



Technical Specifications for the manufacture of:

1L to 5L packaging container¹ specification - PET and HDPE containers

Specification reference: **WINGS code (see below)**

Scope : Vegetable oil

Version: **4, adopted January 2022**

Replacing: **version 3, 09/12/2020**

Date of **SCOQ** issue: **15/02/2022**

This version is superseding the packaging section in all Vegetable specifications

VOLUME	CONTAINER PER CARTON	WINGS CODE
1L	12	CC2
1L	15	CC5
1L	20	CC6
1.5 L	12	CC3
2L	2	CCC
2L	3	CQ0
2L	6	CC7
2L	8	CC8
2L	12	CC4
3L	6	CJB (HDPE jerrycans)
3L	6	CN7 (PET bottles)
4L	2	CP0
4L	4	CP6

¹ Container in this specification (except §6: REQUIRED SHIPPING PALLETIZATION) is used as the technical generic term for all type of packaging containing the oil.

5L	4	CC1
5L	2	CL9

Note: the list of volume and containers per carton is not exhaustive

1. SPECIFICATION PURPOSE

1L to 5L packaging container specification - PET and HDPE containers is the packaging technical specification describing the physical and performance parameters that the packaging must fulfill to be used for vegetable oil products sold to WFP.

2. GENERAL REQUIREMENTS

The packaging covered by the provisions of this specification must be packed in appropriate packaging, which safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. The containers, including packaging material, shall be made of substances that are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odor or flavor to the product.

The packaging is expected to provide physical support to be stacked up to minimum 10 cartons height for PET bottles and 8 cartons height for HDPE jerrycans in their filled state while stored in a warehouse.

3. PRIMARY PACKAGING: CONTAINERS AND CLOSURES REQUIREMENTS

3.1 General requirements

- All the materials (including sealing foils and/or closures) in contact with the oil must be food grade and compliant with the regulation of the country where the product is bottled. The supplier, upon WFP request, must attach a letter of compliance :
 - To the last version of the EU law [Regulation \(EC\) No 1935/2004](#) regarding to food contact
 - AND/OR to the last version of the FDA law Regulation included in the [21 CFR](#) regarding to food contact – more information also on [e-CFR](#)
 - OR certifying the above and completing the WFP form relative to food contact ANNEX 1
- Virgin material should be used to be in contact with the food
- All packaging materials must be free of Phthalates (such as Butyl Benzyl Phthalate, Dibutyl Phthalate, Diethyl Hexyl Phthalate, Diisodecyl phthalate, di-n-octyl phthalate), PVC, PVdC, and be manufactured with materials which do not contain BPA as an intended component of the plastic formulation.

- The plastic resin used should be suitable for usage up to 45°C (considering that oil isn't filled to a temperature superior to 40°C)

3.2 Container material & requirements

PET (Poly Ethylene Terephthalate)

- Square or rectangular shape is preferred to avoid space loss
- Additives allowed:
 - Colorants as specified are allowed to an opacity level that allows a user to view the product fill level.
 - Preferable color is white or transparent. Any other color must be agreed with WFP
- Recycled material could be used following the below conditions:
 - In direct food contact if a close loop regrind system is in place and that the material is coming from the same container production to maintain the food grade compliance.
 - In the external layers as long as the food grade compliance is respected.
 - Post-Consumer Recycle (PCR) can be used up to 30% only if from suppliers who have certified clearances for use in food contact applications, and is of equal or greater physical properties of the primary PET source.
 - No other material additives are allowed.
 - Regrind generated from this container using a closed loop system for manufacturing and handling is allowed up to 5%². This self-generated regrind must be kept clean and free from foreign materials. Regrind from other sources is not allowed unless the material has been processed under the PCR allowances.
- Typical wall thickness ranges: 0.2 – 0.4 mm (middle of side panels) and minimum 0,1mm on the corners
- Intrinsic Viscosity (IV) – Minimum recommended: 0.75 IV

HDPE (High Density Polyethylene)

- Square or rectangular to avoid space loss
- Opacity at a level that allows a user to view the product fill level
- Preferable color is white translucent. Any other color must be agreed with WFP
- The final relative density of the blended material must be less than 1.0
- No other additives are allowed except the one to color the container
- Recycled material could be used following the below conditions:
 - In the external layers, not in direct contact with the food and as long as the food grade compliance is respected.
 - Outside regrind sources are not allowed.

² Additional regrind is allowable with notification to WFP.

- In-house (from the same manufacturing plant) regrind materials are allowed up to 30%, with regrind generated from the containers own trim operation while using a closed loop system for manufacturing and handling. This self-generated regrind must be kept clean and free from foreign materials.
- Typical wall thickness: 1.0 mm (middle of side panels) and minimum 0,6mm on the corners

3.3 Headspace

The container headspace³ must be a minimum of 2.5% of the volume of oil contained in the bottle.

3.4 Closure and sealing system

- The product must be properly sealed with no leakages
- The closure system must have a visible tamper evident system showing that the product has not been opened
- The closure must resist with no cracking and when applied to the same top load as the container (see below)
- The product must be re-closable whilst remaining leakage proof

3.5 Handling system

- The product must have a system to ease its handling
- If required (see table below), the handle should be fit for an adult man hand size – No sharp edges

VOLUME	HANDLING SYSTEM REQUIRED
1L TO 2L	No specific handling system required
2.5 TO 4L	At least a grabbing feature
> 5L	Handle required

3.6 Container performance parameters required

- Every container tested empty should be able to support a minimum top load of (ASTM D2659 or equivalent– Certificate of compliance to be provided) :

VOLUME	MINIMUM TOP LOAD (EMPTY CONTAINER)*
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³ Headspace: remaining empty volume with the container after being filled.

1 L	6 kg = 59 N
1.5 L	9 kg = 88 N
2 L	12 kg = 118 N
2.5 L	15 kg = 147 N
3 L	21 kg = 206 N
4 L	27 kg = 265 N
5 L	30 kg = 295 N

**Value given for a top load measurement performed on containers after at least 10 days on manufacturing – best conditions*

Test parameters (addition to the standard process):

- *Peak measurement through 7mm of travel (alternative: Peak measurement over 10% of force drop off)*
 - *Speed: 50mm/min*
 - *Load points: handle and top neck for jerrycan and top neck for PET bottles*
 - *Vented test: provide a vent to allow equalization of air pressure during test*
- Every container, filled and closed, must pass a drop test ASTM D2463, SPI AU-135 or equivalent on the flat bottom from a 1.9m height – Certificate of compliance to be provided.
 - The lot code marking should be clearly visible, with a minimum height of 3mm per line and resist to the whole product shelf life without fading.

Note: If the volume of the bottle isn't included in the table above, please consult WFP

4. SECONDARY PACKAGING : CARTON SPECIFICATION

- Products will be regrouped into cartons (refer to the table page 1 as per contract agreement)
- The fluting must be vertical, supporting the load
- The carton shall be plain brown (unbleached)
- The dimensions must be adjusted to fit maximum products in the containers with a highly recommended 5mm headspace between the top of the bottle and the box, but a minimum side space
- Looking at the harsh handling, humid conditions, storage time and total stacking (PET bottles: 10 cartons height, HDPE jerrycans: 8 cartons height) cartons should have a minimum 45 ECT = 45 lbf/in = 7.5 kN/m (ISO 3037 or eq – Certificate of compliance to be provided)

5. FINISHED PRODUCT REQUIRED PERFORMANCE

- The final product must pass the first sequence of drop test as per ISTA 3A standard test⁴. After each drop, there shall be no rupture or loss of contents – Certificate of compliance to be provided.

- The final product (filled containers + cartons) working together need to support a minimum of static compression load of (ISO 12048 or eq – certificate of compliance to be provided) :

VOLUME	CONTAINER PER CARTON	FINISH PRODUCT COMPRESSION LOAD RESISTANCE
1L	12	3100 N = 316 kg
1L	15	3850 N = 400 kg
1L	20	4900 N = 500 kg
1.5 L	12	4500 N = 460 kg
2L	3	1800 N = 185 kg
2L	6	3100 N = 316 kg
2L	12	4860 N = 600 kg
3L	6	4200 N = 430 kg
4L	2	2060 N = 210 kg
4L	4	4100 N = 420 kg
5L	4	4415 N = 450 kg
5L	2	2500 N = 255 kg

Note: If the finished product combination isn't included in the table above, please consult WFP

6. REQUIRED SHIPPING PALLETIZATION / STUFFING IN CONTAINERS⁵

6.1 Product on pallet

⁴ Only the first drop test sequence as per ISTA 3A should be performed by the supplier. Tests parameters are found in the ISTA 3A procedure (Annex II – first drop test sequence (9 consecutives drop test))

⁵ Only in this section §6, container is referring to an actual 20' or 40' transport container

- At least the 3 first bottom carton layers must be placed as column stacking the rest is recommended to be interlocked (cross stacking) for load stability



Scheme 1: Explicative scheme of principle of the 3 bottom layers as column stacking

- The pallets are recommended to be heat treated as per ISPM 15 standards (methyl bromide fumigation is not allowed).

6.2 Product directly stuffed in container

- Ensure container internal walls and floors are perfectly cleaned. Recommended to be covered with kraft paper (plastic film/board not accepted).
- Ensure proper stowage so that there is minimum free movement of commodities during transit (max 20cm between top of cargo stow and container roof).
- Unless fully stretch-wrapped pallets are used, dunnage (of carton sheet or plywood...) must be placed inside each container at every 4 layers of cartons to provide the required stacking strength. In addition, protecting material like air bag, carton, polystyrene, lashing rope can be used.

7. DOCUMENTATION REQUIRED FROM SUPPLIERS FOR EVERY DELIVERY

Documents	Mandatory	Ready upon WFP demand / during audits	Documents should be issue/given by
Primary packaging			
Food grade certificates (container and closure)* – validity of 1 year		x	Accredited lab
Technical drawings		X	Food manufacturer / packaging supplier
Material specification		X	Food manufacturer / packaging supplier
Certificate of compliance for container vertical load resistance and drop test	X		Food manufacturer (if equipment available) or accredited lab
Secondary Packaging			
Certificate of compliance for box strength (ECT)* - validity of 1 year	X		Packaging supplier

Technical drawings		X	Food manufacturer / packaging supplier
Material specification		X	Food manufacturer / packaging supplier
Finished Product			
Certificate of compliance for the finished product vertical resistance	X		Food manufacturer (if equipment available) or accredited lab
Certificate of compliance for drop test as per ISTA 3A requirements (first drop test sequence)	X		Food manufacturer (if equipment available) or accredited lab
Packing production quality processes and controls		X	Food manufacturer

*WFP shall be informed if the supplier modify the packaging composition (including but not limited to inks compounds, label material, closure material, jerrycan material...)

WFP is entitled to ask the supplier to perform a complete ISTA 3A test by an accredited laboratory in case of major reported packaging incident.

8. MARKING

8.1 On the containers

The following information should be available on bottles and jerrycans

- Name of the product and “fortified food”
- Net content
- Name and address of the supplier / manufacturer (including “manufactured in”)
- Ingredient list (allergen in bold and “allergens warning: may contain traces of”)
- Nutrient content
- Batch / lot number
- Production date : dd/mm/yyyy⁶
- Best before end: mm/yyyy
- Not for sale
- Storage condition: “store under dry and hygienic conditions and away from direct sunlight”
- “No litter” picto
- Additional marking and donor logos as per contractual agreement.
- For complete artwork templates and WFP logos, refer to :
<http://foodqualityandsafety.wfp.org/specifications>

8.2 On the cartons and preferably on at least 2 consecutive faces

The following information should be available on each carton:

⁶ Production date: mm/yyyy is accepted if the batch number enable the food manufacturer to track back to the exact date of production

- Name of the product and “fortified food”
- Net content (number of unit per carton)
- Name and address of the supplier / manufacturer (including “manufactured in”)
- Batch / lot number
- Production date: dd/mm/yyyy
- Best before end: mm/yyyy
- On at least two consecutive carton faces :
 - “This side up”. Symbol to use → ISO 7000 N°0623
 - “Keep away from Rain” Symbol to use → ISO 7000 N°0626
 - “This packaging has been design to be stacked X boxes high”. Symbol to use → ISO 7000 No.2403
 - “Keep away from sunlight”. Symbol to use → ISO 7000 N°0624
- Not for sale
- Additional marking and donor logos as per contractual agreement.
- For complete artwork templates and WFP logos, refer to :
<http://foodqualityandsafety.wfp.org/specifications>

ANNEX 1: Declaration of Compliance (DoC) for materials and articles intended to come into contact with food

The present declaration of compliance is valid for 1 year, per product.

In the meantime, it is the supplier responsibility to update and send a new declaration of compliance following packaging and/or product formulation changes and/or if the legislation change.

It is the supplier responsibility to be in compliance with the regulation of its country of production.

For countries that have no packaging regulation, compliance with either EU or FDA, or both, is requested.

Please issue the standard regulatory letter of compliance.

EU regulation;

https://ec.europa.eu/food/safety/chemical_safety/food_contact_materials/legislation_en

FDA regulation:

<https://www.fda.gov/Food/IngredientsPackagingLabeling/PackagingFCS/default.htm>

Otherwise, together with the product, the supplier must issue a **Declaration of Compliance** Letter for the packaging that is used in contact with food, including the following:

- (1) **The identity and address of the business operator issuing this declaration of compliance;** including contact details for a person that can be reached in case of questions related to product safety.
- (2) **The identity and address of the business operator that manufactures or imports the packaging material supplied** if different from so above.
- (3) **Packaging material description:** Name of the packaging material and description, from the outer to the inner layer
- (4) **Specifications on the use of the product**, such as:
 1. type(s) of food with which is intended to be put in contact, and/or type(s) of food with which it is not allowed to be put in contact;

2. time, temperature of treatment and storage parameters (humidity, direct sun exposure...) of the packed food under which the food contact compliance of the product can be ensured.

(5) Description of the packaging in contact with food supplied;

Give all relevant details on the following points:

1. Describe the nature (chemical composition) and thickness/quantity of every layer or component used in the material; indicate which layer(s) or part(s) will normally come into contact with the food during its normal intended use.
2. Provide the safety data sheet for all raw materials (that are not of natural origin) used in the packaging in contact with food

(6) Confirmation that the product meets relevant requirements laid down in the applicable food contact guidelines and legislation;

1. Indicate the status of each of the individual raw material used with regard to relevant national or international guidelines, regulations or legislation applying in the country of manufacturer production on materials that put in direct or indirect contact with food.
2. Indicate the status of the finished product (final packaging : e.g. bags, bottle) as a whole with regard to relevant national or international guidelines, regulations or legislation applying in the country of manufacturer production on materials in direct or indirect contact with food.
3. Has the finished product been tested for overall migration or another test for its inertness in contact with food or food simulants? If yes, give details on the test procedure and conditions and on the results obtained such as calculations, migration modelling, migration testing or other relevant scientific methodologies. If migration tests have been done using the services of a third party, the name of this laboratory should be given.

For material ingredients that are not covered by any legislation the supplier should provide data that are demonstrating the suitability for use in material in contact with food. Data on toxicology, migration and exposure are necessary to make a safety evaluation.

(7) Information on substances which are subject to a restriction in food.

Indicate here the presence of substances in the packaging which are listed in relevant national or international food legislation as direct food additives and which could migrate from the product to the food in quantities that (i) could have a technical effect on the food, or (ii) could affect the compliance of the food with the applicable limits on the quantity of allowed food additives indicated in the respective law.

(8) Absence of chemicals of concern.

(name of the company) confirms that the following chemicals are not known or expected to be present in detectable quantities in the finished product (final packaging : e.g. bags, bottle) supplied taking into account the manufacturing process and the raw materials used:

1. alkyl phthalate plasticizers
2. allergens
3. asbestos
4. dioxins
5. flame retardants
6. fungicides
7. heavy metals
8. mineral oil solvents
9. pesticides
10. polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)
11. polychlorinated biphenyls (PCB)
12. polycyclic aromatic hydrocarbons (PAH)

13. substances listed on supplier safety data sheets with properties of severe toxicity to humans (carcinogenic, mutagenic or toxic to reproduction) or the environment.

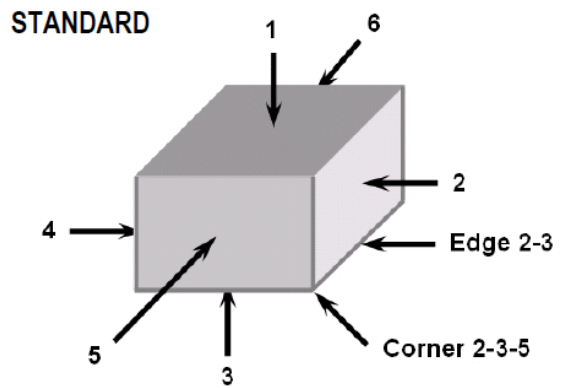
Note:

Supplier shall provide to WFP the Declaration of Compliance and , without further notice, a revised version of the said Declaration in case of :

- A change of the material composition
- Substantial changes in the production that could bring about changes in the migration
- When new scientific data are available as well as
- When the applicable legislation is significantly changed

(8) The date of the declaration, stamp of the company and signature of the legal representative

Annex 2: Extract of the ISTA 3A – first drop test sequence



3A

TEST BLOCK 3
Shock:
First Sequence
(Drop)

For STANDARD,
SMALL,
FLAT and
ELONGATED

TEST SEQUENCE FOR PROCEDURE 3A

SHOCK - DROP				
Complete the following test sequence for each type of package that has a check in the box:				
<input checked="" type="checkbox"/> Standard <input checked="" type="checkbox"/> Small (DO NOT test in bag) <input checked="" type="checkbox"/> Flat <input checked="" type="checkbox"/> Elongated				
Step	Action			
1	Follow the table below to determine the height and orientation for the first 9 drops.			
	Drop Number	< 32 kg (70 lb)	32-70 kg (70-150 lb)	Applies to all package types [STANDARD, FLAT, ELONGATED, SMALL (not in bag)]
	1	460 mm (18 in)	300 mm (12 in)	Edge 3-4
	2	460 mm (18 in)	300 mm (12 in)	Edge 3-6
	3	460 mm (18 in)	300 mm (12 in)	Edge 4-6
	4	460 mm (18 in)	300 mm (12 in)	Corner 3-4-6
	5	460 mm (18 in)	300 mm (12 in)	Corner 2-3-5
	6	460 mm (18 in)	300 mm (12 in)	Edge 2-3
	7	460 mm (18 in)	300 mm (12 in)	Edge 1-2
	8	910 mm (36 in)	600 mm (24 in)	Face 3
	9	460 mm (18 in)	300 mm (12 in)	Face 3
2	Shock test is now complete. Go to TEST BLOCK 4 (Vibration Under Dynamic Load).			