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CLP Regulation
New classification standards of dangerous chemicals

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This booklet has been conceived and realised in order to gain knowledge and understand the requirements of **Regulation (EC) no. 1272/2008** about classification, labelling and packaging of substances and mixtures (Regulation CLP or simply CLP), entered into force on January 20th, 2009.

Many dispositions are strictly linked to a previous regulation (EC no. 1907/2006) concerning registration, evaluation, authorization and restriction of chemicals (REACH).

CLP modifies and integrates some REACH articles, and it is supposed to abrogate definitely the law currently in force (Directive EEC 67/548 about dangerous substances and Directive EC 1999/45 about dangerous preparations) as of June 1st, 2015.

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1 INTRODUCTION

Different stages characterized the process leading to a new classification of hazardous chemicals, whose ultimate goal has been to establish new worldwide rules aiming at human health and environmental protection.

1.1 The Earth Summit – Rio de Janeiro

In June 1992 the Earth Summit took place in Rio de Janeiro where the United Nation conference on Environment and Development established the introduction of a Globally Harmonized System of Classification and Labelling of Chemicals, in order to ensure a globally homogenized classification and labelling.

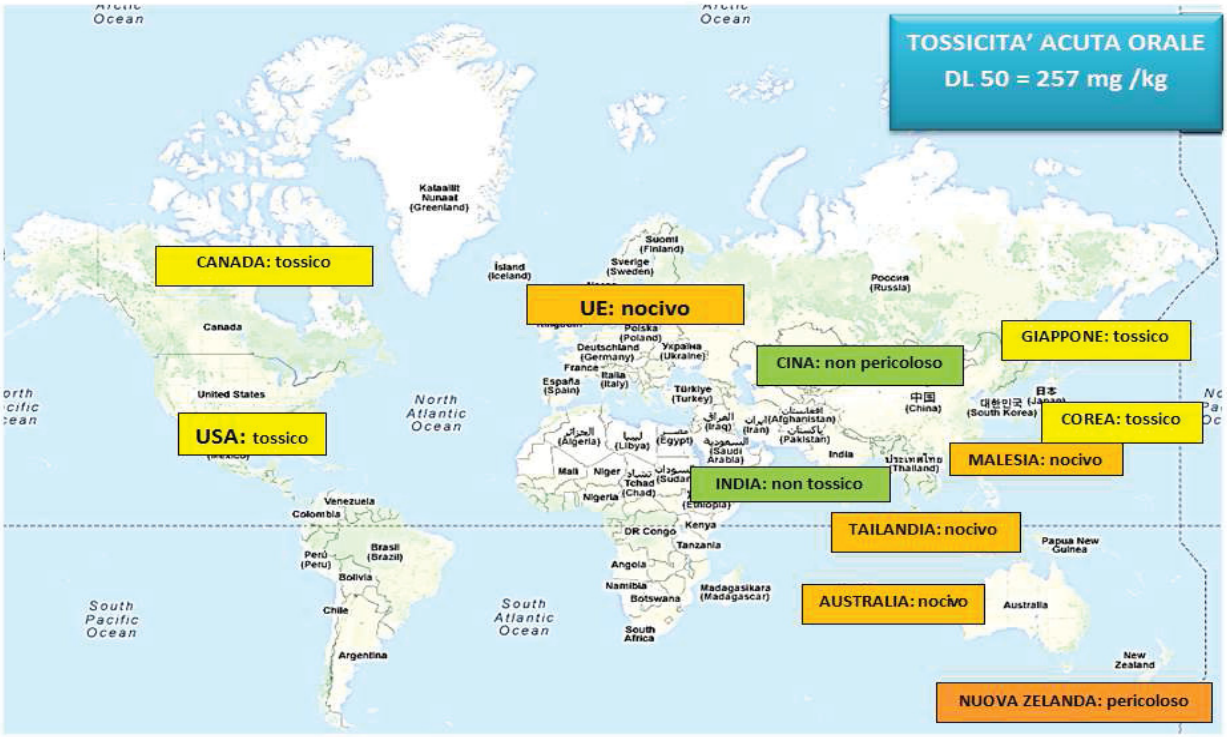
The new classification is supposed to convey a global communication of chemical inherent dangers through a worldwide adoption of the same symbols and terminology (regarding nature and relevant safety precautions to be taken). As a result it is expected to simplify their international trade remarkably, and mainly to supply a higher level of human health protection also to countries currently lacking a system of classification and labelling. The GHS system though is only a framework agreement and should be incorporated into each State's local law to acquire legal validity.

1.2 World summit on Sustainable Development – Johannesburg

In 2002 the World Summit on Sustainable Development was held in Johannesburg. It was arranged by the UN ten years after the Earth Summit of Rio de Janeiro, to discuss the implementation status of the resolutions taken in Rio.

The world meeting encouraged countries to adopt the GHS as soon as possible, in order to put it in full operation within 2008.

The issues to face are really manifold and complex. The main ones are about: discrepancy between guidelines and laws in different countries, different definitions of dangers, different prescriptions on labels and dissimilarity of safety data sheets relevant to a specific substance. A substance with acute oral toxicity DL=257 mg/kg, for instance, is classified:



Picture 1: classification of a substance with acute oral toxicity DL50=257 mg/kg
nocivo= harmful; tossico=toxic; non pericoloso=not dangerous; pericoloso=dangerous

2 WHAT CLP CONSISTS OF

CLP is the acronym of Classification, Labelling, Packaging. It is the term usually associated with the Regulation EC 272/2008, issued on the Official Journal of the EU on December 31st, 2008 and directly applicable to Member States after January 20th, 2009, without transposition into national law.

It introduces new GHS based criteria in the EU- Moreover it sets rules for a substance entry in the inventory of classifications and labelling laid down by ECHA (European CHemical Agency).

CLP Regulation ensues from some European Commission resolutions reiterating its intent to contribute to the global harmonisation of standards for classification and labelling, through incorporation of the internationally agreed GHS criteria into Community law.
CLP Regulation takes into account the operating methods and main procedures provided for by the Dangerous Substances Directive (67/548/EEC – DSD) and by the Dangerous Preparations Directive (1999/45/EC – DPD). Both of them outline the main resolutions regarding the classification and labelling of hazardous substances and mixtures.
CLP is legally biding in all the Member States and it is directly applicable to the industry in question.
It will be enacted simultaneously with the existing law about classification and labelling of substances and preparations up to June 1st, 2015.

2.1 Classification, Labelling and Packaging

- One of the main purpose of CLP is to determine if a substance or mixture has intrinsic properties which entails its classification as hazardous.
  Once such properties are identified and the substance/mixture has been consequently classified, manufactures, importers, distributors and downstream users have to notify the dangers to other actors in the supply chain, among whom final consumers.
- *Labelling* allows immediate notification of the hazard to the user.
- CLP Regulation lays down also general guidelines in the *packaging*, which guarantee the supply safety.

2.2 Risk assessment

The danger of a substance/mixture is the potential chance to be noxious for human beings and environment and depends on its **intrinsic** properties.

The risk assessment is the process of examination of substance intrinsic properties in order to identify potential danger.

Classification of chemicals must reflect the type and severity of intrinsic dangers. It has not to be confused with risk assessment, which connects a specific hazard with the **effective exposure** of human beings to a specific substance/mixture.

CLP defines the hazards, which will be used for the evaluation of the risks.

3 AREA OF APPLICABILITY

CLP shall apply to all the chemical substances and mixtures, including biocides and antiparasitics, with no limits of quantity produced per year.

- This Regulation shall not apply to substances and mixtures which are subject to other European regulations, such as:
  - ✓ radioactive substances and mixtures;
  - ✓ substances and mixtures which are subject to customs supervision;
  - ✓ non-isolated intermediates;
  - ✓ substances and mixtures for scientific research and development which are not placed on the market;
  - ✓ waste.
- CLP shall not apply to substances and mixtures in the following forms, which are in the finished state:
  - ✓ medicinal products;
  - ✓ veterinary medicinal products;
  - ✓ cosmetic products;

- ✓ medical devices;
- ✓ food or feeding stuffs (including when used as a food additive).

- This Regulation shall not apply to the transport of dangerous goods.

4 PRACTICAL CHANGES

DSD, DPD and CLP are conceptually similar, as they are related to:

- classification;
- notification about the hazard by means of the labelling;
- packaging.

Into practice though, remarkable changes can be registered.

4.1 Terminology

First of all a change of terminology has to be mentioned: expressions used in DSD and DPD, even though similar, are not quite equal.
In particular:

- the word "preparation" is replaced with the word "MIXTURE";
- the denomination "category of hazard" is replaced with "CLASS OF HAZARD";
- the word "symbol of hazard" is replaced with "PICTOGRAM";
- the word "risk statement (R statement)" is replaced with "HAZARD STATEMENT - H";
- the denomination "security statement (S statement)" is replaced with "PRECAUTIONARY STATEMENT - P";

4.2 Classification

The purpose of chemical classification is to identify the "intrinsic properties" which entail a potential hazard when handled.

Classification of substances

CLP mentions 'danger category' no more, instead it is used the term **hazard class**; a class defines an hazardous nature, which can be physical, health threatening or environmental.

EU introduced *the GHS' hazard classes whose correspondence with risk categories of DSD is more outstanding* in CLP Regulation, in order to realise the most possible continuity with the use of terms that have become familiar by now.

In particular, as to physical hazards, the total number of hazard classes increased from n°5 to n°16.

All the substances and mixtures which correspond at least to one CLP hazard class are considered ***dangerous.***

Hazard classes are further subdivided in hazard categories, which specify the level of danger severity.

Classification of mixtures

Like DPD, CLP prescribes that mixtures are to be classified on the basis of the same perils associated to individual substances. In order to determine the classification of mixtures, available data about the mixture in the complex have to be mainly taken into account, likewise when substances are concerned. If this is not possible, other methods of mixture classification can be employed, and they partially differs from those considered by DPD: for instance, it is possible to apply the so called 'bridging principles' to some hazards to health and the environment, by using data on **similar tested mixtures** or information on individual substances.

Whenever calculations are carried out, often formulas differs from those used adopting PDP criteria.

4.2.1 Definition of hazard

A substance or a mixture is considered *hazardous* when meeting the criteria relevant to physical, health or environmental dangers referred to in annex I (article 3).

4.2.2 Hazard Casses

CLP is more restrictive than previous regulations: its classification implies a wider definition of dangerous compounds.

n°28 hazard classes are defined as follows:

- n°16 physical hazard classes
- n°10 health hazard classes
- n°2 environmental hazard classes

n°16 **physical** hazard classes

- from n°5 categories belonging to DSD to n°16 CLP hazard classes;
- they are similar to those used for the transport of dangerous goods;

1. Explosives
2. Flammable Gases
3. Flammable Aerosols
4. Oxidising Gases
5. Gases under pressure (compressed gases, liquefied gases, liquefied refrigerated gases, dissolved gases)
6. Flammable Liquids
7. Flammable Solids
8. Self-reactive substances e mixtures
9. Pyrophoric Liquids
10. Pyrophoric Solids

11. Self-heating substances and mixtures
12. Substances and mixtures which, in contact with water, emit flammable gases
13. Oxidising Liquids
14. Oxidising Solids
15. Organic peroxides
16. Corrosive to metals

n°10 **health** hazard classes:
they are almost equal to the categories of the European system but they are not interchangeable due to some different criteria applied.

1. Acute toxicity
2. Skin corrosion/irritation
3. Serious eye damage/irritation
4. Skin / respiratory tract sensitization
5. Germ cell mutagenicity
6. Carcinogenicity
7. Reproductive toxicity besides an additional category including adverse effects on or via lactation
8. Specific target organ toxicity (STOT-SE) – single exposure
9. Specific target organ toxicity (STOT-RE) – repeated exposure
10. Aspiration hazard

n°2 **environmental** hazards**:**

1. Hazardous to the aquatic environment: acute toxicity
2. Hazardous to the aquatic environment: chronic (long term) toxicity

4.2.3 Classification criteria

Standards used for the classification partially differ from previous regulations:

- cut-off values vary in acute oral, dermal and inhalation toxicity;
- the 2 categories relevant to skin corrosion, R35 and R34, develop in 3 categories according to the minimum time of exposure that determine symptoms ;
- the ignition temperatures which define hazard classes of flammable liquids are different from DSD.

Taking into consideration the hazard class: 'acute oral toxicity', the threshold values defining the categories had changed, and the number of categories increased from 3 to 4.

<table>
<tr><td rowspan="3">CLP</td><td>fatal</td><td colspan="2">fatal</td><td colspan="2">fatal</td><td>harmful</td><td>May be harmful</td></tr>
<tr><td>  </td><td colspan="2">  </td><td colspan="2">  </td><td>  </td><td>Pictogram n/a</td></tr>
<tr><td>Category 1</td><td colspan="2">Category 2</td><td colspan="2">Category 3</td><td>Category 4</td><td>Category 5</td></tr>
<tr><td>DL50 mg/kg</td><td>5</td><td>25</td><td>50</td><td>200</td><td>300</td><td>2000</td><td>5000</td></tr>
<tr><td>DSD</td><td colspan="2">Very toxic T+
R28
  </td><td colspan="2">Toxic
R25
  </td><td colspan="3">Harmful Xn
R22
  </td></tr>
</table>

Picture 2: comparison of acute oral toxicity

4.3 Labelling

The label is the main and most immediate tool of notification of danger.

Before handling any product it is necessary to read carefully and understand its label, in order to identify main potential hazards. The visual communication at its basis allows to convey essential information in an immediate, compact way and to gain at once a basic knowledge about the dangerous chemicals which are about to be handled.

4.3.1 Pictograms

One of the principal elements of the new label is the pictogram, which conveys a warning of danger in a visual way.

The pictogram is a graphical composition that includes a symbol plus other graphic elements (such as a border, background pattern or colour) and it is intended to convey specific information on the hazard concerned.

GHS01	 I GO OFF	Explosives Self-heating substances and mixtures Pyrophoric liquids Pyrophoric solids Self-reactive substances e mixtures Organic peroxides
GHS02	 I BURST INTO FLAMES	Self-heating substances and mixtures Pyrophoric liquids Pyrophoric solids Substances and mixtures which, in contact with water, emit flammable gases Flammable gases Flammable aerosols Flammable liquids Flammable solids Auto-reactive substances and mixtures Organic peroxides
GHS03	 I SET FIRE	Oxidising gases Oxidising solids Oxidising liquids
GHS04	 I AM UNDER PRESSION	Gases under pressure
GHS05	 I CORRODE	Corrosive to metals Serious eye damages / eye irritation Skin corrosion / irritation
GHS06	 I KILL	Acute toxicity

GHS07	 I AM HAZARDOUS TO HEALTH	Sensitization of airways Specific target organ toxicity – Single exposure Acute toxicity Serious eye damages / eye irritation Skin corrosion / irritation
GHS08	 I AM SERIOUSLY HARMFUL TO HUMAN HEALTH	Sensitization of airways Specific target organ toxicity – Single exposure Germ cell mutagenicity Carcinogenicity Reproductive toxicity Specific Target Organ Toxicity — Repeated exposure Aspiration hazard
GHS09	 I POLLUTE	Hazardous to the aquatic environment

The colour pattern and the position of labels have to be set up so that the hazard pictogram and its background are clearly visible.

The majority of symbols inserted in pictograms does not differ substantially from those already in use. Hazard classes are associated with pictograms.

4.3.2 Hazard statements

The hazard statements, which replace the previous risk statements R, describe the nature or the intrinsic property of a dangerous product; they are characterized by the **letter H** (hazard) followed by 3 digits which identify the hazard typology:

- H2xx for physical hazards
- H3xx for health hazards
- H4xx for environmental hazards

Currently there are n°62 hazard statements:

- n°28 for physical hazards
- n°29 for health hazards
- n°5 for environmental hazards

Besides the above mentioned there are particular supplemental dispositions, which are applicable only in Europe (see § 4.3.5).

4.3.3 Advice

The advice specifies the relative degree of danger **severity** by means of the words “danger” or “warning” which are printed on the label. The advice aims to inform the reader immediately about a potential hazard:

- “DANGER”: advice for the most serious categories
- “WARNING”: advice for the less serious categories

There is no equivalence in the existing system.

The advice “danger” makes the advice “warning” optional.

4.3.4 Precautionary statements

The *precautionary statements*, likewise the advices S, describe the provisions to be taken to manage dangers, in relation to the uses of the substance or mixture in question. They are characterized by the letter P, followed by a code of 3 digits which identifies the typology of the advice:

- P1xx general
- P2xx prevention
- P3xx reaction
- P4xx conservation
- P5xx disposal

4.3.5 Particular instructions

Some aspects are analysed by DSD or DPD, but they are not (at least not yet) taken into consideration in the UN GHS, for instance hazard class 'hazardous for the ozone layer' (the former R59 statement) which is considered supplementary by the EU.

Such elements are considered as conveying additional labelling information and are reported in CLP - Annex I (part 5) and Annex II.

In order to specify that they are not deriving from any UN classification, they are associated to the statement code EUH followed by 3 digits.

4.3.6 Label

The new labels, placed onto the packaging of hazardous substances or mixtures, are written in the official language of the Member State where they are traded, they are consistent with the new classification criteria and comprise elements (both graphic and textual) which differs from those used so far.

Title III in the CLP defines univocally the label elements required to warn about the danger: CLASSIFICATION, PICTOGRAMS, ADVICE, INDICATION OF DANGER, PRECAUTIONARY STATEMENTS. For instance, in case a substance is provoking "serious eye damage ", the relevant label should read as follows:

Table 3.3.5

Label elements for serious eye damage/eye irritation

Classification	Category 1	Category 2
GHS Pictograms		
Signal Word	Danger	Warning
Hazard Statement	H318: Causes serious eye damage	H319: Causes serious eye irritation
Precautionary Statement Prevention	P280	P264 P280
Precautionary Statement Response	P305 + P351 + P338 P310	P305 + P351 + P338 P337 + P313
Precautionary Statement Storage		
Precautionary Statement Disposal		

Picture 3: extract from Title III of CLP – label elements

BEFORE using any products, it is necessary to study and understand the relevant label, pointing out the main related dangers.

The principal elements of the new label are:

- Supplier details: name, address, telephone number;
- Substance/mixture nominal quantity in the packaging supplied to the general public, exemptions are made if such quantity is specified elsewhere on the packaging itself ;
- Product identification: chemical name, identification code, CAS number
- Pictograms;
- Advice;
- Indication of danger;
- Precautionary advices;
- Supplementary information.

4.3.7 Precedence principles

When reading a label it is important to know if there is a precedence principle to apply to danger pictograms, danger indications and precautionary statements.

All the indications of danger, unless superfluous, shall appear on the label, together with no more than six precautionary statements.

Principles of precedence for hazard pictograms (article n° 26)

1. Where the classification of a substance or a mixture would result in more than one pictogram on the label, the following rules of precedence shall apply to reduce the number of hazard pictograms required:

a) if the hazard pictogram  applies, the use of pictograms  and  is optional, except in cases where more than one of these hazard pictograms are mandatory;

b) if the hazard pictogram  applies, the hazard pictogram  shall not appear;

c) if the hazard pictogram  applies, the hazard pictogram  shall not appear for skin or eye irritation;

d) if the hazard pictogram  applies for respiratory sensitization, the hazard pictogram  shall not appear for skin sensitization or for skin and eye irritation.

2. Where the classification of a substance or mixture would result in more than one pictogram, the label shall include the hazard pictogram corresponding to the **most severe** hazard category for each hazard class in question.

Principles of precedence for hazard statements (article 27)

If a substance or mixture is classified within several hazardous classes or differentiations of a hazard class, the label shall include all the hazard statements resulting from the classification, obviously excluding repetitions or redundancy.

Order of precedence for precautionary statements (article 28)

1. the label shall not show precautionary statements being clearly redundant or unnecessary given the specific substance, mixture or packaging.

2. if the substance or mixture is supplied to the general public, one precautionary statement regarding the disposal of that substance or mixture shall appear on the label, as well as another one about the disposal of the packaging.

A precautionary statement about disposal shall not be required where it is clear that the disposal of the substance or mixture or the

packaging does not represent a hazard to human health or the environment.

3. No more than six precautionary statements shall appear on the label, unless necessary to reflect the hazard nature and severity.

4.4 Safety data sheets

Labels and safety data sheets (SDS) are two tools defined by CLP to warn about dangers of substances and mixtures. As the resolution about safety data sheets are included in the Regulation EC n° 1907/2006 (REACH), according to which such data sheet is the main tool of communication in the supply chain, duplicating the same recommendations in the CLP has been considered unnecessary.
The REACH commits suppliers, or anyway whoever is responsible for distribution on the market, to providing downstream users with a **safety data sheet** (SDS) including the most essential information about the protection of human beings and environment against risks resulting from the handling of chemicals at the workplace.
SDS is supplied to the downstream users in the official languages of the Member States where the substance or mixture is traded (article 31 p.5 REACH). It has to be compiled according to the standards defined in the regulation and SDS represents a more in-depth and full-scale information system if compared to labels.
SDS has to be made available free of charge, either electronically or printed on paper (art. 31, p. 8 REACH).
It shall be dated and shall contain n° 16 items compulsorily:
section 1: identification of the substance/mixture and of the trading company
section 2: identification of the dangers
section 3: composition/information about ingredients
section 4: measures of first aid

section 5: measures of fire fighting
section 6: measures in case of accidental release
section 7: handling and storing
section 8: exposure surveillance/individual protection
section 9: physical and chemical properties
section 10: stability and reactivity
section 11: toxicological information
section 12: ecological information
section 13: considerations about disposal
section 14: transport information
section 15: information on the regulation
section 16: other information

SDS is subject to update by law whenever new data about properties of the chemical in question are gathered. The SDS has to be read and consulted always **BEFORE any** handling. It is advisable to acquire the SDS's before stockpiling, in order to evaluate the risk and consequently choose the less hazardous products.

The new SDS actually changed very little in comparison with the previous regulation:

- the order of sections n°2 “identification of dangers” and n°3 “ compositions/information on the components” has been inverted;
- addition of the e-mail address in the section n°1;
- in section n°2 the classifications according to both the CLP and the Directives are to be reported.

5 STAGES

1) January 20th, 2009: CLP enters into force.

The following resolutions are applied:

- up to December 1st, 2010, the substances have to keep be classified, labelled and packaged according to DSD (although a

substance can also be classified, labelled and packaged under the Regulation CLP before such date).

- Up to June 1st, 2015 the mixtures have to keep be classified, labelled and packaged according to DSD (although a substance can also be classified, labelled and packaged under the Regulation CLP before such date).

2) December 1st, 2010: Regulation CLP replaces DSD

The following resolutions are applied:

- Substances should be classified pursuant to DSD and CLP Regulation;
- Substances should be labelled and packaged only in conformity to CLP Regulation [however substances already classified, labelled and packaged according to DSD and placed on the market (or rather on the shelf) before December 1st, 2010 had to be labelled and packaged again within December 1st, 2012].

Downstream users are supposed not to receive substances labelled according to the outdated regulation as of December 1st, 2012.

3) June 1st, 2015: CLP regulation replaces DPD

The following resolutions are applied:

- substances must be classified, also on the SDS, only according to CLP Regulation;
- mixtures must be classified, labelled and packaged only in conformity to CLP Regulation [however the mixtures already classified, labelled and packaged pursuant to DPD and placed on the market (or rather already 'on the shelf') prior to June 1st, 2015, must be labelled and packaged again within June 1st, 2017].

Downstream users are supposed not to receive mixtures labelled according to outdated regulation as of June 1st, 2017.
Double labelling is NEVER allowed.

6 UPSTREAM IMPACT

The constraints compelling a supplier of substances or mixtures depend largely on his role in the supply chain. Therefore it is of extreme importance to identify one's role under CLP Regulation.
Among the roles specified in the CLP, the laboratory technician is normally defined as: **Downstream user (including formulator / re-importer)** namely "any physical or legal subject as ruled by the EU (other than the producer or the importer) who uses a substance, as such or as an ingredient of a mixture, in his manufacturing or professional practice." (article 2, para. 19).
The following obligations apply to such subject:

Obligations entailed by CLP Regulation – downstream user	
1	substances and mixtures must be classified, labelled and packaged in conformity to CLP Regulation, title II, before being placed on the market (*article* 4). However it is also possible to apply the classification of a substance or mixture that another subject of the supply chain has derived from title II of the CLP, provided the composition of such substance or mixture remains unchanged.
2	In case of alteration of the composition of the substance or mixture about to be placed on the market, the classification must be pursuant to title II of the CLP *(articles 5-14)*.
3	Labelling must be pursuant to title III of the CLP *(articles 17-33)*.
4	Packaging must be pursuant to title IV of the CLP *(article 35)*.
5	It is necessary to take all the reasonable and available measures in order to get to know and keep abreast of updated scientific or technical information that can affect the classification of substances o mixtures about to be traded. If one is made aware about such information that are considered appropriate and reliable, one must proceed to a new evaluation of the classification without any unjustified postponement *(article 15)*.

6	Label must be updated, without any improper delay, after any change of the classification and of the labelling of the substance or mixture in question *(article 30).*

6.1 Obligations of employer and employees

Among the obligations related to the introduction of new classification criteria of substances, it is necessary to comply with:

- information/training of employees: about the aspects of the new Regulation related to their daily activity (meaning of the pictograms, of the indications, etc.) in order to avoid confusion and misunderstanding;
- Update of SDS's:
  - ✓ Take inventory of the hazardous substances and mixtures in use or on stock;
  - ✓ Verify the availability of updated safety data sheets;
  - ✓ Request the supplier with missing or updated data sheets and progressively replace obsolete data sheets, thoroughly examining any occurred variation;
  - ✓ Hand out the data sheets to any involved subject, including the Worker Representative for Health and Safety and Doctors in charge.
- Assessment of chemical risk:
  - ✓ Ascertain or re-evaluate hazards according to the new classification.
- Technical and organisational verifications:
  - ✓ New evaluations may imply the implementation of new operative procedures involving CPD's and IPD's;
  - ✓ Verifying if it is necessary to implement or modify the health supervision of workers.
- Pictograms: progressively updating of the signage complying with new classifications.

6.2 Overall regulatory impact

CLP, replacing the Directive Dangerous Substances and the Directive Dangerous Preparations, will affect all the regulatory dispositions referring to classification criteria of substances and mixtures, sometimes in a direct way, sometimes indirectly and not always immediately. More specificately:

- ✓ Seveso (D.Lgs 334/99 and subsequent modifications and supplements)
- ✓ Wastes
- ✓ Air
- ✓ Waters
- ✓ Health and Safety in working places (D.Lgs 81/08)

In particular, CLP will impact remarkably on the decree n°81 where an assessment of the chemical risk is required.

Since the limits of the danger categories have been redefined, it is impossible to draw a unique conversion table comparing the old and the new classification. Therefore it will be necessary to re-evaluate workers expositions, as the increase of the danger classes and categories leads to a more complex classification.

Considering the chemical danger evaluation system adopted by the University of Pavia, it will be needed to rectify the calculation of danger index (qualitatively expressed as: not applicable – applicable low / medium / high) according to new CLP classification of substances.

For instance, the substance CAS n. 10563-26-5 [1,2-Bis(3-aminopropylamino)ethane] is classified according to DSD "R24 = toxic in contact with skin", whilst according to CLP: "H310 = fatal in contact with skin": the transition from "toxic" to "fatal" implies a jump in the intrinsic danger scale that results in a possible adjustment of the evaluation of chemical hazard.

A decrease in the degree of danger is likely to occur as well.

7 IN A NUTSHELL

- The Global Harmonized System introduces a system aiming to ensure a high level of protection of human health and the environment through an evaluation of the intrinsic risks of chemical substances.
- CLP is the new EU Regulation for the classification, labelling and packaging that adopts the worldwide recommendations deriving from the GHS, according to which some substances or mixtures, currently not harmful pursuant DSD and DPD, can be classified as hazardous.
- It implies a change at the following levels:
  - ✓ terminology used;
  - ✓ labels of dangerous substances and mixtures;
  - ✓ safety data sheets.
- Such changes determine, for any technician of each laboratory where chemicals are handled:
  - ✓ a necessary update;
  - ✓ a re-assessment of the risk at the working place;
  - ✓ a likely modification of some operational procedures depending on the variation of the substance classification.

The European Agency on the chemicals (ECHA) is a EU organisation established by the REACH (2006) for the enforcement of REACH and CLP Regulations, to ensure uniformity across the whole European Union.

8 FOLLOW-UP MATERIALS

An overview of CLP Regulation is available on the ECHA website.
http://www.echa.europa.eu/web/guest/regulations/clp

The website provides also the following information:
Introductory guidance to CLP:
http://www.echa.europa.eu/documents/10162/13562/clp_introductory_en.pdf

Guidance on the application of the CLP criteria:
http://echa.europa.eu/documents/10162/13562/clp_en.pdf

It is possible to contact the national helpdesks for questions about CLP and REACH obligations.

National helpdesks in all the 27 EU Member States provides advice and assistance in local language.
http://echa.europa.eu/it/support/helpdesks/echa-helpdesk

9 LIST OF HAZARD STATEMENTS

Physical hazards	
H200	Unstable explosive
H201	Explosive; mass explosion hazard
H202	Explosive; severe projection hazard
H203	Explosive; fire, blast or projection hazard
H204	Fire or projection hazard
H205	May mass explode in fire
H220	Extremely flammable gas
H221	Flammable gas
H222	Extremely flammable aerosol
H223	Flammable Aerosol
H224	Extremely flammable liquids and vapours
H225	Highly flammable liquids and vapours
H226	Flammable liquids and vapours
H228	Flammable solid
H240	Heating may cause an explosion
H241	Heating may cause a fire or explosion
H242	Heating may cause a fire
H250	Catches fire spontaneously if exposed to air
H251	Self-heating; may catch fire
H252	Self-heating in large quantities; may catch fire
H260	In contact with water releases flammable gases which may ignite spontaneously
H261	In contact with water releases flammable gases
H270	May cause or intensify fire: oxidiser
H271	May cause fire or explosion: strong oxidiser
H272	May intensify fire: oxidiser
H280	Contains gas under pressure: may explode if heated
H281	Contains refrigerated gas: may cause cryogenic burns or injury
H290	May be corrosive to metals
Health hazards	
H300	Fatal if swallowed
H301	Toxic if swallowed
H302	Harmful of swallowed
H304	May be fatal if swallawed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin

H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H331	Toxic if inhaled
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H361	Suspected of damaging fertility or the unborn child
H362	May cause harm to brest-fed children
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposion
H373	May cause damage to organs through prolonged or repeated exposion
Environmental hazards	
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects
H413	May be harmful to aquatic life with long lasting effects
EUH CODES: Physical properties	
EUH 001	Explosive when dry
EUH 006	Explosive with or without contact with air
EUH 014	Reacts violently with water
EUH 018	In use, may form flammable/explosive vapour-air mixture
EUH 019	May form explosive peroxides
EUH 044	Risk of explosion if heated under confinement
EUH CODES: Properties harmful to human health	
EUH 029	Contact with water liberates toxic gas
EUH 031	Contact with acid liberates toxic gas
EUH 032	Contact with acid liberates very toxic gas
EUH 066	Repeated exposure may cause skin dryness or cracking
EUH 070	Toxic by eye contact

EUH 071	Corrosive to the respiratory tract
EUH CODES: Properties hazardous to the environment	
EUH 059	Hazardous to the Ozone Layer
Precautionary statements: general approach	
P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children
P103	Read label before use
Precautionary statements: prevention	
P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P210	Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P211	Do not spray on an open flame or other ignition source.
P220	Keep/Store away from clothing/…/combustible materials.
P221	Take any precaution to avoid mixing with combustibles/….
P222	Do not allow contact with air
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire
P230	Keep wetted with…
P231	Handle under inert gas
P232	Protect from moisture
P233	Keep container tightly closed
P234	Keep only in original container
P235	Keep cool
P240	Ground/bond container and receiving equipment
P241	Use explosion-proof electrical/ventilating/lighting/…/equipment
P242	Use only not sparking tools
P243	Take precautionary measures against static discharge
P244	Keep reduction valves free from grease and oil
P250	Do not subject to grinding/ shock/…/friction
P251	Pressurized container: Do not pierce or burn, even after use
P260	Do not breathe dust/fume/gas/mist/vapours/spray
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P262	Do not get in eyes, on skin, or on clothing
P263	Avoid contact during pregnancy/while nursing
P264	Wash … thoroughly after handling
P270	Do not eat, drink or smoke when using this product
P271	Use only outdoors or in a well-ventilated area
P272	Contaminated work clothing should not be allowed out of the workplace
P273	Avoid release on the environment
P280	Wear protective gloves/protective clothing/eye protection/face protection
P281	Use personal protective equipment as required
P282	Wear cold insulating gloves/face shield/eye protection

P283	Wear fire/flame resistant/retardant clothing
P284	Wear respiratory protection
P285	In case of inadequate ventilation wear respiratory protection
Precautionary statements: reaction	
P301	If swallowed
P302	If on skin
P303	If on skin (or hair)
P304	If inhaled
P305	If in eyes
P306	If on clothes
P307	If exposed
P308	If exposed or concerned: ….
P309	If exposed or if you feel unwell
P310	Immediately call a POISON CENTER or doctor/physician
P311	Call a POISON CENTER or doctor/physician
P312	Call a POISON CENTER or doctor/physician if you feel unwell
P313	Get medical advice/attention
P314	Get medical advice/attention if you feel unwell
P315	Get immediate medical advice/attention
P320	Specific treatment is urgent (see … on this label)
P321	Specific treatment (see …on this label)
P322	Specific measures (see …onthis label)
P330	Rinse mouth
P331	Do NOT induce vomiting
P332	If skin irritation occurs
P333	If skin irritation or rash occurs
P334	Immerse in cool water/wrap in wet bandages
P335	Brush off loose particles from skin
P336	Thaw frosted parts with lukewarm water. Do not rub affected area.
P337	If eye irritation persists
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P340	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P341	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342	If experiencing respiratory symptoms:
P350	Gently wash with plenty of soap and water.
P351	Rinse cautiously with water for several minutes.
P352	Wash with plenty of soap and water.
P353	Rinse skin with water/shower.
P360	Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

P361	Remove/Take off immediately all contaminated clothing.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P370	In case of fire
P371	In case of major fire and large quantities:
P372	Explosion risk in case of fire.
P373	DO NOT fight fire when fire reaches explosives.
P374	Fight fire with normal precautions from a reasonable distance.
P375	Fight fire remotely due to the risk of explosion
P376	Stop leak if safe to do so**.**
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P378	Use ... for extinction
P380	Evacuate area
P381	Eliminate all ignition sources if safe to do so.
P390	Absorb spillage to prevent material damage.
P391	Collect spillage**.**
Precautionary statements: preservation	
P401	Store …
P402	Store in a dry place
P403	Store in a well-ventilated place**.**
P404	Store in a closed container**.**
P405	Store locked up.
P406	Store in corrosive resistant/… container with a resistant inner liner.
P407	Maintain air gap between stacks/pallets.
P410	Protect from sunlight**.**
P411	Store at temperatures not exceeding … °C/…°F.
P412	Do not expose to temperatures exceeding 50 °C/122 °F.
P413	Store bulk masses greater than … kg/…lbs at temperatures not exceeding … °C/… °F.
P420	Store away from other materials
P422	Store contents under ...
Precautionary statements: disposal	
P501	Dispose of contents/container to …