ams OSRAM
Packaging Requirements

Prepared by the ams OSRAM packaging department.
This guideline defines the packaging standards for deliveries to ams OSRAM facilities and logistics centers.

I2P6100

Objective

- To ensure safe transportation, high packaging quality, the use of sustainable materials, and efficient, cost-optimized implementation of packaging components.
- Suppliers are responsible for maintaining the quality of the shipped products, including packaging, throughout the entire supply chain.
- Compliance with all applicable local regulations is mandatory.
- The ams OSRAM Packaging Requirements replaces the previously valid documents ZQR 2146009, ZQR 2125736 and ZSP 2023688.

Scope and validity

- **Geographically**

  Global
- **Organization**

  ams OSRAM

Contacts and validity

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General

1.1. Description

As an integral part of ams OSRAM the “Global Supplier Requirements” provide the details on how to do business with ams OSRAM. The ams OSRAM Global Packaging Requirements and the “Standards for Delivery of Goods” (see chapter “Standards”) specifies the packaging/shipping standards for material being packed and shipped to ams OSRAM.

The requirements in this document are considered as an addendum to ams OSRAM Purchasing Terms & Conditions. Unless otherwise agreed in writing, in case of any conflict between this document and ams OSRAM Purchasing Terms & Conditions, the Purchasing Terms & Conditions shall prevail.

1.2. Applicability & Scope

This Standard shall apply to all worldwide activities of ams OSRAM and all deliveries to worldwide destinations of ams OSRAM. This document is part of the currently valid purchasing agreement between the supplier and ams OSRAM and states binding requirements for supply chain processes and procedures. Except otherwise explicitly specified in the currently valid purchasing agreement, the supplier shall undertake to meet the requirements stated in this standard.
If any of the provisions of this document is ineffective, the other provisions of this document shall remain in full force and effect.

These requirements apply to:

- Packaging departments at ams OSRAM,
- Other departments at ams OSRAM, which source packaging or packed products,
- External suppliers (packaging or packed products) and
- Contract packers, which source packaging or packed products.

1.3. Responsibilities

- The supplier is responsible for the quality and delivery of the products and therefore also for compliance with these packaging requirements. In order to ensure safe handling (in accordance with accident prevention and other regulations) and smooth operations, it is essential for all goods to be delivered in accordance with the requirements stated in this document.
- This document defines packaging procedures and functions. It describes the most important requirements for packaging material and the aspects to be considered when creating/ developing packaging concepts.
- It is the supplier’s responsibility to provide individual and/or collective packaging for the goods. The packaging provided by the supplier must ensure that the goods reach their destination in sufficient condition.
- The packaging must, among other things, protect the goods in transit from damage and from deterioration caused by environmental influences. The packaging must also protect personnel against hazards resulting from the goods themselves (e.g. regulations concerning the handling of hazardous goods).

2. Quality and Tolerances for Packaging Material

- For ams OSRAM packaging and packaging components certain general tolerances must be met. This is due to a variety of conditions, which may occur during the production process. The tolerances must not be taken into account when determining the internal dimensions, as the internal dimensions are defined as minimum dimensions. The supplier must set the tools/settings so that the internal dimensions are achieved taking into account his manufacturing tolerances.
- The tolerances are used only as acceptance criteria for quality control and not used for palletizing schemes. For palletizing and classification of materials the nominal values are used as before. This tolerance applies only to the outer dimensions and tooling lines, measured under standard climate (23 °C/50 % humidity).
- These tolerances apply to standard packaging. Special requirements for tolerances are described in the packaging specification.
  Values written in the packaging specification overrule these general tolerances. Parts made from foam or handmade parts require such special tolerance values.

2.1. Boxes made from corrugated fiberboard or corrugated plastic

- **Creasing tolerances**
  Distance between 2 parallel lines
  - up to 300 mm: ± 2 mm *(up to 11,8 inch: ± 0,08 inch)*
  - 301-700 mm: ± 3 mm (*11,8 inch - 27,6 inch: ± 0,12 inch)*
  - over 700 mm: ± 0,5 % *(over 27,6 inch: ± 0,5 %)*

- **Gluing tolerances**
  Of die cut
  - BC flute: - 4 mm to + 6 mm *(0,16 inch – 0,24 inch)*
  - C flute: ± 4 mm *(± 0,16 inch)*
  - B flute: ± 3 mm *(± 0,12 inch)*
  - E flute: ± 2 mm *(± 0,08 inch)*

- **Size tolerances**
  Of the die cut due to production method
  - Flat bed die cut: ± 2 mm *(± 0,08 inch)*
  - Rotary cut: ± 3 mm *(± 0,12 inch)*
  - Inline (slotted): ± 3 mm *(± 0,12 inch)*

2.2. Boxes made from paperboard or solid fiberboard

In general, a tolerance of ± 0,5 % applies to all thicknesses and materials, but a maximum of ± 1 mm *(± 0,04 inch),* due to gluing and production.

2.3. Parts and sheets made from plastic

Applicable for all shapes and production methods (without gluing).
All thicknesses and materials according to ISO 2768-1 Table 1: Permissible deviations for linear dimensions (tolerance classes: f, m, c, v).

2.4. Other packaging materials

According to specification defined or agreed by ams OSRAM packaging department.

3. Sustainability

3.1. General

For ams OSRAM it is important to continuously improve and harmonize the packaging material in cooperation with our suppliers. Whenever a supplier identifies an improvement opportunity to reduce and avoid packaging material, this must be brought to the attention to ams OSRAM packaging department.

- ams OSRAM tries to avoid packaging material wherever possible.
- Generally, parts must be packed in such a way that the use of packaging material is kept to a minimum while adequately protecting the product.
- ams OSRAM has clear guidelines for the design and procurement of packaging in accordance with PPWR (Packaging and Packaging Waste Regulation, see also chapter 3.6)

3.2. Packaging materials

Below overview lists the different materials used in relation to packaging.
Preferred materials, materials to be avoided and prohibited materials are listed.

Materials that are not approved require special authorisation from the Packaging Department at ams OSRAM.

ITEM	Approved	To avoid	Not Approved
Material in general			
Plastic	- Preferred from recycled material - Mono-Material	- Foamed plastic - PS	- PUR - PVC - CPE - EPS (2022) - Oxidatively degradable plastic - Not separable materials as PET-GAG - Plastic with graphite ~~for end consumer packaging~~
Paper based materials	- Preferred from recycled material	- Virgin fiber but FSC-certified	- Virgin fiber but not FSC-certified - Laminated paper/cardboard
Inks/Lacquers	- Vegetables based inks		- Solvent inks/lacquers - Lead containing inks - Mineral oil based inks

ITEM	Approved	To avoid	Not Approved
Packaging types			
Boxes	- GD/GT paperboard - Corrugated fiberboard - Reusable shipping boxes made from plastic (PP)	- Virgin fiber but FSC-certified	- Virgin fiber but not FSC-certified - Not water-soluble coatings or adhesives - Laminated paper - See "*plastic*"
Blister	- PET - Preferred from recycled material	- Composites are to be avoided in general	- Not separable materials need special approval by the packaging department
Trays	- PS, PP, PET - Paperboard/ corrugated fiberboard - Paper Pulp	- EPE - EPP	- PUR - PVC - EPS (2022) - See *"plastic"*
Shrink/stretch wrapping	- PE - PP		- PVC - Film with graphite
Bags/sacks	- PE, PP, paper		- Labelling made from foreign materials as the substrate
Labels, adhesive tapes	- Paper removable acc. QT504 "Glue-Separation Test" - PE, PP, PET, PS same material as product	- PE/PP or PET - not same material as product but easily removable	- PE/PP/PET/paper not easily removable stickers and adhesive tape made from foreign material
Cushion/ Inlays	- Paperboard / corrugated fiberboard - Paper Pulp	- EPE, EPP	- PUR - EPS (2022)
Straps	- PP		- Steel straps
Cushioning material	- Paper-chips - Paper-cushion		- EPS-Chips - Air-bubble foils - Organic cushioning material (besides paper fibers)
Wire	Only with approval from ams OSRAM packaging department (e.g. for labels, etc.)		
Clamps/ staples	Gluing is always preferred. If clamps/staples are required, this must be approved by the ams OSRAM packaging department.		
Desiccant	In case that desiccant is required, only silica gel is permitted.		

3.3. Recycling Marking

- This section deals with the mandatory labelling of the packaging/components. For product related labelling there are additional requirements (see e.g. WEEE).
- The supplier must fulfill all requirements according to packaging directives 94/62/EC and (EU) 2018/852 “on packaging and packaging waste”.
- Each packaging component must be identified by the recycling code. The symbol consists of a triangular circuit logo, the alphanumeric code and the corresponding material abbreviation.

- This helps the consumer in separate waste and thus contributes to proper return to the recycling cycle.

3.4. REACh Regulation/SVHC (Substance of Very High Concern)

REACh is the acronym for Registration Evaluation Authorisation and Restriction of Chemicals Regulation 1907/2006 (as amended)

According to Art 33 of the REACh Regulation the Candidate List of substances of very high concern (SVHC) is published by ECHA (European Chemicals Agency).

As required by Art. 33 supplier will inform ams OSRAM, if packaging materials contain one or more of these substances in a concentration exceeding 0.1% weight per article.

More information can be found under https://echa.europa.eu/candidate-list-table.
The supplier must find a substitution immediately and is obliged to inform ams OSRAM immediately in written form.

3.5 Substance restrictions in packaging materials

The following EU regulations restricting the use of certain hazardous substances are relevant for packaging and printing materials. The requirements must be fulfilled.

- **Packaging and Packaging Waste Regulation (EU) 2025/40 which replaces Directive 94/62/EC (“Packaging Directive”)**
- **Regulation (EC) No 1907/2006 (“REACh”) Annex XVII**
- **Regulation (EU) 2019/1021 (Persistent Organic Pollutants, POP)**
- **Article 112 of the French Law No. 2020-105 of 10 February 2020 on certain mineral oils (MOSH, MOAH)**

This applies to any kind of packaging material regardless of the packaging level (primary, secondary, tertiary level).

The following table informs about current legal requirements relevant for OSRAM packaging and printing materials.

Chemical Name/ Group	CAS Number	Threshold Limit (ppm)	Reference Standard
Polyvinylchlorid (PVC)	9002-86-2	Not intentionally added[1] 900 (Cl)	company Policy
Cadmium (Cd) Hexavalent chromium (Cr^{+6}) Lead (Pb) Mercury (Hg)	7440-43-9 18540-29-9 7439-92-1 7439-97-6	Sum of heavy metal content Cd+Pb+Cr+Hg < 100	PPWR Packaging and Packaging Waste Regulation (EU) 2025/40 (formerly EU Packaging Directive 94/62/EC and Amendment)
Mineral Oils in inks Aromatic hydrocarbons of mineral oil (MOAH) comprising 1 to 7 aromatic cycles: Mineral oil saturated hydrocarbons (MOSH) with 16 to 35 carbon atoms.		For mineral oil aromatic hydro-carbons (MOAH), where the mass concentration in ink of these substances is greater than 0,1 % or the mass concentration in ink of compounds of 3 to 7 aromatic rings is greater than one part per million (ppm); For hydrocarbons saturated with mineral oil (MOSH), where the mass concentration in ink of these substances exceeds 0,1 %.	Article 112 of the French Law No. 2020-105 of 10 February 2020
Substance of Very High Concern according to REACH	Waste Framework Directive (EU Directive 2008/98/EC) as an article[2] REACH (EC) 1907/2006 and amendments REACH Candidate List of SVHC (latest list link) REACH Annex XVII (link)		

[1] „Intentionally added“ means Substance deliberately used in the formulation of a material or component where the presence of the substance in the final product provides a specific characteristic, appearance or quality.

[2] „Articles” as such, an object in which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition.

3.6 Packaging and Packaging Waste Regulation (PPWR)

PPWR stands for **EU Packaging and Packaging Waste Regulation (Regulation (EU) 2025/40)**, which establishes harmonized and legally binding requirements for packaging and packaging waste placed on the European Union market. The PPWR governs the entire life cycle of packaging, including design, material composition, labelling, recyclability, reuse and waste management, and replaces Directive 94/62/EC with the objective of reducing environmental impact and supporting the circular economy.

The following requirements apply to all packaging placed on the EU market, including:

- Primary packaging
- Secondary packaging
- Distribution / transport packaging

Suppliers shall ensure that all packaging:

- is necessary and minimized in volume and weight,
- is designed for recycling according to EU criteria,
- does not hinder material recycling due to color, coatings, additives or material combinations,
- complies with all applicable PPWR substance restrictions.

3.6.1 Design for Recycling

Packaging must meet the following criteria:

- Use of mono-material solutions wherever technically feasible.
- Permanent composites (e.g. laminated materials, non-separable layers) are not permitted unless explicitly approved.
- Labels, adhesives, inks, coatings shall not negatively affect recycling streams.
- Carbon black, graphite or non-detectable pigments are prohibited.
- Packaging must achieve a “recyclable” classification according to EU criteria (e.g. recognized industry standards such as RecyClass).

3.6.2 Recycled Content Requirements (plastic packaging placed on the EU market)

Mandatory minimum recycled content levels shall be fulfilled according to PPWR timelines.

- Suppliers must declare:
    - type of recycled material,
    - post-consumer / post-industrial share,
    - percentage per packaging component.

3.6.3 Minimisation & Empty Space

- Packaging shall comply with maximum empty space limits.
- Additional packaging elements for marketing purposes are not permitted unless technically justified and approved.
- Transport packaging must be optimized for palletization efficiency.

3.6.4 Reuse & Refill (where applicable)

- Where technically and logistically feasible:
    - Reusable packaging systems shall be preferred.
    - Reusable distribution packaging must be:
        - designed for multiple cycles,
        - repairable and recyclable at end of life.

3.6.5 Labelling & Information Requirements

Each packaging component must be:

- correctly marked with harmonized EU recycling labels,
- clearly identifiable for waste separation,
- free from misleading environmental claims.

Green, sustainability or recycling claims must be, factual, verifiable and compliant with PPWR and future Green Claims requirements.

3.6.6 Documentation & Supplier Declarations

Suppliers must provide upon request:

- PPWR Declaration of Conformity (DoC) per packaging type,
- Material composition breakdown,
- Recyclability assessment,
- Recycled content evidence,
- SVHC declaration (REACh Art. 33),

Supporting technical documentation must be retained for min. 10 years after last placement on the EU market.

3.6.7 Supplier Responsibility & Audits

Suppliers are responsible for ensure continued PPWR compliance, ams OSRAM reserves the right to:

- request documentation,
- perform compliance reviews,
- demand corrective actions,
- reject non compliant packaging.

3.6.8 Effective Dates

PPWR compliance mandatory for packaging placed on the EU market according to applicable transition periods. Suppliers must prepare compliance no later than August 2026, unless otherwise regulated.

4. Primary Packaging

- The packaging that comes into closest contact with the product is often referred to as "retail packaging". Its main purpose is to protect the product and inform or attract a customer.
- In most cases, the primary packaging is a folding box or blister packaging.

4.1. Construction

- The material and construction must meet the requirements of the ams OSRAM specifications.
- The ECMA standard (European Carton Makers Association; www.ecma.org) should be used, in this case no further drawings must be provided in the specification.
- In case the ECMA standard can't be used, the drawings must be provided in the specification and as a dxf-file. Unless otherwise specified, the drawings always show the print side.

4.2. Printing (Offset)

Printing of packaging, particularly primary packaging (e.g. boxes and blister packs) is an important part of ams OSRAM's brand communication. This also applies to our customers and their customer brands. For this reason, the quality of printing (color quality and color consistency) is extremely important.

To avoid errors or to detect any errors early in the supply chain, ams OSRAM relies on a trusting cooperation with its suppliers and on the effectiveness of the quality assurance system.
The term supplier refers here to the supplier of the printed packaging material.

Depending on the brand or product, the packaging is printed in only spot color or four-color (CMYK) or in a combination of spot color(s) and four-color (see table below).
Note: The measures described apply only to offset printing.
To ensure print quality with other print technologies (e.g. flexographic or gravure printing) the measures must be defined individually depending on the respective layout and the machinery available at the supplier.

If ams OSRAM purchases finished products from external suppliers, these suppliers must ensure that the measures described here are also followed by their packaging suppliers.

4.2.1. Actions to be taken by printer

The following measure are intended to ensure that the quality of the printing by packaging suppliers meets ams OSRAM standards: Each supplier is provided with a set of tolerance cards for OSRAM Orange PMS 021 C, Ring Blue PMS 2915 C and Ring Yellow PMS 7408 C (distributed by ams OSRAM packaging department) depending on the design.
Before printing a motif for the first time the supplier will receive the following:

- The ams OSRAM specification describing the material to be used and the technical definition of the corresponding die-cuts, (alternatively, if finished products are procured from external suppliers the use of existing packaging/die-cuts can be agreed).

- The print files in the form of files (PDF/X-4).
- Reference PDF files with low resolution.
- For packaging with the ams OSRAM or customer brand that is printed in four colors (CMYK) in addition to the usual spot colors (e.g. luminaire packaging), ams OSRAM or the agencies will provide a binding digital color proof (ISO 12647) or offset proof for checking the color quality.
- If customer brands are printed in four colors (CMYK) a machine proof of a product representative of the customer's range (provided it has the same color distribution) will be created for the respective brand and provided to the supplier.
-

If neither color cards nor offset proofs or digital proofs are available for customer brands in spot colors, color books (Pantone, HKS) should be used.

	OSRAM brand		**Other brands**	
	PMS 021 C	**PMS 021 C + CMYK**	**CMYK**	**Spot colours**
High-resolution printing pdf (PDF/X-4)	X	X	X	X
Low-resolution reference pdf files	X	X	X	X
Tolerance cards	X	X		
Digital proofs or offset proofs	-	X	X	optional
Colour panel spot colour (Pantone or HKS)	-	-	-	X*
Colour reference from OSRAM if available	-	-	-	X*

**) Supplier must make sure to use current versions of Pantone and HKS panels and store them properly*

Quality control:

- The supplier must use the low-resolution PDF file to check whether the contents of the printout (texts, pictograms, symbols, lamp images, brand elements, barcodes, etc.) meet the specifications. Colours and surfaces (coatings) must be checked with the aid of colour cards, proofs or colour books.
- In cases of doubt, ams OSRAM packaging department or the agency submitting the artwork must be contacted.
-

4.2.2. Legibility of barcodes on packaging components

Barcodes on printed packaging components from suppliers must meet EN ISO/IEC 15416 and the European Standard of the relevant symbology (see chapter *"Standards"*).
The required degree of quality is "good" (EN Grade 3, ANSI Grade B).

5. Distribution packaging/transport packaging

The distribution packaging is designed to contain one or more articles or packages, or bulk material, for the purposes of transport, handling and/or distribution.

5.1. General

The packaging must meet at least the following requirements:

- The weight (incl. content) of the shipping box shall not exceed 12 kg in case the single product weight allows that. In case the product weighs more than 12kg it must have a warning label detailing it is heavy product.
- The packaging (incl. content) has to withstand the transport to the end customer.
  This should be verified by appropriate tests, minimum standard should be drop test, vibration test or simulated transport test (see chapter "*Standards*").
- Double stacking of pallets for transport and storage must be ensured (see document "*ams OSRAM standards for delivery of goods to Global Supply Center"*).
- For further tests the ams OSRAM packaging department must be contacted.

5.2. Construction

- In most cases, the distribution packaging is a shipping box made from corrugated fiberboard, so this chapter is focusing on this.
- The material and construction must meet the requirements of the ams OSRAM specifications.
- The FEFCO standard (FEFCO is the European Federation of Corrugated Board Manufacturers) should be used, in this case no further drawings must be provided in the specifications. If the FEFCO standard can't be used the drawings have to be provided in the specification and as dxf-file.
- Unless otherwise specified, shipping boxes are made from corrugated fiberboard with appropriate ECT values (Edge Crush Test grading). The composite of the corrugated fiberboard must meet the requested value.
- Guide to carton strength:
  To ensure that outer cartons provide adequate support throughout the entire supply chain, the recommended strength parameters given here as a guide should be followed. For packaged products, size and weight usually determine the material specifications and whether paperboard or corrugated fiberboard is used.

Filling weight	Bursting strength (BCT)[1] (min)	Edge crush test (ECT)[2] (min)
0,5 kg – 5 kg *1,1 lbs – 11 lbs*	650 – 1.150 kPa *US: 125 PSI*	2,5 (kN/m) *US: 23 ECT*
5 kg – 10 kg *11 lbs – 22 lbs*	1.000 – 1.723 kPa *US: 150 PSI*	3,5 (kN/m) *US: 26 ECT*
10 kg – 25 kg *11 lbs – 55 lbs*	1.450 – 2.253 kPa *US: 200 PSI*	6,5 (kN/m) *US: 32 ECT*
25 kg – 30 kg *55 lbs – 66 lbs*	2.000 kPa *US: 275 PSI*	11 (kN/m) *US: 44 ECT*
> 30 kg *> 66 lbs*	to be defined	special approval

1) Indicates the ability of the carton to withstand external or internal forces and whether the carton will hold the contents intact during rough handling. (see chapter *"Standards")*
2) Indicates the stacking strength of corrugated board cartons. (see chapter *"Standards")*

5.3. Printing of shipping boxes

- The printing is defined in an artwork or in the specification.
- Unless otherwise specified, flexographic printing is used. A good contrast of ink and print-surface is needed; black, dark brown, dark blue or dark green are the preferred colors.

Recycling Code

- A recycling logo must be printed based on the raw material (see chapter *“Recycling Marking”*).

Supplier Code

- The manufacturer of the packaging may optionally print a symbol or a code of the company on an inner flap of the box.
- China: For shipping boxes sourced and produced in China the supplier code is mandatory. This code is provided by ams OSRAM China.

Production Date

- A date code for the production date of the shipping box is desired.
- Preferably the format should be month/year (mm/yy).

RESY Symbol

- In case “RESY” symbol shall be used as a certificate of the manufacturer’s partnership in the German recycling-cooperation and if the position and size is not defined in the related specification the maximum height of the symbol is 40 mm and of the production code and date 24 pt.

5.4. Closing of shipping boxes

In shelf-ready packaging, no printing or perforation line may be covered by adhesive tape.
Paper tape or hot melt are preferred for closing.

5.5. Content label

- The content label must be designed according the ams OSRAM requirements.
- The content label must adhere to the front side of the shipping box (broadside as per FEFCO description).
- In case the front is too small, change side of the shipping box or place it on top.
- The content label must not be applied to printed surfaces or perforated surfaces (if covered, this must be approved by the packaging department).

6. Standards

The metric system must be used, other systems can only be used additionally.
An overview of used standards can be found in the table below:

Area	Title	Link
General	Packaging – Vocabulary	ISO 21067
	Paper, board, pulps, and related terms – Vocabulary Part 1: Alphabetical index	ISO 4046-1
	General tolerances – Part 1: Tolerances for linear and angular dimensions without individual tolerance indications	ISO 2768-1
	GS1 Package Measurement Rules Standard	www.gs1.org
Paper and board	Paper and board – Determination of grammage	ISO 536
	Paper and board – Determination of bending stiffness	ISO 5628
	Testing of paper and board – Determination of the bending stiffness by the beam method	DIN 53121:2014-08
	Determination of tearing resistance	ISO 1974
	Corrugated fiberboard – Determination of edgewise crush resistance	ISO 3037:2013-12
	Testing of board – Puncture test	DIN 53142-1
	Board – Determination of bursting strength	ISO 2759
	Corrugated board – Part 1: Requirements, testing	DIN 55468-1
Box construction	FEFCO International Case Code	www.fefco.org
	ECMA CODE of folding carton	www.ecma.org
	Vertical Drop test	ISO 2248
	Vertical random vibration test	ISO 13355:2016
	Environmental testing: Shock	IEC 60068-2-27:2008
Recycling	Material recycling codes	https://en.wikipedia.org
	QT-504-glue-separation	www.epbp.org
	RecyClass – Recycling-Tool for plastic packaging	www.recyclass.eu
	Directive 94/62/EC on packaging and packaging waste	http://eur-lex.europa.eu/
	PPWR (Packaging and Packaging Waste Regulation)	http://eur-lex.europa.eu/
Printing and Barcodes	Automatic identification and data capture techniques – Barcode print quality test specification: Linear Symbols	EN ISO / IEC 15416
	Generation of artworks for packaging, quality and legibility of barcodes”	PC 44-701-1-145
	Bar coding – Symbology specifications - Interleaved 2 of 5 - Code 39 - Code 128 - EAN/UPC	ISO/IEC 16390 ISO/ IEC 16388 ISO/IEC 15417 ISO/IEC 15420
ams OSRAM	ams OSRAM standards for delivery of goods to Global Supply Center	www.osram.de/cb/einkaufsportal/join-as-supplier/index.jsp