 to the Guide:



The nominally empty packaging waste under assessment is non-hazardous according to HP 10.

Conclusion: in this hypothetical case, the assessment of nominally empty packaging of alkyd outdoor paints containing anti-corrosion pigments based on the residual material contained in the packaging and the properties of the substances according to the SDS has shown that the packaging waste under assessment is hazardous according to the hazardous property of HP 14. In the case under consideration, the total amount of paint residue in the packaging was quite significant, about 9% of the gross weight of nominally empty packaging. In the present case, the calculations show that if the packaging had a residual of less than 4% of these specific alkyd paints, packaging waste would not have the hazardous property HP 14; therefore, it is obvious that the packaging must first be emptied properly, and the residues actually removed.