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NICD STANDARD V5.0

A TECHNICAL FRAMEWORK FOR UNIVERSAL APPLICATION

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Document Status: Foundational Standard (provisional thresholds)

Scope: Cosmetic products (complete assessment protocol). NICD principles may also guide the design of other personal care, oral care, fragrance and wellness products (see Scope of Application).

NEURO-INCLUSIVE COSMETIC DESIGN (NICD)

Technical Framework & Methodology

Including The ADHD Algorithm™ and ADHD Friendly™ Verification System

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1. LICENCE, ATTRIBUTION & USE

1.1 Free Use Licence

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Where audit results or scores for a specific product, generated using this Standard, are published, the publication should include the Required Attribution Statement set out in **Appendix E**. This requirement does not apply to commentary, critique or citation of the Standard itself (Section 1.2).

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The free licence in Section 1.1 covers use of the Standard. It does **not** extend to the **ADHD Friendly™** mark or to the names **The ADHD Algorithm™** and **NICD** when used as product claims. These names are used as trade marks by COSMETONOESIS; ™ denotes a claimed trade mark, not necessarily a registered one:

- The ADHD Friendly™ mark may appear only on products holding current **Level III — NICD Verified** status and listed in the verification registry (Article VI, 6.3; Article XII).
- Products assessed by their own developers may be described as “**NICD Compatible (self-assessed)**” or “**NICD Designed (self-assessed)**”, provided the audit dossier is available on request (Article XII).

The ADHD Friendly™ mark is a verification mark. The ADHD Algorithm™ and NICD are framework names: describing a product with them (e.g., “NICD-designed”) is a product claim and must use the wording in Article XII.

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1.6 Future Releases

The licence terms of a given release continue to apply to that release. COSMETONOESIS may set different terms for future releases.

STATUS OF THE STANDARD

NICD Standard v5.0 is the first release of the fifth major version of the Neuro-Inclusive Cosmetic Design (NICD) framework. It establishes the principles, terminology, assessment methodology and technical criteria for the evaluation of neuro-inclusive cosmetic products.

This document is intended to function as a normative technical standard for the implementation and assessment of Neuro-Inclusive Cosmetic Design within cosmetic research, formulation, product development and verification.

The methodologies, indices and assessment tools described herein—including the **Standardised Sensory Units (SSU)**, **Neuro-Sensory Irritation Index (NSI)**, **Neuro-Tolerability Score (NTS)**, **Sensory Band Calibration Framework**, and associated assessment protocols—form integral components of the NICD methodology.

Unless superseded by a later official release, this document constitutes the authoritative reference for the NICD Standard.

Validation Status

NICD is a structured design and assessment specification. Its numerical thresholds—including the ADHD Friendly™ threshold (≥ 80 points), the domain floor (60%), $NTS \geq 80$, $HGS \leq 2$, the NSI band maxima and the band-assignment accuracy targets—are **provisional**. They were set by expert judgement and have **not yet been validated** against outcomes for neurodivergent users.

Validation will proceed through:

- **Reliability:** inter-rater agreement on criterion scoring (Appendix A, A.2) and test-retest repeatability of panel measures;
- **Criterion validity:** whether NICD scores predict routine completion, comfort and satisfaction among neurodivergent users in independent use studies;
- **Reproducibility:** inter-laboratory comparison of instrumental and panel-based measures.

Results will be published, and thresholds will be revised where the evidence requires it.

Scope of Application

The NICD Standard distinguishes three levels of application:

- **Universal principles** (Articles II, V, VIII and IX) apply to the design of any personal care, oral care, fragrance or wellness product.
- **Complete assessment protocol** (Articles III, IV, VI and XII; Appendices A–L): specified for cosmetic products within the meaning of Regulation (EC) No 1223/2009 and the UK Cosmetics Regulation, in the categories listed in Appendix A, A.5.
- **Products outside these categories** (e.g., medical devices, food supplements, non-physical wellness products) may apply the principles but cannot hold Level III status or the ADHD Friendly™ mark until a category adaptation is published (Article XI).

ABSTRACT

Neuro-Inclusive Cosmetic Design (NICD) is an emerging discipline applying principles from:

- universal design
- sensory science
- cognitive ergonomics

to the development of **cosmetic and personal care products**.

This framework establishes a **technical methodology** in which the **sensory processing profiles, cognitive patterns, and executive function characteristics of neurodivergent individuals** function as **primary design constraints**, equal in importance to:

- product safety
- formulation stability
- functional efficacy

The NICD framework introduces **measurable parameters, testing protocols, and ethical design principles** for developing products that **reduce neurological friction in everyday care rituals**.

PREAMBLE

The Neurological Blind Spot in Product Design

Contemporary cosmetic and personal care product development is optimised around an **implicit neurotypical user model**, characterised by:

- average sensory thresholds
- stable executive function
- consistent ritual performance

This assumption **systematically excludes** a substantial proportion of the population whose neurological profiles diverge in areas such as:

- sensory processing
- attention regulation
- cognitive load tolerance

Many products further amplify this exclusion through **systemic dishonesty**, including:

- misleading sensory cues
- exaggerated claims
- unnecessary complexity

For many neurodivergent individuals, such inconsistencies represent not merely marketing exaggeration but a **breach of trust**.

NICD recognises **neurological diversity as a fundamental dimension of human variation**.

It asserts that **honesty is the foundation of accessibility**.

Products that misalign **communication, sensory cues, and performance** impose unnecessary:

- cognitive burden
- sensory distress
- emotional friction

These burdens frequently lead to:

- product abandonment
- inconsistent routines
- diminished wellbeing

This framework therefore establishes a transition from **exclusionary optimisation towards inclusive system design**, founded on **radical functional honesty**.

NORMATIVE REFERENCES

The following documents constitute normative references for this framework.
For **dated references**, only the cited edition applies.
For **undated references**, the latest version applies.

- **EU Cosmetic Regulation (EC) No. 1223/2009** — Safety requirements for cosmetic products
- **UK Cosmetics Regulation** — Schedule 34 to the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019 (SI 2019/696) — Safety requirements for cosmetic products placed on the GB market
- **Commission Regulation (EU) No 655/2013** — Common criteria for the justification of claims used in relation to cosmetic products
- **ISO 22716** — Cosmetics — Good Manufacturing Practices
- **SCCS Notes of Guidance for the Testing of Cosmetic Ingredients**

Informative References

- **ISO 8586** — Sensory analysis — Selection and training of sensory assessors
- **ISO 13299** — Sensory analysis — General guidance for establishing a sensory profile
- **ISO 4120** — Sensory analysis — Methodology — Triangle test
- **NASA Task Load Index (NASA-TLX)** — Hart, S. G. & Staveland, L. E. (1988)

The NICD Standard **does not replace toxicological safety evaluation**.
Instead, it provides **an additional assessment layer addressing sensory predictability, sensory comfort and cognitive accessibility of cosmetic products**.

ABBREVIATIONS AND SYMBOLS

Term	Meaning
CBA	Claim-to-Blind Alignment (Appendix D)
CEA	Cue-to-Experience Alignment (Appendix D)
CI	Confidence interval
cP	Centipoise
GC-MS	Gas chromatography-mass spectrometry
HEL	High Executive Load panel profile (Appendix B, B.4)
HGS	Honesty Gap Score (Appendix D)
LSR	Low Sensory Regulation panel profile (Appendix B, B.4)
MP	Mixed Profile (Appendix B, B.4)
ND	Qualifying neurodivergent participant group (Appendix B, B.1)
NITS	Neurosensory Ingredient Classification & Tiering System (Appendix J)
NSI	Neuro-Sensory Irritation Index (Appendix F)
NT	Neurotypical comparison group (Appendix B, B.1)
NTS	Neuro-Tolerability Score (Appendix K)
OP	Omission Penalty (Appendix D)
RH	Relative humidity
S	Sensory-difference participant group (Appendix B, B.1)
SA / SS	Sensory Avoider / Sensory Seeker panel profiles (Appendix B, B.4)
PCA	Principal component analysis
SD	Standard deviation
SSU	Standardised Sensory Units (Appendix G)
TLX	NASA Task Load Index (raw, unweighted)
TOST	Two one-sided tests (equivalence testing)
κ	Weighted Cohen's kappa (inter-assessor agreement)
s_i, w_i	Criterion score and criterion weight (Appendix A)

Term	Meaning
T, P, Q	Tolerance, minimum-proportion and maximum-proportion targets (Appendix A, A.1)
σ_w, μ	Pooled within-panellist SD and mean SSU for a modality (Appendix K)
p_u	Proportion of panellist-days not as expected (Appendix K, K.3.4)
p_d	Proportion of distinguishers in a triangle test (Appendix A, A.4)

Terminology: *neurodivergent* describes an individual whose neurological development or functioning differs from the typical range; *neurodiverse* describes a group containing a range of neurotypes; *neuro-inclusive* describes a design approach. The Standard uses these terms only in these senses.

DOCUMENT HISTORY

Version	Date	Summary
V4.0, V4.1, V4.2	—	Earlier releases; see the corresponding Zenodo records. V4.2 is superseded by V5.0. Scores obtained under V4.x are not comparable with V5.0 scores; products verified under V4.x require reassessment.
V5.0	28 October 2026	Free-use licence for the Standard, with the ADHD Friendly™ mark reserved to Level III. Scoring rules revised (absolute requirements, HGS aggregation, NSI band thresholds, NTS component conversions). Format-specific tactile criteria, olfactory marker selection and batch comparison, and real-time shelf-life evidence defined. Participant groups, panel routes, participant data protection, assessor roles, independent appeals and change control specified. Contents, abbreviations, criterion applicability matrix and worked examples (Appendix L) added.

ARTICLE I
CORE DEFINITIONS

1.1 Neuro-Inclusive Cosmetic Design (NICD)

An interdisciplinary **design and engineering methodology** in which the **sensory processing characteristics, cognitive patterns, and executive function constraints of neurodivergent individuals** are treated as **primary design parameters** governing:

- formulation architecture
- delivery systems
- packaging
- application rituals
- user communication

1.2 COSMETONOESES

Etymology

Greek:

- *kosmetikos* — order, arrangement, adornment
- *noesis* — conscious understanding

Definition

Cosmetonoesis represents the **intentional cognitive act of creating perceptible order through cosmetic formulation**. It denotes the transformation of **sensory and ritual chaos into predictable systems**. Cosmetonoesis functions as the **epistemological foundation of the NICD framework**.

1.3 NICD

The **technical framework, parameters, and assessment methodology** defined in this document.

1.4 ADHD Friendly™

The **consumer-facing verification mark** awarded to products holding **Level III — NICD Verified** status (Article XII). The mark denotes **neuro-usability verification only**. It makes no claim about attention, focus, mood, or any symptom of ADHD or any other condition.

1.5 The ADHD Algorithm™

The overarching intellectual framework encompassing:

- the NICD methodology
- the ADHD Friendly™ verification system

1.6 Neurological Friction

A qualitative construct describing the **combined cognitive, sensory, and emotional load** imposed by a product interface that diverges from a user's neurocognitive profile.

Operationally, neurological friction is measured as the **inverse performance** in the following NICD domains:

- Sensory Predictability
- Cognitive Friction Coefficient
- Task-Completion Architecture

1.7 Stimulation Band

The calibrated **perceived sensory profile** of a product, defined by its dominant sensory character.

Categories include:

Grounding

Low-intensity, slow-onset sensory profile with soft, rich or warm-perceived character, designed to be perceived by users as settling and comfortable.

Clarifying

Distinct, faster-onset sensory profile with fresh, light or crisp character, designed to be perceived by users as clean and refreshing.

Neutral

Minimal sensory signature designed to avoid interference.

Stimulation Bands describe **perceived sensory character only**. They make no claim about physiological, neurological or therapeutic effects (Appendix C).

1.8 The Issuing Authority

The NICD Standard, the ADHD Friendly™ mark and The ADHD Algorithm™ are the intellectual property of **COSMETONOESIS**, which functions as:

- author
- issuer
- administrator of the verification registry

Governance, conflict-of-interest and appeals arrangements are set out in **Article X**. A future **International Consortium for Neuro-Inclusive Cosmetic Design** may be established to support broader governance. No such body currently exists, and no endorsement by any external body is claimed.

1.9 Neuro-Tolerability

Neuro-tolerability is defined as:

the capacity of a cosmetic product to be used repeatedly without inducing sensory distress, cognitive overload, or sensory discomfort.

A neuro-tolerable product must:

- avoid excessive stimulation
- maintain predictable sensory characteristics
- avoid abrupt sensory onset
- avoid lingering sensory persistence
- allow completion of the care routine without cognitive friction

1.10 Neuro-Sensory Irritation (NSI)

Discomfort triggered by **sensory overstimulation in the absence of dermatological irritation**.

"Irritation" in this term refers to **sensory discomfort reported by users**. It is distinct from dermal irritation as assessed in the cosmetic product safety report under Regulation (EC) No 1223/2009.

Where applicable, NSI evaluation shall be supported by the Neurosensory Ingredient Classification & Tiering System (Appendix J).

1.11 Sensory Dissonance

A mismatch between **expected and experienced sensory signals**.

1.12 Cognitive Load

The **mental effort required to understand and complete a product routine**.

1.13 Sensory Predictability

The ability of a product to deliver **consistent sensory responses across repeated uses**.

1.14 Neurological Compatibility

The degree to which a product **avoids triggering sensory distress or cognitive overload** in diverse neurological profiles.

1.15 Neurosensory Ingredient

Any cosmetic ingredient that **produces or modifies a perceptible sensory effect** during or after use—including cooling, warming, tingling, numbing, scent, taste and residual skin feel—or for which published or supplier data describe an effect on **cutaneous sensory signalling**.

1.16 Neurosensory Ingredient Classification & Tiering System (NITS)

A structured classification methodology defined in Appendix J, used to assign ingredients to Tier 0–4 according to the nature and expected magnitude of their **contribution to perceived sensory experience**. NITS is an internal assessment tool and shall not be used in product claims.

1.17 Neurosensory Tier

The categorical classification (Tier 0–4) assigned to an ingredient under Appendix J.

ARTICLE II
FOUNDATIONAL AXIOMS

Axiom 0

The Principle of Radical Functional Honesty

A product’s **communication, sensory cues, and performance must align without deception or omission**. Honesty functions as a **design safety parameter**.

Axiom 1

Completion Supersedes Optimisation

A routine performed **consistently** delivers greater wellbeing than a perfect routine performed once and abandoned.

Axiom 2

Predictability Is Non-Negotiable

Sensory and behavioural predictability is as critical as **microbial and chemical stability**.

Axiom 3

Complexity Requires Justification

Complexity is acceptable only when:

- 1. each component serves a clear purpose
- 2. its function can be intuitively communicated
- 3. it does not increase neurological friction

Axiom 4

The User-Product Interface Is a Unified System

Formulation, packaging, dispensing, and communication must function as **one coherent system**.

Axiom 5

Sensory Attributes Are Functional Parameters

All sensory attributes must serve a **functional purpose for the user**. None exist solely for **marketing appeal**.

ARTICLE III
UNIVERSAL NICD DESIGN PARAMETERS

3.1 Sensory Engineering Specifications

NICD introduces explicit engineering parameters for the sensory performance of cosmetic products. NICD requires **quantifiable sensory reproducibility**.

Parameter	NICD Requirement	Measurement Method
Olfactory Consistency	≤10% relative difference in normalised peak area of each sensory-relevant marker between reference and comparison batches	GC-MS plus blind similarity test (Appendix A, A.4)
Tactile Reproducibility	Format-specific batch reproducibility and temperature recovery	Rheology or format-equivalent measure; panel feedback (Appendix A, A.3)

Parameter	NICD Requirement	Measurement Method
Application Feedback	Clear start/stop indicators	User panel task completion analysis
Sensory Band Stability	Stable for entire shelf life	Accelerated screening; confirmed by real-time stability (Appendix G, G.3.1)

Marker selection and the batch-comparison protocol are defined in Appendix A, A.4.

NICD requires the definition of **explicit targets** for:

- sensory onset
- sensory intensity
- sensory duration
- sensory termination

Cross-modal coherence between **visual, tactile, olfactory, gustatory, and auditory cues** is mandatory wherever those modalities are present; non-applicable modalities are recorded as such.

Contradictory signals constitute **sensory dissonance and design failure**.

3.2 Cognitive Load Management

Cosmetic products designed under NICD must minimise cognitive friction through the following constraints:

- Maximum **one pre-use decision** (zero preferred)
- No ambiguous sequencing requirements
- Clear visual or tactile dosage indicators
- Interrupt-resilient application routines
- Memory-independent instructions

Products requiring **precise techniques, memorised procedures, or extended focus** are incompatible with NICD principles unless the requirement is unavoidable for the product’s function. In that case the demand shall be minimised, explained in the instructions and disclosed in the Honesty Fact Sheet (Appendix D).

3.3 Expanded Stability Definition

NICD expands traditional stability concepts to include **behavioural and sensory stability**.

Verification must therefore include:

- olfactory consistency
- tactile consistency
- behavioural reproducibility (spread, absorption, foam behaviour)
- packaging-formulation interaction stability

A product that maintains chemical stability but **exhibits sensory drift** is considered **functionally unstable under NICD criteria**.

Shelf-life conclusions require **real-time stability data**. Accelerated ageing is a screening tool only. Verification may be granted on accelerated data plus at least 3 months of real-time data. Until real-time data cover the declared shelf life, the registry shows the verification as “**real-time stability in progress**” with the months covered, and NICD stability conclusions extend only as far as the real-time data (Appendix G, G.3.1).

3.4 Neuro-Sensory Irritation Potential

Traditional cosmetic safety assessments evaluate:

- dermatological irritation
- sensitisation

NICD introduces a complementary concept:

Neuro-Sensory Irritation

This refers to **sensory overstimulation that produces discomfort despite dermatological safety**. It is a measure of user-reported sensory comfort and does not assess dermal irritation (Article I, 1.10).

Potential triggers include:

- excessive fragrance intensity
- menthol/camphor stimulation
- abrasive exfoliation particles
- prolonged sensory persistence
- sudden sensory onset

Evaluation is conducted through the **Neuro-Sensory Irritation Index (NSI)** described in Appendix F.

Products exceeding the band-specific NSI maxima (Appendix F.1.4) must be **reformulated or repositioned**.

3.5 Sensory Threshold Calibration

NICD requires semi-quantitative calibration of sensory intensity using **Standardised Sensory Units (SSU)**. SSU measurements may be applied to the following modalities:

- olfactory intensity
- tactile stimulation
- thermal sensation
- visual sensory load
- auditory feedback

Each attribute must be recorded as a **mean SSU value derived from panel testing**.

The product's **dominant stimulation band** must remain stable across:

- production batches
- shelf-life duration
- environmental temperature variation

Reference scales and procedures are described in Appendix G.

3.6 Neuro-Tolerability Requirement

All NICD-assessed products must demonstrate **acceptable neuro-tolerability**.

Neuro-tolerability integrates:

- sensory predictability
- NSI scoring
- SSU calibration stability
- cognitive load analysis
- sensory dissonance evaluation

Products failing these criteria **fail the NICD acceptance criteria for the sensory profiles concerned**.

ARTICLE IV

NICD DEVELOPMENT PROTOCOL

NICD-compliant development proceeds through **five structured phases**.

4.1 Phase 1 — Neurological Profile Mapping

Target use scenarios must be defined by mapping:

- stimulation band
- time of day
- user cognitive state
- ritual context

4.2 Phase 2 — Friction Point Analysis

Existing solutions are audited across the full usage cycle:

1. Procurement
2. Storage
3. Preparation
4. Application
5. Cleanup
6. Repurchase

4.3 Phase 3 — System Architecture Design

Formulation and delivery systems are designed simultaneously.

Ingredient selection prioritises:

- multifunctional synergy
- sensory compatibility
- inherent stability
- communication clarity

4.4 Phase 4 — Neuro-Inclusive Testing

Testing panels must meet the participant-group requirements of Article IV, 4.6 and Appendix B, B.1.

Evaluation includes:

- sensory predictability across repeated use

- ritual completion rates
- cognitive load reporting
- real-world routine integration

4.5 Phase 5 — Communication Architecture

Product communication must be structured to support neurodivergent cognition.

Required elements include:

- ingredient grouping by function
- visual sequential instructions
- explicit sensory trigger warnings
- transparent benefit-friction communication

4.6 Neuro-Inclusive Panel Methodology

Panel requirements include:

Panel Size

Minimum 15 participants.

Composition

Panel composition is counted using the **mutually exclusive** participant groups defined in Appendix B, B.1. Each participant is counted once, in one group; S means participants with sensory differences who do not meet the ND criteria.

- Qualifying neurodivergent (ND): **≥45%** of the panel
- ND and sensory-difference (S) combined: **≥60%** of the panel; S no more than 15%
- Neurotypical comparison (NT): **≥20%** of the panel
- For **ADHD Friendly™ verification**: **≥50% of the total panel** (not of the ND group) in the ADHD subgroup of ND

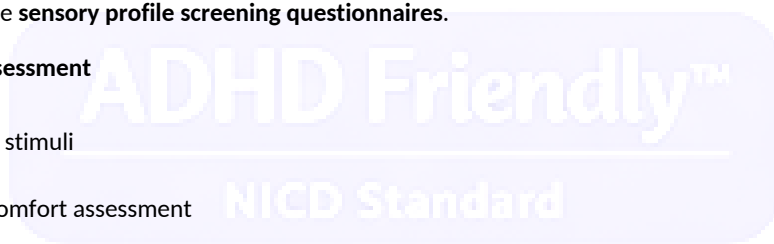
Rounding: minimum proportions are rounded up to the next whole participant and maximum proportions are rounded down (e.g., for n = 15: ND ≥7, ND + S ≥9, S ≤2, NT ≥3, ADHD subgroup ≥8).

Participants must complete **sensory profile screening questionnaires**.

4.7 Neuro-Tolerability Assessment

Evaluation includes:

- sensory mapping of all stimuli
- repeated-use testing
- panel-based sensory comfort assessment
- NSI scoring
- SSU repeatability measurement



ARTICLE V

PROHIBITED DESIGN PATTERNS

The following patterns are incompatible with NICD compliance:

- performative complexity without benefit
- sensory ambiguity
- precision-dependent efficacy
- assumed user competence
- opaque innovation
- guilt-based usage narratives

ARTICLE VI

ASSESSMENT AND VERIFICATION

6.1 NICD Assessment Matrix

Products are evaluated across five domains:

1. Sensory Predictability — 30 points
2. Cognitive Friction Coefficient — 25 points
3. Stimulation Band Fidelity — 20 points
4. Task-Completion Architecture — 15 points
5. Transparent Complexity & Sensory-Trigger Disclosure — 10 points

Maximum Score: 100

Criterion scores are assigned using the rubric in **Appendix A, Section A.1**, by assessors meeting the requirements of **Section A.2**.

ADHD Friendly™ Threshold

- ≥80 points
- No domain below **60% of its maximum score**
- NTS ≥80 (Article VI, 6.4; Appendix K)
- HGS ≤2 (Article VI, 6.2; Appendix D)
- Panel H alignment: ≥80% of panellists rate 4 or 5 (Appendix D, Phase 2)
- NSI within the band-specific maximum (Appendix F, F.1.4)
- NSI discomfort rate ≤20% (Appendix F, F.1.5)
- No absolute requirement failed (criteria 1.6, 5.1 and 5.2; Appendix A, A.1)
- Assessment by two assessors in accordance with Appendix A, A.2 and Article X, 10.3–10.4

These conditions define **Level III — NICD Verified** (Article XII). The ADHD Friendly™ mark requires Level III and nothing further.

Decision rule: every condition above must be met. Failing any one of them means the product is not verified. It may be reformulated or recommunicated and then reassessed in full. A domain below 60% requires redesign of that domain before reassessment.

6.2 Honesty Audit Protocol

Verification uses a **dual-panel system**:

Panel H — Honesty Panel

Participants from the ND and S groups (Appendix B, B.1) evaluate promise-experience alignment.

Panel B — Blind Panel

Naïve users establish ground-truth perception.

The **Honesty Gap Score (HGS)** measures:

- claim alignment
- sensory cue alignment
- omission penalties

Verification Threshold: HGS ≤2

6.3 ADHD Friendly™ Verification Mark

Products holding **Level III — NICD Verified** status and meeting all thresholds in 6.1 may license the **ADHD Friendly™** mark.

Requirements:

- ™ symbol must appear
- mark must link to verification registry
- mark must include verification QR code

The mark and the name The ADHD Algorithm™ shall not be presented—alone, in a product name, or combined with ingredient names or other claims—in a way that states or implies an effect on attention, focus, mood, or any symptom of ADHD or any other condition.

Verification validity: 3 years, subject to annual re-audit and change control (Article VI, 6.7).

6.4 Neuro-Tolerability Score (NTS)

The **Neuro-Tolerability Score (NTS)** quantifies neuro-inclusive tolerability.

Four dimensions are evaluated:

- NSI — Neuro-Sensory Irritation Index
- SSU Variance — Sensory Uniformity (variability of each panellist's SSU ratings across repeated uses)
- Cognitive Load
- Sensory Predictability

Score range: **0–100**

Interpretation:

Score	Interpretation
80–100	Excellent
60–79	Moderate
40–59	Low
<40	Poor

6.5 The ADHD Friendly Test (Browser Tool)

The browser-based ADHD Friendly Test at cosmetonoesis.com is a **screening and self-assessment tool**. Its output is indicative only. It is not a verification, shall not be presented as NICD verification, and does not support use of the ADHD Friendly™ mark.

6.6 Provisional Thresholds

All numerical thresholds in this Standard (Article VI and Appendices A, B, C, D, F, G and K) are **provisional** pending validation (see Status of the Standard: Validation Status).

6.7 Change Control, Re-Audit and Renewal

The verification holder shall notify COSMETONOESIS of any change to a verified product **before** the changed product is placed on the market. The type of change determines the reassessment required; where a change fits more than one category, the highest category applies:

Change	Examples	Requirement
Minor	Artwork changes not affecting claims, instructions or warnings; secondary packaging; supplier change for a Tier 0 ingredient with equivalent specification	Notification; registry updated
Moderate	Supplier change for a Tier 1–4 ingredient; change of manufacturing site or process; reformulation of a fragrance or flavour by its supplier under the same code; primary packaging change not affecting dispensing	Partial reassessment: Domain 1, NSI, SSU batch equivalence (Appendix G, G.3) and HGS
Major	Any other formula change; fragrance or flavour replaced; change to dispensing mechanism, dose, instructions, claims or declared Stimulation Band	Full reassessment

- **Annual re-audit:** HGS (Appendix D, D.4), real-time stability results falling due (Appendix G, G.3.1), and review of complaints and notified changes.
- **Failed or missed re-audit, or unnotified change:** verification is suspended and shown as suspended in the registry. The holder has 90 days to correct the issue and pass a repeat audit; otherwise verification is withdrawn.
- **Reinstatement:** a suspended verification is reinstated on passing the repeat audit, with the original expiry date and annual re-audit schedule unchanged.
- **Renewal:** at the end of the 3-year validity period, a full reassessment is required.

6.8 Assessment Sequence

1. **Eligibility:** the product is a cosmetic product with a completed safety assessment for its market (Appendix I).
2. **Category and applicability:** identify the product category and the applicable criteria; confirm the minimum number of applicable criteria per domain (Appendix A, A.5).
3. **Declarations:** intended Stimulation Band (Appendix C, C.5); Promise Map and cue intentions (Appendix D, Phase 1).
4. **Ingredient classification:** NITS tiers (Appendix J).
5. **Instrumental testing:** format-specific tactile measures, olfactory markers and stability (Appendix A, A.3–A.4; Appendix G, G.3).
6. **Panel testing:** recruit and classify panellists (Appendix B; Appendix H); run SSU, NSI, Domain 2–4, Panel H and Panel B protocols.
7. **Scoring:** criterion scores by two assessors (Appendix A, A.1–A.2); domain scores; HGS; NSI; NTS.
8. **Decision:** all thresholds in 6.1 met → Level III; entry in the verification registry (Article X, 10.5).
9. **Maintenance:** change control and annual re-audit (6.7).

ARTICLE VII
IMPLEMENTATION GUIDELINES

7.1 For Formulators

Formulators should:

- integrate neurological friction analysis (Article IV, Phase 2) early
- design for fault tolerance
- select ingredients for sensory compatibility
- perform neuro-inclusive testing

7.2 For Brands

Brands should:

- communicate transparently
- avoid neurodiversity-washing

- prioritise routine consistency

7.3 For Researchers

Researchers should:

- develop neuro-inclusive testing protocols
- test the reliability and validity of NICD measures
- explore whether perceived sensory bands correspond to measurable physiological responses

ARTICLE VIII

THE PRINCIPLE OF RADICAL FUNCTIONAL HONESTY

8.1 Sensory Misalignment and Trust

For many neurodivergent individuals, misaligned sensory signals are experienced as **systemic trust failures** rather than marketing exaggerations.

NICD therefore treats **honesty as a safety parameter**.

8.2 Honesty Parameters

Sensory Promise Fulfilment

Sensory communication must match actual experience, as measured by Cue-to-Experience Alignment (CEA, Appendix D, Phase 3).

Ingredient Transparency

Ingredients must be communicated in **functional blocks** rather than marketing narratives. Functional grouping is supplementary and does not replace the mandatory ingredient list.

Efficacy Scope Clarity

Claims must describe **direct perceptible outcomes**.

Failure State Transparency

Known limitations must be communicated **with equal prominence to benefits**.

8.3 The “No Gaslighting” Clause

Products must never:

- intentionally create sensory dissonance
- claim to solve problems they merely mask
- misuse neurodiversity narratives
- state or imply a therapeutic, physiological or symptom-related benefit, including any effect on ADHD or any other neurodevelopmental condition
- claim endorsement by non-existent governing bodies

ARTICLE IX

ETHICAL POSITION

NICD recognises self-care as a **fundamental human activity** supporting:

- health
- dignity
- social participation

Neurologically mismatched products create:

- guilt
- anxiety
- financial waste
- social withdrawal

NICD therefore defines **neurological accessibility as an ethical responsibility**.

ARTICLE X

ADMINISTRATION, GOVERNANCE AND EVOLUTION

10.1 Authorship and Ownership

Authored by Vasileios Karamalakos and issued by **COSMETONOESIS**.

Cosmetonoesis maintains:

- intellectual ownership of the framework

- ownership of ADHD Friendly™
- interpretive authority over the methodology, subject to the appeals process in 10.7

10.2 Conflict of Interest Disclosure

The author of this Standard:

- operates **The ADHD Apothecary**, a personal care brand whose products hold ADHD Friendly™ verification;
- provides formulation, product development and regulatory services to cosmetic brands, some of which may seek NICD assessment or verification.

These interests are disclosed so that users of the Standard and of the registry can judge verification decisions with full information.

10.3 Roles and Assessor Qualification

NICD separates three functions:

- **Issuer** (COSMETONOESIS): publishes the Standard, maintains the verification registry, and authorises use of the ADHD Friendly™ mark on the basis of a completed assessment.
- **Assessor**: conducts testing and scoring under Appendix A, A.2.
- **Independent reviewer**: decides appeals (10.7).

Assessors shall hold a degree in a relevant science (e.g., cosmetic science, chemistry, pharmacy, psychology or sensory science) or have at least 3 years' experience in cosmetic product development, sensory evaluation or safety assessment, and shall have completed training on this Standard. For every assessment, each assessor shall declare any commercial or personal relationship with the brand, manufacturer or formulator.

10.4 Impartiality Safeguards

- **Issuer-interest products.** Any product in which COSMETONOESIS or the author has a commercial interest, or which the author formulated or developed, shall be flagged as "**Issuer-interest**" in the verification registry, and its audit dossier shall be published, limited to the aggregate results permitted under 10.6 (group percentages, domain and criterion scores, and NSI, SSU, NTS and HGS results with confidence intervals).
- **Independent second scoring.** For every Level III verification, at least one of the two assessors required by Appendix A, A.2 shall have had no involvement in the development of the product.
- **Outcome-independent fees.** Any fee charged for assessment or verification shall not depend on the outcome.
- **Record retention.** Aggregate audit dossiers shall be retained for at least 5 years after the end of verification validity. Participant-level data are retained and deleted under 10.6.

10.5 Verification Registry

COSMETONOESIS maintains a public verification registry listing, for every verified product: compliance level, domain scores, total score, NTS, HGS, date of verification, next re-audit date, real-time stability months covered, Issuer-interest status, and any suspension. Lapsed, suspended or withdrawn verifications are shown as such.

10.6 Participant Data Protection

Panel data may include health and neurotype information, which is special category personal data under the UK GDPR and EU GDPR. Assessors shall:

- obtain explicit, informed consent covering the purpose, the data collected, retention, and publication of aggregate results, with consent materials available in easy-read format;
- not require proof of diagnosis; self-identification is accepted (Appendix B, B.1);
- pseudonymise participant data at collection, store the identification key separately, and restrict access to the assessors of the product;
- publish **aggregate results only**: group percentages, domain and criterion scores, and means with confidence intervals for NSI, SSU, NTS and HGS components;
- report any panel subgroup of fewer than 5 participants as "<5", and never publish participant-level responses, identifying free-text comments, or diagnoses linked to responses;
- retain participant-level data for no longer than 5 years after the end of verification validity, then delete it. Participants may withdraw at any time; their pseudonymised records are then deleted. Aggregate results already published are not recalculated.

These are minimum requirements. Assessors remain responsible for compliance with the data-protection law that applies to them.

10.7 Complaints and Appeals

- Any person may submit a complaint about a verified product, or about the application of this Standard, to info@cosmetonoesis.com.

- A brand may appeal a verification decision within **30 days** of notification.
- COSMETONOESIS shall acknowledge the appeal and appoint an independent reviewer within **30 days**.
- The reviewer shall be qualified under 10.3, shall have had no involvement in the original assessment, and shall have had no commercial relationship with COSMETONOESIS, the author or the brand in the previous 2 years. The reviewer shall confirm this in writing.
- If COSMETONOESIS does not appoint a reviewer within 30 days, the appellant may nominate one who meets the same criteria.
- The reviewer's decision, with reasons, is binding on the registry entry and is published in summary in the registry.

10.8 Commitment to Evolution

NICD is a **living framework**.

Future updates will reflect:

- validation results (Status of the Standard: Validation Status)
- research developments
- sensory science advances
- cognitive ergonomics insights

ARTICLE XI

FUTURE DEVELOPMENT PATHWAYS

Short-Term (1-2 years)

- publish reliability and validation studies
- document the Sensory Band consensus process
- establish the physical reference standards and digital reference library (Appendix C, C.4)
- refine sensory band calibration
- publish practitioner tools
- develop white papers

Medium-Term (3-5 years)

- integrate NICD into cosmetic science education
- expand interdisciplinary research
- establish independent third-party certification (Level IV)
- publish category adaptations for products outside Appendix A, A.5

Long-Term (5+ years)

- AI-assisted sensory modelling
- sensory-profile personalisation
- broader consumer product design dialogue

ARTICLE XII

NICD COMPLIANCE CLASSIFICATION

Products may be classified into four levels.

Level I — NICD Compatible

Existing products assessed against some or all NICD criteria; a desk assessment without panel testing is permitted. No minimum score applies, but any public statement must read "NICD Compatible (self-assessed)" and must state which criteria were assessed and the scores achieved.

Level II — NICD Designed

Products developed with NICD principles incorporated during design and tested in full: panel testing, NSI, SSU equivalence and cognitive load (Neuro-Tolerability Verification Requirement, below), meeting all numerical thresholds in Article VI, 6.1. Level II may be self-assessed by a single assessor and without the independence safeguards of Article X, 10.4; any public statement must read "NICD Designed (self-assessed)".

Level III — NICD Verified

Products meeting **all** the conditions in Article VI, 6.1, following full NICD assessment, including:

- neuro-inclusive panel testing
- SSU calibration
- NSI scoring

- NTS ≥ 80
- Honesty Audit success (HGS ≤ 2 and Panel H alignment)
- total score ≥ 80 with no domain below 60%

Level III is **required** for use of the ADHD Friendly™ mark. Levels I and II do not permit use of the mark.

Level IV — NICD Certified (Future)

Potential future level involving **third-party certification bodies**.

Neuro-Tolerability Verification Requirement

Products claiming **NICD Designed** or **NICD Verified** must demonstrate:

- NSI within the band-specific maximum (Appendix F.1.4)
- SSU equivalence within Appendix G.3 margins (± 1.0 SSU between batches; ± 1.5 SSU over shelf life)
- neuro-inclusive panel confirmation
- cognitive load compliance

Documentation must be included in the **NICD audit dossier**.



APPENDIX A: THE NICD ASSESSMENT PROTOCOL

A.0 Attribution Requirement

- **Requirement:** Any published audit report, summary, or public communication of findings for a specific product generated using this standard should include the Required Attribution Statement set out in Appendix E.1. A link to the official source (<https://www.cosmetonoesis.com>) is recommended for digital publications.
- **Placement:** The attribution should appear in the **executive summary, methodology section, or footer** of the report.
- **Status:** Attribution is not a product-assessment criterion and does not form part of Domain scoring. It does not apply to commentary, critique or citation of the Standard (Section 1.2).

Step-by-step guide for conducting each domain assessment

(Sensory Predictability, Cognitive Friction, etc.)

- **Sample size:** Instrumental measures (e.g., GC-MS, rheology): minimum triplicate determinations per batch. Panel-based measures (including timing, completion rate and blind sensory evaluation): minimum 15 panellists, 20–25 recommended (Appendix H).
- **Panel composition:** Participant groups per Appendix B, B.1 and Article IV, 4.6 (ND ≥45%; ND + S ≥60%; NT ≥20%; ADHD subgroup ≥50% for ADHD Friendly™ verification).
- **Applicability:** Determine the applicable criteria from A.5 before testing.
- **Statistical analysis:** Use mean ± SD for continuous variables; Chi-square or Fisher’s exact for categorical pass/fail items (e.g., phase separation, completion rate). For domain scores, report 95% confidence intervals.
- **Test environment:** Controlled lab conditions (22±2°C, 40–60% RH) for reproducibility; in-home use for Domain 4 (7-day diary).
- **Weighting adjustments:** Apply product-category weights when converting criterion scores to domain points (see Product Category Adjustments at the end of this appendix).

Scoring Protocol: Score each criterion 1–5 using the rubric in A.1. Convert criterion scores to Domain points: $\text{Domain score} = (\sum(w_i \times s_i) \div (5 \times \sum w_i)) \times \text{Domain maximum points}$, where s_i is the criterion score and w_i its weight (default 1). Criteria marked N/A are excluded from both sums. Total score ≥80 points, together with NTS ≥80 (Appendix K) and HGS ≤2 (Appendix D), is required for ADHD FRIENDLY™ / NICD verification. Any domain scoring <60% of its possible points requires complete redesign. *Note: Some criteria may not apply to certain product categories (N/A).*

A.1 Criterion Scoring Rubric

Graded criteria: the target defines the **score of 4**. A score of 5 requires the target to be met with the margin shown; 3 denotes a marginal miss; 2 a clear miss; 1 failure.

Absolute requirements (1.6, 5.1, 5.2) are scored pass/fail only: **pass = 5, fail = 1**. Scores of 2–4 are not used for absolute requirements.

A product meeting every target therefore scores at least 80 points.

Target type	5 — Exemplary	4 — Target met	3 — Marginal	2 — Clear miss	1 — Failure	Applies to
Tolerance (result within ±T or ≤T)	≤0.5T	≤T	≤1.25T	≤1.5T	>1.5T	1.1, 1.2, 1.4, 1.5, 2.3, 3.3, 4.2, 5.3
Minimum proportion (≥P% of panellists or uses)	≥P + 10 points	≥P	≥P – 5 points	≥P – 10 points	<P – 10 points	2.5, 3.1, 4.1, 4.3, 4.4
Maximum proportion (≤Q% of panellists report)	≤Q/2	≤Q	≤1.5Q	≤2Q	>2Q	1.3, 2.2, 3.2, 3.4
Decision count	0	1	2	3	≥4	2.1
Time and error (2.4)	Median ≤10 s, 0 errors	Median <15 s, ≤1 error	Median <20 s, ≤2 errors	Median <30 s, ≤3 errors	Otherwise	2.4

Target type	5 — Exemplary	4 — Target met	3 — Marginal	2 — Clear miss	1 — Failure	Applies to
Absolute requirement (pass/fail)	Pass	Not used	Not used	Not used	Fail	1.6, 5.1, 5.2

Where a criterion combines an instrumental and a panel target, both must reach a level for that score to be awarded; the lower of the two levels applies.

A.2 Assessor Requirements and Scoring Reliability

- **Two assessors** shall score each criterion independently from the same audit data for Level III verification.
- Where the two scores differ by more than 1 point, the difference shall be resolved by documented consensus; otherwise the mean is used and retained without rounding (e.g., 3.5). For absolute requirements (pass/fail), any disagreement is resolved by documented consensus.
- Each audit report shall state the percentage of criteria with exact agreement and the quadratically weighted Cohen's κ between assessors, calculated across all applicable criteria. If $\kappa < 0.60$, the assessors shall review the scoring guidance and re-score independently before the audit is finalised (provisional threshold).
- For Level III, at least one assessor shall have had no involvement in the development of the product (Article X, 10.4).
- Self-assessments (Levels I and II) may use a single assessor; the report shall state this.

DOMAIN 1: SENSORY PREDICTABILITY (30 Points)

Criterion	Assessment Method	Target (score 4)	Score	Notes
1.1 Olfactory Consistency	GC-MS comparison of reference vs. comparison batch (A.4); blind similarity test	≤10% relative difference in normalised peak area of each sensory-relevant marker (A.4); similarity confirmed	___/5	Applicability per A.5
1.2 Tactile Reproducibility	Format-specific measure (A.3): batch comparison at 25°C and recovery after 10°C and 40°C storage; panel texture feedback	Within ±15% (A.3); ≤10% of panellists report unprompted texture change	___/5	Format-specific; see A.3
1.3 Application Consistency	Panel reports of variance in spread, absorption, or behaviour	≤10% of panellists report unprompted “this feels different today”	___/5	
1.4 Onset Latency	Timing of sensation onset (cooling, warming, tingling, tightening) per A.6	SD of onset time across responding panellists ≤3 seconds; ≤20% non-responders	___/5	Excludes delayed-actives (e.g., retinoids)
1.5 After-Sensation Duration	Panel reporting of sensation persistence after application	≤2 hours for leave-on; ≤30 sec for rinse-off; or, where persistence is a declared intended attribute, within ±25% of the declared duration	___/5	
1.6 Phase Behaviour Stability	Visual/physical inspection for separation, settling, crystallisation	0 phase changes in accelerated ageing or in real-time stability to date (G.3.1)	___/5	Absolute requirement

DOMAIN 1 SUBTOTAL: ___/30

DOMAIN 2: COGNITIVE FRICTION COEFFICIENT (25 Points)

Criterion	Assessment Method	Target (score 4)	Score	Notes
2.1 Decision Points	Count pre-use decisions (shake, mix, choose setting, sequence)	1 decision (0 scores 5)	___/5	
2.2 Dosage Ambiguity	Panel reports: “How much is enough?” “Did I use too much/little?”	≤10% of panellists report dosage uncertainty; clear visual/feel indicator present	___/5	If no indicator is present, the score is capped at 3

Criterion	Assessment Method	Target (score 4)	Score	Notes
2.3 Cleanup Complexity	Residue measurement per A.6; panel feedback on cleanup effort	≤5% residue remaining after the standard removal action	___/5	For products requiring cleanup
2.4 Packaging Intuitiveness	Time-to-first-successful-use with no instructions; error rate	Median <15 seconds, ≤1 error	___/5	
2.5 Memory & Sequencing Load	24-hour recall of steps/sequence; interference with parallel tasks	≥90% accurate recall; ≤10% report “forgot next step”	___/5	Multi-step products only

DOMAIN 2 SUBTOTAL: ___/25

DOMAIN 3: STIMULATION BAND FIDELITY (20 Points)

Criterion	Assessment Method	Target (score 4)	Score	Notes
3.1 Band Assignment Accuracy	Blind panel categorisation vs. designed band	≥75% correct categorisation	___/5	
3.2 Band Purity	Reports of discordant sensations within assigned band	≤10% of panellists report unprompted discordance	___/5	
3.3 Intensity Calibration	Panel rating 1–10 intensity vs. designed intensity	Mean rating within ±1.5 of target	___/5	
3.4 Cross-Modal Alignment	Consistency between visual, olfactory, tactile cues	≤10% of panellists report “looks X but feels Y”	___/5	

DOMAIN 3 SUBTOTAL: ___/20

DOMAIN 4: TASK-COMPLETION ARCHITECTURE (15 Points)

Criterion	Assessment Method	Target (score 4)	Score	Notes
4.1 Fault Tolerance	Panel satisfaction at 50%, 100% and 150% of recommended amount	Satisfaction at 50% ≥65% of satisfaction at 100%; at 150% ≥80% of satisfaction at 100% (otherwise capped at 3)	___/5	Method per A.6
4.2 Ritual Duration	Measured average time vs. claimed/expected time	Within ±20% of expected duration	___/5	
4.3 Completion Rate	7-day in-home use: percentage of intended uses completed	≥80% completion rate	___/5	
4.4 Interrupt Resilience	Recovery rate after mid-ritual interruption	≥90% resume without restarting	___/5	

DOMAIN 4 SUBTOTAL: ___/15

DOMAIN 5: TRANSPARENT COMPLEXITY & SENSORY-TRIGGER DISCLOSURE (10 Points)

Criterion	Assessment Method	Target	Score	Notes
5.1 Ingredient Justification	Documentation of each ingredient's functional role	100% have documented functional justification	___/5	Excludes trace impurities
5.2 Sensory-Trigger Screening	Review for common neurodivergent sensory sensitivities (e.g., strong menthol, gritty scrubs) and disclosure per Appendix D.3	0 high-risk sensory triggers (A.6) without clear warning/alternative	___/5	Addresses sensory triggers, not toxicology

Criterion	Assessment Method	Target	Score	Notes
5.3 Communication Clarity	User testing of explanation comprehension (Flesch-Kincaid)	Flesch-Kincaid Grade Level ≤ 8 (reading age $\approx 13-14$) and function-block comprehension per A.6; the lower level applies	___/5	

DOMAIN 5 SUBTOTAL: ___/10

Domain 5 assesses formulation rationale, sensory-trigger disclosure and accessible communication. It does not assess toxicological or dermatological safety, which is a prerequisite for NICD assessment (Appendix I).

TOTAL SCORE: ___/100

ADHD FRIENDLY™ / NICD VERIFICATION THRESHOLD: ≥ 80 points (provisional; Article VI, 6.6)

DOMAIN FAILURE THRESHOLD: Any domain $< 60\%$ of possible points

Product Category Adjustments

Weights change how much a criterion counts within its domain. They do not change the criterion score itself.

- **Rinse-off products:** Criteria 1.5 and 2.3 weight $w = 1.5$.
- **Products with no added fragrance or flavour and no perceptible odour or taste** (condition C-a not met, A.5): criterion 1.1 is marked N/A (excluded from both sums) and criteria 3.1–3.3 are assessed on the remaining sensory modalities (tactile, visual, auditory). A product with no added fragrance but a perceptible odour from its raw materials is assessed under 1.1.
- **Multi-step systems:** Criteria 2.5 and 4.4 weight $w = 1.5$.

A.3 Format-Specific Tactile Measures (Criterion 1.2)

Viscosity changes with temperature in most formats, and that change is not in itself a loss of sensory predictability. Criterion 1.2 therefore assesses **reproducibility between batches and recovery after temperature exposure**, using the measure suited to the format. Recovery test: at least 24 h at 10°C and, separately, at least 24 h at 40°C , each followed by at least 24 h at 25°C before measurement.

Format	Instrumental measure	Batch reproducibility (25°C)	Temperature recovery
Emulsions, gels, liquids, shampoos	Viscosity (state spindle or geometry and shear rate)	$\pm 15\%$	Within $\pm 15\%$ of the 25°C reference; no phase change
Anhydrous balms, sticks, butters	Hardness or penetration (texture analyser or penetrometer); drop or melting point	Hardness $\pm 15\%$; drop point $\pm 2^{\circ}\text{C}$	Hardness within $\pm 15\%$; no graininess, bloom or oil separation
Oils	Panel only (oil viscosity is inherently temperature-dependent)	—	No cloudiness or separation after recovery
Sprays and mists	Delivered dose per actuation; spray pattern	Dose $\pm 15\%$	Dose within $\pm 15\%$
Powders	Bulk density; payoff	$\pm 15\%$	No caking
Foams and aerosols	Foam density	$\pm 15\%$	Within $\pm 15\%$

For a format not listed, the assessor shall select and justify an equivalent measure. The panel element of criterion 1.2 ($\leq 10\%$ of panellists report unprompted texture change) applies to all formats. Where a format has no instrumental measure (oils), criterion 1.2 is scored on the panel element alone.

A.4 Batch Comparison and Olfactory Markers

Batch comparison

- **New products:** the reference batch is the first production batch, or a pilot batch of at least 10% of production scale; the comparison batch is the next production batch. Level III requires at least two such batches.
- **Established products** (3 or more production batches): the reference batch is the earliest retained batch and the comparison batch is the most recent.
- **Annual re-audit:** the most recent production batch is added as a comparison batch.

Olfactory marker selection

- all fragrance or flavour constituents contributing ≥5% of total fragrance peak area; and
- any lower-abundance constituent identified as sensorially relevant from supplier odour-impact data, published odour thresholds or GC-olfactometry (e.g., potent trace odorants such as damascones or ionones).

The marker list and its justification shall be recorded in the audit dossier.

GC-MS conditions

- the same sample preparation (e.g., headspace SPME or solvent extraction) and instrument method for reference and comparison batches, analysed in the same sequence;
- triplicate determinations per batch, with peak areas normalised to an internal standard;
- peaks identified by mass spectrum and retention index;
- relative difference = $\frac{|\text{mean area}_{\text{comparison}} - \text{mean area}_{\text{reference}}|}{\text{mean area}_{\text{reference}}} \times 100$;
- markers below 3× the limit of quantification are excluded from the 10% rule and assessed by the blind similarity test alone.

Blind confirmation

GC-MS equivalence does not establish perceived equivalence. A triangle test (ISO 4120) performed for similarity ($\beta \leq 0.10$; proportion of distinguishers $p_d \leq 30\%$), with the number of assessors and the decision threshold taken from the ISO 4120 tables for those parameters, shall confirm that panellists cannot reliably distinguish the reference and comparison batches.

A.5 Criterion Applicability Matrix

M = mandatory; C = conditional (condition code below); N/A = not applicable. Criteria marked N/A, or conditional criteria whose condition is not met, are excluded from both scoring sums. The applicability decision and its justification shall be recorded for every criterion.

Criterion	Leave-on skin/body	Rinse-off skin/hair	Leave-on hair	Oral care	Colour cosmetics	Fragrance
1.1 Olfactory Consistency	C-a	C-a	C-a	C-a	C-a	M
1.2 Tactile Reproducibility	M	M	M	M	M	M (dose per actuation)
1.3 Application Consistency	M	M	M	M	M	M
1.4 Onset Latency	C-b	C-b	C-b	C-b	C-b	N/A
1.5 After-Sensation Duration	M	M	M	M	M	N/A (scent longevity is intended performance)
1.6 Phase Behaviour Stability	M	M	M	M	M	M
2.1 Decision Points	M	M	M	M	M	M
2.2 Dosage Ambiguity	M	M	M	M	M	M

Criterion	Leave-on skin/body	Rinse-off skin/hair	Leave-on hair	Oral care	Colour cosmetics	Fragrance
2.3 Cleanup Complexity	C-c	M	C-c	M	M	N/A
2.4 Packaging Intuitiveness	M	M	M	M	M	M
2.5 Memory & Sequencing Load	C-d	C-d	C-d	C-d	C-d	C-d
3.1–3.4 Stimulation Band Fidelity	M	M	M	M	M	M
4.1 Fault Tolerance	C-e	C-e	C-e	C-e	C-e	C-e
4.2 Ritual Duration	M	M	M	M	M	M
4.3 Completion Rate	M	M	M	M	M	M
4.4 Interrupt Resilience	C-f	C-f	C-f	C-f	C-f	C-f
5.1–5.3 Transparent Complexity	M	M	M	M	M	M

- **C-a:** the product contains fragrance or flavour, or has a perceptible odour or taste.
- **C-b:** the product has a declared or perceptible onset sensation (cooling, warming, tingling, tightening) or contains Tier 3 ingredients.
- **C-c:** the product leaves a residue intended to be removed.
- **C-d:** the product is part of a multi-step system or routine.
- **C-e:** the amount used is determined by the user.
- **C-f:** the ritual lasts 30 seconds or longer, or the product is multi-step.

Absent modalities: criteria 3.1–3.3 are assessed on the modalities the product presents, and each absent modality is recorded as not applicable. Criterion 3.4 (cross-modal alignment) requires at least two perceptible modalities; otherwise it is N/A.

Minimum applicable criteria: each domain shall have at least 2 applicable criteria and at least 50% of its criteria applicable. If a domain does not meet this minimum, it cannot be scored and the product cannot be verified until a category adaptation is published (Scope of Application).

A.6 Test Methods and Definitions

Onset latency (criterion 1.4)

Time origin: the end of the standard application. Event: the panellist's first perception of the declared sensation, recorded with a stopwatch or tap-timer. Panellists who perceive nothing within 120 seconds are recorded as non-responders and excluded from the SD. If more than 20% are non-responders, the criterion scores no higher than 3.

Residue (criterion 2.3)

Category	Method	Residue calculation
Skin	UV-fluorescent tracer, shown not to alter the sensory profile, at a fixed concentration on a marked forearm area; standard removal action (10 s rinse at 32–37°C, or the product's stated removal method)	Fluorescent area after removal ÷ area before, from UV-A images × 100
Hair	Fixed dose on standardised hair swatches; standard rinse; swatches dried under fixed conditions	Mass gain of treated swatch ÷ applied mass × 100, against an untreated control
Colour cosmetics	Colorimetry on skin before application, after application and after the stated removal method	ΔE (after removal vs. bare skin) ÷ ΔE (applied vs. bare skin) × 100

Category	Method	Residue calculation
Oral care	Panel report of residual film or taste 5 minutes after the standard rinse	Proportion of panellists reporting residue

Where no instrumental method is feasible, panel-reported residue is used, with a target of $\leq 10\%$ of panellists reporting residue (maximum-proportion rubric), and the reason is recorded.

Satisfaction (criterion 4.1)
The reference amount is the dose stated in the instructions. Each panellist uses 50%, 100% and 150% of this amount on separate days in randomised order and rates overall satisfaction from 0 to 10. Ratios use panel means. This criterion measures usability tolerance to dosing error, not functional efficacy at a reduced dose.

Comprehension (criterion 5.3)
Readability is the Flesch–Kincaid Grade Level of the on-pack and leaflet text. For function-block comprehension, panellists read the product communication and state in their own words the purpose of each functional block; both assessors code each answer as correct or incorrect. Target: $\geq 80\%$ of panellists correctly explain at least 80% of the blocks (minimum-proportion rubric).

High-risk sensory triggers (criterion 5.2)
A high-risk sensory trigger is an ingredient or product property that: (a) is a Tier 3 sensate at a perceptible level (Appendix J); (b) is a physical exfoliant; (c) produced an NSI rating of 3 or 4 in more than 10% of panellists; or (d) falls within Appendix D, D.3.



APPENDIX B: GUIDELINES FOR NEURO-INCLUSIVE USER TESTING

Ethical recruitment practices, compensation guidelines, creating safe testing environments, example demographic surveys, and methods for stratifying by sensory profile (Seeker/Avoider) without requiring a diagnosis.

B.1 Participant Groups

Each participant is assigned to exactly one group, in the order ND → S → NT. Self-identification is accepted; proof of diagnosis is not required (Article X, 10.6).

Group	Definition	Panel proportion
ND — Qualifying neurodivergent	Diagnosed or self-identified ADHD, autism, or another neurodevelopmental condition (e.g., dyspraxia/DCD, Tourette syndrome, specific learning difficulties). Self-identified participants must also show the screening pattern below.	≥45%
ADHD subgroup (within ND)	Diagnosed or self-identified ADHD. A participant with ADHD and another condition counts once in ND and is included in the subgroup.	≥50% of the total panel for ADHD Friendly™ verification
S — Sensory difference	Does not meet ND, but has sensory-processing differences affecting self-care: Sensory Processing Disorder, sensory sensitivity associated with anxiety or depression, or occupational therapist referral for sensory integration challenges. Must show the screening pattern below.	≤15%; ND + S ≥60%
NT — Neurotypical comparison	Meets neither the ND nor the S criteria.	≥20%

Screening pattern (self-identified ND, and S): at least two B.2 universal sensory domains with a preference (P) item rated 1 or 5 or a sensitivity (S) item rated 5, or a B.3 executive-function mean ≥3.5. These cut-offs are provisional (Article VI, 6.6).

Exclusion:

- Inability to give informed consent, with or without reasonable adjustments (e.g., easy-read consent materials)
- Current participation in >3 other panels (sensory fatigue)

Note: Difficulty describing sensory or interoceptive states (e.g., alexithymia) is not an exclusion criterion. Non-verbal response formats (visual analogue scales, pictorial scales and forced-choice comparisons) shall be offered to all panellists.

B.2 Sensory Processing Profile Assessment

Each item has a type with its own anchors:

- **P — Preference** (avoid ↔ seek): 1 = strongly avoid, 3 = neutral, 5 = strongly seek
- **S — Sensitivity:** 1 = not at all sensitive, 3 = moderately sensitive, 5 = extremely sensitive
- **C — Continuum:** a descriptive preference between two options, with anchors given in the item. C items are used for band matching, not for profile assignment (B.4).

Universal Sensory Domains

Tactile

#	Item	Type	Rating (1-5)
1	Texture: Light (gels/mists) = 1 ↔ Heavy (creams/balms) = 5	C	—
2	Sensitivity to residue (“sticky,” “tacky,” “filmy”)	S	—

#	Item	Type	Rating (1-5)
3	Sensitivity to temperature variations in products	S	—
4	Granular, scrubbing or exfoliating textures	P	—
5	Sensitivity to application method (fingers, tools, pads)	S	—

Olfactory

#	Item	Type	Rating (1-5)
1	Sensitivity to triggering scents (list any triggering scent categories)	S	—
2	Scent: Simple = 1 ↔ Complex = 5	C	—
3	Sensitivity to scent persistence	S	—
4	Scented products: 1 = strongly prefer fragrance-free, 5 = strongly prefer scented	P	—

Visual

#	Item	Type	Rating (1-5)
1	Appearance: Clear/translucent = 1 ↔ Opaque/coloured = 5	C	—
2	Sensitivity to visual cues (e.g., colour changes, separation)	S	—
3	Packaging transparency: Not important = 1 ↔ Essential = 5	C	—

Auditory (Packaging-Related)

#	Item	Type	Rating (1-5)
1	Sensitivity to packaging sounds (clicks, snaps, crinkles)	S	—
2	Audible feedback: 1 = strongly prefer silent, 5 = strongly prefer audible	P	—

Product-Specific Domains

Hair Care Addendum:

#	Item	Type	Rating (1-5)
1	Sensitivity to scalp stimulation during application	S	—
2	Sensitivity to the weight of product in hair	S	—
3	Sensitivity to incomplete rinsing	S	—

Skin Care Addendum:

#	Item	Type	Rating (1-5)
1	Sensitivity to tingling/“active” sensations	S	—
2	Layering: Single product = 1 ↔ Multiple layers = 5	C	—
3	Sensitivity to drying time	S	—

Colour Cosmetics Addendum:

#	Item	Type	Rating (1-5)
1	Sensitivity to brush/application tool texture	S	—
2	Application style: Forgiving = 1 ↔ Precise = 5	C	—
3	Sensitivity to the removal process	S	—

B.3 Executive Function Impact Assessment

Rate frequency (1=Never, 5=Always):

#	Item	Rating (1-5)
1	“I abandon self-care rituals when overwhelmed”	—
2	“I avoid products with multiple steps or decisions”	—
3	“I use incorrect amounts because measurement is unclear”	—
4	“I forget products exist if not in direct line of sight”	—
5	“I struggle with sequencing multi-product routines”	—
6	“I dislike products requiring precise timing/waiting”	—

B.4 Panellist Stratification Matrix

Profile	Sensory Score	Executive Score	Use Cases
Sensory Avoider (SA)	In at least one universal domain: mean of P items ≤2, or mean of S items ≥4	Any	Testing sensitive skin, fragrance-free, gentle formats
Sensory Seeker (SS)	In at least one universal domain: mean of P items ≥4	Any	Testing active treatments, textured products, scented lines
High Executive Load (HEL)	Any	≥4 average	Testing multi-step systems, packaging, routine integration
Low Sensory Regulation (LSR)	P items rated 1 or 5, or S items rated 5, in at least two universal domains	Any	Calibration testing, threshold determination
Mixed Profile (MP)	Meets none of the SA, SS or LSR definitions	Below the HEL threshold	General usability, broad appeal assessment

Panel Composition Requirements (per product test):

- Minimum 15 panellists (scalable to 50 for mass market)
- Must include: 30% SA, 30% SS, 30% HEL (overlap permitted: a panellist counts toward every profile they meet; proportions are rounded as in Article IV, 4.6)
- Participant group proportions per B.1 (ND ≥45%; ND + S ≥60%; NT ≥20%; ADHD subgroup ≥50% for ADHD Friendly™ verification)
- Gender ratio within 70/30 split relevant to target market
- Age distribution: 20% aged 18–25, 50% aged 26–45, 30% aged 46 and over. This default applies to adult products. Products intended for people under 18 require an age-appropriate panel design with safeguards; products intended specifically for older adults require a panel weighted to that age group
- Geographic diversity: ≥3 different living environments (urban, suburban, rural)

B.5 Panel Routes, Calibration and Requalification

Panels may be recruited by either route. The route used shall be stated in the audit report.

Requirement	Route L — Calibrated longitudinal panel	Route P — Product-specific panel
Screening (B.2, B.3) and group assignment (B.1)	Required	Required
Calibration test with control products (texture gradient swatches, scent strips, application tools)	Required at entry	Required at recruitment
3-day sensory journal and product ritual audit	Required at entry	Not required
Ongoing calibration (re-assessment against references, fatigue monitoring)	Quarterly	Not applicable
Requalification	After 12 months without participation, or after a pause (below)	Not applicable (new recruitment per product)

Reasonable adjustments (e.g., remote participation, extra time, non-verbal response formats, breaks) shall be offered on request and do not affect eligibility.

Exclusion and pause:

1. Inconsistent responses to calibration controls (>30% variance, meaning a mean absolute deviation of more than 3 points on the 0–10 SSU scale from the control reference ratings; provisional): excluded from the study.
2. Non-completion of >2 consecutive studies (Route L): removed from the panel.
3. Evidence of panellist bias or secondary gain motivation: excluded.
4. A panellist who reports a change in their sense of smell, taste or touch (e.g., temporary loss of smell, or a new medication affecting taste) is paused. No medical details are requested. Data from affected sessions are excluded, and the panellist may rejoin after passing the calibration test.

APPENDIX C: REFERENCE STANDARDS FOR SENSORY BAND CALIBRATION

EVIDENCE STATUS NOTE: The Sensory Band taxonomy is a pragmatic design heuristic developed through iterative consensus with neurodivergent expert panels. It is presented as a stable, testable framework for achieving sensory predictability. Bands describe **perceived sensory character only**; no physiological, neurological or behavioural effect is claimed or implied. The consensus process (participants, method and outputs) will be documented in a supporting publication. Whether bands correspond to measurable physiological responses is a research question (Article VII, 7.3), not a basis for product claims. These reference parameters represent current best practice and will be updated annually with new findings. **Band-defining criteria** are the perceived character, onset and intensity in each Core Principle and the blind-panel assignment in C.5. The category tables (viscosity ranges, scent families, colours) are **illustrative formulation examples**, not requirements.

C.1 Grounding Band (Low-Intensity, Soft, Slow-Onset)

Core Principle: Provides consistent, predictable, low-intensity sensory input that users perceive as settling and comfortable.

Cross-Category Specifications:

Category	Olfactory/Taste	Tactile	Visual	Application
Skin Care	Woody, earthy, vanilla, beeswax	Creams, balms, oils (5,000-50,000 cP)	Earth tones, opaque	Slow absorption, leaves protective film
Hair Care	Sandalwood, coconut, oat	Rich creams, butters, pre-shampoo oils	Creamy, opaque	Weighted feeling, nourishing without buildup
Oral Care	Chamomile, honey, rooibos	Low-foam, viscous pastes/rinses	Cream, light brown	Coating sensation, gentle clean
Body Care	Lavender, cedar, shea butter	Whipped textures, body butters	Pastel, matte	Warming massage, lingering emollience
Fragrance	Base-note dominant (vetiver, musk, amber)	N/A	Amber bottles	Close-to-skin sillage, minimal projection

Avoid Across Categories: Citrus top notes, sharp greens, high-pitched florals, instant-dry textures, high-foam, astringency, glitter/sparkle, strong cooling (<15°C sensation).

C.2 Clarifying Band (Distinct, Fresh, Faster-Onset)

Core Principle: Provides distinct, non-overwhelming sensory input that users perceive as fresh, clean and crisp.

Cross-Category Specifications:

Category	Olfactory/Taste	Tactile	Visual	Application
Skin Care	Herbaceous, citrus, mint, tea tree	Gels, serums, micellar waters (100-5,000 cP)	Green, blue, clear	Fast absorption, matte finish
Hair Care	Rosemary, mint, citrus	Light gels, texturising sprays, clarifying rinses	Clear, translucent	Volumising, scalp-tingling, rinses clean
Oral Care	Spearmint, green apple, cucumber	High-foam, effervescent	Green, blue, clear	Refreshing, palate-cleansing
Body Care	Eucalyptus, juniper, lemongrass	Cooling gels, dry oils, spray mists	Aqua, clear	Quick-dry, fresh
Fragrance	Top/middle note dominant (citrus, herbs, light florals)	N/A	Clear glass	Moderate projection, linear evolution

Avoid Across Categories: Heavy musks, gourmand notes, oily residues, slow absorption, extreme opacity, warming sensations (>32°C), lingering sweetness.

C.3 Neutral Band (Minimal Sensory Signature, Non-Interfering)

Core Principle: Minimises sensory input to near-zero, designed for sensory avoidance or product layering.

Cross-Category Specifications:

Band-defining criterion	Requirement (all formats)
Odour/taste	Undetectable to ≥90% of panel
Overall intensity	Mean SSU ≤2 in every scored modality
After-feel	No residue or after-sensation reported by ≥90% of panel 60 seconds after application
Visual	No colour or visual cue that implies a sensory effect

Illustrative specifications for liquid formats (not requirements): <100 cP; clear and colourless; <0.005% fragrance load; no drag, grab or slip; no temperature change. Fragrance concentration alone does not establish odour neutrality; the panel result decides.

Key Differentiator: Must be tested against both neurodivergent and neurotypical panels to ensure true neutrality (neurodivergent individuals often detect subtler stimuli).

C.4 Calibration Standards Library

Status: the physical reference standards and digital reference library below are **planned resources and are not yet available**. Until they are published, assessors shall prepare in-house reference products matching the parameters below and shall record in the audit dossier each reference’s composition, batch number, preparation date, storage conditions (sealed, 20–25°C, protected from light) and measured key parameters. In-house references shall be replaced at least every 6 months, or sooner if a key parameter moves outside ±10% of its recorded value.

Planned Physical Reference Standards:

Code	Product Type	Band	Key Parameters
GRD-SK01	Face Moisturiser	Grounding	25,000 cP, sandalwood/oat scent, beige opaque
CLF-SK02	Face Serum	Clarifying	800 cP, rosemary/grapefruit, clear green
NTR-SK03	Toner	Neutral	15 cP, odourless, water-clear
GRD-HC01	Hair Mask	Grounding	Coconut/vanilla, rich cream, 40,000 cP
CLF-HC02	Scalp Treatment	Clarifying	Peppermint/tea tree, cooling gel, 1,200 cP
GRD-OC01	Toothpaste	Grounding	Chamomile/honey, low-foam paste, 20,000 cP
CLF-OC02	Mouth Rinse	Clarifying	Cucumber/spearmint, effervescent, 5 cP

Planned Digital Reference Library:

- GC-MS fragrance profiles for each band
- Rheology curves across temperature ranges
- Spectral reflectance/transmission data
- Application footage demonstrating target behaviour

C.5 Band Assignment Protocol

Step 1: Intended Band Declaration

Formulator declares target band with justification based on:

- User preference context (settling vs. fresh character)
- Intended time of use
- Complementary products in routine

Step 2: Blind Panel Categorisation

- Minimum 15 panellists, 20–25 recommended (groups per Appendix B, B.1: ND $\geq 45\%$; ND + S $\geq 60\%$; NT $\geq 20\%$)
- Presented with product + 3 band reference standards
- “Which standard does this product feel most similar to?”

Step 3: Quantitative Sensory Analysis

- Panellists rate the product and the three band references (C.4) on 10 attributes (0–10 SSU): overall intensity, cooling, warming, richness/weight, slip, residue, tackiness, odour intensity, odour freshness (fresh $\leftrightarrow$ warm) and visual opacity
- Each attribute is standardised (z-score across the four samples), and the product’s mean profile is compared with each reference profile by Euclidean distance
- The product is assigned to the band of the nearest reference. PCA may be used to visualise the profiles but does not decide the assignment

Step 4: Real-World Validation

- 3-day in-context use
- Does the product deliver its band character as perceived by panellists? (e.g., Grounding product described as soft, settling or comfortable during use)
- Alignment check: $\geq 75\%$ report intended character
- Band character is assessed as perceived sensory experience only. It shall not be communicated as a therapeutic, physiological, calming, focusing or anxiety-reducing effect (Commission Regulation (EU) No 655/2013, as applicable in the EU and GB).

Band Mismatch Resolution: 60–74% correct categorisation scores below target on criterion 3.1 (A.1) but does not require mandatory action.

If the product is mis-categorised by $>40\%$ of panellists (fewer than 60% correct), one of the following is required:

1. Reformulate to adjust dominant sensory attributes
2. Re-categorise to actual band with updated communication
3. In rare cases: create new sub-band with defined parameters

APPENDIX D: THE HONESTY ALIGNMENT & VERIFICATION PROTOCOL

D.1 Purpose & Scope

This appendix operationalises **Article VIII: The Principle of Radical Functional Honesty**. It provides the testing framework to ensure that every NICD-verified product's **communication, sensory cue, and performance align without deception or omission**.

D.2 The Honesty Verification Method Framework

Phase 1: Claim & Cue Deconstruction

Step 1.1: Promise Extraction

- List every explicit and implicit promise made by the product through:
 - Packaging text
 - Marketing claims
 - Sensory cues (colour, texture in tube/jar, scent through packaging if applicable)
 - Product name
 - Imagery
- **Output:** “Promise Map” document.

Step 1.2: Cue Intention Declaration

- For each sensory attribute, the formulator must declare its intended sensory purpose:
 - *Example:* “Pale yellow colour → visual cue for ‘gentle creaminess’ and ‘lemon note’”
 - *Example:* “Spearmint oil at 0.05% → mild cool sensation (≤2/10 intensity) as a light freshness cue, not intense freshness”

Phase 2: Dual-Panel Verification

Panel H (Honesty Panel): participants screened per Appendix B

- **Composition:** 15–20 participants from groups ND or S (Appendix B, B.1).
- **Method:** Given **only the final product and its packaging**. No additional instructions.
- **Task:** Use product for 3–7 days. Complete daily log answering:
 - “What did you expect based on the packaging?”
 - “What did you actually experience?”
 - “Did today’s use feel as you expected? (yes/no)”
 - “Was there any point where the product surprised you in a negative way?” If yes: describe it, rate how much it bothered you (1 = not at all, 5 = very much), and say whether it made you stop or change how you used the product.
 - “Rate the alignment between promise and experience: 1 (betrayed) to 5 (perfectly aligned).”
- **Final-day cue rating:** for each declared cue (Step 1.2), rate the experience as “as promised”, “moderately different” or “deceptively different”.
- **Success Metric:** ≥80% of panellists must rate alignment at 4 or 5 on their final day (required in addition to the HGS threshold). Panellists completing fewer than 3 days are excluded from Panel H analyses.

Panel B (Blind Panel): Ground Truth Establishment

- **Composition:** 15-20 individuals (mixed neurotypes), **completely naïve** to the product and brand.

- **Method:** Given the **product in plain, unmarked container**. No packaging, no claims.
- **Task:** Use product. Then answer:
 - “What is this product’s main purpose, in your own words?”
 - “What sensory band does it belong to? (Grounding/Clarifying/Neutral)”
 - “What is its dominant sensation (e.g., cooling, warming, creamy, light)?”
 - “Who do you think this is for?”
- **Output:** “Blind Perception Profile.”

Panel independence: Panel B shall not include anyone who has seen the product’s packaging or taken part in any other panel for the product. Panel H may include members of the Domain or NSI panels. The panellist is the unit of analysis; daily “as expected” answers are pooled as panellist-days (Appendix K, K.3.4).

Phase 3: Alignment Analysis & “Honesty Gap” Scoring

The **Honesty Gap Score (HGS)** is calculated as follows. Free-text responses are coded independently by both assessors against the Promise Map, using a codebook that lists accepted synonyms for each declared purpose; coder agreement (κ) is reported, and disagreements are resolved by documented consensus.

Component	Aggregation rule	Points
Claim-to-Blind Alignment (CBA)	Two proportions from Panel B: purpose match (responses whose stated purpose matches the declared purpose) and band match (responses naming the declared band). Missing responses are excluded from the denominator; if more than 20% are missing, Panel B is repeated.	Full: both $\geq 75\%$ = 0 Partial: both $\geq 50\%$, not full = 1 Misalignment: either $< 50\%$ = 3
Cue-to-Experience Alignment (CEA)	For each declared cue, Panel H final-day ratings. Cue score: 0 if $\geq 75\%$ rate “as promised” and $< 10\%$ “deceptively different”; 3 if $\geq 25\%$ rate “deceptively different”; otherwise 1 . Missing final-day ratings are excluded from that cue’s denominator; if more than 20% are missing for any cue, Panel H is repeated. CEA = mean of cue scores (each cue weighted equally), rounded to one decimal place.	Per cue: 0, 1 or 3 CEA = mean (0–3)
Omission Penalty (OP)	Number of qualifying omissions (D.2.1) $\times$ 5.	5 points per omission

D.2.1 Omission Rules

- **Unit:** one omission is one distinct negative experience category — a single sensory or usage effect (e.g., stinging on application, staining of fabric, softening in warm conditions). Assessors code free-text reports into categories.
- **Significant:** a report counts if the panellist rated it ≥ 3 on the 1–5 bother scale, or stopped or changed their use because of it.
- **Threshold:** a category qualifies if significant reports come from $> 20\%$ of Panel H. Each panellist is counted once per category, however many times they report it.
- **Not warned:** the effect is not stated on the pack, in the instructions or in the Honesty Fact Sheet.
- **Overlap:** two categories with the same cause, which a single warning would cover, count as one omission.
- **Ordinary negative experiences** that do not meet these criteria are reported descriptively and do not add to OP.

All percentage thresholds in Appendix D are applied to unrounded values. “More than 20%” excludes exactly 20%.

A worked HGS calculation is given in Appendix L, L.2.

HGS Formula: $HGS = CBA + CEA + OP$

Verification Threshold:

HGS Score	Result
≤ 2	NICD Honesty Verification (excellent alignment)

HGS Score	Result
> 2 and < 6	Requires reformulation or recommunication
≥ 6	Fails NICD verification

Honesty Verification requires **both** HGS ≤2 **and** ≥80% of Panel H rating alignment 4 or 5. If either condition is not met, the product fails Honesty Verification.

Phase 4: Transparency Documentation

For verified products, the following must be publicly available:

1. The Honesty Fact Sheet: A simple document showing:

- **Our Promise:** [Core claim]
- **Our Sensory Design:** [Band + key sensations]
- **What We Don't Promise:** [Explicit limitation statement]
- **Who Should Be Cautious:** [Clear allergy/avoidance warnings]

2. The “Why We Chose This” Statement: For any potentially controversial ingredient (e.g., a synthetic preservative, a known allergen), a brief, honest rationale accessible via QR code:

- *Example:* “We include phenoxyethanol at 0.5% as our preservative. After testing 12 alternatives, this was the only one that prevented microbial growth without altering the sensory profile our neurodivergent panellists require.”

D.3 Special Case: Disclosure of Known Irritants and Allergens

For products containing **known high-prevalence irritants or allergens**, **passive honesty is insufficient**. For this clause, these are: (a) fragrance allergens requiring individual labelling under Regulation (EC) No 1223/2009 or the GB equivalent; (b) substances with a harmonised or notified CLP classification for skin sensitisation (Skin Sens. 1, 1A or 1B) or skin irritation (Skin Irrit. 2); (c) propolis, exfoliating acids at pH ≤4, and essential oils; and (d) other ingredients identified by the safety assessor. These disclosures are in addition to, and do not replace, legal labelling obligations:

1. Their presence shall be stated **prominently on pack**, in addition to the INCI list, and in the Honesty Fact Sheet.
2. Their characteristic sensory signatures (e.g., propolis odour, acid tingle) shall **not be masked** by fragrance, numbing agents or anti-sensory agents **so as to conceal the ingredient’s presence**.
Reducing discomfort with soothing (Tier 1–2) ingredients is permitted where the ingredient remains clearly declared.
3. Sensory effects shall **not be deliberately added or intensified** to act as a warning.

Labelling, not sensation, is the warning mechanism.

D.4 Annual Honesty Re-Audit

Because ingredients and manufacturing can drift, NICD verification requires **annual re-audit** of the Honesty Gap Score using the same protocol. Drift beyond thresholds results in suspension under Article VI, 6.7.

D.5 Integration with Other Appendices

Appendix	Integration Point
Appendix A (Assessment Matrix)	Domain 5 “Transparent Complexity” draws its data from the Honesty Audit.
Appendix B (Panel Screening)	Panel H (ND and S groups) should include High Executive Load (HEL) and Sensory Avoider (SA) profiles, as they are most sensitive to promise-experience gaps.
Appendix C (Sensory Bands)	The Blind Panel (Panel B) results become the empirical calibration for whether a product truly belongs to its claimed band.

APPENDIX E: ATTRIBUTION AND AUDIT REPORTING FORMAT

This appendix sets out the attribution format for publishing the results of an NICD audit of a specific product. It does not apply to commentary, critique, teaching or citation of the Standard itself (Section 1.2).

E.1 Required Attribution Statement

Any public communication, blog post, video, social media post, or report that shares the results or scores of an NICD audit of a specific product should include the following text in a clearly visible position:

"This assessment was conducted using the NICD Standard V5.0 and The ADHD Algorithm™ methodology, authored and issued by COSMETONOESIS. The standard provides the technical framework for evaluating neuro-inclusive design. For more information on the standard or verification, visit www.cosmetonoesis.com."

Self-assessed results shall additionally state "self-assessed" (Article XII).

Placement:

- For written reports: Executive summary, methodology section, or footer
- For videos: In the description box and spoken/displayed within the first 60 seconds
- For social media: In the caption or as an overlay (platform character limits permitting)
- For audio/podcasts: Verbally stated at the beginning of the segment discussing results

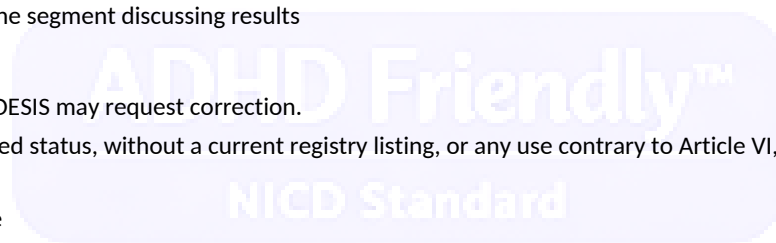
E.2 Misuse of the Mark and Verification Claims

Where published audit results omit attribution, COSMETONOESIS may request correction.

Use of the ADHD Friendly™ mark, or any claim of NICD Verified status, without a current registry listing, or any use contrary to Article VI, 6.3, is misuse of the mark. Consequences may include:

- Revocation of verification status for the product
- Removal from the verification registry, with a public note
- Legal action for unauthorised use of the mark, including for passing off or, where registered, trade mark infringement

Decisions under E.2 may be appealed under Article X, 10.7.



APPENDIX F: NEURO-SENSORY IRRITATION INDEX (NSI) & NEUROSENSORY INGREDIENT INTEGRATION

F.1 Neuro-Sensory Irritation Index (NSI)

The **Neuro-Sensory Irritation Index (NSI)** evaluates the potential for sensory overstimulation during product use. This parameter complements dermatological irritation assessments by addressing **sensory discomfort in the absence of visible skin irritation**. It is a user-reported comfort measure and does not assess dermal irritation.

F.1.1 Assessment Domains

NSI evaluates five sensory domains:

Domain	Description
1. Olfactory intensity spike	Sudden or overwhelming scent onset
2. Abrupt tactile stimulation	Unexpected texture or application sensation
3. Thermal or chemical tingling response	Cooling, warming, or tingling sensations
4. Persistence of sensory after-effects	Lingering sensations after use
5. Cross-modal sensory conflict	Contradictory cues across senses (e.g. visual expectation vs tactile reality)

F.1.2 Scoring Scale

Each domain is scored on a scale from **0–4**:

Score	Description
0	No perceptible stimulation
1	Very mild sensory presence
2	Noticeable but comfortable stimulation
3	Strong stimulation approaching discomfort
4	Sensory overload or avoidance response

F.1.3 Total NSI Score Range & Interpretation

Total NSI Score	Classification
0 – 5	Comfortable
6 – 10	Acceptable stimulation
11 – 15	Elevated risk of sensory discomfort
16 – 20	Unacceptable sensory load

The general classification describes the sensory load of any product. Acceptance is decided by the band-specific maxima in F.1.4, all of which fall within the “comfortable” or “acceptable stimulation” classes.

F.1.4 Band-Specific Thresholds

Product Band	Maximum NSI
Neutral	≤ 5
Grounding	≤ 8
Clarifying	≤ 10

F.1.5 Discomfort Rate

The **discomfort rate** is the proportion of panellists who rate any domain 3 or 4 at any time point. It separates discomfort from comfortable stimulation, which the total NSI also counts. Acceptance requires a discomfort rate ≤20% (provisional), in addition to the band maximum.

F.2 Neurosensory Ingredient Integration

F.2.1 Mandatory Classification

Every ingredient in the formulation shall be screened and assigned a Neurosensory Tier according to **Appendix J** (Tier 0 where no contribution is observed), or recorded as “Unresolved” where the evidence is insufficient.

F.2.2 Assessment Validity Requirement

NSI evaluation shall not be considered valid unless Neurosensory Tier classification has been completed in accordance with Appendix J.

F.2.3 Interpretation Framework

Neurosensory Tier distribution within a formulation shall be considered when interpreting NSI outcomes, including:

- potential reduction of neuro-sensory irritation
- potential contribution to sensory overstimulation

Particular attention shall be given to formulations containing **Tier 3 and Tier 4 ingredients** in cases of elevated NSI scores.

F.2.4 Non-Quantitative Role

Neurosensory Tier classification supports structured interpretation of NSI results and does not alter numerical scoring.

F.2.5 Documentation Requirement

Neurosensory Tier classification and its role in NSI interpretation shall be explicitly documented within the assessment report.

F.3 NSI Assessment Protocol

Step 1: Panel Selection

- Minimum **15 panellists** (groups per Appendix B, B.1: ND ≥45%; ND + S ≥60%; NT ≥20%)
- Inclusion of both:
 - Sensory Seeker (SS) profiles
 - Sensory Avoider (SA) profiles

Step 2: Controlled Application

- Standardised application amount and method

- Controlled environment:
 - Temperature: **22 ± 2°C**
 - Relative Humidity: **40–60%**

Step 3: Domain Scoring

Panellists shall rate each of the five domains:

- Immediately after application (rinse-off products: immediately after rinsing; later time points are measured from the end of rinsing)
- Re-assessment at:
 - 1 minute
 - 5 minutes
 - 15 minutes (mandatory for Domain 4: persistence)

Step 4: Aggregate Calculation

- For each panellist, the domain score is the **highest rating across the assessment time points** for Domains 1, 2, 3 and 5, and the **15-minute rating** for Domain 4 (persistence).
- Domain scores shall be averaged across panellists
- Total NSI = sum of domain means (0–20)
- Final value rounded to nearest whole number; the rounded value is used for the band maxima (F.1.4) and the NTS (Appendix K)
- **95% confidence intervals shall be reported**; acceptance decisions use the rounded point value, and confidence intervals are descriptive

Rationale: the peak rating is used for Domains 1, 2, 3 and 5 because a brief spike in stimulation can trigger discomfort or avoidance even when the average is low. Domain 4 measures persistence, so it uses the 15-minute rating.

Missing time points: for Domains 1, 2, 3 and 5, the peak is taken over the time points recorded, provided the immediate rating is present. A panellist without a 15-minute rating is excluded from Domain 4. If more than 20% of panellists lack usable data for any domain, the test is repeated.

Step 5: Neurosensory Integration Analysis

For each NSI domain scoring above 1, the assessor shall identify the ingredients (by Neurosensory Tier) that plausibly drive the response. The assessment shall include:

- Identification of the Tier 3 and Tier 4 ingredients relevant to each elevated domain
- The basis for each attribution (supplier data, literature, panel descriptions)
- Documentation of the interpretation supporting the NSI outcome

Statistical correlation between tier distribution and NSI scores is meaningful only across several formulations or variants. It is not required for the assessment of a single product.

APPENDIX G: STANDARDISED SENSORY UNITS (SSU)

Standardised Sensory Units (SSU) provide a semi-quantitative system for recording perceived sensory intensity. SSU allows comparison of sensory characteristics across formulations and batches.

G.1 SSU Scoring Scale

Each sensory modality is scored by panellists using a **0–10 scale**:

Score Range	Descriptor
0	No perceptible stimulus
1 – 2	Barely detectable
3 – 4	Mild stimulation
5 – 6	Moderate stimulation
7 – 8	Strong stimulation
9 – 10	Dominant sensory experience

SSU is a panel-derived rating of **perceived intensity**. Equal numerical intervals are not assumed to represent equal perceived changes, and SSU values are comparable within a modality, not between modalities. For each modality the question is “How intense is [attribute] now?”, with 0 = none and 10 = the strongest the panellist can imagine for that attribute. At each session, panellists are calibrated against a blank (0) and an in-house reference sample with a recorded value (Appendix C, C.4).

G.2 Calculation

The final SSU value is calculated as the **mean score across panel participants** for a given sensory modality.

Formula:

$$SSU = (\sum_{i=1...n} \text{Panellist Score}_i) \div n$$

Where:

- n = number of panellists (minimum 15, per Appendix B)
- Panellist Score_i = individual 0–10 rating

G.3 Equivalence Margins

Comparison	Equivalence Margin
Batch comparison (reference vs. comparison batch; Appendix A, A.4)	±1.0 SSU
Shelf life (time zero vs. each real-time sampling point)	±1.5 SSU
Accelerated ageing (screening only)	±1.5 SSU

These margins are provisional (Article VI, 6.6). Equivalence testing rules:

- Paired at panellist level: each panellist rates both samples, coded and presented blind in randomised order. Only complete pairs are analysed, with at least 12 valid pairs.
- Each scored modality is tested separately against the same margin, and equivalence must be shown for every modality. No multiplicity adjustment is needed because every modality must pass.
- Where both sample means are below 1.0 SSU, equivalence may instead be shown by both 90% upper confidence limits lying below 2.0 SSU.

Consequence: Products not demonstrating equivalence within these margins fail sensory predictability requirements (Domain 1).

G.3.1 Stability Evidence

- **Real-time:** storage at 25 ± 2°C; sampling at 0, 3, 6 and 12 months, then every 12 months, and always at the end of the declared shelf life. For a shelf life under 12 months, sampling is at 0, 3 and 6 months as applicable and at the end of the shelf life.
- **Accelerated (screening):** 40 ± 2°C for at least 3 months, or conditions justified for the format (e.g., a lower temperature for anhydrous products that melt near 40°C).
- **At verification:** accelerated data plus at least 3 months of real-time data. The registry shows “real-time stability in progress”, with the months covered, until real-time data cover the declared shelf life.
- **After verification:** real-time results falling due are submitted at each annual re-audit. A failed real-time sampling point shall be reported to COSMETONOESIS within 30 days and is treated as a failed re-audit, with immediate suspension (Article VI, 6.7).

G.4 Application Protocol

Step 1: Modality Selection

Select relevant sensory modalities for the product type:

Product Category	Typical Modalities to Score
Skin care	Cooling, tingling, tackiness, residue feel
Hair care	Scalp sensation, wet slip, dry feel, weight
Oral care	Foaming, cooling, astringency, after-taste
Fragrance	Intensity, note clarity
Colour cosmetics	Drag, cushion, finish

Temporal attributes (absorption speed, drying time, fragrance longevity) and projection are recorded in seconds, minutes or distance, not in SSU.

Step 2: Panel Administration

- Standardised application amount and method
- Controlled environment (22±2°C, 40-60% RH)
- Panellists score immediately after application
- For persistence metrics: re-score at defined intervals (e.g., 1 min, 5 min, 15 min)
- For sensory uniformity (Appendix K, K.3.2): each panellist rates the same batch in ≥3 sessions on separate days

Step 3: Statistical Reporting

- Report mean SSU ± standard deviation
- Report 95% confidence interval
- Batch and shelf-life stability shall be demonstrated by **equivalence testing**: two one-sided tests (TOST, α = 0.05) against the G.3 margins, using a paired design where the same panellists rate both samples. Equivalence is shown when the 90% confidence interval of the mean difference lies entirely within the margin.

- A non-significant difference test (e.g., $p \geq 0.05$ in a t-test) does not demonstrate stability.

G.5 Integration with Other Appendices

Appendix	Integration Point
Appendix A	SSU ratings are used for batch and shelf-life equivalence (G.3) and intensity calibration (criterion 3.3). They are not converted directly into other Appendix A scores
Appendix B (Panels)	SSU panels use same recruitment and stratification requirements
Appendix C (Sensory Bands)	Band reference standards (Appendix C.4) provide the SSU anchors for key modalities
Appendix F (NSI)	NSI Domain 3 (Thermal/chemical tingling) may be quantified using SSU
Appendix K (NTS)	Repeated-session SSU ratings provide the Sensory Uniformity component



APPENDIX H: PANEL COMPOSITION & TESTING PROTOCOL

To ensure reproducible NICD assessments, panels must follow standardised composition guidelines.

H.1 Panel Size

Minimum	Recommended	For Mass Market Verification
15 participants	20–25 participants	30–50 participants

H.2 Neurodivergent Representation

Minimum requirements (groups as defined in Appendix B, B.1; each participant counted once):

Group	Required proportion	Example: 20-person panel for ADHD Friendly™ verification
ND — qualifying neurodivergent	≥45%	12 (60%)
ADHD subgroup (within ND)	≥50% of the total panel for ADHD Friendly™ verification; otherwise no minimum	10 (50%)
S — sensory difference	≤15%	2 (10%)
ND + S	≥60%	14 (70%)
NT — neurotypical comparison	≥20%	6 (30%)

H.3 Control Group

The NT requirement is set in H.2. **Control group role:**

- Establish baseline responses
- Compare ND, S and NT responses descriptively. Differences between groups do not by themselves show that an experience is unique to a neurotype
- Confirm the product remains usable for the general market (if intended)

H.4 Testing Conditions

Products should be evaluated under the following conditions:

Condition	Requirement
Repeated uses	Minimum 3–7 days of consecutive use
Real-world environments	In-home routine, not lab-only
Interruption scenarios (where applicable)	Mid-ritual interruption with recovery tracking (per Domain 4.4)
Time-of-day variation	Morning, evening, and as-intended use context
Temperature variation	Where relevant, samples stored at 10°C, 25°C and 40°C (≥24 h) and equilibrated to 22 ± 2°C before application. A condition unsafe or inappropriate for the product is excluded, with the reason recorded

H.5 Evaluation Metrics

Panel data must include:

Metric	Source Appendix
SSU sensory scoring	Appendix G
NSI sensory-load scoring	Appendix F
Completion success rate	Domain 4.3
Cognitive friction feedback	Domain 2 (Dosage Ambiguity, Decision Points, Memory Load)
Honesty alignment rating	Appendix D (Panel H)
Sensory band categorisation	Appendix C (Blind Panel)

H.6 Panellist Management

H.6.1 Recruitment Sources

- Neurodivergent community organisations
- Occupational therapy clinics
- University disability services
- Online neurodivergent communities (with ethical compensation)

H.6.2 Compensation Guidelines

- Hourly rate: minimum local living wage
- Per-study stipend in local currency, set by duration and in line with local ethical-research guidance
- Reimbursement for travel, childcare, or other participation barriers
- No contingent compensation based on outcomes

H.6.3 Safe Testing Environment Requirements

- Low-sensory waiting area (dim lighting, no fragrance, quiet)
- Option for virtual participation where applicable
- Break accommodations during longer sessions
- No pressure to complete if sensory overload occurs
- Clear exit protocol with full compensation

H.6.4 Example Demographic Survey Fields

- Age range
- Gender identity
- Neurotype (self-identified or diagnosed; multiple selection allowed)
- Sensory profile (per Appendix B.2)
- Executive function impact (per Appendix B.3)



- Living environment (urban/suburban/rural)
- Current product routine length and complexity

H.7 Data Quality & Exclusion Criteria

Valid data requires:

- Completion of ≥80% of scheduled uses (for multi-day protocols)
- Completion of the questionnaires for the sessions attended
- No straight-line responding, defined as identical ratings on every item of three or more consecutive questionnaires, confirmed by the assessor against the panellist’s free-text responses

Withdrawal: a panellist may stop at any time, including because of sensory overload, without penalty and with full compensation. Withdrawal is not misconduct. Data collected before withdrawal are used only with the panellist’s consent, and missing sessions are handled as missing data.

Missing data: analyses use the panellists and sessions with valid data, subject to each protocol’s minimum counts (e.g., 12 valid pairs for TOST, Appendix G, G.3; at least 3 completed days for Panel H, Appendix D). If a minimum is not met, the test is repeated.

Exclusion after recruitment:

- Inconsistent responses to calibration controls (>30% variance per Appendix B.5)
- Non-completion of >2 consecutive studies (for ongoing panels)
- Reported change in sense of smell, taste or touch: paused per Appendix B.5 (no medical details requested)

H.8 Integration with Other Appendices

Appendix	Integration Point
Appendix B	Detailed screening, stratification, and calibration
Appendix D	Panel H (Honesty Panel): ND and S groups, including HEL and SA profiles
Appendix E	Attribution for published panel results
Appendix G	SSU scoring protocol
Appendix F	NSI scoring protocol

APPENDIX I: RELATIONSHIP BETWEEN TOXICOLOGICAL SAFETY AND NICD

Cosmetic product safety assessment evaluates whether a cosmetic product is safe for human health under normal and reasonably foreseeable conditions of use, taking account of its composition, exposure, toxicological profile and relevant safety data. It assesses applicable hazards and risks, including:

- irritation
- sensitisation
- systemic toxicity
- phototoxicity

It does not guarantee that adverse reactions will never occur.

However, such assessments do not evaluate **sensory comfort** or **cognitive usability**.

I.1 What NICD Adds

NICD introduces an additional evaluation dimension addressing:

Dimension	Description
Sensory predictability	Consistency of sensory experience across uses and batches
Stimulation intensity	Alignment with target sensory band (Grounding/Clarifying/Neutral)
Cognitive accessibility	Reduction of decision points, dosage ambiguity, memory load
Routine stability	Fault tolerance, interrupt resilience, completion rates

I.2 Relationship Statement

NICD **does not replace** regulatory safety evaluation. The two assessments answer **different questions**:

Question	Answered by	Methods
Is the product safe for human health under normal and reasonably foreseeable conditions of use?	Cosmetic product safety assessment (Regulation (EC) No 1223/2009, Article 10; Schedule 34 to SI 2019/696 for GB)	Toxicological evaluation of ingredients, exposure assessment, dermatological testing where required
Is the product comfortable, predictable and usable across sensory and cognitive profiles?	NICD	Panel testing with neurodivergent participants, NSI, SSU, cognitive load and honesty analysis

No NICD measure substitutes for, or is equivalent to, any element of the safety assessment. NSI does not measure dermal irritation, and NICD panel testing is not patch testing.

I.3 Core Analogy

Dermatological tolerability evaluates whether the skin can tolerate a cosmetic product. Within NICD, neuro-tolerability is an operational term for the reported sensory comfort and cognitive usability of a cosmetic product across the assessed participant profiles. It is not a clinical diagnosis or a measure of neurological safety.

I.4 Overlap & Independence

Assessment Type	Required Separately?	Relationship
Regulatory safety (toxicology, dermatology)	Yes – NICD does not certify safety	NICD assumes product is already legally safe
NICD neuro-usability verification	Yes – separate panel and protocol	Builds on safe product; adds neuro-inclusive layer

Verification prerequisite: NICD verification **only applies** to products that have passed all applicable regulatory safety assessments for their market.

I.5 Documentation Requirement

Any NICD audit report must include a **declaration of regulatory safety status** for each named jurisdiction, selecting one of **Passed**, **Not passed** or **Not evaluated**, and stating eligibility: *“Regulatory safety status for [jurisdiction]: [Passed / Not passed / Not evaluated]. Eligible for NICD verification: [Yes / No]. NICD verification assesses neuro-usability only and does not constitute a safety certification.”*
Only “Passed” makes a product eligible for verification (I.4). A product that is not eligible may be described in an assessment report but shall not be represented as verified.

I.6 Integration with Other Appendices

Appendix	Integration Point
Appendix F (NSI)	Complements dermatological irritation assessment with a user-reported sensory comfort measure
Appendix H (Panels)	Neurodivergent panel composition ensures neuro-tolerability data
Appendix A (Domain 5)	Domain 5 addresses sensory-trigger disclosure and communication, not toxicology

APPENDIX J: NEUROSENSORY INGREDIENT CLASSIFICATION & TIERING SYSTEM (NITS)

J.1 Purpose

The **Neurosensory Ingredient Classification & Tiering System (NITS)** establishes a structured methodology for the identification and classification of ingredients according to their **contribution to perceived sensory experience**.

This Appendix supports the evaluation of:

- **NSI (Neuro-Sensory Irritation Index)**
- **Neuro-Tolerability Score (NTS)**

NITS is an **internal assessment tool**. Tier assignments and the mechanistic data behind them shall not be used in product claims or consumer communication (Commission Regulation (EU) No 655/2013).

J.2 Scope

This system applies to:

- Screening of every ingredient in the formulation; each ingredient receives a tier, and Tier 0 assignments carry a one-line rationale
- Both leave-on and rinse-off formulations
- Finished formulations and pre-audit ingredient screening

NITS is **mandatory where NSI evaluation is performed**.

J.3 Definitions

Neurosensory Ingredient

Any cosmetic ingredient that produces or modifies a perceptible sensory effect during or after use—including cooling, warming, tingling, numbing, scent, taste and residual skin feel—or for which published or supplier data describe an effect on cutaneous sensory signalling.

Contribution Pathways

Sensory contribution shall be interpreted across four pathways:

1. **Indirect** (barrier, skin comfort, hydration)
2. **Documented sensory-signalling activity** without a directly perceptible sensation at use level
3. **Direct sensation** (cooling, warming, tingling, numbing, astringency)
4. **Olfactory and gustatory perception** with high inter-individual variability

J.4 Tier Classification

Each ingredient is assigned one **primary tier**, based on its dominant contribution at the use concentration in the finished formulation. Other pathways (J.3) are recorded as **secondary flags** (e.g., menthol: primary Tier 3, secondary olfactory flag). Tiers describe contribution pathways, not hazard, potency or adverse effect. The examples below are illustrative, not automatic assignments.

Tier 0 — Sensory-Neutral

Ingredients with no perceptible sensory contribution observed at use level under the specified test conditions. Absence of published data does not by itself establish Tier 0.

NICD Role: Baseline contribution only.

Tier 1 — Indirect Comfort Support

ADHD Friendly™

Ingredients that reduce drivers of sensory discomfort without a direct sensory effect.

Mechanisms: barrier reinforcement; non-neurogenic soothing or anti-inflammatory action; hydration stabilisation.

NICD Role: May reduce baseline sensory reactivity.

Tier 2 — Documented Sensory-Signalling Activity

Ingredients for which published or supplier data describe effects on cutaneous sensory signalling (e.g., TRPV1 antagonism, reduced CGRP or substance P release, typically in vitro), without a directly perceptible sensation at use level.

NICD Role: May modify perceived discomfort; effect at use concentration is often unconfirmed.

Tier 3 — Direct Sensates

Ingredients that produce a perceptible sensation at use level (e.g., menthol, menthyl lactate, camphor, vanillyl butyl ether, spilanthes extract, exfoliating acids).

NICD Role: Primary driver of NSI Domain 3; high contribution.

Tier 4 — High-Variability Odorants and Flavours

Fragrance compounds, essential oils and flavours whose perceived intensity and hedonic response vary strongly between individuals.

NICD Role: Primary driver of NSI Domain 1; high-variability contribution.

Note: Tier 4 ingredients require **heightened scrutiny due to variability and, for many, sensitisation potential**. Fragrance and flavour materials and essential oils are treated as high-variability by default.

Unresolved

Evidence is insufficient or conflicting. The ingredient is treated as a potential contributor when interpreting NSI, and the uncertainty is documented.

J.5 Tier Assignment Criteria

Tier classification shall be based on:

- Published scientific literature
- Supplier technical dossiers
- Regulatory and toxicological data
- Perceptible sensory behaviour observed in panel testing

Where published evidence is limited, classification shall be based on the ingredient's observed sensory behaviour at use level, and the basis shall be recorded. Where sources conflict, observed behaviour in the finished product takes precedence over published literature, which takes precedence over supplier data, and the conflict is documented.

Tier assignment is a structured qualitative assessment. It does not quantify an ingredient's contribution to NSI, establish causality or predict a finished-product score.

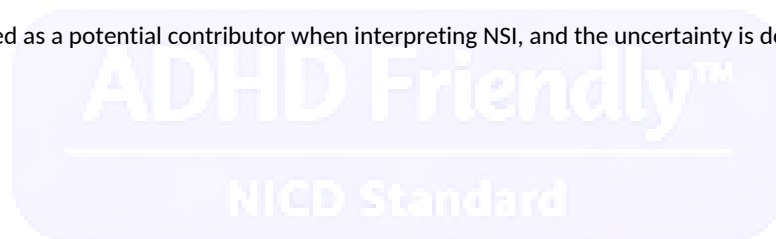
J.6 Integration into the Neuro-Sensory Irritation Index (NSI)

NITS shall be used to support NSI interpretation as follows:

- Tier distribution within the formula shall be identified
- Relative contribution shall consider:
 - concentration
 - exposure conditions
 - cumulative and synergistic effects

Guidance (non-prescriptive):

- Tier 0 → baseline (no contribution)



- Tier 1 → low contribution (may reduce discomfort)
- Tier 2 → low to moderate, uncertain contribution
- Tier 3 → high contribution
- Tier 4 → variable contribution

NSI scores are **panel-derived** and are not adjusted by the assessor. NITS supports interpretation and reformulation decisions only (F.2.4).

J.7 Risk Considerations

The presence of higher-tier ingredients does not inherently indicate improved NICD performance.

Assessors shall consider:

- Sensitisation potential
- Overstimulation risk
- Population-specific vulnerability (e.g. neurodivergent users)

J.8 Documentation Requirements

NICD reports shall include:

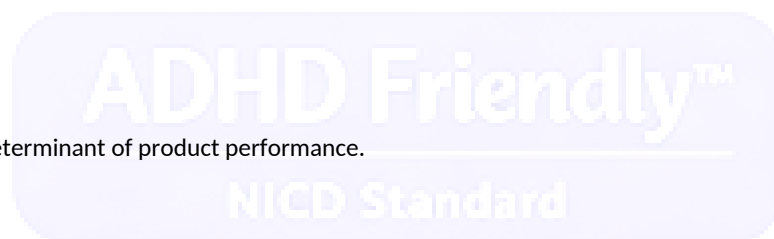
- Primary tier and secondary flags for every ingredient
- Justification for Tier ≥1 and Unresolved assignments
- Summary of tier distribution within the formulation

J.9 Limitations

NITS is a **classification and support tool**, not a standalone determinant of product performance.

Final NICD outcomes shall always consider:

- Full formulation context
- Sensory profile
- Use conditions



APPENDIX K: NEURO-TOLERABILITY FRAMEWORK

Traditional cosmetic safety frameworks evaluate toxicological and dermatological safety. Within NICD, **neuro-tolerability** is an operational term for the reported sensory comfort and cognitive usability of a cosmetic product across the assessed participant profiles (Appendix I, I.3). It is not a clinical endpoint.

K.1 Core Dimensions of Neuro-Tolerability

Neuro-tolerability focuses on three core dimensions:

Dimension	Description
Sensory Stability	The product delivers consistent sensory responses across uses and batches
Sensory Comfort	The product does not trigger sensory distress, overstimulation, or avoidance behaviour
Cognitive Usability	The product can be used without excessive mental effort, confusion, or routine disruption

Neuro-tolerability therefore represents **an additional layer of cosmetic product compatibility**, complementing existing toxicological and dermatological safety assessments.

K.2 Neuro-Tolerability Score (NTS) – Detailed Calculation

The NTS is a composite index (0–100) that quantifies a product’s neuro-inclusive tolerability and usability.

K.2.1 Components

Component	Description	Raw Score (0–25)
NSI – Neuro-Sensory Irritation Index	Panel-measured neuro-sensory irritation (Appendix F), interpreted with Neurosensory Tier classification (Appendix J); Total NSI (0–20) rescaled to 0–25	0–25
SSU Variance – Sensory Uniformity	Within-panellist variability of SSU ratings across repeated sessions (test–retest), pooled across the panel	0–25
Cognitive Load	Mental effort required to interpret instructions, apply product, and integrate into routines; raw NASA-TLX × 0.25 (K.3.3)	0–25
Sensory Predictability	Consistency and predictability of sensory experience; proportion of Panel H use-days not as expected × 25 (K.3.4)	0–25

K.2.2 NTS Formula

$$NTS = 100 - [(w_1 \cdot NSI + w_2 \cdot SSU_Variance + w_3 \cdot Cognitive_Load + w_4 \cdot Sensory_Predictability) \div (25 \cdot \sum w_i)] \times 100$$

Default equal weights: $w_1 = w_2 = w_3 = w_4 = 1$

Note: Equal weights are a provisional design choice, not evidence that the components contribute equally. Levels II and III use the default weights; non-default weights may be used for research only and must be documented.

Normalisation: each component is scored 0–25, where 0 is the most favourable outcome. Dividing by $25 \cdot \sum w_i$ normalises the weighted mean to a 0–1 scale, so NTS ranges from 100 (no neuro-tolerability burden) to 0 (maximum burden).

NTS is reported to the nearest whole number. A worked example is given in Appendix L, L.4.

K.2.3 Interpretation

NTS Score	Classification
80 – 100	Excellent neuro-tolerability
60 – 79	Moderate neuro-tolerability
40 – 59	Low neuro-tolerability
< 40	Poor neuro-tolerability – product may trigger sensory or cognitive discomfort

K.3 Component Scoring Methodology

K.3.1 NSI – Neuro-Sensory Irritation Index

1. Classify formula ingredients by Neurosensory Tier (Appendix J)
2. Determine Total NSI (0–20) by panel assessment in accordance with Appendix F
3. Convert to the NTS component: NSI component = (Total NSI ÷ 20) × 25

K.3.2 SSU Variance – Sensory Uniformity

1. Conduct sensory evaluation with a panel meeting Appendix B, B.1 (minimum 15 participants; 20–25 recommended, per Appendix H)
2. Each panellist rates the relevant modalities (tactile, olfactory, visual, auditory, or thermal) using SSU (Appendix G) in **≥3 sessions on separate days**, using the same batch
3. For each scored modality m, calculate each panellist's variance across sessions and pool across panellists: $\sigma_{w,m} = \sqrt{(\text{mean within-panellist variance})}$; μ_m = mean SSU for that modality
4. Compute the modality component and average across modalities (equal weight per modality):

$$V_m = 25 \times \sigma_{w,m} \div \max(\mu_m, 1.0), \text{ capped at 25; SSU_Variance} = \text{mean of } V_m \text{ across scored modalities}$$

Where:

- $\sigma_{w,m}$ = pooled within-panellist standard deviation across sessions for modality m
- μ_m = mean SSU for modality m across panellists and sessions

Low-intensity modalities: the denominator $\max(\mu_m, 1.0)$ prevents an unstable coefficient of variation when the mean is near zero. The formula is continuous at $\mu_m = 1.0$ (see Appendix L, L.4).

Between-panellist differences reflect the diversity of sensory profiles the panel is designed to capture. They are reported descriptively by profile (SA, SS, HEL, MP; Appendix B.4) and do not contribute to the NTS.

Subgroup reporting: all four NTS components and the NTS shall also be reported separately for the ND, S and NT groups and the ADHD subgroup. A subgroup NTS below 60 is flagged in the audit report and the registry (provisional).

K.3.3 Cognitive Load

1. Each panellist completes the NASA-TLX after the first unassisted use and on the final day of in-home use.
2. Use the **raw (unweighted) TLX**: the mean of the six subscales, each scored 0–100.
3. Take the mean of the final-day scores across panellists. First-use scores are reported descriptively.
4. Cognitive_Load = mean raw TLX × 0.25 (0 = minimal load; 25 = maximal load).

Administration: the six NASA-TLX subscales (mental demand, physical demand, temporal demand, performance, effort, frustration) in the published wording, each rated 0–100 in steps of 5; on the performance subscale, 0 = perfect and 100 = failure. If any subscale is missing, that panellist's TLX is excluded. Assistance or accessibility adjustments are recorded and do not invalidate the result.

Other instruments may be used for Level I self-assessment only. Levels II and III use the raw TLX, or an equivalent instrument on the list of accepted conversions published by COSMETONOESIS.

K.3.4 Sensory Predictability

- 1. Source: Panel H daily log (Appendix D), question “Did today’s use feel as you expected?” over 3–7 days.
- 2. p_u = panellist-days answered “no” ÷ total panellist-days answered.
- 3. Sensory_Predictability = $25 \times p_u$ (0 = fully predictable; 25 = never as expected).

Predictive modelling from formulation properties (viscosity, fragrance volatility, spreadability) may be used for design screening and Level I–II self-assessment only. Level III requires the empirical measure above.

K.4 Integration with NICD Audits

Requirement	Specification
Mandatory status	NTS is mandatory for Levels II and III. It is an additional NICD assessment and is not a substitute for regulatory safety assessment, which is a prerequisite (Appendix I, I.4)
Reporting	Must be reported numerically in audit reports, with subgroup results (K.3.2)
Verification	NTS ≥80 is one of the conditions in Article VI, 6.1. A high NTS cannot offset any other failed condition

K.5 Relationship to Other Appendices

Appendix	Integration Point
Appendix A (Domains)	NTS components map to Domain 1 (Sensory Predictability) and Domain 2 (Cognitive Friction)
Appendix F (NSI)	NSI component of NTS
Appendix G (SSU)	Repeated-session SSU ratings provide the Sensory Uniformity component
Appendix D (Honesty)	Sensory Predictability component uses the Panel H daily log
Appendix H (Panels)	Panel composition requirements for SSU Variance and Cognitive Load

APPENDIX L: WORKED EXAMPLES

Illustrative calculations for a hypothetical fragrance-free leave-on face balm declared in the Grounding band. All figures are invented for illustration. Panel sizes differ by protocol: NSI and Domain 1 panel n = 20, Panel B n = 20, Panel H n = 16.

L.1 Domain Score (Domain 1)

Criterion	Result	Rubric (A.1)	Score
1.1 Olfactory Consistency	Fragrance-free; no perceptible odour ($\geq 90\%$ of panel detect none)	N/A (A.5, condition C-a not met)	—
1.2 Tactile Reproducibility	Hardness difference between batches 9%; recovery within 11%; 1 of 20 panellists report a texture change (5%)	Tolerance T = 15%: 9% is $\leq T$ but $> 0.5T$ (7.5%) $\rightarrow$ 4. Panel element $\leq Q/2 \rightarrow$ 5. The lower level applies.	4
1.3 Application Consistency	1 of 20 (5%) report “feels different today”	Maximum proportion Q = 10%: $\leq Q/2$	5
1.4 Onset Latency	No onset sensation declared; no Tier 3 ingredients	N/A (condition C-b not met)	—
1.5 After-Sensation Duration	Persistence 1.5 h	Tolerance T = 2 h: $\leq T$ but $> 0.5T$	4
1.6 Phase Behaviour Stability	No phase change	Absolute requirement: pass	5

Applicable criteria: 4 of 6, meeting the A.5 minimum (at least 2 criteria and at least 50% of the domain’s criteria). All weights = 1.

$$\text{Domain 1} = (4 + 5 + 4 + 5) \div (5 \times 4) \times 30 = 18 \div 20 \times 30 = \mathbf{27.0 / 30}$$

L.2 Honesty Gap Score

- CBA:** Panel B n = 20, 2 responses missing (10%, within the 20% limit), so the denominator is 18. Purpose match $15/18 = 83\%$; band match $12/18 = 67\%$. Both $\geq 50\%$ but not both $\geq 75\% \rightarrow$ partial $\rightarrow$ **CBA = 1**.
- CEA:** Panel H n = 16. Texture “soft, rich”: $13/16$ (81%) as promised, $1/16$ (6%) deceptively different $\rightarrow$ 0. Colour “ivory”: $16/16$ as promised $\rightarrow$ 0. After-feel “light film”: $9/16$ (56%) as promised, $2/16$ (12.5%) deceptively different $\rightarrow$ 1. $\text{CEA} = (0 + 0 + 1) \div 3 = 0.33 \rightarrow$ **CEA = 0.3**.
- OP:** “Softens in a warm bathroom”: significant reports from $5/16$ (31%), but stated on pack $\rightarrow$ not an omission. “Residue on pillowcase”: significant reports from $3/16$ (18.75%), which is not more than 20% $\rightarrow$ reported descriptively. **OP = 0**.

$$\text{HGS} = 1 + 0.3 + 0 = \mathbf{1.3} (\leq 2: \text{meets the verification threshold})$$

Had the softening not been stated on pack, it would be a qualifying omission: $\text{HGS} = 1 + 0.3 + 5 = 6.3$, which fails verification.

L.3 Neuro-Sensory Irritation Index

NSI domain	Time point used	Panel mean (n = 20)
1. Olfactory intensity spike	Peak	0.4
2. Abrupt tactile stimulation	Peak	1.2
3. Thermal or chemical tingling	Peak	0.3

NSI domain	Time point used	Panel mean (n = 20)
4. Persistence of after-effects	15 minutes	1.1
5. Cross-modal conflict	Peak	0.6
Total NSI		3.6 → 4

Total NSI = 4: “comfortable” (F.1.3); within the Grounding maximum of 8 (F.1.4). Discomfort rate: 2 of 20 panellists (10%) rated a domain 3 or above, within the 20% limit (F.1.5).

L.4 Neuro-Tolerability Score

Component	Input	Calculation	Score (0-25)
NSI	Total NSI = 4	$(4 \div 20) \times 25$	5.00
SSU_Variance	Tactile: $\sigma_w = 0.6, \mu = 4.0$; visual: $\sigma_w = 0.3, \mu = 2.0$	Tactile $25 \times 0.6 \div 4.0 = 3.75$; visual $25 \times 0.3 \div 2.0 = 3.75$; mean	3.75
Cognitive_Load	Mean final-day raw TLX = 22	22×0.25	5.50
Sensory_Predictability	9 of 112 panellist-days not as expected (seven-day protocol option; all 16 panellists answered on all 7 days)	$25 \times (9 \div 112)$	2.01

$$NTS = 100 - [(5.00 + 3.75 + 5.50 + 2.01) \div (25 \times 4)] \times 100 = 100 - 16.26 = 83.74 \rightarrow 84$$

NTS = 84: “excellent neuro-tolerability”; meets the ≥80 threshold.

Low-intensity check: for a Neutral toner with tactile $\mu = 0.6$ and $\sigma_w = 0.2$, $V = 25 \times 0.2 \div \max(0.6, 1.0) = 5.0$. At $\mu = 1.0$ the same σ_w gives $25 \times 0.2 \div 1.0 = 5.0$, so the component does not jump at the threshold.

L.5 Verification Decision

Every condition in Article VI, 6.1 must be met. For this example:

Condition (Article VI, 6.1)	Example result	Met?
Total score ≥80; no domain below 60%	Domain 1 = 27.0/30 (90%); Domains 2-5 not shown	Depends on Domains 2-5
NTS ≥80	84 (L.4)	Yes
HGS ≤2	1.3 (L.2)	Yes
Panel H alignment ≥80% rating 4 or 5	14 of 16 (87.5%)	Yes
NSI within band maximum	4, Grounding maximum 8 (L.3)	Yes
NSI discomfort rate ≤20%	10% (L.3)	Yes
No absolute requirement failed	1.6 pass (L.1); 5.1 and 5.2 not shown	Depends on Domain 5
Two assessors (A.2; Article X, 10.3-10.4)	Procedural requirement	To be confirmed

The product reaches Level III — NICD Verified, and may use the ADHD Friendly™ mark, only if the conditions not shown here are also met.

END OF UNIVERSAL APPENDICES (A–L)

These appendices constitute the cross-category implementation framework for Neuro-Inclusive Cosmetic Design. Products in the categories of Appendix A, A.5 are evaluated against these criteria using the applicability rules and category adjustments defined there. Categories outside A.5 require a published category adaptation before verification (Scope of Application).

