152584/EU XXV. GP
Eingelangt am 18/08/17

Council of the
European Union

Brussels, 18 August 2017
(OR. en)

11688/17

ENV 709
IND 193
CHIMIE 73

COVER NOTE

From:	Secretary-General of the European Commission, signed by Mr Jordi AYET PUIGARNAU, Director
date of receipt:	10 August 2017
To:	Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2017) 283 final
Subject:	COMMISSION STAFF WORKING DOCUMENT EU Green Public Procurement criteria for Furniture

Delegations will find attached document SWD(2017) 283 final.

Encl.: SWD(2017) 283 final

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EUROPEAN
COMMISSION

Brussels, 10.8.2017
SWD(2017) 283 final

COMMISSION STAFF WORKING DOCUMENT

EU Green Public Procurement criteria for Furniture

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EU GPP Criteria for Furniture

1 INTRODUCTION

EU Green Public Procurement (GPP) criteria aim at facilitating public authorities the purchase of products, services and works with reduced environmental impacts. The use of the criteria is voluntary. The criteria are formulated in such a way that they can be, if deemed appropriate by the individual authority, integrated into its tender documents. This document provides the EU GPP criteria developed for the product group "Furniture". The criteria are split into three broad sections depending on whether the subject matter of the contract is a **refurbishment service for existing used furniture (A.)**, the procurement of **new furniture items (B.)** or the procurement of **furniture end-of-life services (C.)**. An accompanying Technical Background Report provides further rationales supporting the selection of these criteria and references for further information.

The criteria are split into Technical Specifications and Award Criteria. For each set of criteria there is a choice between two ambition levels:

- The *Core criteria are designed to allow for easy application of GPP, focussing on the key area(s) of environmental performance of a product and aimed at keeping administrative costs for companies to a minimum*.
- The *Comprehensive criteria take into account more aspects or higher levels of environmental performance, for use by authorities that want to go further in supporting environmental and innovation goals*.

The formulation "(same for core and comprehensive)" is inserted when criteria are identical for both levels of ambition.

It should be borne in mind that furniture items which lie within the scope of the product group can vary substantially in nature and in the types of materials used. For this reason, a number of criteria are accompanied by conditional clauses which state under what circumstances these criteria should be considered as relevant enough to include in the invitation to tender.

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1.1 Definition and Scope

The product group "furniture" shall comprise free-standing or built-in units, whose primary function is to be used for the storage, placement or hanging of items and/or to provide surfaces where users can rest, sit, eat, study or work, whether for indoor or outdoor use. Bed mattresses are included within the scope.

The product group does not include the following products:

(a) Products whose primary function is not to be used as furniture. Examples include but are not limited to: streetlights, railings and fences, ladders, clocks, playground equipment, stand-alone or wall-hung mirrors, electrical conduits, road bollards and building products such as steps, doors, windows, floor coverings and cladding.

(b) Furniture fitted into vehicles used for public or private transit.

(c) Furniture products which consist of more than 5% (weight by weight) of materials other than: solid wood, wood-based panels, cork, bamboo, rattan, plastics, metals, leather, coated fabrics, textiles, glass or padding materials.

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1.2 Key environmental impacts

According to the available evidence from scientific literature, the following conclusions were drawn regarding environmental impacts of furniture through its life cycle:

- The dominant fraction (80-90%) of environmental impacts is linked to furniture **materials/ components**. While embodied energy in metals and plastics is higher than in wood, durability and recyclability are also important considerations. Specifying recycled materials can help reduce material impact.
- **Manufacturing**, assembly and/or treatment of components are the next most significant sources of environmental impacts due to the use of chemical mixtures, heat and electricity in drying and curing processes.
- Impacts due to **packaging** vary depending on the individual product but two Life Cycle Assessments (LCA) studies for work desks and wardrobes respectively, estimated total environmental impacts of packaging to be around 6%.
- **Distribution** was difficult to investigate since this can vary widely due to the global nature of the furniture market. In most studies, average transportation scenarios were used, which masks the varying importance of this part of the furniture life cycle.
- The **use** phase was negligible in terms of environmental impact. However, durability and reparability factors are crucial for extending the use phase.
- The End of Life (**EoL)** impacts vary considerably depending on what materials are used in the furniture. Recycling of furniture components or recovering energy from furniture waste is often complicated due to difficulties in separating components.

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Key Environmental Impacts during furniture lifecycle	Proposed EU GPP furniture approach
• Loss of biodiversity and soil erosion as a result of unsustainable forest management and illegal logging. • Depletion of resources due to the use of non-renewable resources such as oil/natural gas for plastics. • CO_2 and other emissions as a result of energy consumption in the production of several materials. • Risk to workers, consumers or to the wider environment of the release of toxic substances. • Contribution to poor indoor air quality due to Volatile Organic Compounds (VOC) emissions from indoor furniture products. • Wasted materials due to premature End of Life of sub-standard quality furniture. • Wasted materials due to difficulties with repairing, acquiring spare parts or separating parts for recycling.	• Procure timber from legal sources • Use materials made partly or totally from renewable materials (such as wood). • Set maximum limits for total VOC emissions from furniture items and specific formaldehyde emission limits for wood-based panels and upholstery materials. • Procure durable and fit-for-use furniture complying with relevant EN standards. • Procure easy-to-disassemble, repairable and recyclable furniture that is covered by a warranty.

1.3 General note on verification

For a number of criteria, the proposed means of verification is the provision of test reports. For each of the criteria, the relevant test methods are indicated. It is up to the public authority to decide at which stage such test results should be provided. In general, it does not seem necessary to require all tenderers to provide test results from the outset. To reduce the burden on tenderers and public authorities, a self-declaration could be considered as sufficient when submitting bids. Then, there are different options for if and when these tests could be required:

a) At tendering stage:

For one-off supply contracts, the bidder with the most economically advantageous tender could be required to provide this proof. If the proof is deemed to be sufficient, the contract can be awarded. If the proof is deemed insufficient or non-compliant then:

i) where the means of verification concerns a technical specification, the proof would be requested from the next highest-scoring bidder who would then be considered for contract award;

ii) where the means of verification concerns an award criterion, the additional points awarded would be removed and the tender ranking would be recalculated with all the ensuing consequences applying.

A test report verifies that a sample model has been tested for certain requirements, not the furniture actually delivered under the contract. For framework contracts the situation may be different. This scenario is covered further in the next point relating to contract execution and in the additional explanations below.

b) During contract execution:

Test results could be requested for one or several items delivered under the contract, either in general, or if there are doubts about false declarations. This is particularly important for framework contracts which do not stipulate an initial order of furniture.

It is recommended to explicitly set contract performance clauses. These should stipulate that the contracting authority is entitled to carry out random verification tests at any time during the term of the contract. If the results of such tests show that the delivered products do not meet the criteria, the contracting authority shall then be entitled to apply penalties and has the possibility to terminate the contract. Some public authorities include conditions that if, following the tests, the product is meeting their requirements, the testing costs have to be borne by the public authority; but if the requirements are not met, the costs have to be borne by the supplier.

For framework agreements, the point at which provision of proof is requested will depend on the specific set-up of the contract:

- For framework agreements with a single operator where the individual models to be delivered are identified when awarding the framework agreement, and it is just a question of how many units will be needed, the same considerations apply as for one-off supply contracts described above.
- For framework agreements that pre-select several potential suppliers with ensuing competitions among those pre-selected, at this initial preselection stage, tenderers may only need to show their capability to deliver products meeting the minimum performance requirements of the framework agreement. For ensuing call-down contracts (or orders) that are awarded following the competition among the pre-selected suppliers, in principle the same considerations as under i) and ii) above apply, if additional requirements have to be proven under the competition. If the competition is only about price, then a check at the contract execution stage should be considered.

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It is also important to highlight the option for bidders to provide verification based on furniture holding the EU Ecolabel or another relevant ISO 14024 Type I Eco-label (according to ISO 14024) fulfilling the same specified requirements. Such furniture should be deemed to comply with the relevant criteria, and verification would be requested following the same approach as has been set out for test results.

Please also note that, according to Art. 44 (2) of Directive 2014/24/EU, contracting authorities shall accept other appropriate means of proof. This could include a technical dossier of the manufacturer where the economic operator concerned had no access to test reports, or no possibility of obtaining them within the relevant time limits. This is under the condition that the lack of access was not attributable to the economic operator concerned and that the economic operator concerned thereby proves that the works, supplies or services provided by it meet the requirements or criteria set out in the technical specifications, the award criteria or the contract performance conditions. In case a reference to a certificate/test report drawn up by a specific conformity assessment body is made for the execution of the tests, contracting authorities shall also accept certificates/test reports issued by other equivalent assessment bodies.

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2 EU GPP CRITERIA FOR FURNITURE

A. Procurement of furniture refurbishment services	
Core criteria	**Comprehensive criteria**
TECHNICAL SPECIFICATION	
TS1: Refurbishment requirements ***(same for core and comprehensive)*** The tenderer shall refurbish the furniture items provided by the contracting authority according to the specified requirements. Depending on the kind of furniture to be refurbished and the condition of the existing furniture, the public authority shall detail as much as possible the operations to be carried out (e.g. re-spraying of metalwork, repair and/or re-finishing of wood surfaces, re-upholstery, desk conversions etc.). (The public authority might first tender a separate study to receive an evaluation of the existing furniture stock (type, number, state etc) and provide this description with the call for tender.) **Verification:** The tenderer shall provide details of all the refurbishing operation(s) to be carried out.	
TS2: Durable upholstery coverings ***(only applicable to upholstered furniture)*** ***(same for core and comprehensive)*** (*This criterion shall only apply when the refurbishment operations involve the introduction or replacement of upholstery covers*). The tenderer shall use upholstery covering materials, which may be based on either leather, textile fabrics or coated fabrics that comply with all of the physical quality requirements set out in Table 2, Table 3 or Table 4 of Appendix I, as appropriate. **Verification:** The tenderer shall provide a declaration from the leather supplier, textile fabric supplier or coated fabric supplier, as appropriate, supported by relevant test reports, that the upholstery covering material meets the physical requirements for leather, textile fabrics or coated fabrics as specified in Table 2, Table 3 or Table 4 of Appendix I, respectively. Upholstery materials which have been awarded the EU Ecolabel for textiles, as established in Commission Decision 2014/350/EU or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.	
TS3: Blowing agents ***(only applicable to upholstered furniture)*** ***(same for core and comprehensive)*** Where foam padding materials are used in furniture upholstery, halogenated organic compounds shall not be used as blowing agents or as auxiliary blowing agents in the manufacture of such	

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<table>
<tr><td colspan="2">padding materials.

Verification:

The tenderer shall provide a declaration of non-use from the manufacturer of the foam.</td></tr>
<tr><td>TS4: Refurbished furniture product warranty

The tenderer shall provide a minimum two year (longer for more valuable items) warranty effective from the date of delivery of the product. This warranty shall cover repair or replacement and include a service agreement with options for pick-up and return or on-site repairs.

The warranty shall guarantee that the goods are in conformity with the contract specifications at no additional cost.

Verification:

The tenderer shall provide a written declaration covering the above-mentioned guarantee.

A copy of the warranty shall be provided by the tenderer. They shall provide a declaration that they cover the conformity of the goods within the contract specifications.</td><td>TS4: Refurbished furniture product warranty

The tenderer shall provide a minimum three year (longer for more valuable items) warranty effective from the date of delivery of the product. This warranty shall cover repair or replacement and include a service agreement with options for pick-up and return or on-site repairs.

The warranty shall guarantee that the goods are in conformity with the contract specifications at no additional cost.

Verification:

The tenderer shall provide a written declaration covering the above-mentioned guarantee.

A copy of the warranty shall be provided by the tenderer. They shall provide a declaration that they cover the conformity of the goods within the contract specifications.</td></tr>
<tr><td colspan="2">AWARD CRITERIA</td></tr>
<tr><td></td><td>AC1: Low chemical residue upholstery coverings

(only applicable to upholstered furniture)

Points shall be awarded where the upholstery covering material is shown to comply, as appropriate, with the limits for restricted arylamine dyes, extractable heavy metals and free formaldehyde set out below.

For textile fabrics and coated fabrics:

• No restricted arylamines (see Table 5 in Appendix II) present above 30 mg/kg (limit applies to each individual amine) according to EN ISO 14362-1 and 14362-3.
• Free and partly hydrolysable formaldehyde ≤ 75 mg/kg according to EN ISO 14184-1.
• Extractable heavy metals determined according to EN ISO 105-E04 being less than the following limits (in mg/kg): antimony ≤ 30.0; arsenic ≤ 1.0; cadmium ≤ 0.1; chromium ≤ 2.0; cobalt ≤ 4.0; copper ≤ 50.0; lead ≤ 1.0; mercury ≤ 0.02 and nickel ≤ 1.0.

For leather:

• No restricted arylamines (see Table 5 in Appendix II) present above 30 mg/kg (limit applies to each individual amine) according to EN ISO 17234-1.
• Chromium VI should not exceed 3 mg/kg according to EN ISO 17075 (detection limit).</td></tr>
</table>

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	• Free and partly hydrolysable formaldehyde ≤ 300 mg/kg according to EN ISO 17226-1. • Extractable heavy metals determined according to EN ISO 17072-1 being less than the following limits (in mg/kg): antimony ≤ 30.0; arsenic ≤ 1.0; cadmium ≤ 0.1; chromium ≤ 200.0; cobalt ≤ 4.0; copper ≤ 50.0; lead ≤ 1.0; mercury ≤ 0.02 and nickel ≤ 1.0. **Verification:** Points shall be awarded to tenderers that provide a declaration that the leather, textile fabric or coated fabric upholstery covering material, as appropriate, complies with the above limits, supported by results from relevant test methods either commissioned by the tenderer themselves or the material supplier. Upholstery materials which have been awarded the EU Ecolabel for textiles, as established in Commission Decision 2014/350/EU or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.
	AC2: Low chemical residue padding materials[1] ***(only applicable to upholstered furniture)*** Where latex foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for chlorophenols, heavy metals, pesticides and butadiene listed in Table 6 of Appendix III, in accordance with the corresponding test method (A-D) listed in the same table. Where polyurethane foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for heavy metals, plasticisers, TDA, MDA, tinorganic substances and other specific substances listed in Table 7 of Appendix III in accordance with the corresponding test method (A-E) listed in the same table. Where other padding materials are used, points shall be awarded if compliance with the chemical residue limits set out in either Table 6 or Table 7 of Appendix III can be demonstrated. **Verification:** **For latex foams:** The tenderer shall provide a declaration of compliance with this criterion, supported by test reports according to the following methods: A. For chlorophenols the tenderer shall provide a report presenting the results of the following test procedure. 5 g of sample shall be milled and chlorophenols shall be extracted in the form of phenol (PCP), sodium salt (SPP) or esters. The extracts shall be analysed by means of gas chromatography (GC). Detection shall be made with mass spectrometer or electron capture detector (ECD). B. For heavy metals the tenderer shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate

[1] Note that chemical residue testing requirements for latex foam and polyurethane foams have been established by industry-led voluntary schemes such as the EuroLatex ECO Standard and the CertiPUR standard. At the time of writing, these schemes were considered to provide a sufficient level of assurance.

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	shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by inductively coupled plasma optical emission spectrometry (ICP-OES), also known as inductively coupled plasma atomic emission spectrometry (ICP-AES), or by atomic absorption spectrometry using a hydride or cold vapour process. C. For pesticides the tenderer shall provide a report presenting the results of the following test procedure. 2 g of sample is extracted in an ultrasonic bath with a hexane/dichloromethane mixture (85/15). The extract is cleaned up by acetonitrile agitation or by adsorption chromatography over florisil. Measurement and quantification are determined by gas chromatography with detection on an electron capture detector or by coupled gas chromatography/mass spectrometry. The testing on pesticides is requested for latex foams with a content of at least 20 % natural latex. D. For butadiene the tenderer shall provide a report presenting the results of the following test procedure. Following milling and weighing of the latex foam, headspace sampling shall be performed. Butadiene content shall be determined by gas chromatography with detection by flame ionisation. **For polyurethane foams:** The tenderer shall provide a declaration of compliance with this criterion, supported by test reports that demonstrate compliance with the limits in Table 7 of Appendix III. For methods B, C, D and E, 6 composite samples shall be taken from a maximum depth of up to 2 cm from the surface faces of the material sent to the relevant laboratory. A. For phthalates and other specific substances listed in Table 7 of Appendix III, the tenderer shall provide a declaration supported by declarations from suppliers of the foam confirming that they have not been added intentionally to the foam formulation. B. For heavy metals the tenderer shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by atomic emission spectrometry with inductively coupled plasma (ICP-AES or ICP-OES) or by atomic absorption spectrometry using a hydride or cold vapour process. C. For the total amount of plasticizers the tenderer shall provide a report presenting the results of the following test procedure. Extraction shall be performed using a validated method such as the subsonic extraction of 0.3 g of sample in a vial with 9 ml of t-Butylmethylether during 1 hour followed by the determination of phthalates by GC using a single ion monitoring mass selective detector (SIM Modus). D. For TDA and MDA the tenderer shall provide a report presenting the results of the following test procedure. Extraction of a 0.5 g composite sample in a 5 ml syringe shall be performed with 2.5 ml of 1 % aqueous acetic acid solution. The syringe is squeezed and the liquid returned to the syringe. After repeating this operation 20 times, the final extract is kept for analysis. A new 2.5 ml of 1% aqueous acetic acid is then added to the syringe and another 20 cycles repeated. After this, the extract is combined with the first extract and diluted to 10 ml in a volumetric flask with acetic acid. The extracts shall be analysed by high-performance liquid chromatography (HPLC-UV) or HPLC-MS. If HPLC-UV is performed and interference is suspected, reanalysis with high performance liquid chromatography–mass spectrometry (HPLC-MS) shall be performed. E. For tinorganic substances the tenderer shall provide a report presenting the results of the following test procedure.

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	A composite sample of 1-2 g weight shall be mixed with at least 30ml of extracting agent during 1 hour in an ultrasonic bath at room temperature. The extracting agent shall be a mixture composed as follows: 1750 ml methanol + 300 ml acetic acid + 250 ml buffer (pH 4.5). The buffer shall be a solution of 164 g of sodium acetate in 1200 ml of water and 165 ml acetic acid, to be diluted with water to a volume of 2000 ml. After extraction the alkyl tin species shall be derivatized by adding 100 µl of sodium tetraethylborate in tetrahydrofuran (THF) (200 mg/ml THF). The derivative shall be extracted with n-hexane and the sample shall be submitted to a second extraction procedure. Both hexane extracts shall be combined and further used to determine the organotin compounds by gas chromatography with mass selective detection in SIM modus.
	AC3: Low emission padding materials[2] **AC 3.1. Low emission latex foam padding materials** ***(only applicable to upholstered furniture)*** Where latex foam is used as a padding material in furniture upholstery, points shall be awarded if the latex foam complies with the requirements for VOC emissions as listed below. Where other padding materials are used, points can also be awarded if compliance with the VOC emission limits set out below can be demonstrated.

Substance	**Limit value (mg/m³)**
1,1,1 – trichloroethane	0.2
4-Phenylcyclohexene	0.02
Formaldehyde	0.01
Nitrosamines*	0.001
Styrene	0.01
Tetrachloroethylene	0.15
Toluene	0.1
Trichlorethylene	0.05
Vinyl chloride	0.0001
Vinyl cyclohexene	0.002
Aromatic hydrocarbons (total)	0.3
VOCs (total)	0.5
* N-nitrosodimethylamine (NDMA), N-nitrosodiethylamine (NDEA), N-nitrosomethylethylamine (NMEA), N-nitrosodi-i-propylamine (NDIPA), N-nitrosodi-n- propylamine (NDPA), N-nitrosodi-n-butylamine (NDBA), N-nitrosopyrrolidinone (NPYR), N-nitrosopiperidine (NPIP), N-nitrosomorpholine (NMOR).	

Verification:

The tenderer shall provide a declaration of compliance with this criterion, supported by a test report presenting the results of chamber test analysis in accordance with ISO 16000-9 or an equivalent test.

[2] Note that VOC emission testing requirements for latex foam and polyurethane foams have been established by industry-led voluntary schemes such as the EuroLatex ECO Standard and the CertiPUR standard. At the time of writing, these schemes were considered to provide a sufficient level of assurance.

The wrapped sample shall be stored at room temperature at least for 24 hours. After this period the sample shall be unwrapped and immediately transferred into the test chamber. The sample shall be placed on a sample holder, which allows air access from all sides. The climatic factors shall be adjusted according to ISO 16000-9. For comparison of test results, the area specific ventilation rate (q=n/l) shall be 1. The ventilation rate shall be between 0.5 and 1. The air sampling shall be done 24±1 h after loading of the chamber during 1 hour on DNPH cartridges for the analysis of formaldehyde and other aldehydes and on Tenax TA for the analysis of other volatile organic compounds. Sampling duration for other compounds may be longer but shall be completed before 30 hours.

The analysis of formaldehyde and other aldehydes shall comply with the standard ISO 16000-3 or equivalent tests. Unless specified differently, the analysis of other volatile organic compounds shall comply with the standard ISO 16000-6.

The analysis of nitrosamines shall be done by means of gas chromatography in combination with a thermal energy analysis detector (GC-TEA), in accordance with the BGI 505-23 method (formerly: ZH 1/120.23) or equivalent.

AC 3.2: Low emission polyurethane foam padding materials

(only applicable to upholstered furniture)

Where polyurethane foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for VOC emissions listed below.

Where other padding materials are used, points can also be awarded if compliance with the VOC emission limits set out below can be demonstrated.

Substance (CAS number)	Limit value (mg/m³)
Formaldehyde (50-00-0)	0.01
Toluene (108-88-3)	0.1
Styrene (100-42-5)	0.005
Each detectable compound classified as categories C1A or C1B according to the Regulation (EC) No 1272/2008 of the European Parliament and of the Council	0.005
Sum of all detectable compound classified as categories C1A or C1B according to Regulation (EC) No 1272/2008	0.04
Aromatic hydrocarbons	0.5
VOCs (total)	0.5

Verification:

The tenderer shall provide a declaration of compliance with this criterion, supported by test results that show compliance with the limits stated above. The test sample/chamber combination shall be either:

1 sample of 25x20x15 cm dimensions is placed in a 0.5 m^3 test chamber or

2 samples of 25x20x15 cm dimensions are placed in a 1.0 m^3 test chamber.

The foam sample shall be placed on the bottom of an emission test chamber and conditioned for 3 days at 23 °C and 50 % relative humidity, applying an air exchange rate n of 0.5 per hour and a chamber loading L of 0.4 m^2/m^3 (=

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	total exposed surface of sample in relation to chamber dimensions without sealing edges and back) in accordance with ISO 16000-9 and ISO 16000-11 or equivalent tests. Sampling shall be done 72 ± 2 h after loading of the chamber during 1 hour via Tenax TA and DNPH cartridges for VOC and formaldehyde analysis respectively. The emissions of VOC are being trapped on Tenax TA sorbent tubes and subsequently analysed by means of thermo-desorption-GC-MS in accordance to ISO 16000-6 or equivalent tests. Results are semi-quantitatively expressed as toluene equivalents. All specified individual analytes are reported from a concentration limit ≥ 1 µg/m³. Total VOC value is the sum of all analytes with a concentration ≥ 1 µg/m³ and eluting within the retention time window from n-hexane (C6) to n-hexadecane (C16), both included. The sum of all detectable compounds classified as categories C1A or C1B according to Regulation (EC) No 1272/2008 is the sum of all these substances with a concentration ≥ 1 µg/m³. In case the test results exceed the standard limits, substance specific quantification needs to be performed. Formaldehyde can be determined by collection of the sampled air onto DNPH cartridge and subsequent analysis by HPLC/UV in accordance with ISO 16000-3 or equivalent tests.

AC4: Extended warranty periods

(same for core and comprehensive)

A maximum of X additional points shall be awarded for each additional year of warranty and service agreement offered that is more than the minimum technical specification (see TS above) as follows:

- 4 or more years extra warranty: x points
- 3 years extra warranty: 0.75x points
- 2 years extra warranty: 0.5x points
- 1 year extra warranty: 0.25x points

Verification:

The tenderer shall provide a written declaration detailing the offered period and stating that it covers the conformity of the goods with the contract specifications, including all indicated usage.

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B. Procurement of new furniture

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
TS1: Sourcing of legal timber for furniture production ***(same for core and comprehensive)*** All timber used in furniture[3] to be supplied under the contract must be legally harvested in accordance with Regulation (EU) 995/2010 (the 'EU Timber Regulation') [4]. Any timber or timber products not covered by the Regulation (EU) 995/2010 should be either covered by FLEGT licences, covered by CITES licences or subject to a due diligence system implemented by the tenderer which provides information on the country of harvest, species, quantities, supplier details and information on compliance with relevant national legislation. Where a risk of illegal timber in the supply chain is identified, the due diligence system should define procedures for mitigating this risk. **Verification:** A declaration that only timber from legal sources will be used in the furniture product (see CPC1 below).	
CONTRACT PERFORMANCE CLAUSE	
CPC1. Sourcing of legal timber *(Same requirements for Core and Comprehensive criteria. When possible it is recommended that spot checks be carried out in cooperation with the competent authority responsible for implementation of Regulation (EU) 995/2010)* The contracting authority is entitled to carry out spot checks regarding compliance with Technical Specification TS1 for all or a specified sub-set of the wood-containing furniture products used under the contract. Upon request, the contractor should provide evidence to demonstrate compliance with the EU Timber Regulation: In most cases – where the contractor is not the company first placing timber or timber products on the EU market but obtains such products from others (defined as a 'trader' [5] in Regulation 995/2010), the contractor should provide the following information in respect of timber or timber products to be verified during the spot check: - The operators or the traders who have supplied the timber and timber products used in the piece of furniture; - Documents or other information indicating compliance of those timber products with the applicable legislation[6]; - Evidence of the risk assessment and mitigation procedures put in place in accordance with Article 6(1) (b) and (c) of Regulation (EU) 995 of 2010. In cases where the contractor places timber or wood-containing furniture products for the first time on the EU market (defined as an 'operator' [7] in Regulation 995/2010), the contractor should provide the following information in respect of timber or timber products covered by the spot check:	

[3] for timber and timber products within the remit of EU Timber Regulation

[4] *Note to contracting authorities on the sourcing of legal timber:* Suitable remedies should be provided under the contract for cases of non-compliance with the above clause. Advice on the application of these requirements, and the monitoring organisations able to verify compliance, may be obtained from the competent national authorities listed at: http://ec.europa.eu/environment/forests/pdf/list_competent_authorities_eutr.pdf

[5] 'trader' means any natural or legal person who, in the course of a commercial activity, sells or buys on the internal market timber or timber products already placed on the internal market

6 see Regulation (EU) 995/2010 article 2 (h)

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- A description of each type of timber used, including the trade name, type of product, the common name of tree species and, where applicable, its full scientific name; - Name and address of the supplier of the timber and timber products; - The country of harvest, and where applicable[8]: (i) Sub-national region where the timber was harvested; (ii) Concession of harvest; (iii) Quantity (expressed in volume, weight or number of units); - Documents or other information indicating compliance of those timber products with the applicable legislation; - Evidence of the risk assessment and mitigation procedures put in place in accordance with Article 6(1) (b) and (c) of Regulation (EU) 995 of 2010. This may include certification or other third party verified schemes. Timber covered by valid EU FLEGT licences or CITES permits shall be considered to have been legally harvested according to Regulation (EU) No 995/2010.	
Note: These GPP criteria do not include a proposal on the sourcing of wood from sustainable forestry, for the following reasons: The EU Forest Strategy provides a definition of sustainable forest management (SFM). Nonetheless, for public procurement, precise requirements, detailing the different elements of the SFM definition would be needed. For the time being, however, such detailed elements are not available on the EU level. Accordingly, several Member States are using their own sets of national criteria, to identify wood-based products stemming from sustainably managed sources, in their respective tendering processes for green or sustainable public procurement. They also have different procedures in place to determine whether certification or other third-party-verified schemes provide sufficient assurance of SFM. In this situation, it has not yet been possible to propose a set of procurement requirements which include harmonised criteria for sustainable forest management. The current consensus of the Member States with an active sustainable timber procurement policy is that, in general, proprietary certification schemes, such as those of the FSC and PEFC, provide sufficient levels of assurance for compliance with their national criteria. Although wood certified as 100% sustainable wood is desirable, it could be difficult or impossible to achieve due to: a) a relatively limited supply of certified wood available on the market, despite widespread forest certification in the EU and other major global supply regions; b) possible fluctuations in specific market supplies, particularly for SMEs that are accustomed to working with a limited number of suppliers. Instead, a minimum of 70% sustainable wood should be achievable. This level also fits well with the current requirements of the FSC and PEFC labelling schemes. Nonetheless, public authorities are recommended to seek feed-back from the market prior to publishing the Invitation To Tender (ITT) and are reminded that, in any case and under all circumstances, alternative means of proof must be allowed.	
TS2: Formaldehyde emissions from wood-based panels (*This requirement applies regardless of the weight fraction of wood-based panels in the furniture product*) Formaldehyde emissions from all supplied wood-based panels, in the form that they are used in the furniture product (in other words, unfaced, coated, overlaid, veneered), and which were manufactured using formaldehyde-based resins, shall be equal to or less than the E1 threshold	**TS2: Formaldehyde emissions from wood-based panels** (*This comprehensive requirement should be considered as of added value if the weight fraction of the wood-based panels in the furniture product exceeds 5%).* Formaldehyde emissions from all supplied wood-based panels, in the form that they are used in the furniture product (in other words, unfaced, coated, overlaid, veneered), and which were manufactured using formaldehyde-based resins, shall be equal to or less than 65% of the E1

[7] 'operator' means any natural or legal person that places timber or timber products on the market;

[8] for more information, see: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0607&from=

<table>
<tr>
<td>limits for formaldehyde emissions as defined in Annex B of EN 13986.

Verification:

A declaration from the wood-based panel supplier shall be provided, stating that the panels supplied are compliant with E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 / EN ISO 12460-3 or EN 120 / EN ISO 12460-5.[9]

Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.</td>
<td>threshold limits for formaldehyde emissions as defined in Annex B of EN 13986.

Verification:

A declaration from the wood-based panel supplier shall be provided, stating that the panels supplied are compliant with 65% of E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 / EN ISO 12460-3 or EN 120 / EN ISO 12460-5.

Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.</td>
</tr>
<tr>
<td></td>
<td>TS3: Coating mixture restrictions

Coating mixtures used by the furniture manufacturer to coat any wooden or metal components of the furniture product shall not be classified according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council as:

• Category 1 or 2 carcinogenic, mutagenic or toxic to reproduction.

• Acutely Toxic by oral, dermal or inhalation pathways (categories 1 or 2) or to the aquatic environment (category 1).

• Category 1 for specific target organ toxicity.

And not contain any additives based cadmium, lead, chromium VI, mercury, arsenic or selenium in concentrations exceeding 0.010% by weight.

Verification:

The tenderer shall declare what coating mixtures they have used in the furniture product (if any). This shall be supported by Safety Data Sheets that clearly indicate the hazard classification of the coating mixture (if any) and shows that the formulation is not classified with any of the following classifications:

<table>
<tr><th>Hazard</th><th>Hazard statement</th></tr>
<tr><td>Carcinogenic (Cat. 1A, 1B or 2)</td><td>H350, H350i, H351,</td></tr>
<tr><td>Mutagenic (Cat. 1A, 1B or 2)</td><td>H340, H341,</td></tr>
<tr><td>Toxic to Reproduction (Cat. 1A, 1B or 2)</td><td>H360, H360F, H360D, H360FD, H360Fd, H360Df, H361f, H361d, H361fd, H362</td></tr>
<tr><td>Acute toxicity (Cat.1 or 2)</td><td>H300, H304, H310, H330</td></tr>
</table>
</td>
</tr>
</table>

[9] EN ISO 12460-3 and EN ISO 12460-5 were officially adopted in November2015 and supersede the EN 717-2 and EN 120 standards respectively. However, only minor changes have been made in the new standards to improve the reproducibility of results. For the purposes of verification of compliance with GPP criteria, test reports according to either the older or newer standards will be acceptable.

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	<table><tr><td>Specific Target Organ Toxicity (Cat. 1)</td><td>H370, H372</td></tr><tr><td>Hazardous to the aquatic environment (Cat. 1)</td><td>H400, H410</td></tr></table> Additionally, the Safety Data Sheet and/or other documentation (if any) shall state whether cadmium, lead, chromium VI, mercury, arsenic or selenium are present at any concentrations exceeding 0.010% by weight. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.
	TS4: Restrictions for metals Cadmium shall not be used for electroplating operations of any metal component parts used in the final furniture product. Nickel shall only be permitted in electroplating operations if the nickel release rate from the electroplated component part is less than 0.5 µg/cm^2/week according to EN 1811. **Verification:** The applicant shall provide a declaration from the supplier of the metal component part(s) that no plating treatments involving cadmium or cadmium compounds have been used in any metal component parts. Where nickel has been used in electroplating operations, the applicant shall provide a declaration from the supplier of the metal component part(s), supported by a test report according to EN 1811, where results reveal nickel release rates to be less than 0.5 µg/cm^2/week. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling these requirements, or using equivalent methods, shall be deemed to comply.
TS3: REACH Candidate List substance reporting The tenderer shall declare the presence of any REACH Candidate List[10] substances that are present at a concentration of greater than 0.1% (weight by weight) in the product and any component parts/materials thereof. **Verification:** The tenderer shall provide a declaration identifying specific REACH Candidate List substances that are present according to the latest version of the Candidate List at the date of publication of the invitation to tender.	**TS5: REACH Candidate List substance restrictions** The product and any component parts/materials thereof, shall not contain any REACH Candidate List substances that are present at a concentration of greater than 0.1% (weight by weight). **Verification:** The tenderer shall provide a declaration stating that the furniture product and component parts/materials thereof do not contain any specific REACH Candidate list substances in quantities greater than 0.1% (weight by weight) according to the latest version of the Candidate

[10] Candidate List of substances of very high concern for Authorisation published in accordance with Article 59(10) of the REACH Regulation https://echa.europa.eu/candidate-list-table

	List at the date of publication of the invitation to tender. This declaration shall be supported by similar declarations from all suppliers of component parts[11] and component materials[12] that remain in the final product. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling these requirements, or using equivalent methods, shall be deemed to comply.
	TS6: Durable upholstery coverings ***(only applicable to upholstered furniture)*** Where upholstery covering materials that are based on either leather, textile fabrics or coated fabrics are used, they shall comply with all of the physical quality requirements set out in Table 2, Table 3 or Table 4 of Appendix I as appropriate. **Verification:** The tenderer shall provide a declaration from the leather supplier, textile fabric supplier or coated fabric supplier as appropriate, supported by relevant test reports, that the upholstery covering material meets the physical requirements for leather, textile fabrics or coated fabrics as specified in Table 2, Table 3 or Table 4 of Appendix I respectively. Upholstered furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332, textile based upholstery which have been awarded the EU Ecolabel for textiles, as established in Commission Decision 2014/350/EU or upholstery coverings that have been awarded other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.
TS4 / 7: Blowing agents ***(only applicable to upholstered furniture)*** ***(same for core and comprehensive)*** Where foam padding materials are used in furniture upholstery, halogenated organic compounds shall not be used as blowing agents or as auxiliary blowing agents in the manufacture of such padding materials. **Verification:** The tenderer shall provide a declaration of non-use from the manufacturer of the foam padding material. Upholstered furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to	

[11] "Component parts" are considered as rigid and discrete units whose shape and form does not need to be altered prior to assembly of the final product in its fully functional form, although its position may change during use of the final product.

[12] "Component materials" are considered as non-rigid materials whose shape and form may change prior to furniture assembly or during use of the furniture product. Obvious examples include upholstery material but also potentially timber, which may be considered as a component material but be later sawn and treated to be converted into a component part.

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comply.

TS5 / 8: Fitness for use

(same for core and comprehensive)

The furniture product shall comply with the requirements set out in the latest versions of the following relevant EN standards that may relate to the durability, dimensional requirements, safety and strength of the product:

(contracting authority to make reference to specific standards from Appendix IV or other sources that are most relevant to the furniture being procured)

Verification:

The tenderer shall provide a declaration of compliance with any relevant EN standards, supported by test reports from either the furniture manufacturer or component part/material suppliers, as appropriate. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.

TS6 / 9: Design for disassembly and repair

(same for core and comprehensive)

The tenderer shall provide clear disassembly and repair instructions (e.g. paper or electronic copy, video) to enable a non-destructive disassembly of the furniture product for the purpose of replacing component parts/materials. Instructions shall be provided in a hard copy together with the product and/or in electronic copy via the manufacturer's website. Disassembly and replacement operations should be capable of being carried out using common and basic manual tools and unskilled labour.

Verification:

A manual shall be provided by the tenderer which shall include an exploded diagram of the product, illustrating the parts that can be removed and replaced and the tools required. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision 2016/1332/EU or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.

TS7: Product warranty and spare parts	**TS10: Product warranty and spare parts**
The tenderer shall provide a minimum three-year warranty effective from the date of delivery of the product. This warranty shall cover repair or replacement and include a service agreement with options for pick-up and return or on-site repairs. The warranty shall guarantee that the goods are in conformity with the contract specifications at no additional cost.	The tenderer shall provide a minimum five-year warranty effective from the date of delivery of the product. This warranty shall cover repair or replacement and include a service agreement with options for pick-up and return or on-site repairs. The warranty shall guarantee that the goods are in conformity with the contract specifications at no additional cost.
The tenderer shall guarantee the availability of spare parts, or elements which achieve an equivalent function, for a period of at least three years from the date of delivery of the furniture product. Contact details that should be used in order to arrange the delivery of spare parts shall be provided.	The tenderer shall guarantee the availability of spare parts, or elements which achieve an equivalent function, for a period of at least five years from the date of delivery of the furniture product. Contact details that should be used in order to arrange the delivery of spare parts shall be provided.
Verification:	**Verification:**
The tenderer shall provide a written declaration detailing the offered period and stating that it covers the conformity of the goods with the contract specifications, including all indicated usage.	The tenderer shall provide a written declaration detailing the offered period and stating that it covers the conformity of the goods with the contract specifications, including all indicated usage.
The tenderer shall provide a declaration that compatible spare parts will be made available to	The tenderer shall provide a declaration that compatible spare parts will be made available to

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the contracting authority or through a service provider. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.	the contracting authority or through a service provider. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.
AWARD CRITERIA	
AC1: Formaldehyde emissions from wood-based panels Points shall be awarded when all wood-based panels used in the furniture are shown to have formaldehyde emission rates that comply with 65% of the E1 threshold limits for formaldehyde emissions as defined in Annex B of EN 13986. **Verification:** Compliance with 65% of E1 emission limits to be shown as described in TS2 above.	**AC1: Formaldehyde emissions from wood-based panels** Points shall be awarded when all wood-based panels used in the furniture are shown to have formaldehyde emission rates that comply with 50% of the E1 threshold limits for formaldehyde emissions as defined in Annex B of EN 13986. **Verification:** Compliance with 50% of E1 emission limits to be shown as described in TS2 above.
AC2: Plastic marking ***(same for core and comprehensive)*** Points shall be awarded when plastic parts with a mass greater than 100g shall be marked in accordance with EN ISO 11469 and EN ISO 1043 (parts 1-4). The lettering used in markings should be at least 2.5 mm high. Where any fillers, flame retardants or plasticisers are intentionally incorporated into the plastic in proportions greater than 1 % w/w, their presence should also be reflected in the marking as per EN ISO 1043 parts 2-4. In exceptional cases, non-marking of plastic parts with a weight greater than 100g may be permitted if: • Marking would adversely impact on the perfomance or functionality of the plastic part; • Where marking is not technically possible due to the production method; • Where parts cannot be marked because of insufficient appropriate surface area available for the marking to be of a legible size to be identified by a recycling operator. In the above cases, where non-marking is justified, further details about the polymer type and any additives as per the requirements of EN ISO 11469 and EN ISO 1043 (parts 1-4) shall be provided in written form. ***Assessment and verification:*** The tenderer shall provide a declaration of compliance with this criterion, listing all the plastic components with a weight greater than 100g in the furniture product and stating whether or not they been marked according to EN ISO 11469 and EN ISO 1043 (parts 1-4). The marking of any plastic components shall be clearly visible upon visual examination of the plastic component. Marking does not necessarily need to be clearly visible in the final assembled furniture product.	

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In the case of non-marking of any plastic parts with a weight greater that 100g, the tenderer shall provide a justifications and relevant information. Furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other relevant ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.	
	AC3: Low chemical residue upholstery coverings ***(only applicable to upholstered furniture)*** Points shall be awarded where the upholstery covering material is shown to comply, as appropriate, with the limits for restricted arylamine dyes, extractable heavy metals and free formaldehyde set out below. For textile fabrics and coated fabrics: • No restricted arylamines (see Appendix II) present above 30 mg/kg (limit applies to each individual amine) according to EN ISO 14362-1 and 14362-3. • Free and partly hydrolysable formaldehyde ≤ 75 mg/kg according to EN ISO 14184-1. • Extractable heavy metals determined according to EN ISO 105-E04 being less than the following limits (in mg/kg): antimony ≤ 30.0; arsenic ≤ 1.0; cadmium ≤ 0.1; chromium ≤ 2.0; cobalt ≤ 4.0; copper ≤ 50.0; lead ≤ 1.0; mercury ≤ 0.02 and nickel ≤ 1.0. For leather: • No restricted arylamines (see Appendix II) present above 30 mg/kg (limit applies to each individual amine) according to EN ISO 17234-1 and EN ISO 172334-2. • Chromium VI should not exceed 3 mg/kg according to EN ISO 17075 (detection limit). • Free and partly hydrolysable formaldehyde ≤ 300 mg/kg according to EN ISO 17226-1. • Extractable heavy metals determined according to EN ISO 17072-1 being less than the following limits (in mg/kg): antimony ≤30.0; arsenic ≤1.0; cadmium ≤0.1; chromium ≤200.0; cobalt ≤ 4.0; copper ≤ 50.0; lead ≤ 1.0; mercury ≤ 0.02 and nickel ≤ 1.0. **Verification:** Points shall be awarded to tenderers that provide a declaration that the leather, textile fabric or coated fabric upholstery covering material, as appropriate, complies with the above limits, supported by results from relevant test methods either commissioned by the tenderer themselves or the material supplier. Upholstered furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or textile fabrics which have been awarded the EU Ecolabel for textiles, as established in Commission Decision 2014/350/EU, or upholstery materials that have been awarded other ISO 14024 Type I ecolabels directly fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.

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AC4: Low VOC emission furniture

(only applicable to upholstered furniture)

Points will be awarded for demonstrating that the Total Volatile Organic Compound (TVOC) emissions from the entire upholstered furniture product (such as armchairs, sofas or office chairs), or from testing of the upholstery material alone (when this is considered to be the most significant source of VOC emissions from the furniture product (e.g. leather or coated fabrics) result in chamber concentrations of TVOCs of less than 500 µg/m^3 after 28 days testing according to ISO 16000 or equivalent standards under the following loading and ventilation rates:

Test element	Chamber volume and loading rate	Ventilation rate
Armchairs and sofas	2-10m^3 test chamber with at least 25% of volume occupied by product	4.0 m^3/h
Office chairs		2.0 m^3/h
Leather and coated fabric upholstery materials	≥20 L chamber volume (loading rate linked to ventilation rate)	1.5 m^3/m^2/h

Verification:

The tenderer shall provide a copy of a chamber test report carried out in accordance with the requirements of the ISO 16000 series of standards or equivalent standards. If the chamber concentration limit specified at 28 days can be met earlier, then the test may be stopped prematurely.

The tenderer shall make it clear whether the test was applied to the entire furniture product or only to defined components materials.

Upholstered furniture products which have been awarded the EU Ecolabel for furniture, as established in Commission Decision (EU) 2016/1332 or other ISO 14024 Type I ecolabels fulfilling the listed requirements, or using equivalent methods, shall be deemed to comply.

AC3 / 5: Extended warranty periods

(same for core and comprehensive)

A maximum of X additional points shall be awarded for each additional year of warranty and service agreement offered that is more than the minimum technical specification (see TS 7/10 above) as follows:

- +4 or more years extra warranty: x points
- +3 years extra warranty: 0.75x points
- +2 years extra warranty: 0.5x points

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- +1 year extra warranty: 0.25x points **Verification:** The tenderer shall provide a written declaration detailing the offered period and stating that it covers the conformity of the goods with the contract specifications, including all indicated usage.	
	AC6: Low chemical residue padding materials[13] ***(only applicable to upholstered furniture)*** Where latex foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for chlorophenols, heavy metals, pesticides and butadiene listed in Table 7 of Appendix III, in accordance with the corresponding test method (A-D) listed in the same table. Where polyurethane foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for heavy metals, plasticisers, TDA, MDA, tinorganic substances and other specific substances listed in Table 8 of Appendix III in accordance with the corresponding test method (A-E) listed in the same table. Where other padding materials are used, points shall be awarded if compliance with the chemical residue limits set out in either Table 7 or Table 8 of Appendix III can be demonstrated. **Verification:** **For latex foams:** The tenderer shall provide a declaration of compliance with this criterion, supported by test reports according to the following methods: A. For chlorophenols the tenderer shall provide a report presenting the results of the following test procedure. 5 g of sample shall be milled and chlorophenols shall be extracted in the form of phenol (PCP), sodium salt (SPP) or esters. The extracts shall be analysed by means of gas chromatography (GC). Detection shall be made with mass spectrometer or electron capture detector (ECD). B. For heavy metals the tenderer shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by inductively coupled plasma optical emission spectrometry (ICP-OES), also known as inductively coupled plasma atomic emission spectrometry (ICP-AES), or by atomic absorption spectrometry using a hydride or cold vapour process. C. For pesticides the tenderer shall provide a report presenting the results of the following test

[13] Note that chemical residue testing requirements for latex foam and polyurethane foams have been established by industry-led voluntary schemes such as the EuroLatex ECO Standard and the CertiPUR standard. At the time of writing, these schemes were considered to provide a sufficient level of assurance.

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	procedure. 2 g of sample is extracted in an ultrasonic bath with a hexane/dichloromethane mixture (85/15). The extract is cleaned up by acetonitrile agitation or by adsorption chromatography over florisil. Measurement and quantification are determined by gas chromatography with detection on an electron capture detector or by coupled gas chromatography/mass spectrometry. The testing on pesticides is requested for latex foams with a content of at least 20 % natural latex. D. For butadiene the tenderer shall provide a report presenting the results of the following test procedure. Following milling and weighing of the latex foam, headspace sampling shall be performed. Butadiene content shall be determined by gas chromatography with detection by flame ionisation. **For polyurethane foams:** The tenderer shall provide a declaration of compliance with this criterion, supported by test reports that demonstrate compliance with the limits in Table 8 of Appendix III. For methods B, C, D and E, 6 composite samples shall be taken from a maximum depth of up to 2 cm from the surface faces of the material sent to the relevant laboratory. A. For phthalates and other specific substances listed in Table 8 of Appendix III, the tenderer shall provide a declaration supported by declarations from suppliers of the foam confirming that they have not been added intentionally to the foam formulation. B. For heavy metals the tenderer shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by atomic emission spectrometry with inductively coupled plasma (ICP-AES or ICP-OES) or by atomic absorption spectrometry using a hydride or cold vapour process. C. For the total amount of plasticizers the tenderer shall provide a report presenting the results of the following test procedure. Extraction shall be performed using a validated method such as the subsonic extraction of 0.3 g of sample in a vial with 9 ml of t-Butylmethylether during 1 hour followed by the determination of phthalates by GC using a single ion monitoring mass selective detector (SIM Modus). D. For TDA and MDA the tenderer shall provide a report presenting the results of the following test procedure. Extraction of a 0.5 g composite sample in a 5 ml syringe shall be performed with 2.5 ml of 1 % aqueous acetic acid solution. The syringe is squeezed and the liquid returned to the syringe. After repeating this operation 20 times, the final extract is kept for analysis. A new 2.5 ml of 1% aqueous acetic acid is then added to the syringe and another 20 cycles repeated. After this, the extract is combined with the first extract and diluted to 10 ml in a volumetric flask with acetic acid. The extracts shall be analysed by high-performance liquid chromatography (HPLC-UV) or HPLC-MS. If HPLC-UV is performed and interference is suspected, reanalysis with high performance liquid chromatography–mass spectrometry

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(HPLC-MS) shall be performed.

E. For tinorganic substances the tenderer shall provide a report presenting the results of the following test procedure. A composite sample of 1-2 g weight shall be mixed with at least 30ml of extracting agent during 1 hour in an ultrasonic bath at room temperature. The extracting agent shall be a mixture composed as follows: 1750 ml methanol + 300 ml acetic acid + 250 ml buffer (pH 4.5). The buffer shall be a solution of 164 g of sodium acetate in 1200 ml of water and 165 ml acetic acid, to be diluted with water to a volume of 2000 ml. After extraction the alkyl tin species shall be derivatized by adding 100 µl of sodium tetraethylborate in tetrahydrofuran (THF) (200 mg/ml THF). The derivative shall be extracted with n-hexane and the sample shall be submitted to a second extraction procedure. Both hexane extracts shall be combined and further used to determine the organotin compounds by gas chromatography with mass selective detection in SIM modus.

AC7.1: Low emission latex foam padding materials[14]

(only applicable to upholstered furniture)

Where latex foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for VOC emissions as listed below.

Substance	Limit value (mg/m³)
1,1,1 – trichloroethane	0.2
4-Phenylcyclohexene	0.02
Formaldehyde	0.01
Nitrosamines*	0.001
Styrene	0.01
Tetrachloroethylene	0.15
Toluene	0.1
Trichlorethylene	0.05
Vinyl chloride	0.0001
Vinyl cyclohexene	0.002
Aromatic hydrocarbons (total)	0.3
VOCs (total)	0.5
* N-nitrosodimethylamine (NDMA), N-nitrosodiethylamine (NDEA), N-nitrosomethylethylamine (NMEA), N-nitrosodi-i-propylamine (NDIPA), N-nitrosodi-n- propylamine (NDPA), N-nitrosodi-n-butylamine (NDBA), N-nitrosopyrrolidinone (NPYR), N-nitrosopiperidine (NPIP), N-nitrosomorpholine (NMOR).	

Where polyurethane foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for VOC emissions as listed in Table

[14] Note that VOC emission testing requirements for latex foam and polyurethane foams have been established by industry-led voluntary schemes such as the EuroLatex ECO Standard and the CertiPUR standard. At the time of writing, these schemes were considered to provide a sufficient level of assurance.

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10_of Appendix IV.

Where other padding materials are used, points can also be awarded if compliance with the VOC emission limits set out in either Table 9 or Table 10 of Appendix IV can be demonstrated.

Verification:

For latex foams

The tenderer shall provide a declaration of compliance with this criterion, supported by a test report presenting the results of chamber test analysis in accordance with ISO 16000-9 or equivalent tests.

The wrapped sample shall be stored at room temperature at least for 24 hours. After this period the sample shall be unwrapped and immediately transferred into the test chamber. The sample shall be placed on a sample holder, which allows air access from all sides. The climatic factors shall be adjusted according to ISO 16000-9. For comparison of test results, the area specific ventilation rate (q=n/l) shall be 1. The ventilation rate shall be between 0.5 and 1. The air sampling shall be done 24±1 h after loading of the chamber during 1 hour on DNPH cartridges for the analysis of formaldehyde and other aldehydes and on Tenax TA for the analysis of other volatile organic compounds. Sampling duration for other compounds may be longer but shall be completed before 30 hours.

The analysis of formaldehyde and other aldehydes shall comply with the standard ISO 16000-3 or equivalent tests. Unless specified differently, the analysis of other volatile organic compounds shall comply with the standard ISO 16000-6.

The analysis of nitrosamines shall be done by means of gas chromatography in combination with a thermal energy analysis detector (GC-TEA), in accordance with the BGI 505-23 method (formerly: ZH 1/120.23) or equivalent.

AC7.2: Low emission polyurethane foam padding materials

(only applicable to upholstered furniture)

Where polyurethane foam is used as a padding material in furniture upholstery, points shall be awarded if the foam complies with the requirements for VOC emissions listed below.

Substance (CAS number)	**Limit value (mg/m³)**
Formaldehyde (50-00-0)	0.01
Toluene (108-88-3)	0.1
Styrene (100-42-5)	0.005
Each detectable compound classified as categories C1A or	0.005

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C1B according to the Regulation (EC) No 1272/2008 of the European Parliament and of the Council	
Sum of all detectable compound classified as categories C1A or C1B according to Regulation (EC) No 1272/2008	0.04
Aromatic hydrocarbons	0.5
VOCs (total)	0.5

Verification:

The tenderer shall provide a declaration of compliance with this criterion, supported by test results that show compliance with the limits stated in Table 10. The test sample/chamber combination shall be either:

1 sample of 25x20x15 cm dimensions is placed in a 0.5 m^3 test chamber or

2 samples of 25x20x15 cm dimensions are placed in a 1.0 m^3 test chamber.

The foam sample shall be placed on the bottom of an emission test chamber and conditioned for 3 days at 23 °C and 50 % relative humidity, applying an air exchange rate n of 0.5 per hour and a chamber loading L of 0.4 m^2/m^3 (= total exposed surface of sample in relation to chamber dimensions without sealing edges and back) in accordance with ISO 16000-9 and ISO 16000-11 or equivalent tests.

Sampling shall be done 72 ± 2 h after loading of the chamber during 1 hour via Tenax TA and DNPH cartridges for VOC and formaldehyde analysis respectively. The emissions of VOC are being trapped on Tenax TA sorbent tubes and subsequently analysed by means of thermo-desorption-GC-MS in accordance to ISO 16000-6 or equivalent tests.

Results are semi-quantitatively expressed as toluene equivalents. All specified individual analytes are reported from a concentration limit ≥ 1 µg/m³. Total VOC value is the sum of all analytes with a concentration ≥ 1 µg/m³ and eluting within the retention time window from n-hexane (C6) to n-hexadecane (C16), both included. The sum of all detectable compounds classified as categories C1A or C1B according to Regulation (EC) No 1272/2008 is the sum of all these substances with a concentration ≥ 1 µg/m³. In case the test results exceed the standard limits, substance specific quantification needs to be performed. Formaldehyde can be determined by collection of the sampled air onto DNPH cartridge and subsequent analysis by HPLC/UV in accordance with ISO 16000-3 or equivalent tests.

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C. Procurement of furniture End-of-Life services

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATION	
TS1: Collection and reuse of existing furniture stock *An assessment of the condition of the furniture to be collected shall be provided by the contracting authority (CA) in the ITT which also may define a minimum re-use target to be met (e.g. 50% of provided furniture). Bed mattresses should be excluded from any minimum re-use targets due to hygiene reasons.* Tenderers shall collect the furniture directly from a site specified by the contracting authority and provide a re-use and recycling service for furniture that has reached the end of its service life. The tenderer shall provide a description of how they will extend the service life of the furniture by supplying it for reuse. Furniture items/parts that are considered not suitable to reuse, and according to the knowledge of the CA about appropriate recycling facilities in the region, one of the following options shall be chosen: **Option a.** Furniture items/parts that are not possible to re-use shall be disassembled into different material streams, as a minimum plastics, metals, textiles and wood before being sent to different recycling facilities[15]. Any remaining materials shall be sent to energy recovery facilities, wherever these are available at the regional level. **Option b.** Metal parts from furniture items/parts that are not possible to re-use shall be recycled and the remainder of the furniture product shall be sent to energy recovery facilities, wherever these are available at the regional level. **Verification:** The tenderer shall provide details of the arrangements for the collection of the furniture, as well as re-use and recycling routes to be used. This shall include the details of all involved parties in the re-use and recycling of the furniture.	**TS1: Collection and reuse of existing furniture stock** *An assessment of the condition of the furniture to be collected shall be provided by the contracting authority (CA) in the ITT which also may define a minimum re-use target to be met (e.g. 50% of provided furniture). Bed mattresses should be excluded from any minimum re-use targets due to hygiene reasons.* Tenderers shall collect the furniture directly from a site specified by the contracting authority and provide a re-use and recycling service for furniture that has reached the end of its service life. The tenderer shall provide a description of how they will extend the service life of the furniture by supplying it for reuse. Furniture items/parts that are not possible to re-use shall be disassembled into different material streams, as a minimum plastics, metals, textiles and wood before being sent to different recycling facilities[16]. Any remaining materials shall be sent to energy recovery facilities, wherever these are available at the regional level. **Verification:** The tenderer shall provide details of the arrangements for the collection of the furniture, as well as re-use and recycling routes to be used. This shall include the details of all involved parties in the re-use and recycling of the furniture.
AC1: Improvement in the re-use targets Points shall be awarded to tenderers offering higher levels of re-use than those stated in the Technical Specification. **Verification:** The tenderer shall provide details of how the additional level of re-use will be achieved.	

[15] All recycling facilities shall be permitted in compliance with Article 23 of Directive 2008/98/EC.

[16] See footnote 11

3 LIFE CYCLE COSTING

There are virtually no running costs associated with furniture items included within the EU GPP scope. Consequently, the most important influence on life cycle costs is the lifetime of the furniture item. The choice of durable and resistant materials is important but perhaps even more important is that component parts and materials are combined together to form a robust product that is lends itself well to repair or refurbishment. The optimum way to ensure such a product is to require compliance with relevant EN technical standards and to have a minimum warranty included. Due to the increased risk and responsibility, extended warranties are often associated with price increases. Whether or not an extended warranty is attractive or not will depend on the nature of the product itself and what it is to be used for, i.e. moving parts, outdoor use etc.

According to Bartlett[17], the typical lifetime of office furniture in the UK is 9-12 years, despite the fact that furniture is often designed with much longer function lifetimes. The premature End-of-Life (EoL) of office furniture is often determined by corporate decisions to redecorate or relocate offices and results in perfectly functional furniture being disposed of for aesthetic reasons. In general, the need for new furniture stock in a public organisation may be due to:

- New premises/staff or expansion of existing premises,
- Old furniture not being adequate after renovation of existing public buildings (for example the wrong colour, shape or size),
- Old furniture falling into disrepair (damaged furniture that is no longer safe and/or fully functional).

With the latter two situations, it may be possible to actually refurbish existing furniture instead of buying brand-new products. Recently (June 2014), the UK government published the latest version of its guidance document for furniture procurement. Anecdotal evidence states that the refurbishment of existing furniture has clear and substantial economic savings compared to the purchasing of equivalent new furniture. Concrete data is difficult to find on the actual cost savings associated with choosing furniture refurbishment. Walsh[18] estimated savings to be 25-50% and the UK government have published the following data as an indicative guide:

Table 1. Estimated average unit prices for furniture items as new, reused or refurbished[19]

	Desks (£)	**Chairs (£)**	**Shelving (£)**	**Pedestal (£)**
New Recommended Retail Price	209	122	100	107
Reused Recommended Retail Price (proxy)	105	86	50	53
Refurbished Recommended Retail Price (proxy)	84	49	40	43

Markets for good-quality second hand office furniture generally involve dealers and auctioneers[20] while not-for-profit organisations are strongly involved with lower quality second-hand furniture. Neither of these types of suppliers is well set up to respond to invitations to tender.

Based on the indicative guide costs above, it is clear that cost savings of up to 50% can be achieved. The biggest obstacle to growth in the furniture refurbishment sector in the EU appears to be a lack of demand from the market. It must be borne in mind that furniture refurbishment is most attractive for high quality and expensive

[17] Bartlett, 2009. "Reuse of office furniture – incorporation into the 'Quick Wins' criteria: A study of the market potential for reused and remanufactured office furniture in the UK.

[18] Walsh, 2011. "Public procurement of remanufactured products. An examination of the potential for increasing the use of remanufactured products by local authorities in the North East of England". See: www.remanufacturing .org.uk

[19] UK Government Buying Standards Impact Assessment: accessed: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341462/Furniture_GBS_impact_assessment_1407.pdf

[20] Kelday, 2009. An assessment of the remanufacture of office furniture in the UK. Centre for Remanufacturing and Reuse. See: www.remanufacturing.org

furniture items, such as professional office furniture, and that while simple refurbishment tasks can be carried out onsite by technicians; other tasks may require the transport of the furniture to a workshop.

APPENDIX I. Durability requirements for leather, textile fabric and coated fabric materials

Requirements for good physical quality upholstery materials in furniture are defined in Tables 2, 3 and 4 below.

Table 2. Physical requirements of leather materials in furniture upholstery (taken from Tables 1 and 2 in EN 13336)

Fundamental characteristics	Test method		Recommended values		
			Nubuck, Suede and Aniline*	Semi-aniline*	Coated, pigmented and other*
pH and ΔpH	EN ISO 4045		≥ 3.5 (if the pH is ≤4.0, ΔpH shall be ≤ 0.7		
Tear load, average value	EN ISO 3377-1		> 20 N		
Colour fastness to to-and-fro rubbing	EN ISO 11640. Total mass of finger 1000g. Perspiration alkaline solution as defined in EN ISO 11641.	Aspects to be evaluated	Change of leather colour and felt staining	Change of leather colour and felt staining No destruction of finish	
		using dry felt	50 cycles, ≥ 3 grey scale	500 cycles, ≥ 4 grey scale	
		using wet felt	20 cycles, ≥ 3 grey scale	80 cycles, ≥ 3/4 grey scale	250 cycles, ≥ 3/4 grey scale
		using felt wetted with artifical persperation	20 cycles, ≥ 3 grey scale	50 cycles, ≥ 3/4 grey scale	80 cycles, ≥ 3/4 grey scale
Colour fastness to artificial light	EN ISO 105-B02 (method 3)		≥ 3 blue scale	≥ 4 blue scale	≥ 5 blue scale
Dry finish adhesion	EN ISO 11644		--	≥ 2N / 10mm	
Dry flex resistance	EN ISO 5402-1		For aniline leather with non-pigmented finish only, 20 000 cycles (no finish damage cracks)	50 000 cycles (no finish damage cracks)	50 000 cycles (no finish damage cracks)
Colour fastness to water spotting	EN ISO 15700		≥ 3 grey scale (no permanent swelling)		
Cold crack resistance of finish	EN ISO 17233		--	-15°C (no finish crack)	
Fire resistance	EN 1021 or relevant national standards		Pass		

*Definitions of these leather types are according to EN 15987

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Table 3. Physical requirements for textile fabric covering materials in furniture upholstery.

Test factor	Method	Removable and washable coverings	Non-removable and washable coverings
Dimensional changes during washing and drying	Domestic washing: ISO 6330 + EN ISO 5077 (three washes at temperatures as indicated in the product with tumble drying after each washing cycle) Commercial washing: ISO 15797 + EN ISO 5077 (at minimum of 75 °C)	+/- 3.0% for woven fabrics +/- 6.0% for non-woven fabrics	N/A
Colour fastness to washing	Domestic washing: ISO 105-C06 Commercial washing: ISO 15797 + ISO 105-C06 (at minimum of 75 °C)	≥ level 3-4 for colour change ≥ level 3-4 for staining	N/A
Colour fastness to wet rubbing*	ISO 105 X12	≥ level 2-3	≥ level 2-3
Colour fastness to dry rubbing*	ISO 105 X12	≥ level 4	≥ level 4
Colour fastness to light	ISO 105 B02	≥ level 5**	≥ level 5**
Fabric resistance to pilling	Knitted and non-woven products: ISO 12945-1 Woven fabrics: ISO 12945-2	ISO 12945-1 result >3 ISO 12945-2 result >3	ISO 12945-1 result >3 ISO 12945-2 result >3

***** does not apply to white products or products that are neither dyed nor printed

** A level of 4 is nevertheless allowed when furniture covering fabrics are both light coloured (standard depth ≤ 1/12) and made of more than 20 % wool or other keratin fibres, or more than 20 % linen or other bast fibres.

† For further guidance about performance classes and limits, procurers are referred to EN 14465.

Table 4. Physical requirements for coated fabric covering materials in furniture upholstery.

Property	Method	Requirement
Tensile strength	ISO 1421	CH ≥ 35daN and TR ≥ 20daN
Tear resistance of plastic film and sheeting by the trouser tear method	ISO 13937/2	CH ≥ 2,5daN and TR ≥2daN
Colour fastness to artificial weathering – Xenon arc fading lamp test	EN ISO 105-B02	Indoor use ≥ 6; Outdoor use ≥ 7
Textiles – abrasion resistance by the Martindale method	ISO 5470/2	≥ 75,000
Determination of coating adhesion	EN 2411	CH ≥ 1,5daN and TR ≥ 1,5daN

Where: daN = deca Newtons, CH = Warp and TR = Weft

APPENDIX II. Restricted arylamines in leather, textile and coated fabric materials

Included here are the substances listed in Entry 43 of Annex XVII to Regulation (EC) No 1907/2006 that shall be tested for in any dyed leather (using the EN ISO 17234 standard) or textiles (using the EN ISO 14362-1 and 14362-3 standards).

Table 5. Carcinogenic arylamines to be tested in textiles or leather.

Aryl amine	CAS Number	Aryl amine	CAS Number
4-aminodiphenyl	92-67-1	3,3′-dimethyl-4,4′-diaminodiphenylmethane	838-88-0
Benzidine	92-87-5	4,4′-oxydianiline	101-80-4
4-chloro-o-toluidine	95-69-2	4,4′-thiodianiline	139-65-1
2-naphtylamine	91-59-8	o-toluidine	95-53-4
o-amino-azotoluene	97-56-3	2,4-diaminotoluene	95-80-7
2-amino-4-nitrotoluene	99-55-8	2,4,5-trimethylaniline	137-17-7
4-chloroaniline	106-47-8	4-aminoazobenzene	60-09-3
2,4-diaminoanisol	615-05-4	o-anisidine	90-04-0
4,4′-diaminodiphenylmethane	101-77-9	p-cresidine	120-71-8
3,3′-dichlorobenzidine	91-94-1	3,3′-dimethylbenzidine	119-93-7
3,3′-dimethoxybenzidine	119-90-4	4,4’-methylene-bis-(2-chloro-aniline)	101-14-4

A number of dye compounds, although not directly restricted by Entry 43 of Annex XVII to Regulation (EC) No 1907/2006, are known to cleave during processing to form some of the prohibited substances listed in Table 5 above. In order to greatly reduce uncertainty about compliance with the established limit of 30 mg/kg for the substances listed in Table 5, manufacturers are recommended, but not obliged, to avoid the use of the dyes listed in Table 6.

Table 6. Indicative list of dyes that may cleave to form carcinogenic arylamines

Disperse dyes		Basic dyes	
Disperse Orange 60	Disperse Yellow 7	Basic Brown 4	Basic Red 114
Disperse Orange 149	Disperse Yellow 23	Basic Red 42	Basic Yellow 82
Disperse Red 151	Disperse Yellow 56	Basic Red 76	Basic Yellow 103
Disperse Red 221	Disperse Yellow 218	Basic Red 111	
Acid dyes			
CI Acid Black 29	CI Acid Red 4	CI Acid Red 85	CI Acid Red 148
CI Acid Black 94	CI Acid Red 5	CI Acid Red 104	CI Acid Red 150
CI Acid Black 131	CI Acid Red 8	CI Acid Red 114	CI Acid Red 158
CI Acid Black 132	CI Acid Red 24	CI Acid Red 115	CI Acid Red 167
CI Acid Black 209	CI Acid Red 26	CI Acid Red 116	CI Acid Red 170
CI Acid Black 232	CI Acid Red 26:1	CI Acid Red 119:1	CI Acid Red 264
CI Acid Brown 415	CI Acid Red 26:2	CI Acid Red 128	CI Acid Red 265
CI Acid Orange 17	CI Acid Red 35	CI Acid Red 115	CI Acid Red 420
CI Acid Orange 24	CI Acid Red 48	CI Acid Red 128	CI Acid Violet 12
CI Acid Orange 45	CI Acid Red 73	CI Acid Red 135	
Direct dyes			
Direct Black 4	Direct Blue 192	Direct Brown 223	Direct Red 28
Direct Black 29	Direct Blue 201	Direct Green 1	Direct Red 37
Direct Black 38	Direct Blue 215	Direct Green 6	Direct Red 39

Direct Black 154	Direct Blue 295	Direct Green 8	Direct Red 44
Direct Blue 1	Direct Blue 306	Direct Green 8.1	Direct Red 46
Direct Blue 2	Direct Brown 1	Direct Green 85	Direct Red 62
Direct Blue 3	Direct Brown 1:2	Direct Orange 1	Direct Red 67
Direct Blue 6	Direct Brown 2	Direct Orange 6	Direct Red 72
Direct Blue 8	Basic Brown 4	Direct Orange 7	Direct Red 126
Direct Blue 9	Direct Brown 6	Direct Orange 8	Direct Red 168
Direct Blue 10	Direct Brown 25	Direct Orange 10	Direct Red 216
Direct Blue 14	Direct Brown 27	Direct Orange 108	Direct Red 264
Direct Blue 15	Direct Brown 31	Direct Red 1	Direct Violet 1
Direct Blue 21	Direct Brown 33	Direct Red 2	Direct Violet 4
Direct Blue 22	Direct Brown 51	Direct Red 7	Direct Violet 12
Direct Blue 25	Direct Brown 59	Direct Red 10	Direct Violet 13
Direct Blue 35	Direct Brown 74	Direct Red 13	Direct Violet 14
Direct Blue 76	Direct Brown 79	Direct Red 17	Direct Violet 21
Direct Blue 116	Direct Brown 95	Direct Red 21	Direct Violet 22
Direct Blue 151	Direct Brown 101	Direct Red 24	Direct Yellow 1
Direct Blue 160	Direct Brown 154	Direct Red 26	Direct Yellow 24
Direct Blue 173	Direct Brown 222	Direct Red 22	Direct Yellow 48

APPENDIX III. Low chemical residue padding materials

The concentrations in the latex foam of the substances listed below shall not exceed the limit values shown in Table 7.

Table 7. Restricted substances in latex foams used in furniture upholstery padding materials

Group of substances	Substance	Limit value (ppm)	Assessment and verification conditions
Chlorophenols	mono- and di-chlorinated phenols (salts and esters)	1	A
	Other chlorophenols	0.1	A
Heavy metal	As (Arsenic)	0.5	B
	Cd (Cadmium)	0.1	B
	Co (Cobalt)	0.5	B
	Cr (Chromium), total	1	B
	Cu (Copper)	2	B
	Hg (Mercury)	0.02	B
	Ni (Nickel)	1	B
	Pb (Lead)	0.5	B
Pesticides (only to be tested for foams composed of natural latex by at least 20 % by weight).	Aldrin	0.04	C
	o,p-DDE	0.04	C
	p,p-DDE	0.04	C
	o,p-DDD	0.04	C
	p,p-DDD	0.04	C
	o,p-DDT	0.04	C
	p,p-DDT	0.04	C
	Diazinone	0.04	C
	Dichlorfenthion	0.04	C
	Dichlorvos	0.04	C
	Dieldrin	0.04	C
	Endrin	0.04	C
	Heptachlor	0.04	C
	Heptachlorepoxide	0.04	C
	Hexachlorobenzene	0.04	C
	Hexachlorocyclohexane	0.04	C
	α-Hexachlorocyclohexane	0.04	C
	β-Hexachlorcyclohexane	0.04	C
	γ-Hexachlorocyclohexane (Lindane)	0.04	C
	δ-Hexachlorocyclohexane	0.04	C
	Malathion	0.04	C
	Methoxichlor	0.04	C
	Mirex	0.04	C
	Parathion-ethyl	0.04	C
	Parathion-methyl	0.04	C
Other specific substances that are restricted	Butadiene	1	D

The concentrations in the PUR foam of the substances and mixtures listed below shall not exceed the limit values shown in Table 8.

Table 8. List of restricted substances in PUR

Substance group	Substance (acronym, CAS number, element symbol)	Limit value	Method
Heavy Metals	As (Arsenic)	0.2 ppm	B
	Cd (Cadmium)	0.1 ppm	B
	Co (Cobalt)	0.5 ppm	B
	Cr (Chromium), total	1.0 ppm	B
	Cr VI (Chromium VI)	0.01 ppm	B
	Cu (Copper)	2.0 ppm	B
	Hg (Mercury)	0.02 ppm	B
	Ni (Nickel)	1.0 ppm	B
	Pb (Lead)	0.2 ppm	B
	Sb (Antimony)	0.5 ppm	B
	Se (Selenium)	0.5 ppm	B
Plasticizers	Dibutylphthalate (DBP, 84-74-2)*	0.01 % w/w (sum of all 6 phthalates in furniture for children less than 3 years old)) *0.01% w/w (sum of 4 phthalates in all other furniture products)	C
	Di-n-octylphthalate (DNOP, 117-84-0)*		
	Di (2-ethylhexyl)-phthalate (DEHP, 117-81-7)*		
	Butylbenzylphthalate (BBP, 85-68-7)*		
	Di-iso-decylphthalate (DIDP, 26761-40-0)		
	Di-iso-nonylphthalate (DINP, 28553-12-0)		
	ECHA Candidate List** phthalates	Not added intentionally[1]	A
TDA and MDA	2,4 Toluenediamine (2,4-TDA, 95-80-7)	5.0 ppm	D
	4,4'-Diaminodiphenylmethane (4,4'-MDA, 101-77-9)	5.0 ppm	D
Tinorganic substances	Tributyltin (TBT)	50 ppb	E
	Dibutyltin (DBT)	100 ppb	E
	Monobutyltin (MBT)	100 ppb	E
	Tetrabutyltin (TeBT)	-	-
	Monooctyltin (MOT)	-	-
	Dioctyltin (DOT)	-	-
	Tricyclohexyltin (TcyT)	-	-
	Triphenyltin (TPhT)	-	-
	Sum	500 ppb	E
Other specific substances that are restricted	Chlorinated hydrocarbons: (1,1,2,2-Tetrachloroethane, Pentachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene)	Not added intentionally	A
	Chlorinated phenols (PCP, TeCP, 87-86-5)	Not added intentionally	A
	Hexachlorocyclohexane (58-89-9)	Not added intentionally	A
	Monomethyldibromo–Diphenylmethane (99688-47-8)	Not added intentionally	A
	Monomethyldichloro-Diphenylmethane (81161-70-8)	Not added intentionally	A
	Nitrites	Not added intentionally	A
	Polybrominated Biphenyls (PBB, 59536-65-1)	Not added intentionally	A
	Pentabromodiphenyl Ether (PeBDE, 32534-81-9)	Not added intentionally	A
	Octabromodiphenyl Ether (OBDE, 32536-52-0)	Not added intentionally	A
	Polychlorinated Biphenyls (PCB, 1336-36-3)	Not added intentionally	A
	Polychlorinated Terphenyls (PCT, 61788-33-8)	Not added intentionally	A
	Tris(2,3-dibromopropyl) phosphate (TRIS, 126-72-7)	Not added intentionally	A
	Trimethylphosphate (512-56-1)	Not added intentionally	A
	Tris-(aziridinyl)-phosphinoxide (TEPA, 545-55-1)	Not added intentionally	A
	Tris(2-chloroethyl)-phosphate (TCEP, 115-96-8)	Not added intentionally	A
	Dimethyl methylphosphonate (DMMP, 756-79-6)	Not added intentionally	A

** With reference to the latest version of the ECHA Candidate List at the time of application

[1] "For this purpose non-intentionally added substances mean chemical compounds that are present in a material but have not been added for a technical reason during the production process."

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APPENDIX IV. List of relevant EN fitness for use standards

Table 9. Indicative list of EN furniture standards (elaborated by the Technical Committee CEN/TC 207 "Furniture").

Standard	Title
	Upholstered furniture
EN 1021-1	Furniture - Assessment of the ignitability of upholstered furniture - Part 1: Ignition source smouldering cigarette
EN 1021-2	Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source match flame equivalent
Note: In case there is national legislation or mandatory standards, which requires that furniture meets a specific level of flammability, the public authority has to take this into account when writing the tender documents. If no binding rules/standards exist, the public authority is not bound to adhere to any specific voluntary standard. In the case of the standards listed above, EN 1021-2 requires a lower level of flammability than EN 1021-1. This can lead to the use of flame retardant chemicals which may have negative effects for the environment, health, durability and quality of products, and may lead to cost increases. The public authority should therefore consider, according to the intended use and location of the furniture items, what levels of flammability it needs to require.	
	Office furniture
EN 527-1	Office furniture - Work tables and desks - Part 1: Dimensions
EN 527-2	Office furniture - Work tables and desks - Part 2: Mechanical safety requirements
EN 1023-2	Office furniture - Screens - Part 2: Mechanical safety requirements
EN 1335-1	Office furniture - Office work chair - Part 1: Dimensions - Determination of dimensions
EN 1335-2	Office furniture - Office work chair - Part 2: Safety requirements
EN 14073-2	Office furniture - Storage furniture - Part 2: Safety requirements
EN 14074	Office furniture - Tables and desks and storage furniture - Test methods for the determination of strength and durability of moving parts. (after testing, the components shall not be damaged and shall still function as intended).
	Outdoor furniture
EN 581-1	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 1: General safety requirements
EN 581-2	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 2: Mechanical safety requirements and test methods for seating
EN 581-3	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 3: Mechanical safety requirements and test methods for tables
	Seating furniture
EN 1022	Domestic furniture - Seating - Determination of stability
EN 12520	Furniture - Strength, durability and safety - Requirements for domestic seating
EN 12727	Furniture - Ranked seating - Test methods and requirements for strength and durability
EN 13759	Furniture - Operating mechanisms for seating and sofa-beds - Test methods
EN 14703	Furniture - Links for non-domestic seating linked together in a row - Strength requirements and test methods
EN 16139	Furniture - Strength, durability and safety - Requirements for non-domestic seating
	Tables
EN 12521	Furniture - Strength, durability and safety - Requirements for domestic tables
EN 15372	Furniture - Strength, durability and safety - Requirements for non-domestic tables
	Kitchen furniture
EN 1116	Kitchen furniture - Co-ordinating sizes for kitchen furniture and kitchen appliances
EN 14749	Domestic and kitchen storage units and worktops - Safety requirements and test methods
	Beds
EN 597-1	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 1: Ignition source: Smouldering cigarette
EN 597-2	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 2: Ignition source: Match flame equivalent
	Note: As regards to the flammability, please see remark on "Upholstered furniture" and standards EN 1021 above

EN 716-1	Furniture - Children's cots and folding cots for domestic use - Part 1: Safety requirements
EN 747-1	Furniture - Bunk beds and high beds - Part 1: Safety, strength and durability requirements
EN 1725	Domestic furniture - Beds and mattresses - Safety requirements and test methods
EN 1957	Furniture - Beds and mattresses - Test methods for determination of functional characteristics and assessment criteria
EN 12227	Playpens for domestic use - Safety requirements and test methods
Storage furniture	
EN 16121	Non-domestic storage furniture - Requirements for safety, strength, durability and stability
Other types of furniture	
EN 1729-1	Furniture - Chairs and tables for educational institutions - Part 1: Functional dimensions
EN 1729-2	Furniture - Chairs and tables for educational institutions - Part 2: Safety requirements and test methods
EN 13150	Workbenches for laboratories - Dimensions, safety requirements and test methods
EN 14434	Writing boards for educational institutions - Ergonomic, technical and safety requirements and their test methods

APPENDIX V: List of abbreviations used in the ISO 1043 plastic marking scheme

Table 10: ISO 1043-1 symbols for homopolymeric polymers

Symbol	Material	Symbol	Material	Symbol	Material
CMC	Carboxymethylcellulose	POM	Poly(oxymethylene);Polyformadehyde	PEEKK	Polyehtheretherketoneketone
CA	Celluloseacetate	PPE	Poly(phenyleneEther)	PEEST	Polyesterester
CAB	Celluloseacetatebutyrate	PPS	Poly(phenylenesulfide)	PEEK	Polyetheretherketone
CAP	Celluloseacetatepropionat	PPSU	Poly(phenylenesulfone)	PEI	Polyetherimide
CN	Cellulosenitrate	PVAC	Poly(vinylacetate)	PEK	Polyetherketone
CP	Cellulosepropionate	PVAL	Poly(vinylalcohol)	PEKEKK	Polyetherketoneetherketoneketone
CTA	Cellulosetriacetate	PVB	Poly(vinylbutyral)	PEKK	Polyetherketoneketone
CF	Cresol-formaldehyde	PVK	Poly(vinylcarbazole)	PES	Polyethersulfone
EP	Epoxide;Epoxy	PVC	Poly(vinylchloride)	PEUR	Polyetherurathane
EC	Ethylcellulose	PVF	Poly(vinylfluoride)	PE	Polyethylene
FF	Furan-formaldehyde	PVFM	Poly(vinylformal)	PI	Polyimide
PS-HI	Highimpactmodifiedpolystyrene	PVDF	Poly(vinylidenefluoride)	PIB	Polyisobutylene
MF	Melamine-formaldehyde	PVP	Poly(vinylpyrrolidone)	PIR	Polyisocyanurate
MC	Methylcellulose	PVDC	Poly(viynlidenechloride)	PMI	Polymethacylimide
PFA	Perfluoroalkoxlalkanepolymer	PMS	Poly-(α-methylstyrene)	PP	Polypropylene
PF	Phenol-formaldehyde	PAN	Polyacrylonitrile	PS	Polystyrene
PBAK	Poly(butylacylate)	PAEK	Polyacyetherketone	PSU	Polysulfone
PBT	Poly(butyleneterephthalate)	PA	Polyamide	PTFE	Polytetrafluorouethylene
PDAP	Poly(diallylphthalate)	PAI	Polyamidimide	PUR	Polyurethane
PEOX	Poly(ethyleneoxide)	PB	Polybutene	SI	Silicone
PET	Poly(ethyleneterephthalate)	PC	Polycarbonate	UP	Unsaturatedpolyester
PMMA	Poly(methylmethacrylate)	PCTFE	Polychlorotrifluoroethylene	UF	Urea-formaldehyde

Table 11: ISO 1043-1 symbols for co-polymeric materials

Symbol	Material	Symbol	Material
ABAK	Acrylonitrile-butadiene-acrylate	PEBA	Poly(etherblockamide)
ABS	Acrylonitrile-butadiene-styrene	PESTUR	Polyesterurethane
ACS	Acrylonitrile-chlorinatedpolyethylene-styrene	PFEP	Perfluoro(ethylene-propylene)
AEPDS*	Acrylonitrile/ethylene-propylene-diene/styrene	PMMI	Poly(N-methylmethylacylimide)
AMMA	Acrylonitrile-methylmethacrylate	PMP	Poly(4-methylpent-1-ene)
ASA	Acrylonitrile-styrene-acrylate	SAN	Styrene-acrylonitrile
CFS	Casein-formaldehyde	SB	Styrene-butadiene
E/P	Ethylene-propylene	SMAH	Styrene-maleicanhydride
EEAK	Ethylene-ethylacrylate	SMS	Styrene-α-methylstyrene
EMA	Ethylene-methacrylicacid	VCE	Vinylchloride-ethylene
ETFE	Ethylene-tetrafluoroethylene	VCEMAK	Vinylchloride-ethylene-methylacrylate
EVAC	Ethylene-vinylacetate	VCEVAC	Vinylchloride-ethylene-vinylacetate
EVOH	Ethylene-vinylalcohol	VCMAK	Vinylchloride-methylacrylate
LCP	Liquid-crystalpolymer	VCMMA	Vinylchloride-methylmethacrylate
MBS	Methacrylate-butadiene-styrene	VCOAK	Vinylchloride-octylacrylate
MMABS	Methylmethacrylate-acrylonitrile-butadiene-styrene	VCVAC	Vinylchloride-vinylacetate
MPF	Melamine-phenol-formadehyde	VCVDC	Vinylchloride-vinylidenechlodire
PAR	Polyarylate		

*AEPDS was known as EDPM

Table 12: ISO 1043-2 symbols for fillers and reinforcing materials in plastics

Symbol	Material [1]		Symbol	Form/Structure
B	Boron		B	Beads, spheres, balls
C	Carbon		C	Chips, cuttings
D	Alumina trihydrate		D	Fines, powders
E	Clay		F	Fiber, fibre
G	Glass		G	Ground
K	Calcium carbonate		H	Whisker
L	Cellulose		K	Knitted fabric
M	Mineral: metal [2]		L	Layer
N	Natural organic (cotton, sisal: hemp: flax: and so forth.)		M	Mat (thick)
P	Mica		N	Non-woven (fabric, thin)
Q	Silica		P	Paper
R	Aramid		R	Roving
S	Synthetic organic (finely divided PTFE: polyimides or thermoset resins)		T	Talcum
S	Flake		W	Wood
T	Twisted or braided fabric, cord		X	Not specified
V	Veneer		Z	Others (not included on this list)
W	Woven fabric		X	Not specified
Y	Yarn		Z	Others, not included on this list
[1] Materials may be further defined; for example by their chemical symbols or by additional symbols defined in the relevant International Standard.				
[2] In the case of metals (M), the type of metal must be indicated by its chemical symbol.				

Table 13: ISO 1043-3 abbreviations used for plasticizers

Abbreviation	Common name	IUPAC* equivalent	CAS-RN**
ASE	Alkysulfonic acid ester	Alkysulfonates or Alkyl alkanesulfonates	not known
BAR	butylo-acetylricinoleate	Butyl ®-12-acetoxyoleate	140-04-5
BBP	Benzyl butyl phthalate	same	85-68-7
BCHP	Butyl cyclohexl phthalate	same	84-64-0
BNP	Butyl nonyl phthalate	same	not known
BOA	Benzyl octyladipate	benzyl2-ethyhexyl adipate	3089-55-2
BOP	Butyl octyl phthalate	butyl2-ethylhexyl phthalate	85-69-8
BST	Butyl stearate	same	123-95-5
DBA	Dibutyl adipate	same	105-99-7
BEP	di-(2-butoxyethyl) phthalate	bis(2-butoxyethyl) phthalate	117-83-9
DBF	dibutyl fumarate	same	105-75-9
DBM	dibutyl maleate	same	105-76-0
DBP	dibutyl phthalate	same	84-74-2
DBS	dibutyl sebacate	same	109-43-3
DBZ	dibutyl azelate	same	2917-73-9
DCHP	dicyclohexyl phthalate	same	84-61-7
DCP	dicapryl phthalate	bis(1-methylheptyl) phthalate	131-15-7
DDP	didecyl phthalate	same	84-77-5
DEGDB	diethylene glycol dibenzoate	oxydiethylene dibenzoate	120-55-8
DEP	diethyl phthalate	same	84-66-2
DHP	diheptyl phthalate	same	3648-21-3
DHXP	dihexyl phthalate	same	84-75-3
DIBA	diisobutyl adipate	same	141-04-8
DIBM	diisobutyl maleate	same	14234-82-3
DIBP	diisobutyl phthalate	same	84-69-5
DIDA	diisobutyl adipate	***	27178-16-1
DIDP	diisodecyl phthalate	***	26761-40-0
DIHP	diisoheptyl phthalate	as above	41451-28-9
DIHXP	diisohexyl phthalate	same	71850-09-4
DINA	diisononyl adipate	***	33703-08-1
DINP	diisononyl phthalate	***	28553-12-0

Abbreviation	Common name	IUPAC* equivalent	CAS-RN**
DIOA	diisooctyl adipate	***	1330-86-5
DIOM	diisooctyl maleate	***	1330-76-3
DIOP	diisooctyl phthalate	***	27554-26-3
DIOS	diisooctyl sebacate	***	27214-90-0
DIOZ	diisooctyl azelate	***	26544-17-2
DIPP	diisooctyl phthalate	same	605-50-5
DMEP	di-(2-methyloxyethyl)	bis(2-methoxyethyl)	117-82-8
DMP	dimethyl phthalate	same	131-11-3
DMS	dimethyl sebacate	same	106-79-6
DNF	dinonyl fumarate	same	2787-63-5
DMN	dinonyl maleate	same	2787-64-6
DNOP	di-n-octyl phthalate	dioctyl phthalate	117-84-0
DNP	dinonyl phthalate	same	14103-61-8
DNS	dinonyl sebacate	same	4121-16-8
DOA	dioctyl3) adipate	bis(2-ethylhexyl)3) adipate	103-23-1
DOIP	dioctyl isophthalate	bis(2-ethylhexyl) isophthalate	137-89-3
DOP	dioctyl phthalate	bis(2-ethylhexyl) phthalate	117-81-7
DOS	dioctyl sebacate	bis(2-ethylhexyl) sebacate	122-62-3
DOTP	dioctyl terephthalate	bis(2-ethylhexyl) terephthalate	6422-86-2
DOZ	dioctyl azelate	bis(2-ethylhexyl) azelate	2064-80-4
DPCF	diphenyl cresyl phosphate	diphenyl x-tolyl orthophosphate where x demotes o, m, p or mixture	26444-49-5
DPGDB	di-x--propylene glycol dibenzoate	not possible	not known
DPOF	diphenyl octyl phosphate	2-ethylhexyl diphenyl orthophosphate or octyl diphenyl orthophosphate	1241-94-7
DPP	diphenyl phthalate	same	84-62-8
DTDP	diisotridecyl phthalate (see note X)	***	27253-26-5
DUP	diundecyl phthalate	same	3648-20-2
ELO	epoxidized linseed oil	not possible	8016-11-3
ESO	epoxidized soya bean oil	not possible	8013-07-8
GTA	glycerol triacetate	same	102-76-1
HNUA	heptyl nonyl undecyl adipate	not possible	Not known

Abbreviation	Common name	IUPAC* equivalent	CAS-RN**
	(=711A)		
HNUP	heptyl nonyl undecyl phthalate (=711P)	not possible	68515-42-4
HXODA	heptyl octyl decyl adipate (=610A)	not possible	not known
HXODP	heptyl octyl decyl phthalate (=610P)	not possible	68515-51-5
NUA	nonyl undecyl adipate (=911A)	not possible	not known
NUP	nonyl undecyl phthalate (=911P)	not possible	not known
ODA	octyl decyl adipate	decyl octyl adipate	110-29-2
ODP	octyl decyl phthalate	decyl octyl phthalate	68515-52-6
ODTM	n-octyl decyl trimellitate	decyl octyl hydrogen Benzene1,2,4-tricarboxylate	not known
PO	paraffin oil	not possible	8012-95-1
PPA	poly(propylene adipate)	same	not known
PPS	poly(propylene sebacate)	not possible	not known
SOA	sucrose octa-acetate	sucrose octaacetate	126-14-7
TBAC	tributyl o-acetylcitrate	same	77-90-7
TBEP	tri-(2-butoxyethyl) phosphate	tris(2-butoxyethyl) orthophosphate	78-51-3
TBP	tributyl phosphate	tributyl orthophosphate	126-73-8
TCEF	trichloroethyl phosphate	tris(2-chloroethyl) orthophosphate	6145-73-9
TCF	tricresyl phosphate	tri-x-tolyl orthophosphate where x denotes o, m, p or mixture	1330-78-5
TDBPP	tri-(2,3-dibromopropyl) phosphate	tris(2,3-dibromopropyl) orthophosphate	126-72-7
TDCPP	tri-(2,3-dichloropropyl) phosphate	tris(2,3-dichloropropyl) orthophosphate	78-43-3
TEAC	triethyl o-acetylcitrate	same	77-89-4
THFO	tetrahydrofurfuryl oleate	same	5420-17-7
THTM	triheptyl trimellitate	triheptyl benzene-1,2,4-tricarboxylate	1528-48-9
TIOTM	triisooctyl trimellitate	tris(6-methylheptyl) Benzene-1,2,4-tricarboxylate	27251-75-8
TOF	trioctyl phosphate	tris(2-ethylhexyl) orthophosphate	78-42-2
TOPM	tetraoctyl pyromellitate	tetrakis(2-ethylhexyl) benzene-1,2,45-tetracarboxylate	3126-80-5
TOTM	trioctyl trimelliate	tris(2-ethylhexyl) benzene-1,2,45-tetracarboxylate	89-04-3
TPP	triphenyl phosphate	triphenyl orthophosphate	115-86-6

Abbreviation	Common name	IUPAC* equivalent	CAS-RN**
TXF	trixylyl phosphate	tri-x,y-xylyl orthophosphate, where x and y denotes o, m, por mixture	25155-23-1

* IUPAC = International Union of Pure and Applied Chemicals

** CAS-RN = Chemical Abstracts Service – Registry Number

*** Several plasticizers having "iso" names indicating brached groups may consist of several isomers. For this reason, no single IUPAC name can describe the detailed chemical composition of each of these plasticizers.

Table 14. List of code numbers from ISO 1043-4 for flame retardant types used in plastics

HALOGONATED COMPOUNDS	
10	aliphatic/alicyclic chlorinated compounds
11	aliphatic/alicyclic chlorinated compounds in combination with antimony compounds
12	aromatic chlorinated compounds
13	aromatic chlorinated compounds in combination with antimony compounds
14	aliphatic/alicyclic brominated compounds
15	aliphatic/alicyclic brominated compounds in combination with antimony compounds
16	aromatic brominated compounds (excluding brominated diphenyl ether and biphenyls)
17	aromatic brominated compounds (excluding brominated diphenyl ether and biphenyls) in combination with antimony compounds
18	polybrominated diphenyl ether
19	polybrominated diphenyl ether in combination with antimony compounds
20	polybrominated biphenyls
21	polybrominated biphenyls in combination with antimony compounds
22	aliphatic/alicyclic chlorinated and brominated compounds
23, 24	not allocated
25	aliphatic fluorinated compounds
26 to 29	not allocated
NITROGEN COMPOUNDS	
30	nitrogen compounds (confined to melamine, melamine cyanurate, urea)
31 to 39	not allocated
ORGANIC PHOSPHORUS COMPOUNDS	
40	Halogen-free organic phosphorus compounds
41	Chlorinated organic phosphorus compounds
42	Brominated organic phosphorus compounds
43 to 49	not allocated
INORGANIC PHOSPHORUS COMPOUNDS	
50	ammonium orthophosphates
51	ammonium polyphosphates
52	red phosphorus
53 to 59	not allocated

METAL OXIDES, METAL HYDROXIDES, METAL SALTS	
60	aluminum hydroxide
61	magnesium hydroxide
62	antimony (III) oxide
63	alkali-metal antimonate
64	magnesium/calcium carbonate hydrate
65 to 69	not allocated
BORON AND ZINC COMPOUNDS	
70	inorganic boron compounds
71	organic boron compounds
72	zinc borate
73	organic zinc borate
74	not allocated
SILICA COMPOUNDS	
75	inorganic silica compounds
76	organic silica compounds
77 to 79	not allocated
OTHERS	
80	graphite
81 to 89	not allocated
90 to 99	not allocated