MAIN ISSUES ON IDENTITY AND PHYSCHEM PROPERTIES OF PPP IN EU

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Current basis of the EU legal framework for Plant Protection Products (PPPs)

REGULATIONS

REGULATION (EC) No 1107/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 21 October 2009

concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

A Regulation is not a directive, and as such is directly applicable in all member states (MS).
It does not need to be transposed into national legislation.

Regulation (EC) No 1107/2009

provides the possibility to reject active substances on the basis of their intrinsic properties

Hazard-based cut-off criteria

for the approval of active substances

Human Health	Environmental
Carcinogen C1A & C1B Mutagen M1A & M1B Toxic for Reproduction R1A & R1B	PBT POP (Persistent Organic Pollutant) vPvB
Endocrine disruptor	Endocrine disruptor
Category 1A: Substances known to have CMR potential for humans. Category 1B: Substances presumed to have CMR potential for humans.	
Default MRL: 0,01 mg/kg (10 ppt) Considered "negligible"	Default MRL: 0,01 mg/kg (10 ppt) Considered "negligible"

some questions remain over the interpretation of some of the criteria and the cut-off criteria will only take effect on renewal of each a.s. (most taking place between 2016 and 2019)

Regulation (EC) No 1107/2009

Zonal evaluation

Under 1107/2009, the EU is divided into three zones; Northern, Central & Southern. The concept is that once a PPP approval is granted in one MS, other MS in that zone are able to use the evaluation to grant an approval (a process commonly known as **Mutual Recognition**), as long as any national specific data requirements and risk assessments have been completed. This process is intended to speed-up decision making and to encourage a level playing field within a zone in terms of pesticide availability.

Zone A — Northern zone:

Denmark, Estonia, Latvia, Lithuania, Finland, Sweden

Zone B — Central zone:

Belgium, Czech Republic, Germany, Ireland, Luxembourg, Hungary, Netherlands, Austria, Poland, Romania, Slovenia, Slovakia, United Kingdom

Zone C — Southern zone:

Bulgaria, Greece, Spain, France, Italy, Cyprus, Malta, Portugal

Mutual Recognition

A mutual recognition agreement is an international agreement by which two or more MSs agree to recognize one another's conformity assessments.

The principle of mutual recognition is one of the means of ensuring the **free movement of goods** within the Community. To **avoid any duplication** of work, to **reduce the administrative burden** for industry and for Member States and to provide for more harmonised availability of plant protection products, authorisations granted by one Member State should be accepted by other Member States where agricultural, plant health and environmental (including climatic) conditions are comparable.

However, environmental or agricultural circumstances specific to the territory of one or more Member States might require that, on application, Member States recognise or amend an authorisation issued by another Member State, or refuse to authorise the plant protection product in their territory, where justified as a result of **specific environmental or agricultural circumstances** or where the high level of protection of both human and animal health and the environment required by this Regulation cannot be achieved.

5 areas of expertise

Section 1	Identity, Physical/Chemical Properties, Details of Uses, Further Information, Methods of Analysis
Section 2	Mammalian Toxicology
Section 3	Residues and consumer risk assessment
Section 4	Environmental fate and behaviour
Section 5	Ecotoxicology

Draft Registration Reports

All the evaluations (new product, amendment and renewal) for PPPs is made in the form of a draft Registration Report (dRR).

The dRR is split into 3 sections:

Part A – risk management (national)

Part B – data evaluation and risk assessment

Part C – confidential information

Identity of Plant Protection Product- Main Issues

Data point	What are the key issues for the detailed technical sift
1.3 Trade names and producer's development code numbers for the preparations (KCP 1.3)	All code names used in the dRR and studies should be listed
1.4.2 Information on the active substance (KCP1.4.2)	The ISO name, CAS number, EINECS number, CIPAC number and a statement as to whether the active is present in the PPP as an ester, salt or anion or cation must be included. Where an active is present as a variant, information on the amount of the active moiety and variant should be stated. Information on how the identity complies with the implementing regulation is required (e.g. the implementing regulation covers the acid moiety). The tolerance limits for the technical material and pure active in the PPP should be stated.
1.5 Type and code of the plant protection product (KCP 1.5)	The formulation type and the corresponding croplife international codes should be stated
1.6 Function (KCP 1.6)	The function of the PPP (e.g. herbicide, fungicide, insecticide) should be stated
Other missing information not covered under general or specific data points	
Any missing information/data that does not apply to any point raised above may also be raised in the detailed technical sift if the lack of the data/information means it is not possible to proceed with the assessment	
dRR Part C	
1.1.3 Statement of purity (and detailed information on impurities) of the active substance (s) (KCP 1.2)	A clear reference to where the sources of the active substances used in the PPP were considered is required e.g. reference the DAR or reference the details of the technical equivalence report (MS and date)
1.2.2 Composition of the plant protection product (KCP 1.4)	The amount of the pure and technical grade active ingredient (TGAI) in the PPP should be stated. Where an active is present as a variant, information must be provided outlining at what stage in the manufacturing process the variant is produced i.e. the manufacture of the TGAI or manufacture of the PPP. The amount of the variant and the 'acid moiety' should be stated. Compliance with the identity established in the implementing regulation is required. Information on relevant impurities are required.

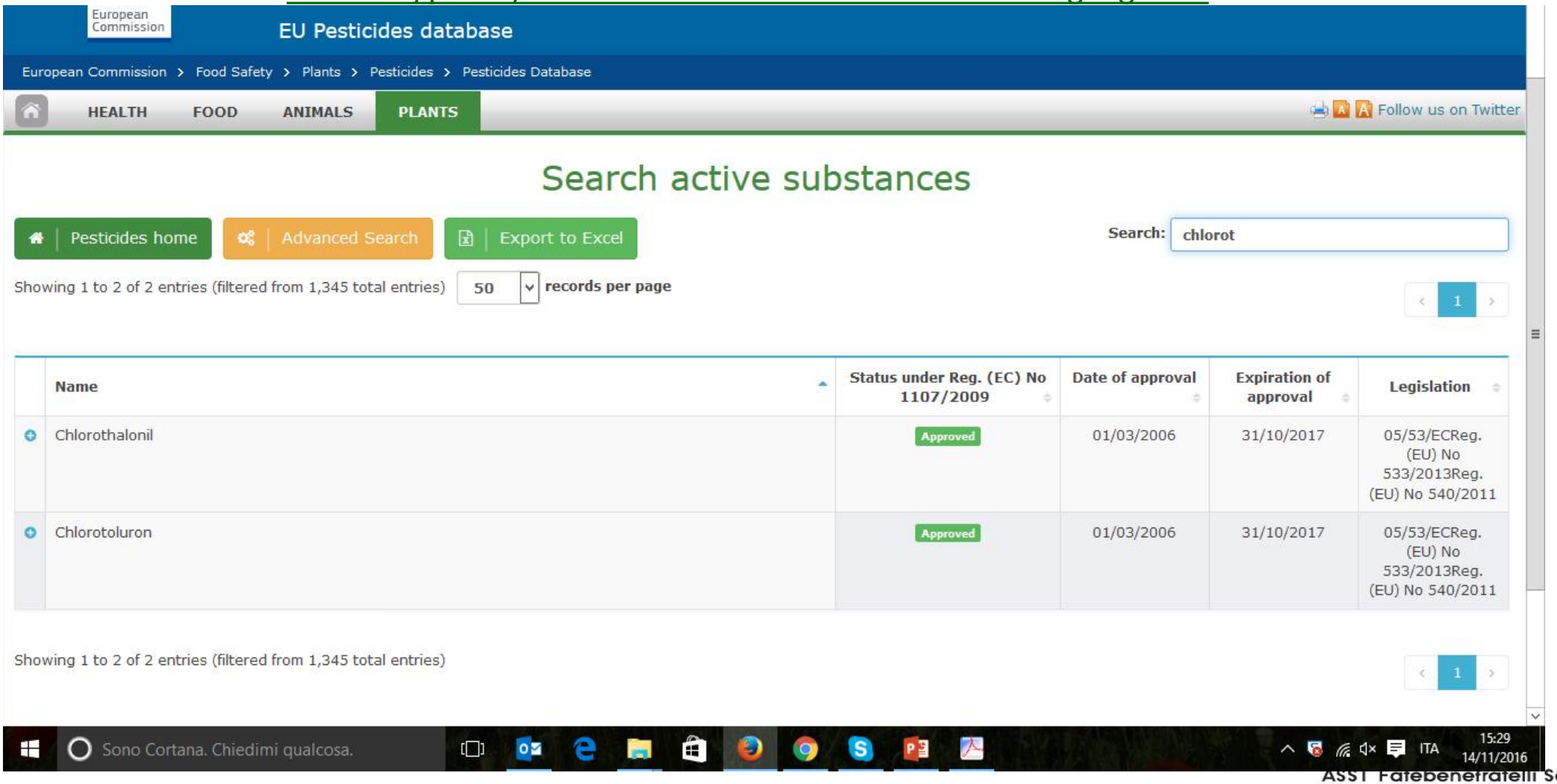
Identity of Plant Protection Product- Main Issues

	Where data have been conducted on different formulations from the one for which an authorisation is being sought then the full composition details should also be given along with a case on why the data generated can be extrapolated to the PPP being supported for authorisation.
1.2.2 Information on co-formulants (KCP 1.4.3)	For each co-formulant a MSDS should be provided. The applicant should confirm that these represent the latest version. For each co-formulant the following information is required: • Trade name • IUPAC name • Chemical name • CAS number • Relevant EC numbers • Structure/formula • Function
Other missing information not covered under general or specific data points	
Any missing information/data that does not apply to any point raised above may also be raised in the detailed technical sift if the lack of the data/information means it is not possible to proceed with the assessment.	

Source: *HSE Overview of the Processes and Procedures for the Authorisation of Plant Protection Products in the UK under Regulation (EC) No 1107/2009, June 2016, version 1.2..*

EU Pesticide Database

http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=activesubstance.selection&language=EN



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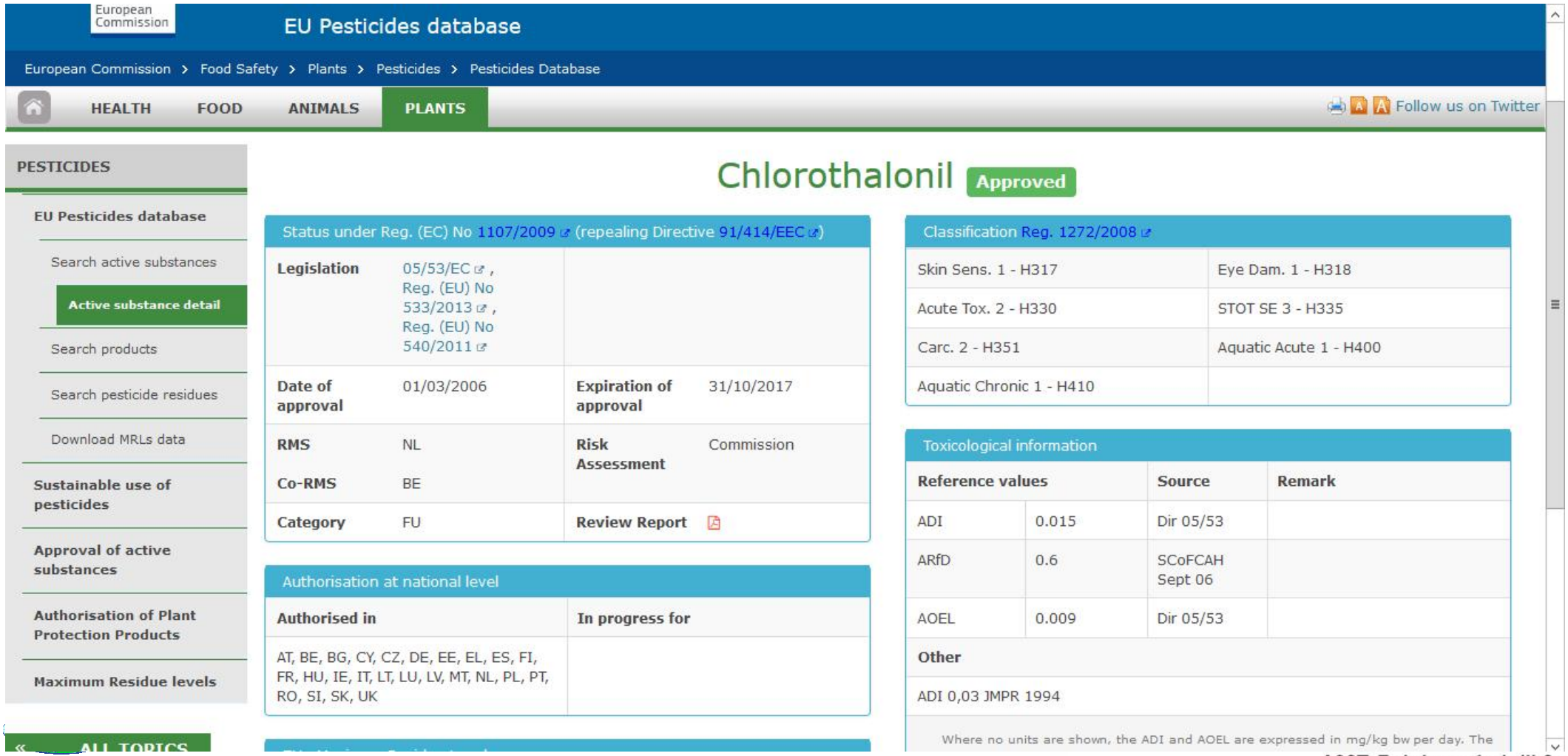


PHYSICAL, CHEMICAL AND TECHNICAL PROPERTIES

PLANT PROTECTION PRODUCT

- Evaluation of physicochemical properties of plant protection product (appearance, pH/acidity/alkalinity, viscosity, surface tension, density, storage stability at high/low/ambient temperature, physicochemical compatibility with other products and adherence/distribution to seeds).
- Evaluation of technical properties of plant protection product (depending on the type of the formulation) according to **CIPAC** methods and compliance with the relevant **FAO/WHO** specifications for pesticides.
- Evaluation of safety properties (flash point, flammability, self-heating, explosive and oxidising properties)
- Classification and labelling (under Regulation 1272/2008).

Source: *K.Dandika et al., Data requirements for the EU approval of active substances and their plant protection products regarding the identity, the physicochemical properties and methods of analysis under Regulation EC 1107/2009, CIPSC Symposium Poster*

Test methods

3.4.2013 EN Official Journal of the European Union C 95/21

Commission communication in the framework of the implementation of Commission Regulation (EU) No 284/2013 of 1 March 2013 setting out the data requirements for plant protection products, in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market [1]

(Text with EEA relevance)

(2013/C 95/02)

Suitable methods are listed in the Commission Communication (2013/C 95/02)

- EC Methods - REGULATION (EC) No 440/2008 lays down test methods to be applied for REACH chemicals, Biocides, Pesticides …
- OECD Test Guidelines
- CIPAC Methods
- United Nations Recommendations on the Transport of Dangerous Goods (UN RTDG) Manual of Tests and Criteria

dRR Part B Section 1

Table 2-1: → Physical, chemical and technical properties of the plant protection product

Annex point	Method used / deviations	Test material	Findings	GLP Y/N	Reference	Acceptability / comments
Colour and physical state (KCP 2.1)						
Explosive properties (KCP 2.2.1)						
Oxidizing properties (KCP 2.2.2)						
Flash point (KCP 2.3.1)						
Flammability (KCP 2.3.2)						
Self-heating (KCP 2.3.3)						
Acidity or alkalinity and pH (KCP 2.4.1)						
pH of a 1% aqueous dilution, emulsion or dispersion (KCP 2.4.2)						
Viscosity (KCP 2.5.1)						
Surface tension (KCP 2.5.2)						
Relative density (KCP 2.6.1)						

SAFETY PROPERTIES

DATA POINTS	KEY ISSUES TO CHECK
Classification properties: **Explosive properties (KCP 2.2.1)** **Oxidizing properties (KCP 2.2.2)** **Flash point (KCP 2.3.1)** **Flammability (KCP 2.3.2)** **Self-heating (KCP 2.3.3)**	The classification of the PPP must be in accordance with CLP (Regulation EC (No) 1272/2008) The test methods applicable are outlined in the commission communication document (2013/C 95/02). For the active it is acceptable to refer to data evaluated for the approval (provided data access is available), or make a case based on the chemical structure. For the co-formulants reference to the MSDS can be made.

EXPLOSIVE PROPERTIES

DATA POINTS	TO CHECK
Explosive properties (KCP 2.2.1)	✓ The method: • Method A14 of Regulation (EC) No. 440/2008 • United Nations Recommendations on the Transport of Dangerous Goods (UN RTDG) Manual of Tests and Criteria ST/SG/AC.10/11/Rev. 5 – Part I (Test series), section 11. ✓ Where a statement is submitted, this should either be based on the basis of decomposition energy (< 500 J/g by DSC analysis), the absence of functional groups or the oxygen balance, based on all components of the product. ✓ This data requirement may also be waived if none of the components in the formulation is classified as explosive (see related MSDS). ✓ In order to classify based on Regulation (EC) 1272/2008, the EC test methods can no longer be used.

GROUPS ASSOCIATED WITH EXPLOSIVE PROPERTIES

Structural formula	Examples
C-C unsaturation	Acetylenes, actylides, 1,2-dienes
C-Metal, N-Metal	Grignard reagents, organo-lithium compounds
Contiguous nitrogen atoms	Azides, aliphatic azo compounds, diazonium salts, hydrazines, sulfonylhydrazines
Contiguous oxygen atoms	Peroxides, ozonides
N-O	Hydroxylamines, nitrates, nitro compounds, nitroso compounds, N-oxides, 1,2-oxazoles
N-halogen	Chloramines, fluoroamines
O-halogen	Chlorates, perchlorates, iodosyl compounds

Source: *CRD Guidance document for the generation of data on the physical, chemical and technical properties of plant protection products under Regulation (EC) No. 1107/2009 of the EU Parliament and Council on placing plant protection products on the market.*

OXIDIZING PROPERTIES

Serving to establish whether the preparation can show an exothermic reaction with flammable material.

Method	**A17**	**of Regulation (EC) No. 440/2008 for solids**
	A21	**of Regulation (EC) No. 440/2008 for liquids**
	Test O.1	**Test for oxidizing solids (Manual of tests and Criteria Part III sub-section section 34.4.1 of United Nations Recommendations on the Transport of Dangerous Goods – UN RTDG)**
	Test O.2	**Test for oxidizing liquids (Manual of tests and Criteria Part III sub-section section 34.4.2 of UN RTDG)**

A17: Burning rates of test substance and reference substance to be reported. The formulation is not oxidizing when burning rate of test substance is less than reference substance

A21: mean pressure rise time for test substance and reference substance to be reported. The formulation is not oxidizing when time for mean pressure rise of test substance is greater than for reference substance.

Source: *CRD Guidance document for the generation of data on the physical, chemical and technical properties of plant protection products under Regulation (EC) No. 1107/2009 of the EU Parliament and Council on placing plant protection products on the market.*

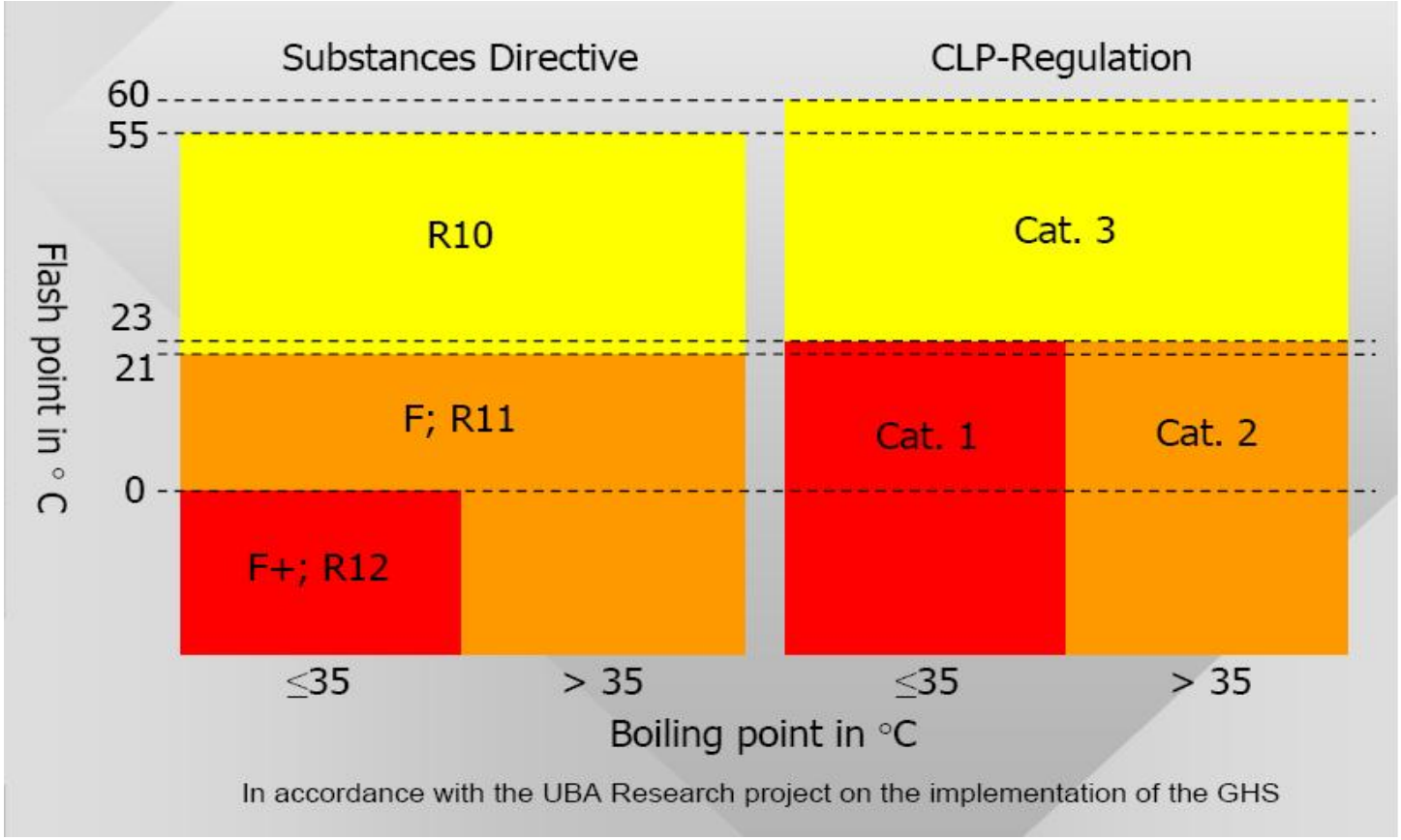
OXIDIZING PROPERTIES

DATA POINTS	TO CHECK
Oxidizing properties (KCP 2.2.2)	✓ The method: • Method A17(solids) or A21(liquids) of Regulation (EC) No. 440/2008 • Test O.1(solids) or Test O.2 (liquids) United Nations Recommendations on the Transport of Dangerous Goods (UN RTDG) Manual of Tests and Criteria ✓ Where a statement is submitted, this should be based on the absence of functional elements/ groups based on all components of the product. ✓ Reference can be made to the Material Safety Data Sheets and structural characteristics of the co-formulants (i.e. that the formulation does not contain Cl, F or O or if it does contain Cl, F or O but these are bonded to C and/or H only) ✓ In order to classify based on Regulation (EC) 1272/2008, the EC test methods can no longer be used.

FLAMMABILITY – Flash Point

DATA POINTS	TO CHECK
Flash point (KCP 2.3.1)	✓ This test is only required for preparations that contain flammable liquids. ✓ The method: Method A9 (closed cup) of Regulation (EC) No. 440/2008 ✓ No classification if >60°C ✓ The test is not required if a case can be made showing the individual components of the preparation are not flammable. Reference can be made to the Material Safety Data Sheets.

FLAMMABLE LIQUIDS



FLAMMABILITY

DATA POINTS	TO CHECK
Flammability (KCP 2.3.2)	✓ The method: • Method A10(solids) or A11(gas) or A12 (contact with water) of Regulation (EC) No. 440/2008 • Test N.1(solids) United Nations Recommendations on the Transport of Dangerous Goods (UN RTDG) Manual of Tests and Criteria ✓ Data from method A12 are only required if the preparation is designed to liberate a gas on contact with water or if data on ingredients show the individual components may release a gas on contact with water. ✓ The test is not required if a case can be made showing the individual components of the preparation are not flammable. Reference to MSDS is possible

SELF-HEATING

DATA POINTS	TO CHECK
Self-heating (KCP 2.3.3)	✓ The method: • Method A16(solids) or A15(liquids and gases) of Regulation (EC) No. 440/2008 • Test N.4 United Nations Recommendations on the Transport of Dangerous Goods (UN RTDG) Manual of Tests and Criteria ✓ When using Test N.4 the classification is in accordance with CLP.

dRR Part B Section 1

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Explosive properties (KCP 2.2.1)						
Oxidizing properties (KCP 2.2.2)						
Flash point (KCP 2.3.1)						
Flammability (KCP 2.3.2)						
Self-heating (KCP 2.3.3)						
Acidity or alkalinity and pH (KCP 2.4.1)						
pH of a 1% aqueous dilution, emulsion or dispersion (KCP 2.4.2)						
Viscosity (KCP 2.5.1)						
Surface tension (KCP 2.5.2)						
Relative density (KCP 2.6.1)						

Acidity/Alcalinity and pH value

2.4 Acidity/alkalinity and pH value

2.4a pH

Method MT 75.3 Determination of pH values

In the case of aqueous preparations, the pH value of the neat preparation should be determined.

For solid and non-aqueous liquid preparations to be applied as aqueous dilution the pH of a 1% aqueous dilution, emulsion or dispersion of the preparation should be determined.

A change in pH on storage can provide an indication of instability of the active substance or preparation.

Source: *CRD Guidance document for the generation of data on the physical, chemical and technical properties of plant protection products under Regulation (EC) No. 1107/2009 of the EU Parliament and Council on placing plant protection products on the market.*

Acidity/Alcalinity and pH value

2.4b Acidity/alkalinity

Method	**MT 191**	**Free acidity or alkalinity of formulations**
	MT 31	**Free acidity or alkalinity**

MT 191 is the preferred method.

The acidity or alkalinity should be tested if the preparation has pH <4 or pH >10. The test expresses free acidity or alkalinity calculated as H_2SO_4 or NaOH.

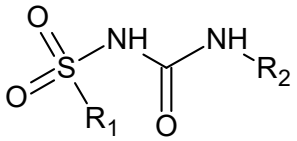
The pH only gives an indication of the ionisation of strong acids/bases. The acidity/alkalinity gives the total concentration of weak and strong acids/bases and hence is used to assess corrosive nature of formulations.

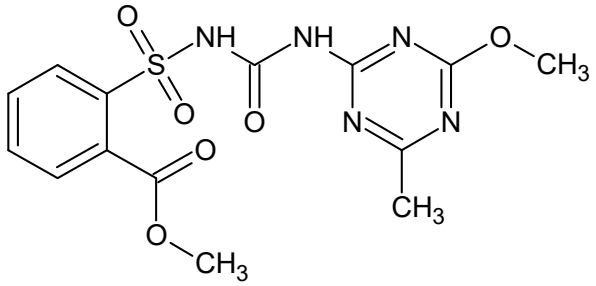
Source: *CRD Guidance document for the generation of data on the physical, chemical and technical properties of plant protection products under Regulation (EC) No. 1107/2009 of the EU Parliament and Council on placing plant protection products on the market.*

Example: Sulfonylurea herbicide

Section 1 data requirements

Sulfonylureas form a class of herbicides widely used in agriculture owing to their **low application rates**, good crop selectivity and very **low animal toxicity**.
They are composed of an aryl group (R_1) and an N-heterocycle (R_2) connected through a **sulfonylurea bridge**. The main degradation pathways are **microbial metabolization** and **hydrolysis**, but **photodegradation** induced by sunlight can affect their persistence. Chemical hydrolysis of sulfonylureas is a **pH dependent process**, whose rate is greater at acidic pH. These compounds behave as **weak acids** and the chemical **degradation rate of the neutral form is greater than that of the anionic one.**





Sulfonylureas are also used as **antidiabetic drugs**
Stimulate endogenous release of insulin in type II diabetes

Active substance (ISO Common Name) ‡	Metsulfuron-methyl
Function (e.g. fungicide)	Herbicide

Rapporteur Member State	Slovenia
Co-Rapporteur Member Sate	Sweden

dRR Part B Section 1

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Flash point (KCP 2.3.1)						
Flammability (KCP 2.3.2)						
Self-heating (KCP 2.3.3)						
Acidity or alkalinity and pH (KCP 2.4.1)						
pH of a 1% aqueous dilution, emulsion or dispersion (KCP 2.4.2)						
Viscosity (KCP 2.5.1)						
Surface tension (KCP 2.5.2)						
Relative density (KCP 2.6.1)						

Viscosity

Method	**OECD**	**Test guideline No. 114**
	MT 192	**Viscosity of liquids by rotational viscometry**

Where the hydrocarbon content is ≥ 10 % the preparation must be considered for classification as an aspiration hazard, based on the viscosity of the formulation.

The kinematic viscosity must be determined and reported at 20°C and 40 °C.

Dynamic viscosity can be converted to kinematic viscosity as follows:

$$\frac{\text{Dynamic viscosity (mPa s)}}{\text{Density (g/cm}^3\text{)}} = \text{Kinematic viscosity (mm}^2\text{/s)}$$

Source: *CRD Guidance document for the generation of data on the physical, chemical and technical properties of plant protection products under Regulation (EC) No. 1107/2009 of the EU Parliament and Council on placing plant protection products on the market.*

STORAGE STABILITY

Annex point	Method used / deviations	Test material	Findings	GLP Y/N	Reference	Acceptability / comments
Bulk density (KCP 2.6.2)						
Storage Stability after 14 days at 54° C (KCP 2.7.1)						
Stability after storage for other periods and/or temperatures (KCP 2.7.2)						
Minimum content after heat stability testing (KCP 2.7.3)						
Effect of low temperatures on stability (KCP 2.7.4)						
Ambient temperature shelf life (KCP 2.7.5)						
Shelf life in months (if less than 2 years) (KCP 2.7.6)						
Wettability (KCP 2.8.1)						
Persistence of foaming (KCP 2.8.2)						
Suspensibility (KCP 2.8.3.1)						

STORAGE STABILITY

DATA POINTS	TO CHECK
Storage Stability after 14 days at 54º C (KCP 2.7.1) **Stability after storage for other periods and/or temperatures (KCP 2.7.2)** **Minimum content after heat stability testing (KCP 2.7.3)** **Ambient temperature shelf life (KCP 2.7.5)**	✓ The active content should be determined prior to and after storage. Any decrease observed must be within acceptable criteria (<10%) or the decrease adequately addressed including the fate of the active and a justification of an appropriate shelf life. ✓ Any relevant impurities that can form or increase on manufacture or storage of the PPP must be determined prior to and after storage. For any relevant impurities not determined, a case to justify their non-determination must be given. ✓ It should be made clear what analytical methods have been used to determine the active content and any relevant impurities (cross reference details outlined in section 5 of the dRR). ✓ All relevant technical properties should be determined prior to and after storage. ✓ It should be made clear what packaging the formulation has been stored in for the stability and shelf life studies.