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DfE General Screen for Safer Ingredients

1 Introduction

The DfE General Screen for Safer Ingredients was developed by the Environmental Protection Agency's Design for Environment Program (DfE). The screen is a comprehensive, science-based tool designed to ensure that the safest possible ingredients are used in DfE-recognized products. The contents of this screen, including definitions and toxicological preferences were developed to facilitate use of safer chemistry under the Design for the Environment Program.

In DfE's Product Recognition Program, the General Screen serves as the primary tool to advance Green Chemistry in product formulation and to implement Informed Substitution, the reasoned transition from a chemical of particular concern to safer chemicals or non-chemical alternatives. DfE will use the general screen to review all product ingredients (and their components) for which a more customized screen has not been developed.

The DfE Program provides a unique approach to product review and recognition. DfE evaluates each and every ingredient in a formulation within its functional class context (e.g., surfactants, solvents) and based on its key, distinguishing, human health and environmental characteristics. In this way, potential product ingredients can be viewed as part of a continuum of improved or safer ingredient choices.

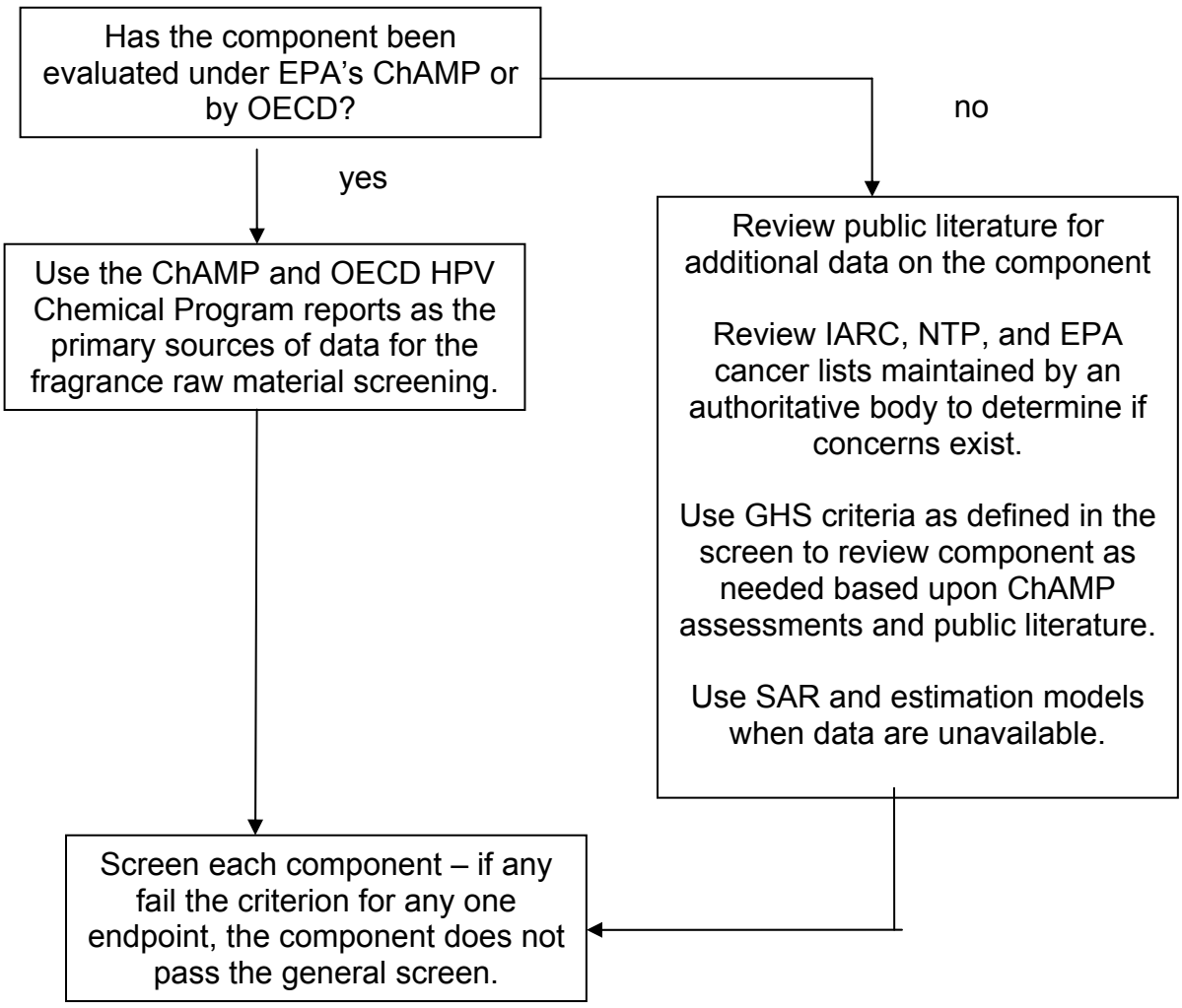
The General Screen makes it possible to draw a line demarcating the greener or "low-concern" end of the continuum. To define low-concern, DfE uses toxicological thresholds established by several highly respected health and environmental protection authorities; namely, EPA's New Chemicals Program, EPA's Chemical Assessment and Management Program (ChAMP), and the United Nation's Globally Harmonized System (GHS) for the Classification and Labelling of Hazard Substances. For component classes where no low-concern ingredients currently exist, DfE works with its stakeholders to carefully modify the General Screen in a way that allows for ingredient choices while ensuring the safest possible ingredients in that functional class. (Determinations made under this screen are solely for use in distinguishing safer chemicals for the DfE Program. The screen is not a classification system.)
The DfE product review is chemistry and toxicology intensive, calling on the extensive expertise of the EPA's Office of Pollution Prevention and Toxics. This depth of expertise helps ensure that chemicals are fully and accurately characterized based on the best available information. Information will be drawn from peer-reviewed literature, primary source materials, hazardous chemical lists, and Agency databases, and by using predictive tools to estimate potential human health and environmental concerns based on a chemical's structural and/or biological similarity to known chemicals of concern.

For any chemical that is subject to evaluation under the Chemical Assessment and Management Program (ChAMP), for which EPA has developed a screening-level hazard characterization, the EPA's ChAMP hazard characterization will serve as the basis of the fragrance screen. Details on how EPA develops screening-level hazard characterizations under ChAMP can be found at: http://www.epa.gov/champ/.

Reviews under this screen will be conducted by qualified third parties. Reviewers will consult relevant source and supporting documents that describe the derivation and scope of the classification criteria for the different end points to ensure consistent use of the information. Every subsection in section 3 includes references for data interpretation. The third-party reviewer will proceed with the screening process as illustrated in Diagram 1. The third-party reviewer will:

1. If the component has been evaluated under ChAMP or the OECD, the resulting characterization(s) shall be the primary source of information for screening. Characterizations represent EPA's interpretations of studies reviewed for ChAMP.
2. If a ChAMP or OECD assessment is not available, the third-party reviewer will proceed with the chemical screening as described in this document.

Diagram 1: Review Process



2 Preferences and Terms

The following preferences and terms apply to all attributes and data requirements.

2.1 A *component* is a chemical as identified by its Chemical Abstract Service (CAS) number.

2.2 An *ingredient* may be one component or a blend of multiple components.

2.3 Test data using dermal and inhalation exposure routes are preferred over oral exposure data because the former are more likely routes of exposure for cleaning products.

2.4 Data for all available routes of exposure will be evaluated. Failure to pass an endpoint by any route of exposure results in failure to pass the screen.

2.5 The GHS criteria and data evaluation approach, and EPA risk assessment guidance, will inform professional judgment in the review of both no observed adverse effect levels/concentrations (NOAEL/NOAEC) and lowest observed adverse effect levels/concentrations (LOAEL/LOAEC). NOAEL/NOAEC and LOAEL/LOAEC values are preferred to no observed effect levels/concentrations (NOEL/NOECs) and lowest observed effect levels/concentrations (LOEL/LOECs).

2.6 Use of existing data should follow the EPA HPV Challenge Program's and OECD HPV Programme data adequacy guidelines.

3 Attributes of Concern for all Components

Each attribute listed below applies to all components.

3.1 ACUTE MAMMALIAN TOXICITY

3.1.1 Criteria and Data Evaluation

To be acceptable under the screen, components must have a median lethal dose or concentration greater than those values listed in Table 1. Data must be available for at least one route of exposure. For inhalation, exposure should be at least four hours; the thresholds for inhalation are the same for exposures greater than four hours. Exposures of less than four hours will be evaluated on a case-by-case basis. Data for all available routes of exposure will be evaluated. Failure to pass this endpoint by any route of exposure results in failure to pass the screen.

Table 1 – Acute Mammalian Toxicity

Route of Exposure	Median Lethal Dose/Concentration
Oral LD50 (mg/kg)	>2000
Dermal LD50 (mg/kg)	>2000
Inhalation LC50 (gas) (ppm)	>5000
Inhalation LC50 (vapor) (mg/L)	>20
Inhalation LC50 (dust/mist) (mg/L)	>5

3.1.2 Test Methods

– OPPTS Harmonized Guideline: 870.1100 Acute oral toxicity [1];

- OPPTS Harmonized Guideline: 870.1200 Acute dermal toxicity [2];
- OPPTS Harmonized Guideline: 870.1300 Acute inhalation toxicity [3];
- OECD Test Guideline 420: Acute Oral Toxicity – Fixed Dose Method [4];
- OECD Test Guideline 423: Acute Oral Toxicity – Acute Toxic Class Method [5];
- OECD Test Guideline 425: Acute Oral Toxicity – Up-and-Down Procedure [6];
- OECD Test Guideline 402: Acute Dermal Toxicity [7]; and
- OECD Test Guideline 403: Acute Inhalation Toxicity [8].

3.2 CARCINOGENICITY

3.2.1 Criteria and Data Evaluation

Components will be screened for carcinogenicity based upon established lists (see Table 2) and GHS criteria. Components not on the established lists in Table 2, but that are considered known or presumed human carcinogens (Category 1), or suspected human carcinogens (Category 2) under GHS [9], will not pass the screen. Available data on the component or a chemically (e.g., based on chemical structure) or biologically (e.g., based on metabolic breakdown, or likely mechanistic/mode of action considerations) similar analog along with OncoLogic™ [10] will be used to assess a chemical under GHS.

Table 2 – Carcinogenicity

Authoritative Body	Criteria that will not pass the DfE Screen
International Agency for Research on Cancer (IARC)	Group 1 – carcinogenic to humans Group 2A – probably carcinogenic to humans Group 2B – possibly carcinogenic to humans
National Toxicology Program (NTP)	Known to Be Human Carcinogen Reasonably Anticipated to Be Human Carcinogen
U.S. Environmental Protection Agency (EPA)	(2005/1999) “Carcinogenic to humans”, “Likely to be carcinogenic to humans”, or “Suggestive evidence of carcinogenic potential” (1996) “Known/Likely” (1986) “Group A – Human Carcinogen”, “Group B – Probable human carcinogen,” or “Group C – Possible human carcinogen”
EU CMR List (Dangerous Substances Directive 67/548/EEC Annex I) [11]	Category 1 – Known Category 2 – Should be considered carcinogenic to humans Category 3 – Possible carcinogenic effects

3.2.2 Preferred Test Methods

- OECD Test Guideline 451: Carcinogenicity Studies [12]
- OECD Test Guideline 453: Combined Chronic Toxicity/Carcinogenicity Studies [13]
- OPPTS Harmonized Guideline 870.4200: Carcinogenicity [14]
- OPPTS Harmonized Guideline 870.4300: Combined Chronic Toxicity/Carcinogenicity [15]
- NTP 2 year Study Protocol “Specifications for the conduct of studies to evaluate the toxic and carcinogenic potential of chemical, biological and physical agents in laboratory animals for the National Toxicology Program” [16].

3.2.3 Data Interpretation

- Section 2, Hazard Assessment in *Guidelines for Carcinogen Risk Assessment* [17]
- GHS Ch 3.6 Carcinogenicity [9]

3.3 ENVIRONMENTAL TOXICITY AND FATE

3.3.1 Criteria and Data Evaluation

If a component is an acute aquatic toxicant, then it must biodegrade rapidly and not be bioaccumulative (see Table 3, lines 1-3). If a component has low aquatic toxicity (Table 3, line 4), then its rate of biodegradation may be >28 days.

Table 3 – Environmental Toxicity and Fate

	Acute Aquatic Toxicity Value (L/E/IC50)[a,b]	**Persistence** (Measured in terms of level of biodegradation)	**Bioaccumulation Potential**
1	If ≤1 ppm…	…then may be acceptable if the component meets the 10-day window as measured in a ready biodegradation test[c] without degradation products of concern[d]…	…and BCF <1000.
2	If >1 ppm and ≤10 ppm…	…then if the component must meet the 10-day window as measured in a ready biodegradation test without degradation products of concern[d] …	
3	If >10 ppm and <100 ppm…	…then the component must meet the 28-day pass level as measured in a ready biodegradation test without degradation products of concern[d]…	
4	If ≥100 ppm…	…then the component need not meet the 28-day pass level as measured in a ready biodegradation test if there are no degradation products of concern[d] and half-life < 180 days…	

[a] In general, there is a predictable relationship between acute aquatic toxicity and chronic aquatic toxicity for organic chemicals, i.e., chemicals that have high acute aquatic toxicity also have high chronic aquatic toxicity. [18] Since acute aquatic toxicity data are more readily available, the DfE Screens use these data to screen chemicals that may be toxic to aquatic life. Where measured chronic toxicity data is available, it will be assessed with other data and applied in the screen based on the relationship between acute and chronic aquatic toxicity.

[b] Data, whether estimated or measured, are required for each of the following groups of organisms algae, aquatic invertebrates and fish (all fresh water). Data for marine species may be added when available.

[c] A case-by-case approach focusing on rate of biodegradation and degradation products of concern will be implemented for solvents toxic to aquatic organisms at ≤ 1ppm.

[d] Degradation products of concern are compounds with high acute aquatic toxicity (L/E/IC50 ≤ 10ppm) which mineralize <60% in 28 days.

3.3.2 Test Methods, Acute Aquatic Toxicity

A baseline data set is required that should include freshwater test data for a species each of algae, aquatic invertebrate and fish. Additional aquatic toxicity data in other species or in marine species will also be reviewed if available.

3.3.2.1 Preferred test methods for fish

- OECD Test Guideline 203: Fish, Acute Toxicity Test [19]
- OPPTS Harmonized Guideline 850.1075: Fish acute toxicity test, freshwater and marine [20]

3.3.2.2 Preferred test methods for aquatic invertebrates

- OECD Test Guideline 202, Part 1, Daphnia sp., Acute Immobilisation Test [21]
- OPPTS Harmonized Guideline 850.1010: Aquatic invertebrate acute toxicity test, freshwater daphnids [22]
- OPPTS Harmonized Guideline 850.1035: Mysid acute toxicity test [23]*

*NOTE – A 96 hour Mysid shrimp acute toxicity test can be used in place of a daphnid acute toxicity test when the latter is not available.

3.3.2.3 Preferred test methods for aquatic plants

- OECD Test Guideline 201, Alga, Growth Inhibition Test [24]
- OPPTS Harmonized Guideline 850.5400: Algal toxicity, Tiers I and II [25]

3.3.2.4 Alternative test methods for acute aquatic toxicity

The following test methods may be considered, when relevant:

- OPPTS Harmonized Guideline 850.1085: Fish acute toxicity mitigated by humic acid [26]
- OPPTS Harmonized Guideline 850.1025: Oyster acute toxicity test (shell deposition) [27]
- OPPTS Harmonized Guideline 850.1045: Penaeid acute toxicity test [28]
- OPPTS Harmonized Guideline 850.1055: Bivalve acute toxicity test (embryo larval) [29]
- OPPTS Harmonized Guideline 850.4400: Aquatic plant toxicity test using *Lemna spp.* Tiers I and II [30]
- Modeled data from sources such as ECOSAR [31] are acceptable when data are unavailable

3.3.3 Test Methods, Persistence (measured as biodegradation)

Data from experimental methods is generally preferred over estimations of persistence. For the purposes of screening safer chemicals, ready biodegradation tests are preferred. It is noted that simulation tests are likely to better describe the biodegradability of a particular chemical in specific environmental conditions.

3.3.3.1 Preferred test methods

- OECD Test Guideline 301: Ready Biodegradability (sections A-F [32])
- OPPTS Harmonized Guideline 835.3110: Ready biodegradability [33]

3.3.3.2 Alternative test methods

- Modeled data from sources such as EPISuite [34] and the PBT Profiler [35] are acceptable when data are unavailable.

3.3.4 Test Methods, Bioaccumulation

3.3.4.1 Preferred test methods

A field-measured BAF (located in the literature) is the most preferred data for indicating bioaccumulation. When not possible, the following test methods may be used:

- OECD Test Guideline 305: Bioconcentration: Flow-through Fish Test [36]
- OPPTS Harmonized Guideline 850.1710: Oyster BCF [37]
- OPPTS Harmonized Guideline 850.1730: Fish BCF [38]

3.3.4.2 Alternative test methods

- Modeled data from sources such as EPISuite [34] and the PBT Profiler [35] are acceptable when data are unavailable. An estimated BAF is preferred to an estimated BCF for compounds where log Kow > 5.

3.4 GENETIC TOXICITY

3.4.1 Criteria and Data Evaluation

Components will be screened for mutagenicity based upon test data (see Table 4 for details). Data on genetic toxicity must be available for at least one potential mutagenic effect. Data for all available effects will be evaluated. Effects to be considered are: heritable germ cell mutagenicity, germ cell genetic toxicity, and somatic cell mutagenicity or genetic toxicity. Data from *in vivo*, *in vitro*, and epidemiological studies will be considered.

Table 4 – Genetic Toxicity

Authoritative Body	Criteria that will not pass the DfE Screen
Globally Harmonized System (GHS) [39]	Category 1A – Known to induce heritable mutations in germ cells Category 1B – Should be regarded as if they induce heritable mutations in germ cells Category 2 – May induce heritable mutations in germ cells

3.4.2 Preferred Test Methods

- OECD Test Guideline 474: Mammalian Erythrocyte Micronucleus Test [40];
- OECD Test Guideline 475: Mammalian Bone Marrow Chromosome Aberration Test [41];
- OECD Test Guideline 478: Genetic Toxicology: Rodent Dominant Lethal Test [42];
- OECD Test Guideline 479: Genetic Toxicology: *In Vitro* Sister Chromatid Exchange Assay in Mammalian Cells [43];
- OECD Test Guideline 483: Mammalian Spermatogonial Chromosome Aberration Test [44];
- OECD Test Guideline 484: Genetic Toxicology: Mouse Spot Test [45];
- OECD Test Guideline 485: Genetic Toxicology: Mouse Heritable Translocation Assay [46];
- OPPTS Harmonized Guideline 870.5195: Mouse Biochemical Specific Locus Test [47];
- OPPTS Harmonized Guideline 870.5200: Mouse Visible Specific Locus Test [48];
- OPPTS Harmonized Guideline 870.5380: Mammalian Spermatogonial Chromosome Aberration Test [49];
- OPPTS Harmonized Guideline 870.5385: Mammalian Bone Marrow Chromosome Aberration Test [50];
- OPPTS Harmonized Guideline 870.5395: Mammalian Erythrocyte Micronucleus Test [51];
- OPPTS Harmonized Guideline 870.5450: Rodent Dominant Lethal Assay [52]; and
- OPPTS Harmonized Guideline 870.5460: Rodent Heritable Translocation Assays [53].

3.4.3 Acceptable Test Methods

Per GHS [39], results from multiple acceptable test methods must be used in conjunction for evaluation of genetic toxicity. In some cases, the results from acceptable test methods must be used in conjunction with preferred test methods. The following test methods are acceptable:

- OECD Test Guideline 471: Bacterial Reverse Mutation Test [54];
- OECD Test Guideline 473: *In Vitro* Mammalian Chromosome Aberration Test [55];
- OECD Test Guideline 476: *In Vitro* Mammalian Cell Gene Mutation Test [56];
- OECD Test Guideline 486: Unscheduled DNA Synthesis (UDS) Test with Mammalian Liver Cells *In Vivo* [57];
- OPPTS Harmonized Guideline 870.5100: Bacterial Reverse Mutation Test [58];

- OPPTS Harmonized Guideline 870.5300: *In Vitro* Mammalian Cell Gene Mutation Test [59];
- OPPTS Harmonized Guideline 870.5375: *In Vitro* Mammalian Chromosome Aberration Test [60];
- OPPTS Harmonized Guideline 870.5500: Bacterial DNA Damage or Repair Tests [61];
- OPPTS Harmonized Guideline 870.5550: Unscheduled DNA Synthesis in Mammalian Cells in Culture [62];
- OPPTS Harmonized Guideline 870.5900: *In Vitro* Sister Chromatid Exchange Assay [63]; and
- OPPTS Harmonized Guideline 870.5915: *In Vivo* Sister Chromatid Exchange Assay [64].

3.4.4 Data Interpretation

GHS Ch. 3.5 Germ Cell Mutagenicity [39]

3.5 NEUROTOXICITY

3.5.1 Criteria and Data Evaluation

Components that are considered neurotoxicants under GHS [9] criteria (see guidance values in Table 5) will not pass the screen. Available data on the component or a chemically (e.g., based on chemical structure) or biologically (e.g., based on metabolic breakdown, or likely mechanistic/mode of action considerations) similar analog will be used to assess a solvent under GHS. Insufficiently characterized chemicals may be considered for the DfE Screen.

Table 5 - Neurotoxicity

Route of Exposure	Guidance values[1]
Oral (mg/kg-bw/day)	>100
Dermal (mg/kg-bw/day)	>200
Inhalation (gas) (ppm/6h/day)	>250
Inhalation (vapor) (mg/L/6h/day)	>1.0
Inhalation (dust/mist) (mg/L/6h/day)	>0.2
[1]*The doses provided are for 90-day studies. Guidance values are tripled for chemicals evaluated in 28-day studies.*	

3.5.2 Preferred Test Methods

- OECD Test Guideline 424: Neurotoxicity Study in Rodents [65] and
- OPPTS Harmonized Guideline 870.6200: Neurotoxicity screening battery [66].

3.5.3 Optional Test Methods

Additional evidence from OECD Test Guideline 426: Developmental Neurotoxicity Study [67] and OPPTS Harmonized Guideline: 870.6300 Developmental neurotoxicity study [68] can be used to screen components for neurotoxicity.

3.5.4 Data Interpretation

- Section 3, Hazard Characterization in *Guidelines for Neurotoxicity Risk Assessmen*t [69]
- GHS Ch. 3.9 Specific Target Organ Toxicity Repeated Exposure [70]

3.6 REPEATED DOSE TOXICITY

3.6.1 Criteria and Data Evaluation

Components that are considered systemic toxicants under GHS [70] (see guidance values in Table 6) will not pass the screen. Data for all available routes of exposure will be evaluated, and any study must be 28 days or greater to satisfy this endpoint. Should testing be pursued to meet the screen data requirement, a functional observational battery (FOB) should be added to the test method to provide neurotoxicity information.

Table 6 – Repeated-Dose Toxicity

Route of Exposure	Guidance values[a]
Oral (mg/kg-bw/day)	>100
Dermal (mg/kg-bw/day)	>200
Inhalation (gas) (ppm/6h/day)	>250
Inhalation (vapor) (mg/L/6h/day)	>1.0
Inhalation (dust/mist/fume) (mg/L/6h/day)	>0.2
[a]The doses provided are for 90-day studies. Guidance values are tripled for chemicals evaluated in 28-day studies and similarly modified for studies of longer durations.	

3.6.2 Preferred Test Methods

- OECD Test Guideline 408: Repeated Dose 90-Day Oral Toxicity Study in Rodents [71]
- OECD Test Guideline 409: Repeated Dose 90-Day Oral Toxicity Study in Non-Rodents [72]
- OECD Test Guideline 411: Subchronic Dermal Toxicity: 90-day Study [73]
- OECD Test Guideline 413: Subchronic Inhalation Toxicity: 90-day Study [74]
- OPPTS Harmonized Guideline 870.3100: 90-Day oral toxicity in rodents [75]
- OPPTS Harmonized Guideline 870.3150: 90-Day oral toxicity in nonrodents [76]
- OPPTS Harmonized Guideline 870.3250: 90-Day dermal toxicity [77]
- OPPTS Harmonized Guideline 870.3465: 90-Day inhalation toxicity [78]

3.6.3 Acceptable Test Methods

- OECD Test Guideline 412: Repeated Dose Inhalation Toxicity: 28-day Study [79]
- OECD Test Guideline 410: Repeated Dose Dermal Toxicity: 28-day Study [80]
- OECD Test Guidelines 407: Repeated Dose 28-day Oral Toxicity Study in Rodents [81]
- OECD Test Guideline 422, Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test [82]
- OPPTS Harmonized Guideline 870.3050: Repeated dose 28-day oral toxicity study in rodents [83]
- OPPTS Harmonized Guideline 870.3200: 28-Day dermal toxicity [84]

3.6.4 Data Interpretation

GHS Specific Target Organ Toxicity – Repeated Exposure [70]

3.7 REPRODUCTIVE AND DEVELOPMENTAL TOXICITY

3.7.1 Criteria and Data Evaluation

Components that are considered reproductive or developmental toxicants under GHS [85] (see guidance values in Table 7) will not pass the screen. Following the SIDS Dossier [86], all chemicals must be reviewed for both fertility and developmental effects. Data on reproductive and developmental toxicity must be available via at least one route of exposure, oral, dermal, or inhalation. Data for all available routes of exposure will be evaluated. Failure to pass this endpoint by any route of exposure or toxic effect (fertility or development) results in failure to pass the screen.

Table 7 – Reproductive and Developmental Toxicity

Route of Exposure	Guidance Values
Oral (mg/kg-bw/day)	>250
Dermal (mg/kg-bw/day)	>200
Inhalation (gas) (ppm/6h/day)	>250
Inhalation (vapor) (mg/L/6h/day)	>1.0
Inhalation (dust/mist) (mg/L/6h/day)	>0.2

3.7.2 Test Methods

3.7.2.1 Fertility test methods, preferred

- OECD Test Guideline 415: One-Generation Reproduction Toxicity Study [87] and
- OECD Test Guideline 416: Two-Generation Reproduction Toxicity Study [88].

3.7.2.2 Fertility test methods, acceptable

The following test methods may be used to identify reproductive toxicity per GHS [85]:

- OPPTS Harmonized Guideline 870.3800: Reproduction and fertility effects [89];
- OECD Test Guideline 421: Reproduction/Developmental Toxicity Screening Test [90];
- OECD Test Guideline 422: Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test [82];
- OPPTS Harmonized Guideline 870.3550: Reproduction/developmental toxicity screening test [91]; and
- OPPTS Harmonized Guideline 870.3650:Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [92].

3.7.2.3 Developmental toxicity test methods, preferred

- OECD Test Guideline 414: Prenatal Developmental Toxicity Study [93].

3.7.2.4 Developmental toxicity test methods, acceptable

The following test methods may be used to identify developmental toxicity per GHS [85]:

- OPPTS Harmonized Guideline 870.3800: Reproduction and fertility effects [89];
- OECD Test Guideline 421: Reproduction/Developmental Toxicity Screening Test [90];

- OECD Test Guideline 422: Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test [82];
- OPPTS Harmonized Guideline 870.3550: Reproduction/developmental toxicity screening test [91]; and
- OPPTS Harmonized Guideline 870.3650:Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [92].

3.7.3 Data Interpretation

- Section 3, Hazard Characterization, *Guidelines for Reproductive Toxicity Risk Assessmen*t [94]
- Section 3, Hazard Characterization, *Guidelines for Developmental Toxicity Risk Assessment* [95]
- GHS Ch 3.7 Reproductive Toxicity [85]

3.8 RESPIRATORY SENSITIZATION

3.8.1 Criteria and Data Evaluation

Although recognized animal models for the testing of respiratory hypersensitivity are not available at present, the following will be applied when models are available. Components that are considered respiratory sensitizers under GHS [96] will not pass the screen. Data on respiratory sensitization will normally be based on human experience. Hypersensitivity may be demonstrated by clinical history with supporting tests, positive bronchial challenge tests, or appropriate animal studies. There is currently no preferred test method, so evaluation will be based on all valid, available data.

3.8.2 Data Interpretation

GHS Ch. 3.4 Skin or Respiratory Sensitization [96]

3.9 SKIN SENSITIZATION

3.9.1 Criteria and Data Evaluation

Components that are considered skin sensitizers under GHS [96] will not pass the screen. Available data for the component and analogs will be used to assess a component under GHS.

3.9.2 Preferred Test Methods

- OECD Test Guideline 406: Skin Sensitization [97]
- OECD Test Guideline 429: Skin Sensitization: Local Lymph Node Assay [98]
- OPPTS Harmonized Guideline 870.2600: Skin Sensitization [99]

3.9.3 Data Interpretation

GHS Ch. 3.4 Skin or Respiratory Sensitization [96]

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