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Welcome

RoHS Hazardous Substance Exemptions - Current Status of Renewals and Changes in Scope

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Regulatory Consultants, RINA

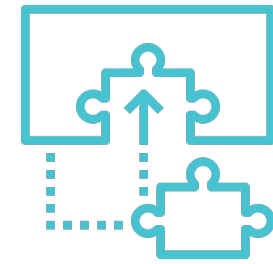
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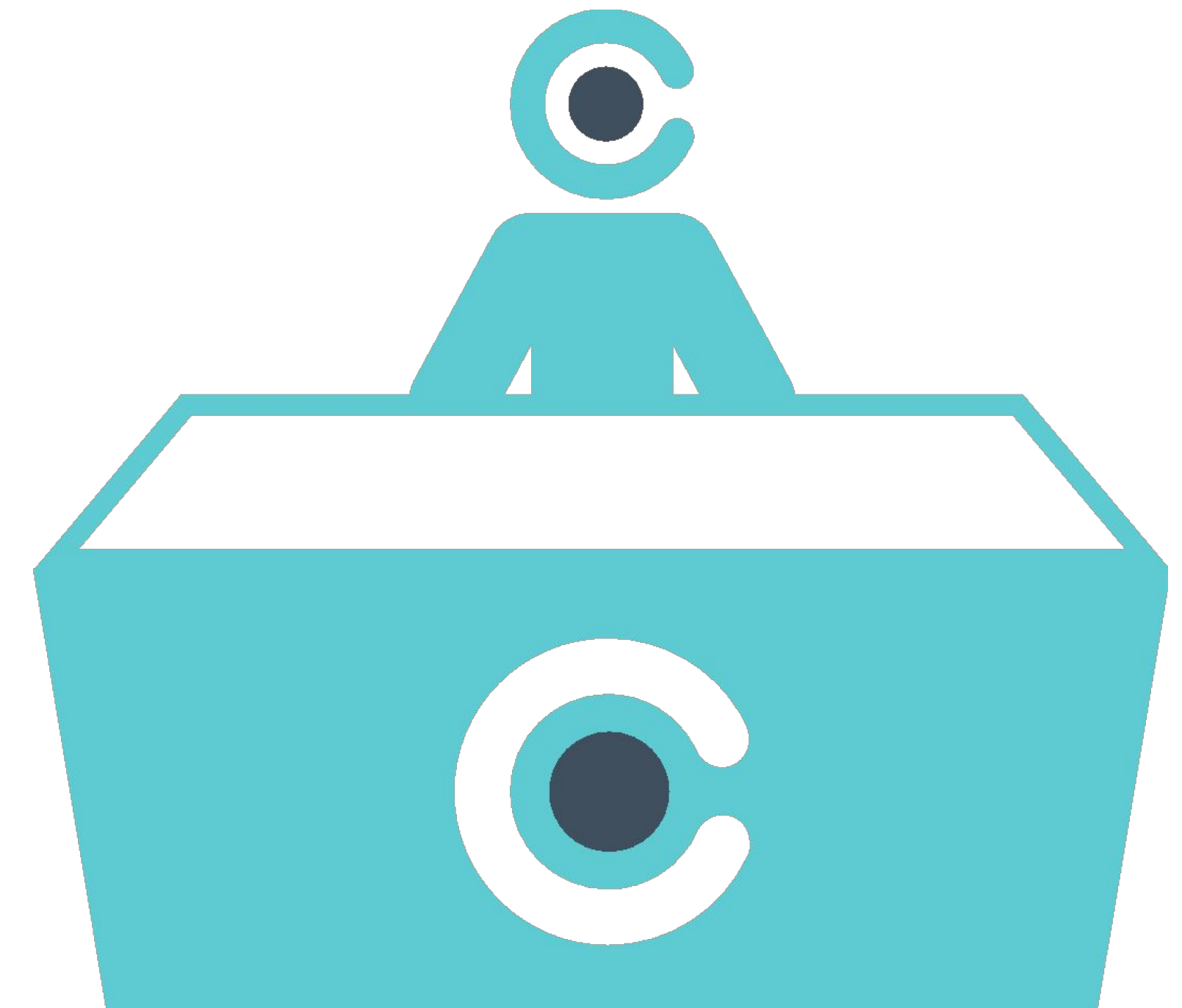
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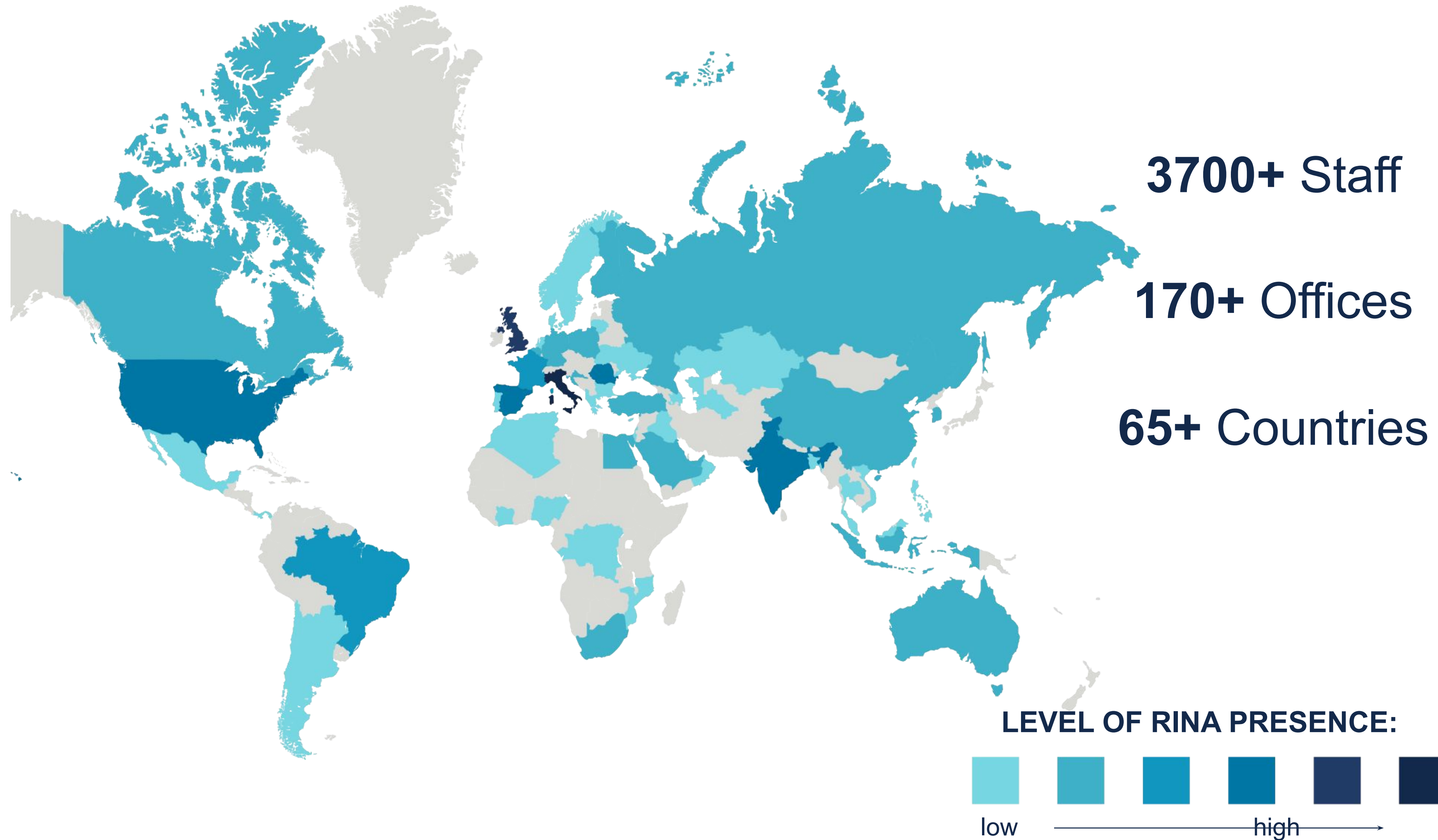
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Introduction

- Overview of RoHS obligations and exemptions
- Exemption assessment criteria
- Current exemptions under review
- Pack 22 recommendations
- Overview of recommendation trends
- What happens next
- Conclusions
- Questions



Product Regulatory Compliance Team

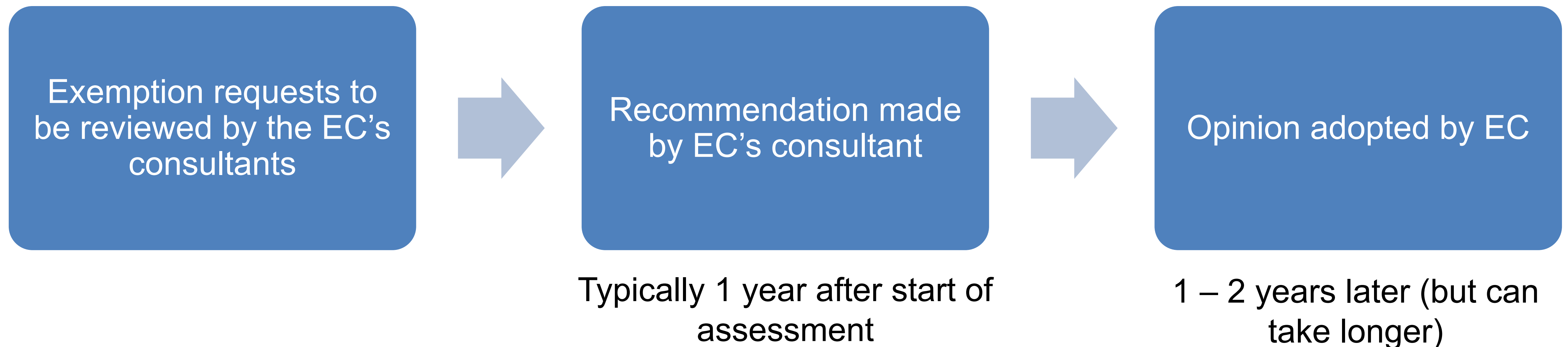


- ❑ We support the European Commission, manufacturers, importers and distributors of electrical and engineering products to identify, understand and meet technical and environmental legislation
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RoHS Overview and Exemption Process

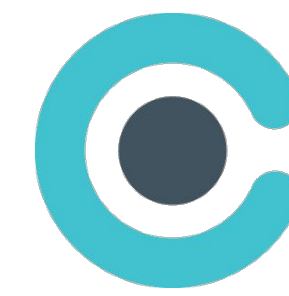
- ❑ RoHS Directive 2011/65/EU restricts 10 substances in EEE, unless excluded or an exemption is in place
- ❑ There are two lists of exemptions; Annex III for all categories and Annex IV for categories 8 and 9 only
- ❑ Many Annex III and IV exemptions would have expired 21 July 2021
- ❑ Requested exemptions benefit from continued validity exemption is published



The consultant's task is to determine:

- Whether exemptions are valid according to the criteria permitted by the RoHS Directive:
 - Substitution is **technically** impractical
 - **Reliability** of substitutes is not ensured
 - **Overall health, safety and environmental** impact of substitutes is more negative than that of the RoHS substance overall.
- Can the scope of exemptions be reduced?
 - The Directive does not permit exemptions for uses with suitable substitutes
- Can an earlier expiry date be adopted?
 - What is the timescale of substitution plans?
- Can the exemption be limited to specific RoHS product categories?

Current Exemptions Under Review



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Pack 22:

Oeko

- 6a** Pb in steel
- 6a-I** Pb in steel for machining and hot dip galvanised steel
- 6b** Pb in Al
- 6b-I** Pb in Al from scrap
- 6b-II** Pb in Al for machining
- 6c** Pb in Cu
- 7a** Pb in high melting temperature solder
- 7c-I** Pb in glass or ceramic
- 7c-II** Pb in dielectric ceramic in capacitors etc.

Pack 24:

- 18(b)** Pb in lamps (suntanning)
- 18(b)-I** Pb in lamps (medical)
- 24** Pb solder multilayer capacitors
- 29** Pb glass
- 32** PbO in lasers
- 34** Pb in potentiometers

Pack 23 (Annex III):

- 4f** Hg lamps
- 8b & 8b(I)** Cd electrical contacts
- 9a-II** CrVI in refrigeration
- 13a** Pb glass
- 13b & 13b-I/-II/-III** Cd & Pb glass
- 15 & 15a** Pb solder flip chip

BioIS et

Pack 21 (Annex IV):

- 1, 1a, 1b, 1c, 2, 3, 5, 11, 13, 14, 15, 17, 26, 29, 31a, 39

Pack 22 Recommendations

6(a) (lead in steel) has been split into two parts, with the original wording remaining valid for a short time for Category 8 IVD (July 2023), Category 9 Industrial, and Category 11 (July 2024):

6(a)-I: Lead as an alloying element in steel for machining purposes containing up to 0,35 % lead until July 2024,

6(a)-II: Lead as an alloying element in batch hot dip galvanised steel components containing up to 0,2 % lead by weight until July 2026

■ Pack 22 Recommendations

6(b)-I (lead in aluminium) has had the limit of lead lowered from 0.4% to 0.3% through the creation of 6(b)-III, with the original 0.4% limit expiring after a 12-month transitional period.

6(b)-II (lead in aluminium for machining) has had a reduction in scope to only gas valves applied in large household appliances through the creation of 6(b)-IV, with the original scope which can be used for all categories expiring after an 18-month transitional period

6(c) (lead in copper) renewed with no changes to the scope

7(a) (lead in high melting point solder) as currently written, be valid until July 2024, with the exemption suggested to be split into seven specific uses.

7(c)-I (lead in glass/ceramics) original wording expires in July 2024 for all categories, and two other subcategories have been added with a latter validity period of July 2026 for all categories:

7(c)-V: EEE containing Pb in a glass/glass matrix for:

- 1) protection and electrical insulation in glass beads of high voltage diodes and glass layers for wafer on the basis of a lead-zinc-borate or a lead-silica-borate glass body,
- 2) for hermetic sealings between ceramic, metal and/or glass parts,
- 3) for bonding purposes in a process parameter window for $< 500^{\circ}\text{C}$ combined with a viscosity of 1013,3 dPas,
- 4) used as resistance materials such as ink, with a resistivity range from 1 Ohms/square to 1 Mega Ohms/square, excluding trimmer potentiometers
- 5) used in chemically modified glass surfaces for Microchannel Plates, Channel Electron Multipliers and Resistive Glass Products.

7(c)-VI: Electrical and electronic components containing lead in a ceramic that fulfils the following functions:

- 1) piezoelectric lead zirconium titanate (PZT) ceramics
- 2) providing ceramics with a positive temperature coefficient (PTC)

■ Pack 22 Recommendations



7(c)-II (lead in glass/ceramics) recommend this remains unchanged and is valid until July 2026 for all categories.

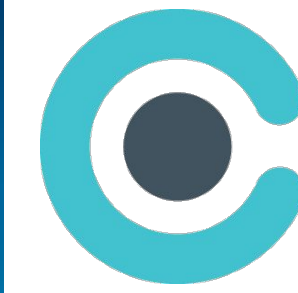
Recommendation Trends

- More limited scope – new more detailed wording (e.g. 7c-I)
- Applicable to fewer categories or only for specific products (e.g. 6b-II)
- Splitting exemptions (e.g. 7a) – subparts may have different expiry dates (e.g. 6a)
- Early expiry dates when consultant believes scope too broad but unable to demarcate (e.g. 6a-I)
- Expiry date same for all categories (several)
- Not accepting arguments based on “Overall health, safety and environmental impact of substitutes” – difficult to prove (e.g. 6b-II)

What's Next?

- European Commission to consider Oeko's recommendations before publication of the draft proposal in the Official Journal
- Once proposals are published, a stakeholder consultation is carried out.
- The European Parliament and Council can object to proposals in which case they will be rejected (very unusual)

- ❑ Results of two of four RoHS exemptions studies have been published – Packs 22 and 24
- ❑ For many Annex III exemptions, the expiry date for all categories is the same so industry can collaborate on renewal of requests
- ❑ Most of the assessed exemptions are recommended to be renewed but many with different wording – some with smaller more limited scope
- ❑ The EC and Member States believe that many exemptions are too broad
- ❑ Most renewed exemptions are recommended to expire July 2026
 - Renewal requests will need to be submitted again by **Jan 2025**



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Exemption 7a continued

- I) for internal interconnections for attaching die, or other components along with a die in semiconductor assembly with steady state or transient/impulse currents of 0.1 A or greater or blocking voltages beyond 10 V, or die edge sizes larger than 0.3 mm x 0.3 mm
- II) for integral (meaning internal and external) connections of die attach in electrical and electronic components, if the thermal conductivity of the cured/sintered die-attach material is $>35\text{W}/(\text{m}\cdot\text{K})$ AND the electrical conductivity of the cured/sintered die-attach material shall be $>4.7\text{MS}/\text{m}$ AND solidus melting temperature has to be above 260°C
- III) in first level solder joints (internal or integral connections - meaning internal and external) for manufacturing components so that subsequent mounting of electronic components onto subassemblies (i.e., modules or sub-circuit boards or substrates or point to point soldering) with a secondary solder does not reflow the first level solder. This item excludes die attach applications and hermetic sealings
- IV) In second level solder joints for the attachment of components to printed circuit board or lead frames:
 - 1. in solder balls for the attachment of ceramic ball-grid-array (BGA)
 - 2. in high temperature plastic overmouldings ($> 220^\circ\text{C}$)
- V) as a hermetic sealing material between:
 - 1. a ceramic package or plug and a metal case,
 - 2. component terminations and an internal sub-part
- VI) for establishing electrical connections between lamp components in incandescent reflector lamps for infrared heating or high intensity discharge lamps or oven lamps
- VII) for audio transducers where the peak operating temperature exceeds 200°C



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Thank You

