

Was ist REACH ?

R egistration

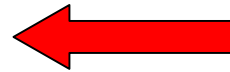
Umfang



E valuation

Verantwortliche

A uthorization



Chemicals

Was ist neu ?

Regulation of EU on Industrial Chemicals

Classification, Packaging Labelling of dangerous Substances
Directive 67/548/EEC 1967/69



6th Amendment 67/548/EEC
79/831/EEC 1981



Distinction between New Notified Substances and Existing Chemicals



New Notified Chemicals

Existing Chemicals

ELINCS cumulative Index
published by ECB

EINECS Inventory of
Substances produced
between 1/1971 - 9/1981



7th Amendment 67/548/EEC
92/32/EEC
Risk Assessment for
New Notified Substances



793/93 EEC
Evaluation and Control
of Existing Chemicals



76/769/EEC
Action program
HPV Chemicals, 1994
LPV Chemicals, 1998



2001 white paper

REACH

October 2003

2003/0256 (COD)
consolidated version

Interim period

December 2006

Regulation (EC)1907/2006

Transition period

June 2008

Agency fully operative

Data set required for industrial chemicals before REACH

All chemical substances placed on the market had to be classified, labelled and packaged as specified in Directive 67/548/EEC	
Classification criteria	<i>(tests, plus available knowledge or assessment)</i>
Physicochemical properties	explosive, oxidizing, flammable
Acute toxicity	very high/high toxic, harmful, irritant, corrosive, sensitizing
Other effects	mutagenic, carcinogenic, toxic for reproduction

New Chemicals had to be notified before being placed on market (6th Amendment and 7th Amendment Directive 67/548/EEC)	
Production volume	Data set required for notification
10 kg/a per manufacturer 50 kg/a total	Base set according to Annex VII C Annex VII B before 100 kg/a /manufacturer or (500 kg/a total) are reached
100 kg/a per manufacturer 500 kg/a total	Base set according to Annex VII B; Annex VII A before 1000 kg/a /manufacturer or (5000 kg/a total) are reached
1000 kg/a per manufacturer 5000 kg/a total	Base set according to Annex VII A
1 t/a per manufacturer 5 t/a total	Base set Annex VII A
10 t/a per manufacturer 50 t/a total	Base set Annex VII A Case by case some or all tests from Annex VIII, level 1
100 t/a per manufacturer 500 t/a total	Base set Annex VII A Tests from Annex VIII, level 1
1000 t/a per manufacturer 5000 t/a total	Base set Annex VII A Tests from Annex VIII, level 2

Annex VII C, B, A

Annex VIII
level 1, 2

Existing Chemicals already on market before 1981 were listed in the European Inventory of Existing Chemicals (EINEC)	
Production volume	Not notified, required information for entrance into the Inventory
> 10 kg /manufacturer	Items 0, 1 (part) of Annex VII
Since 1993 Directive (793/93/EEC)	Evaluation and Control of Existing Chemicals Aim is protection of the environment,
> 1000 t/a /manufacturer (HPV) 1994	Priority setting (1488/94/EEC) selection of 141 compounds by Competent Authorities Risk assessment (76/769/EEC) by Competent Authorities required data according to Annex VII A; Annex VIII level 2
> 10 - 1000 t/a/manufacturer (LPV) 1998	Priority setting (1488/94/EEC) Risk assessment (76/769/EEC) required data according to Annex VII A; Annex VIII level 1

..... *die Defizite*

Das Wissen focussiert sich auf zu wenig Stoffe

Verbreiterung der Wissensbasis

Die Beurteilungsverfahren dauern zu lang

Straffung der Abläufe &
Vollzugssicherheit

Einige Stoffe haben problematische Eigenschaften

- Wirkungsendpunkte
- Verhalten
- Verteilung /Anreicherung

Berücksichtigung integrierter
Wirkungsbeschreibungen

Wertschöpfungsketten sind komplex verwoben

Aufbau einer neuen Wissensbasis

Chemicals have useful physico-chemical properties
 Chemicals are intensively used and widely distributed
 Chemicals have manifold biological effects

Distinction between wanted and unwanted effects and restrictions for use

- Drugs
- Pesticides
- Compounds for Cosmetics
- Chemicals with carcinogenic, mutagenic and reprotoxic properties
- Persistent organic substances

Safe handling and prevention of damage for Industrial Chemicals

Worker's Health
 Information by
 Classification &
 Labelling
 Work place limits

Protection of Consumers

Protection of Man and Environment
 Inventory of Existing Chemicals
 Notification of New Chemicals
 Risk assessment for selected high production volume chemicals

Aims of REACH

- More information on the hazard of chemicals
- Insight into production chain
- Overview on produced chemicals
- Duty of care within hands of producers / importers
- Evaluation of dangerous effects also by in vitro assays and predictive tools,
- Exposure driven risk assessment
- Authorisation and restriction of dangerous substances

Registration of Chemical Substances under REACH

All substances ≥ 1 t/a per Manufacturer or Importer

June 1, 2007

Agency

pre-registration

- compiles and publishes lists of pre-registered substances
- time line for registration
- production or import may continue
- Substance Information Exchange Forum

Existing Substances

EINECS list
+ other substances

Manufacturer/Importer

- information on registrant
- identity of substance (CAS)

PRE-REGISTRATION

June 1 - Dec 1, 2008

PHASE-IN

Time lines for registration

>1000 t: Dec 1, 2010
CMR (1&2): Dec 1, 2010
PBT, vPvB: Dec 1, 2010
100 -1000 t: June 1, 2013
1 - 100 t: June 1, 2018

New substances
June 1, 2008

New Notified Substance
ELINCS list
(Dec 1, 2008)

REGISTRATION

Agency

registration

- registration number for New Notified Substances
- technical evaluation of dossiers
- substance evaluation

Manufacturer / Importer

Classification, labelling,
Safety data sheet (SDS),
Chemical safety report (CSR)
Chemical safety assessment (CSA)

Submission of dossiers
Proposal for test on vertebrates
Time line for gathering missing data

Registration, Evaluation and Duty of Care under REACH

Required General Information for all chemical substances > 1 t/a

(article 10)

Information 1	General registrant information
Information 2	Identification of the substances
Information 3	Information on the manufacture and use(s) of the substances
Information 4	<p>Classification (Directive 67/548 EEC)</p> <p>article 4 intrinsic properties categories <i>(explosive(s) – oxidizing properties – flammable very toxic – toxic – harmful corrosive – irritant – sensitizing carcinogenic – mutagenic – toxic for reproduction dangerous for the environment)</i></p> <p>article 6 obligations to carry out investigations</p> <p>Labelling articles 23, 24, 25 (Directive 67/548 EEC)</p>
Information 5	<p>Guidance on safe use</p> <p><i>(measures in accidents, handling and storage, transport, exposure control, disposal)</i></p>
Information 6	<p>Information on exposure</p> <p><i>(Use categories, human exposure, environmental exposure)</i></p>

Guidance notes given in Annex VI on fulfilling the requirements

Article 10	information for general registration
Article 12	information depending on tonnage
Article 13	generation of information in intrinsic properties
Step 1	Gather and share existing information Collect all available and relevant information to identify presence or absence of hazardous properties
Step 2	Consider information needs (specified in Annexes VI to IX) Information depending on tonnage (article 12)
Step 3	Identify information gaps
Step 4	Generate new data <i>(variations from standard testing are specified in Annex XI)</i> Propose testing strategy to fulfill requirements for substances > 100 t/a <i>(testing on vertebrates only when all other sources have been exhausted)</i>



Substanzen ≥ 1 t/a pro Hersteller oder Importeur

<p>All non phase in substances in quantities of 1 - 10 tonnes Phase in substances meeting the criteria of Annex III:</p> <ul style="list-style-type: none"> - classified as carcinogens class 1 and 2 - classified as PBT or vPvB (specified in Annex XIII) - dispersive use in consumer products - QSAR prediction for classification according to Directive 67/548/EEC 		
	<p>General rules from adaptation of testing regime are specified in Annex XI <i>(1. use of existing data, weight of evidence, QSAR, in vitro methods, grouping of substances; 2. testing is technically not possible)</i></p>	
Information 7	<p>Standard information on physicochemical properties</p> <ul style="list-style-type: none"> 7.1. state of the substance 7.2. melting/freezing point 7.3. boiling point 7.4. relative density 7.5. vapour pressure 7.6. surface tension 7.7. water solubility 7.8. partition coefficient n-octanol/water 7.9. flash point 7.10. flammability 7.11. explosive properties 7.12. self-ignition temperature 7.13. oxidising properties 7.14. granulometry 	<p>Specific rules for adaptation and exemptions to conduct studies are given</p>
Information 8	<p>Toxicological information</p> <ul style="list-style-type: none"> 8.1. skin irritation or corrosion <i>(assessment of available information or in vitro studies)</i> 8.2. eye irritation <i>(as mentioned for 8.1)</i> 8.3. skin sensitization <i>(assessment of available information and consecutively to outcome in vivo testing)</i> 8.4. Mutagenicity <i>(8.4.1. in vitro gene mutation, bacteria)</i> 8.5. acute toxicity <i>(8.5.1 oral route)</i> 	
Information 9	<p>Ecotoxicological information</p> <ul style="list-style-type: none"> 9.1. aquatic toxicity <i>(9.1.1 short term test on daphnia, 9.1.2 growth inhibition test on algae)</i> 9.2. degradation <i>(9.2.1 biotic degradation)</i> 	



Substanzen \geq 10 t/a pro Hersteller oder Importeur

All substances in quantities of 10 tonnes or more		(Article 12 (1) c)
	General rules from adaptation of testing regime are specified in Annex XI <i>(1. use of existing data, weight of evidence, QSAR, in vitro methods, grouping of substances; 2. testing is technically not possible)</i>	
Information 7	Standard information on physicochemical properties 7.1. – 7.14 (see Table 6)	Specific rules for exemptions to conduct studies are given in Annex VII
Information 8	<p>Toxicological information</p> <p>8.1 skin irritation <i>(in vivo study)</i></p> <p>8.2 eye irritation <i>(in vivo study)</i></p> <p>8.3 skin sensitization <i>(assessment of available information and consecutively to outcome in vivo testing)</i></p> <p>8.4 Mutagenicity <i>(8.4.1. in vitro gene mutation, bacteria</i> <i>8.4.2. in vitro cytogenicity study in mammalian cells or in vitro micronucleus assay</i> <i>8.4.3. in vitro gene mutation in mammalian cells, if 8.4.1. and 8.4.2. are negative)</i></p> <p>8.5 acute toxicity <i>(8.5.1 oral route</i> <i>8.5.2 by inhalation</i> <i>8.5.3 by dermal route)</i></p> <p>8.6 repeated dose toxicity <i>(8.6.1. 28 day test one species, most appropriate route for human exposure,</i></p> <p>8.7 reproductive toxicity <i>(8.7.1 screening test OECD 421 or 422, if there is no evidence from other sources)</i></p> <p>8.8 Toxicokinetics <i>(assessment from relevant available information)</i></p>	<p>In vivo mutagenicity studies, if any of in vitro genotoxicity studies is positive</p> <p>Testing in section 8.6 and 8.7 may be omitted based on exposure scenarios = Annex XI, (3) <i>substance-tailored exposure-driven testing</i></p>



Information required for chemical substances \geq 10 tonnes per year under REACH

All substances in quantities of 10 tonnes or more	(Article 12 (1) c)	
	General rules from adaptation of testing regime are specified in Annex XI <i>(1. use of existing data, weight of evidence, QSAR, in vitro methods, grouping of substances; 2. testing is technically not possible)</i>	
Information 9	<p>Ecotoxicological information</p> <p>9.1 aquatic toxicity <i>(9.1.1 short term test on daphnia, 9.1.2 growth inhibition test on algae 9.1.3 short term test on fish 9.1.4 activated sludge respiration inhibition testing)</i></p> <p>9.2 degradation <i>(9.2.1 biotic degradation)</i></p>	

Substanzen \geq 100 t/a pro Hersteller oder Importeur

All substances in quantities of 100 tonnes or more		(Article 12 (1) d)
	General rules from adaptation of testing regime are specified in Annex XI (1. use of existing data, weight of evidence, QSAR, in vitro methods, grouping of substances; 2. testing is technically not possible, and 3. substance-tailored exposure driven testing)	
Information 7	Standard information on physicochemical properties 7.1. – 7.14 (see Table 6) 7.15 stability in organic solvents 7.16 dissociation constant 7.17 viscosity	Specific rules for exemptions to conduct studies are given in Annex VII
Information 8	<p>Toxicological information</p> <p>8.1 skin irritation (in vivo study)</p> <p>8.2 eye irritation (in vivo study)</p> <p>8.3 skin sensitization (assessment of available information and consecutively to outcome in vivo testing)</p> <p>8.4 Mutagenicity (8.4.1. in vitro gene mutation, bacteria 8.4.2. in vitro cytogenicity study in mammalian cells or in vitro micronucleus assay 8.4.3. in vitro gene mutation in mammalian cells, if 8.4.1. and 8.4.2. are negative)</p> <p>8.5 acute toxicity (8.5.1 oral route 8.5.2 by inhalation 8.5.3 by dermal route)</p> <p>8.6 repeated dose toxicity (8.6.1. 28 day test one species, most appropriate route for human exposure, 8.6.2. subchronic toxicity study (90 days)</p> <p>8.7 reproductive toxicity (8.7.1 screening test OECD 421 or 422, if there is no evidence from other sources 8.7.2 pre-natal developmental toxicity study 8.7.3 two generation toxicity study, if repeated toxicity study indicates adverse effects on reproductive organs)</p> <p>8.8 Toxicokinetics</p>	<p>In vivo somatic cell genotoxicity, if in vitro genotoxicity studies are positive Germ cell mutagenicity including toxicokinetic evidence, if in vivo cell genotoxicity is positive</p> <p>tests in 8.6, 8.7, 9.1, 9.2, 9.3, 9.4 marked bold can be omitted based on exposure scenarios Annex XI (3) substance-tailored exposure – driven testing</p>

Substanzen \geq 100 t/a pro Hersteller oder Importeur

All substances in quantities of 100 tonnes or more		(Article 12 (1) d)
Information 9	<p>Ecotoxicological information</p> <p>9.1 aquatic toxicity (9.1.1 <i>short term test on daphnia</i>, 9.1.2 <i>growth inhibition test on algae</i> 9.1.3 <i>short term test on fish</i> 9.1.4 <i>activated sludge respiration inhibition testing</i> 9.1.5 long term toxicity on daphnia 9.1.6 long term toxicity on fish)</p> <p>9.2 degradation (9.2.1 <i>biotic degradation, simulation testing on ultimate degradation in surface, water, soil simulation test, sediment, simulation test</i>) 9.2.2 <i>abiotic degradation</i> 9.2.3 identification of degradation products)</p> <p>9.3 fate and behaviour in the environment (9.3.1 <i>adsorption/desorption screening</i> 9.3.2 bioaccumulation in aquatic species 9.3.3 further information on adsorption desorption test)</p> <p>9.4 effects on terrestrial organisms (9.4.1 <i>short term toxicity to invertebrates</i>, 9.4.2 <i>effects on soil microorganisms</i> 9.4.3 <i>short term toxicity to plants</i>)</p>	

Substanzen \geq 1000 t/a pro Hersteller oder Importeur

All substances in quantities of 1000 tonnes or more		(article 12 (1) e)
	General rules from adaptation of testing regime are specified in Annex XI (1. <i>use of existing data, weight of evidence, QSAR, in vitro methods, grouping of substances</i> ; 2. <i>testing is technically not possible, and</i> 3. <i>substance-tailored exposure driven testing</i>)	
Information 7	Standard information on physicochemical properties 7.1. – 7.14 (see Table 6) 7.15 stability in organic solvents 7.16 dissociation constant 7.17 viscosity	Specific rules for exemptions to conduct studies are given in Annex VII
Information 8	Toxicological information 8.1 skin irritation (<i>in vivo study</i>) 8.2 eye irritation (<i>in vivo study</i>) 8.3 skin sensitization (<i>assessment of available information and consecutively to outcome in vivo testing</i>) 8.4 Mutagenicity (8.4.1. <i>in vitro gene mutation, bacteria</i> 8.4.2. <i>in vitro cytogenicity study in mammalian cells or in vitro micronucleus assay</i> 8.4.3. <i>in vitro gene mutation in mammalian cells, if 8.4.1. and 8.4.2. are negative</i>) 8.5 acute toxicity (8.5.1 <i>oral route</i> 8.5.2 <i>by inhalation</i> 8.5.3 <i>by dermal route</i>) 8.6 repeated dose toxicity (8.6.1. <i>28 day test one species, most appropriate route for human exposure,</i> 8.6.2. subchronic toxicity study (90 days) 8.7 reproductive toxicity (8.7.1 <i>screening test OECD 421 or 422, if there is no evidence from other sources</i> 8.7.2 <i>pre-natal developmental toxicity study</i> 8.7.3 <i>two generation toxicity study, if repeated toxicity study indicates adverse effects on reproductive organs</i>) 8.8 Toxicokinetics	In vivo somatic cell genotoxicity, if in vitro genotoxicity studies are positive Germ cell mutagenicity including toxicokinetic evidence, if in vivo cell genotoxicity is positive tests in 8.6, 8.7, 8.9, 9.1, 9.2, 9.3, 9.4 marked bold can be omitted based on exposure scenarios Annex XI (3) <i>substance-tailored exposure – driven testing</i>

Substanzen \geq 1000 t/a pro Hersteller oder Importeur

All substances in quantities of 1000 tonnes or more		(article 12 (1) e)
Information 9	<p>Ecotoxicological information</p> <p>9.1 aquatic toxicity (9.1.1 <i>short term test on daphnia</i>, 9.1.2 <i>growth inhibition test on algae</i> 9.1.3 <i>short term test on fish</i> 9.1.4 <i>activated sludge respiration inhibition testing</i> 9.1.5 long term toxicity on daphnia 9.1.6 long term toxicity on fish)</p> <p>9.2 degradation (9.2.1 <i>biotic degradation, simulation testing on ultimate degradation in surface, water, soil simulation test, sediment, simulation test</i>) 9.2.2 <i>abiotic degradation</i> 9.2.3 identification of degradation products)</p> <p>9.3 fate and behaviour in the environment (9.3.1 <i>adsorption/desorption screening</i> 9.3.2 bioaccumulation in aquatic species 9.3.3 further information on adsorption desorption test 9.3.4 further information on the environmental fate and behaviour of the substance and/or degradation products)</p> <p>9.4 effects on terrestrial organisms (9.4.1 <i>short term toxicity to invertebrates</i>, 9.4.2 <i>effects on soil microorganisms</i> 9.4.3 <i>short term toxicity to plants</i>)</p>	

..... die Architektur

Stoffe ≥ 1000 t/a

Exposition



Wirkungsprüfung

Interpretation
ggf Zulassungs-
verfahren

CMR Stoffe (1 & 2 (R & 3))
 ≥ 1 t/a

ggf ergänzende
Prüfung

Zulassungs-
verfahren

Stoffe 100 – 1000 t/a

Exposition



Wirkungsprüfung
(*konditional C / R*)

Interpretation
ggf Zulassungs-
verfahren

Stoffe 10 – 100 t/a

eingeschränkte
Wirkungsprüfung

Stoffe 1 – 10 t/a

Vorhersage der
Wirkung



(Q)SAR;
Alternative Verfahren
Vorhandene Information

Adaptation of Standard Test Regime (Annex XI)

General Information for all Substances > 1 t / year

1. Registrant Information
2. Identification of substance
3. Information on manufacture and use(s)
4. Classification
5. Guidance on safe use
6. Information on exposure / use categories

General Adaptation

1. Use of existing data, weight of evidence, QSAR, in vitro methods
2. Testing technically not possible

>1 t plus Annex VII	≥10 t plus Annex VII, VIII	≥100 t plus Annex VII, VIII, Annex IX	≥1000 t plus Annex VII, VIII, Annex IX, X
Specific exemptions from test regimes are given in Column 2 of Annexes			

General Adaptation

3. Substance-tailored exposure-driven testing

..... *welche Arbeitslast ist zu bewältigen ?*

2700 Stoffe > 1000 t/a
in 3 a zu registrieren

ICCA/OECD 400 Stoffe in 7 a
1000 Stoffe in 12 a erwartet
BUA 300 + 220 Stoffe in 20 a
EU 120 von 140 Stoffe in 12 a
MAK 1000 Stoffe, BG-Chemie 447 Stoffe

4200 Stoffe 100 – 1000 t/a
in 6 a zu registrieren

davon 30 % im höheren Mengenband

7200 Stoffe 10 – 100 t/a
in 11 a zu registrieren

davon 30 % im höheren Mengenband

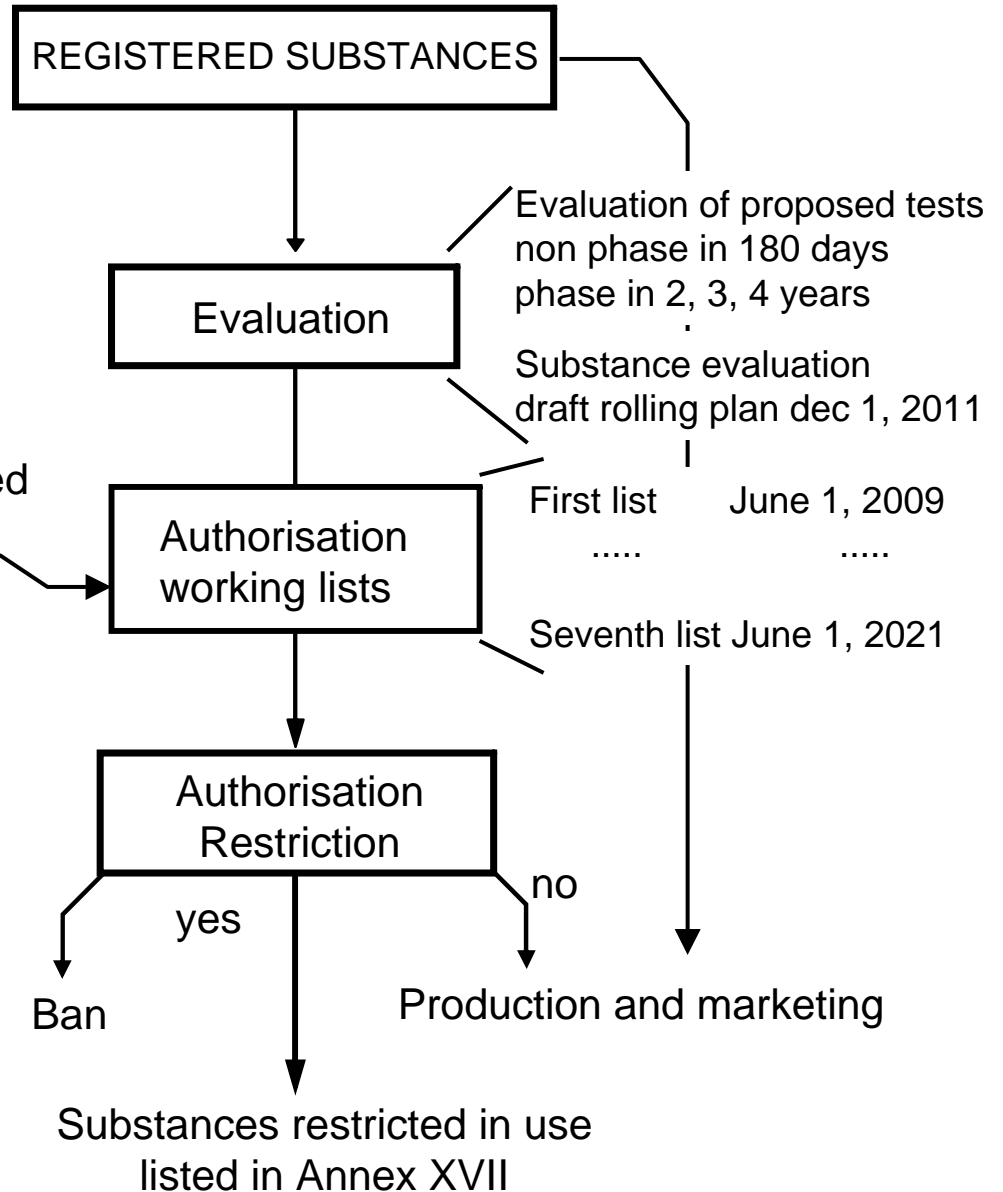
17 500 Stoffe 1 – 10 t/a
In 11 a zu registrieren

Mischzuordnung unbekannt

Evaluation and Authorisation of Substances under REACH

Evaluation

- Dossier evaluation by ECHA
compliance check (5% of any dossiers),
evaluation of tests on vertebrates
(all > 100 t/a substances)
evaluation of overall testing protocol
- Substance evaluation
(risk based priority, > 100 t/a substances
ECHA and CA MS)



Annex XIV lists substances for Authorisation approval

Annex XV specifies dossier for restriction decision

Annex XVII lists restricted substances and their use

Challenges under REACH

Knowledge required also for compounds below high production volumes

New acteurs
Manyfold increased
Number of compounds

Companies are responsible to decide on safe handling of their compounds and to provide information

Less acteurs

Knowledge required how compounds are distributed along producer chains and in consumer products

More information to protect humans & environment

New approaches within REACH for Evaluation of Industrial Chemicals

Before REACH

- Specialised commissions
 - for classification of hazards and labelling
 - for evaluation of chemicals with risk for worker's health and classification of carcinogenic, mutagenic and reprotoxic properties including setting of standards and justification
- (since 1981)
- Obligation to notify New Chemicals including classification of dangerous properties and risk assessment
- Inventory of Existing Chemicals and risk assessment for a selected substances

Pre-registration
6 - 12 / 2008
phase-in status



Registration
6 / 2008
phase-in
12 / 2010
6 / 2013
6 / 2018



Evaluation
Dossier evaluation
Substance Evaluation



Authorisation
Annex XIV

Annex XV
Annex XVII

under REACH

Close information gaps for industrial chemicals („no data – no market“)

- full responsibility of producer for identification of dangerous properties
- incentives for cooperation between competitors (SIEF)

Approaches to gain speed

- grouping of substances
- predictive tools (QSAR)
- adaptation of test regimes

Need for justification of test on vertebrates

- proposal for planned tests before doing
- publication of the identity of the substance(s) and hazard(s) planned to be checked
- 45 day period to comment by interested parties
- incentives to use alternative methods

Authorization of dangerous chemicals

- restriction in use pattern
- justification for/against substitution
- periodically recheck by reports on new data

Concept of REACH
in force June 1, 2007

Producer / Importer

All > 1 t / a substances
need registration under REACH
„no data – no market“

EINECS listed substances
are *phase-in* substances
Notified New Substances
are considered as registered

Sheets / dossiers needed
Safety data sheet, SDS
Chemical Safety report, CSR
(Chemical safety assessment,
CSA)

Proposal for test(s) on
vertebrates and time line
for closing data gaps

Reasons for / against
restrictions

Pre-registration

6 - 12 / 2008
phase-in status



Registration

6 / 2008
phase-in
12 / 2010
6 / 2013
6 / 2018



Evaluation

Dossier evaluation
Substance Evaluation



Authorisation

Annex XIV

Annex XV
Annex XVII

Agency

Working list on pre-registered
Substances on 1 / 2009
SIEF, Substance information
exchange Forum

Dossier evaluation
compliance check (5 % of all)
Check of proposed test(s) on
vertebrates
all > 100 t / a substances
non phase-in within 180 days
phase-in within 2, 3, 4 years

Substance evaluation
draft rolling plan 1 / 2011

Authorisation
including not registered, but known
dangerous compounds
working list(s) 1 – 7 between
6 / 2009 and 6 / 2021
Annex XVII will cumulatively list
all restricted substances and their
tolerated use

Identification and Regulation of Carcinogens under REACH

Before REACH

- Specialised commissions
 - for classification of hazards and labelling
 - for evaluation of chemicals with risk for worker's health and classification of carcinogenic, mutagenic and reprotoxic properties including setting of standards and justification

Pre-registration
of class 1 & 2
carcinogens > 1 t/a



Registration
6 / 2010
Identification of
Unknown carcinogens
12 / 2010
6 / 2013
6 / 2018

required specific data
to assess carcinogenic
properties:
>1 t/a = in vitro muta-
genicity, bacteria
>10 t/a = plus cytogeni-city
in mammalian cells
>100 t/a = if positive plus
in vivo genotox, and
germ cell mutagenicity
>1000 t/a = as >100 t/a
plus carcinogenicity study

Specific tasks under REACH

Exemptions from standard test regime

- concentration limits for impurities
- concentration limits in products

- use of QSAR(s)
- use of alternatives for tests on vertebrates

Evaluation of unknown Carcinogens

- standard study on carcinogenic properties only for > 1000 t/a (high production volume)
- adaptation of test regime possible on the basis of substance-tailored exposure-driven testing (before tests are performed)
- concentration limit(s) for exposure to carcinogens are acceptable (depends on justification)

Authorization of dangerous chemicals

- restriction in use pattern
- justification for/against substitution
- periodically recheck by reports on new data

Table 3

Data sets required for notification of New Substances and for classification of Existing Chemicals under REACH

	7 th Amendment 67/548				79/831/EEC	
	VII C	VII B	VII A	VIII		793/93/EEC
	"Base set"			Level 1	Level 2	(LPV) (HPV)
0. Identity of manufacturer	X	X	X			
1. Identity of the substance						
1.1 Name	X	X	X			
1.2 Molecular and structural formula	X	X	X			
1.3 Composition of the substance	X	X	X			
1.4 Methods of detection and determination	X	X	X			
2. Information on the substance						
2.1 Production	X	X	X			
2.2 Proposed uses	X	X	X			
2.3 Recommended methods and precautions	X	X	X			
2.4 Emergency measures in the case of accidental spillage	X	X	X			
2.5 Emergency measures in the case of injury to persons	X	X	X			
2.6 Packaging	X	X	X			
3. Physicochemical properties of the substance						
3.1 State of the substance	X	X	X			
3.2 Melting-point		X	X			
3.3 Boiling-point		X	X			
3.4 Relative density			X			
3.5 Vapour pressure		(X)	X			
3.6 Surface tension			X			
3.7 Water solubility			X			
3.8 Partition coefficient n/octanol/water		X	X			
3.9 Flash-point	X	X	X			
3.10 Flammability	X	X	X			
3.11 Explosive properties			X			
3.12 Self-ignition temperature			X			
3.13 Oxidizing properties			X			
3.14 Granulometry			X			

	7 th Amendment 67/548					79/831/EEC	
	VII C	VII B	VII A	VIII		793/93/EEC	
	"Base set"			Level 1	Level 2	(LPV)	(HPV)
4. Toxicological studies							
4.3 Acute toxicity			X				
Administered orally	X	X	X				
Administered by inhalation	X	X	X				
Administered cutaneously		X	X				
Skin irritation		X	X				
Eye irritation		X	X				
Skin sensitization		X	X				
<i>Additional tests to investigate organ or system toxicity</i>					X		
4.2 Repeated dose toxicity (28 days)			X				
<i>Sub-chronic toxicity study</i>				X			
<i>Chronic toxicity study</i>					X		
4.3 Other effects							
Mutagenicity		X	X				
Screening for toxicity related to reproduction			X				
Assessment of the toxicokinetic behaviour			X				
<i>Additional mutagenesis studies</i>				X			
<i>screening study(ies) for carcinogenesis</i>				X			
<i>Carcinogenicity study</i>					X		
<i>Fertility study (one generation).</i>				X			
<i>Fertility study (e.g. three-generation study)</i>					X		
<i>Developmental toxicity study on peri- and postnatal effects</i>					X		
<i>Teratology study (one species)</i>				X	X		
<i>Teratology study (species not employed in the respective level 1)</i>					X		
<i>Basic toxicokinetic information.</i>				X			
<i>Toxicokinetic studies which cover biotransformation, pharmacokinetics</i>					X		

	7 th Amendment 67/548					79/831/EEC	
	VII C	VII B	VII A	VIII			793/93/EEC
	“Base set”			Level 1	Level 2	(LPV)	(HPV)

5. Ecotoxicological studies							
5.1 Effects on organisms							
Acute toxicity for fish			X				
Acute toxicity for daphnia		X	X				
Growth-inhibitor test on algae			X				
Bacterial inhibition			X				
<i>Prolonged toxicity study with Daphnia magna (21 days)</i>				X	X		
<i>Test on higher plants</i>				X	X		
<i>Test on earthworms</i>				X	X		
<i>Further toxicity studies with fish</i>				X	X		
<i>Further toxicity studies with fish</i>					X		
<i>Toxicity studies with birds</i>					X		
<i>Additional toxicity studies with other organisms</i>					X		
<i>Tests for species accumulation; one species, preferably fish</i>				X			
5.2 Degradation							
biotic		X	X				
abiotic			X				
<i>Supplementary degradation study(ies)</i>				X	X		
5.3 Absorption/desorption screening test			X				
<i>Additional tests for accumulation, degradation, mobility and absorption/desorption</i>					X		
6. Possibility of rendering the substance harmless							
6.1 For industry/skilled trades			X				
6.2 For the public at large			X				

Toxikologische Prüfungen unter REACH

Testsystem	Zielgröße(n)	Grenzen	Kosten
			1000 Euro
Toxikokinetik	Präsenzdauer im Körper Ausscheidungswege	Spezielle Analytik in biologischen Proben	n. b.
Toxizität, akut	Dosis im Wirkungsbereich	Spezifität der Wirkung, Mechanismus	
• oral	Aufnahme, Wirkung auf innere Organe	lokale Wirkungen, Geschmack	1 – 10
• inhalativ	Aufnahme, Wirkung am Atemtrakt	Applizierbarkeit	10 – 100
• dermal	Aufnahme, Wirkung an der Haut	Ätzende Wirkung	1 – 10
Reizung/Ätzung	Chemische Reaktivität, Abgrenzung gegenüber falsch negativen Ergebnissen		
• in vitro Ätzung	Zytotoxizität		1 – 10
• in vivo Haut/Auge	Rötung, Hautdefekte	3 Tiere/Substanz	1 – 10
Sensibilisierung	Hinweise am Menschen	Sensitivität, Zufälligkeit der Feststellung	1 – 10
• <i>local lymph node assay</i>	dermale Behandlung und Lymphknotenreaktion	Speziessensitivität, Mechanismus	1 – 10
Mutagenität	Vererbare DNA-Modifikationen, strukturelle DNA-Schäden		
• Bakterielle Tests	Kolonienbildung Erworbene Funktion Verlorene Funktion	Kein Zellkern, bakterielle DNA, geringer Stoffwechsel	1 – 10
• Zytogenität	strukturelle DNA-Veränderungen	Zellteilungsrate, keine Funktionsprüfung	10 – 100
• Genmutation an Säugerzellen	DNA-Funktionsänderung	Sensitivität, Interpretierbarkeit	10 – 100
Toxizität, mit häufiger Gabe	Gewicht, Erscheinung, Gewebe-Histologie, Zielorgane, NOEL		
• (sub)akut	28 Tage Test	Wirkmechanismus 40 Tiere/Substanz	100 – 1000
• (sub)chronisch	90 Tage Test	80 Tiere/Substanz	1000
Kanzerogenität	Tumorbildung nach langer Behandlung mit Gentoxizität ohne Gentoxizität	Speziessensitivität, Spezifität, Dosis, Dauer bis 3,5 Jahre, Mechanismus 500 Tiere/Substanz	1000 oder mehr
Reproduktions-toxizität	Effekte auf Reproduktionsorgane, Fruchtbarkeit, Entwicklung,		
• Entwicklung	Strukturelle Anomalien Organentwicklung	Speziessensitivität, Mechanismus	100 – 1000
• Fruchtbarkeit und Entwicklung	2 Generationen-Studie	Speziessensitivität; 120 Tiere /Substanz	100 – 1000

Ökotoxikologische Prüfungen unter REACH

Testsystem	Zielgröße(n)	Grenzen	Kosten
			1000 Euro
Aquatisches System • Daphnie, akut • Daphnie, 21 Tage • Alge, akut • Fisch, akut • Fisch, Langzeit	Überleben, Wachstum, Entwicklung, Fortpflanzung		
	Schwimmfähigkeit	Kurz-Test	1 – 10
	Reproduktion	Kein Populationsendp.	1 – 10
	Zellzahl/Biomasse	Kein Populationsendp.	1 – 10
	Letalität	Kein Populationsendp.	1 – 10
	Life cycle	Keine Altersstruktur	1 – 10
Abbaubarkeit • Biotischer Abbau • Hydrolyse	Persistenz in der Umwelt		
	Sauerstoff-Verbrauch	Keine Mineralisation	1 – 10
	pH-Abhängigkeit	Keine Mineralisation	1 – 100
Verbleib und Verhalten • Sedimentation • Biokonzentration	Verteilung und Persistenz in der Umwelt		
	Adsorption/Desorption	Desorptionsverhalten	1 – 10
	Biomagnifikation	nur eine Stufe	1 – 10
Terrestrisches System • Regenwürmer, k • Regenwürmer, l • Wirbellose Tiere • Mikroorganismen • Pflanzen • Sediment-Org. • Vögel	Populationsstabilität, Diversität		
	Letalität	Kein Populationsendp.	1
	Reproduktion	Keine Altersstruktur	1
	Letalität	Kein Populationsendp.	1
	Letalität	Kein Populationsendp.	1
	Wachstum		1 – 10
	Letalität	Kein Populationsendp.	1 – 10
	Letalität, Brutverhalten	Keine Altersstruktur	1 – 10

Candidates for Registration from Inventory of Existing Chemicals under REACH

Volumes of production or import , per enterprise	> 1000 t/a	100 - 1000 t/a	10 -100 t/a	> 1 t/a
Time for pre-registration	June 1, 2008 Nov 30, 2008	June 1, 2008 Nov 30, 2008	June 1, 2008 Nov 30, 2008	June 1, 2008 Nov 30, 2008
Dead line for registration	Nov 30, 2010	May 31, 2013	May 31, 2018	May 31, 2018
Number of substances which are candidates for registration under REACH	2 693	4 152	7 335	17 500
substances with highest production volume in this band, % of the total number in this band	100 %	70,3 %	66,3 %	(a) unknown
Substance which have also higher production volumes, % of the total number in this band	(b)	29,7 %	33,7 %	(a) unknown
Number of registrations, calculated from number of competitors	14 545	7 668	13 513	(a) unknown
Mean number of competitors / substance	5,4	1,8	1,8	(c) < 1,8
% substances with one producer / importer	40 %	61 %	61 %	
% substances with less than 3 producers / importers	67 %	92 %	91 %	(c) > 90 %
Number of substances with more than 30 competitors	77	3	3	(c) 0

**Past experience suggests needed time lines for substance evaluation
under REACH**

HPV substances	
ICCA program (since 1998)	400 (1000 until 2010)
EU Evaluation & Control of ECS (since 1993)	119 out of 141 substances
BUA (since 1982)	330 full and 200 reduced reports on substances
Substance exceeding 10 t/ a production	
IUCLID data bank (since 1994)	10 476 substances Information on hazards
Substances relevant for working environment	
BG-Chemie (since 1977)	477 Substances Basis for classification and work place limits
MAK (since 1954)	1000 Substances Basis for classification, work place limits and justification

Sources

*EU-Commission, Directorate General, Unit Toxicology and Chemical Substances,
Evaluation and Control of existing Chemicals (793/93/EEC; 1488/94/EEC)*

COSHH Control of Substances Hazardous to Health essentials, UK database

IUCLID International Uniform Chemical Information Database

BG-Chemie (Berufsgenossenschaft) Employer' Liability Insurance Association

*MAK (maximale Arbeitsplatz Konzentration) Occupational Exposure Limits, set by
the DFG Senate Commission for Health Hazards of Chemical Compounds in
the Work Area*

DFG (Deutsche Forschungsgemeinschaft) German Research Foundation