UNHCR Environmentally Friendly Procurement

DOCUMENT VERSION

This is the second version of the solar lantern with enhanced sustainability attributes, representing UNHCR's ongoing commitment to advancing the environmental, technical, social and economic sustainability of relief items, as of **January 25, 2024**.

PORTABLE SOLAR LANTERNS

Providing material assistance to forcibly displaced populations is fundamental to UNHCR's protection mandate. In an emergency, solar lanterns are one of the main essential items that UNHCR distributes as part of the assistance to the affected populations. Portable solar lanterns should provide lighting in camps while serving as mobile device chargers.

END USERS

UNHCR is mandated to protect and assist refugees, internally displaced, and stateless people. The product with this specification will be used by the people we protect, primarily in emergencies. The end users include people of all ages ranging from infants to older persons, persons with disabilities, and pregnant women. Therefore, the supplier needs to understand and study the needs of a forcibly displaced population, especially in emergencies, to ensure an innovative and sustainable product design that is user-centered.

SUSTAINABLE SUPPLY CHAIN

For UNHCR to fulfill its mandate, it is imperative to minimize the environmental footprint of humanitarian assistance. Our approach to a sustainable end-to-end supply chain includes planning, sourcing, material, manufacturing processes, procurement, delivery, and lifecycle management of goods.

A holistic assessment of sustainable products includes but is not limited to, the following criteria:

- The product design follows Universal Design principles that are user-friendly and accessible.[1]
- Manufacturing processes take into consideration the protection of the environment and respect for social standards.[2]
- Products are made from sustainable materials, and through sustainable mechanisms.
- Packaging is made from sustainable material, ideally with a second-life purpose.
- All unnecessary single-use plastic is removed.[3] The primary packaging should include information regarding the product's origin, as well as details about the recyclability of both the material and the packaging.
- Packaging, palletizing, and load ability of transport units are optimized.
- Products and packaging are, to the maximum extent possible, recyclable.
- A life cycle analysis, including GHG emission factors, is performed and shared with UNHCR for all products.
- The geographical distribution of the supplier base is diversified to ensure the proximity of product delivery.

PREFERENCE

Preference will be given to a product that is most user-friendly and has the highest overall sustainability elements that satisfy technical specifications. Please see the Sustainability Procurement Indicators from the United Nations Global Market that we comply with.[4]

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1 https://universaldesign.ie/what-is-universal-design/the-7-principles/

2 Suppliers to demonstrate the application of ISO 14001:2015: Environmental managing systems, ISO 9001:2015: Quality Management systems, ISO 26000: Guidance on social responsibility

3 https://www.unep.org/resources/report/single-use-plastics-roadmap-sustainability

4 Sustainable Procurement Indicators (ungm.org)

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PORTABLE SOLAR LANTERN

UNHCR Item No HH-LE-10025

Item Application Sample

General information and description

A portable solar lantern is a device that ensures lighting for family use as well as mobile device charging, either in camps/settlements or private accommodations.

Note: The above images are for reference purposes only.

The composition of a portable solar lantern

A portable solar lantern kit consists of:

1. One or several solar photovoltaic (PV) panels.
2. One powerful rechargeable battery component.
3. One LED lighting component.
4. Solar lantern(s) is(are) embedded into a durable casing connected by screws or bolts in a way that allows several assembly and disassembly. The lighting modules are placed behind a (semi) transparent luminous plexiglass screen.
5. At least one switch (on/off/luminous intensity levels).
6. One (USB-A) or optionally multiple external charge ports.

Design restrictions/recommendations

To avoid overheating of the battery, the solar lantern should be separated from the PV panel. It is recommended the entire electronics should be on a single PCB, which can be replaced easily (plug & play) using a simple screwdriver.

User-friendly features

Battery Status Indicator.
Solar Charge Indicator.
A handle for easy carriage.

The lantern should be designed in a way that enables it to stand sturdy on a flat surface and to be hung on a hook.
An additional feature of the solar lantern could be a siren in a form of a red light signal lamp which helps to locate people or raise an alarm to any threat.

Product weight

0.2-1.0kg* (including all solar lantern components - e.g. solar lantern, battery, PV panel, cables, and packaging). Products with lower weight contribute to minimizing the environmental impact, therefore, preference will be given to solutions that have less weight within the previous range and without compromising quality.

Features to allow a solar lantern to be hung

Compact and lightweight hanging is required. For example, a flexible band (with fasteners). Hanging should not contain sharp edges. Other innovative solutions are welcome.

The volume of the packed product

A solar lantern and a PV panel(s) should have a compact universal design, which enables compact packaging together with cabling and all the other supplementary devices. The maximum volume of the packed solar lantern kit should not exceed 0.005 m^3.

Products with lesser volume contribute to minimizing the environmental impact, therefore, preference will be given to solutions that have less volume within the previous range and without compromising quality.

Material composition

Cables (option 1): PVC-free cables.

Cables (option 2): Cables for solar lantern can be made of PVC (polyvinyl chloride). In this case, no degassing should occur up to 70°C operating temperature.

Cases of solar lantern and other structural elements (such as PV panel frames) should be made of plastic, such as Acrylonitrile Butadiene Styrene (ABS), Polycarbonate (PC), Polypropylene (PP), or others. Alternatively, a PV panel frames can be made of aluminum.

Preferences will be given to those products which contain less total plastic and the highest percentage of post-consumer recycled (PCR) plastic. The content of recycled plastic should be proved by a sustainability certificate.

Restricted colours: no military/camouflaged colours.

Drop test

Portable lighting components: Six out of six samples have no damages and are functional after the drop test (one meter onto concrete); none result in dangerous failures (Verasol 2018b).

UNHCR may carry out ad-hoc tests as its own discretion to verify the quality and performance of the product.

* The maximum weight of the product should not exceed 1kg (excluding packaging)

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Technical specification for a portable solar lantern

Soldering and electronics quality	The system and any included appliances must be rated "Good" or "Fair" for workmanship quality as defined in Annex F of IEC/TS 62257-9-5.
Environmental durability	**Climate – range of temperature for operation:** -10°C to + 55°C **Ingress protection rating (IP):** IP 63, PV modules IP 34
Battery requirements	
Battery chemistry, hazardous substances limitations	Lithium-ion batteries or equivalent technology. No battery may contain cadmium or mercury at levels greater than trace amounts (<0.0005% Hg and <0.002% Cd by weight). All components must hold the EU RoHS-6 requirements or equivalent.
Battery durability	The average capacity loss of six samples must not exceed 25%, and only one sample may have a capacity loss greater than 35% following the battery durability storage test as defined in IEC 62257-9-5 Annex BB.
Minimum number of full cycles for the battery	All samples and any included appliances are functional after 2,000 battery cycles (above Verasol 2018b). The battery needs to be conformed to IEC 61427–1 standard.
Battery operating voltage	3-4 V
Battery capacity	Rechargeable, battery, adequate for 500 lm/hrs.
Operating hours at each light setting (powered by battery only)	6-12 hours
Possibility of battery replacement	Easy replacement of the battery that can be carried out by the end-user or non-skilled personnel. RoHS-compliant (Restriction of Hazardous Substances) or equivalent. Compliant with EN 45554 (repairability) or equivalent.
Spare batteries	Guaranteed availability of spare parts for at least the rated life of the lanterns provided by the same suppliers.
Battery protection	Protected by an appropriate charge controller that prolongs battery life and protects the safety of the user. Lithium-ion batteries shall meet the requirements of a standard that ensures safety during use. Test reports from accredited laboratories shall cover both the individual cell and the fully assembled battery pack (International Electrotechnical Commission 2020). Lithium-ion batteries must carry IEC 62281, IEC 62133-2, UL 1642 or UN 38.3 certification and have overcharge protection for individual cells or sets of parallel-connected cells. Batteries of included appliances must also meet this standard (International Electrotechnical Commission 2020; Verasol 2018b). For PAYG systems, appropriate battery protection must remain active regardless of whether the system is in an enabled or disabled state. To avoid damage to a battery during long-term periods of non-payment disabled system status, the solar module must be able to charge the battery even if the product is in a disabled state (Verasol 2018b). Six out of six samples must meet the requirements outlined above under this section.
Battery Specification Sheets	A specification sheet from the battery manufacturer, showing at a minimum acceptable deep discharge protection and overcharge protection thresholds, shall be provided for all batteries. This information shall be made available to both buyers and users. Manufacturers' declaration on battery chemistry and a safety data sheet (SDS) or similar documentation should be provided for all batteries (according to the International Electrotechnical Commission 2020).
Lantern requirements	
Light performance	Minimum two lighting settings, at least one setting with light output ≥ 25 lumens. The maximum light output should be at least 300 lumens.
Colour temperature	3000-6000 K white light
Colour rendering index	≥80
Lumen maintenance at 2,000 hours	The average relative light output of six samples ≥ 90% of initial light output at 2,000 hours with only one sample allowed to fall below 85% OR; All six samples maintain ≥ 95% of initial light output at 1,000 hours.
Illuminance	≥40 lux at one meter
Total lighting service per solar day	Adequate for 500 lm-hrs
PV-panel requirements	
Output rating	Minimum 2.5 Wp
PV-panel overall quality and performance	PV-panels should preferably be free of lead & cadmium. PV-panels should have a strong plastic frame. Refer to the material composition requirements above under the section of General Requirements. PV-panels must be able to charge the battery even if the product is in a disabled state.
Recharge time at 1,000 w/m2 and 25°C (fully discharged)	PV-panel must have the capacity to fully recharge a completely discharged battery within maximum four hours.
Cables, connectors, housing, and other parts	
Cables	Minimum of three-metre cable length to connect a solar panel to light/battery unit
Switch, gooseneck, moving parts, and connector durability	Mechanisms are expected to be used regularly. All samples and any included appliances are functional after 1,000 cycles (Verasol 2018b).

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Certification and Quality Assurance

The product must satisfy the requirements of the Verasol standard for Pico PV systems. It must be certified by Lighting Global or by any other recognized International Certification Body where the product has been tested at equivalent technical standards to the ones mentioned in Annex F of IEC/TS 62257-9-5, or in the absence of a certification, it has been independently tested against equivalent standards to demonstrate compliance with these technical specifications by an ISO 17095 accredited test laboratory to conduct testing according to IEC TS 62257-9-5.

The devices must be compliant with electrical safety standards and be certified accordingly (e.g. CE, VDE, UL).

Branding details

The UNHCR logo should be placed on the product (solar lantern). The logo sizes will depend on the solar lantern model, and final design needs to be approved by UNHCR before production.

Primary packaging

Reducing plastic waste in the environment: all single-use plastic must be removed from packaging. Each portable solar lantern kit should be placed in a brown (natural-coloured) carton box made of recycled paper.

Secondary packaging

An optimal number of products should be packed in export-quality secondary packaging, preferably using sustainable material with its natural colour - plastic packaging is forbidden. In case cardboard is used, it must be unbleached, unlaminated, and made from recycled wastepaper. Ink must be non-toxic and ecologically friendly. Innovative solutions are welcome.

Preference will be given to innovative packaging that protects the product during transport, handling and storage, ideally with a second-life purpose, and minimizes packaging waste.

The user-friendliness and safety aspects of handling persons should be considered in the packaging design.

Tertiary packaging

Secondary packaging might be packed on a pallet; in this case, they need to be wrapped in a water-tight material, preferably made of or containing sustainable material, e.g. recycled plastic or reusable material (such as tarpaulins) or other alternatives. Packaging needs to ensure that products are protected from any damage, including water and moisture. Innovative sustainable solutions are welcome. Avoid compostable plastics for packaging and increase recycled content wherever possible.

All the plastic packaging materials (wrapping film), straps (if any), others must contain a proper recycling code, which specifies the type of plastic used. Use recycling codes as per ASTM International Resin Identification Coding System (RIC)*.

In order to avoid pallets slippage during transportation and possible damage to the carton boxes and their contents, the boxes should be piled to best fit the pallet, e.g. cartons should fit perpendicularly to the edge of the palette and not hang over it or not reach it (edge of the pallet).

Optimal shipping / Container information

In preparing shipping, the maximum number of items that can fit into a transport unit must be considered. The container layout plan will be defined on the purchase order.

20’ DC container (without pallets)
40’ DC container (without pallets)
40’ HC container (without pallets)
20’ DC container (with pallets)
40’ DC container (with pallets)
40’ HC container (with pallets)

The final number of the transport unit and maximum height of loaded pallet, if palletized, will be defined on the purchase order.

Manufactured marking

The solar lantern should include the following data:

- a serial number assuring traceability of the date of manufacture. The date of manufacture shall be reported with a precision of at least the month, year and batch number. If components are packed separately, each component shall carry these component-specific markings.
- material composition (type of material(s)) and the ratio of each material in the product
- certified sustainability claim/eco-labelling
- information related to the reuse/recyclability of the item
- manufacturer name

No company logo should be included with the manufacturer’s marking. A sustainability claim can be added, but it must be proven accurate.

The final design of manufacturer marking needs to be approved by UNHCR before production.

Marking on the secondary packaging

UNHCR logo + Solar lantern kit, number of pieces + PO number.

No logo of the supplier is allowed.

The marking must remain readable and well fixed on the secondary packaging after a minimum of ten handlings. Other markings as specified in the contract/purchase order. The UNHCR visibility logo will need to be applied on five sides of the secondary packaging (excluding the bottom).

Marking techniques

- Laser engraving
- Printing with water-based ink
- Printing on sustainable sticky tapes

Ink/colouring must be non-toxic and ecologically friendly

Consumer information

User manual: The user manual must present instructions for the installation, use, and troubleshooting of the system. The user manual must be written in all official UN languages, in natural black ink, on recycled, unbleached paper. Pictograms are preferred to reduce paper usage.

Instructions on the end-of-life of the product: Instructions or guidelines with graphics (pictograms) should be provided, without additional cost, to help consumers to maintain, repair, recycle and dispose of at the end-of-life of the solar lantern, best if it is with online tutorials.

Warranty: Three years

* https://www.astm.org/d7611_d7611m-21.html

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UNHCR Logo Application Reference

UNHCR Vertical Visibility logo

UNHCR Horizontal Visibility logo

Logo and Shipping Markings on Individual Boxes

The front and back of the packaging (the largest surface sides of the carton) should include only the UNHCR visibility vertical logo. The two other opposite sides should include the UNHCR visibility vertical logo with the shipping marking information area (below the logo). The top side should include the horizontal visibility logo in one of the closures and the content list in the other closure.

Every box made of recycled paper must have a symbol about its recycled nature and the possibility to be recycled (see Graphic 1):

Graphic 1: Recycled Paper Symbol

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Logo and Shipping Marking on Individual Boxes

Logo and Shipping Marking for Portable Solar Lantern

Graphic 2

A. Application of the logo and marking for the front and back sides of the secondary packaging:
On the front and back sides of the Secondary Packaging, the vertical logo must be placed centrally, occupying a minimum of 60% surface space without any image distortion (as per Graphic 2). Visibility logo in one of the closures and the content list in the other closure.
Every box made of recycled paper must have a symbol about its recycled nature and the possibility to be recycled (see Graphic 1):

Technical Drawing

Logo and Shipping Marking on Individual Boxes

B. Application of the logo in the 2 other opposite sides of the Secondary Packaging:

On the two other opposite sides of individual packaging, the vertical logo and shipment information are to be placed centrally, occupying a minimum of 60% surface space (45% for the UNHCR visibility logo and 15% for the shipment information) without any image distortion.

Important: In order to respect the integrity of the logo, the shipment information area should be visually separated from the lower part of the UNHCR visibility logo and framed with the same indelible ink as the detailed information as per Graphic 2.

The information to be placed on the secondary packaging typically include:

UNHCR Item name and number:
PO No:
PO Quantity:
Consignor (supplier/manufacturer):
Consignee:
Destination:
Packing units: {number / total number} - To be marked with consecutive numbers shown over the total number of packing units comprising the consignment (N/N: i.e 1/20, 19/20)

This graphical reference of the shipping marks is given as an example only. Shipping marks can be printed on a non-plastic and non-laminated sticker paper and placed on the carton box. The marks shall include the specified information as detailed in the "Shipping Marks" section of the relevant Goods PO.

Technical Drawing

Logo and Shipping Marking on Individual Boxes

C. Application of the logo and marking on the top side of the secondary package:

On the top side of the secondary packaging for kitchen sets, the UNHCR horizontal logo is to be placed centrally in one of the closures, occupying a minimum of 60% surface space and without any image distortions. The complete content list of the kitchen set should be included in the other closure. Please see the graphic below.

Technical Drawing

Top

Left

Front

Right

Back

Bottom