



Technical Specifications for **SOYBEANS**

Specification reference: **Dry Soybean grains**

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1. SCOPE

This specification applies to dry **Soybean grains** of the plant *Glycine max*, purchased by WFP.

2. DEFINITION

Yellow soybeans are soybeans that have yellow or green seed coats and which in cross section, are yellow or have a yellow tinge, and may include not more than 10.0 percent of soybeans of others colors.

Mixed soybeans are soybeans that do not meet the requirements of the class Yellow Soybeans.

Heat-damaged kernels are soybeans and pieces of soybeans that are materially discolored and damaged by heat. Soybeans with a light to dark brown cotyledon when cut in cross section are considered heated.

Damaged kernels are soybeans and pieces of soybeans that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, heat-damaged, insect-bored, mold-damaged, sprout-damaged, purple mottled or stained, immature, shrivelled, stinkbug-stung or otherwise materially damaged. Stinkbug-stung kernels are considered damaged kernels at the rate of one-fourth of the actual percentage of the stung kernels.

Frost-damaged soybeans, when cut in cross-section, are soybeans whose cotyledons are green or greenish-brown with a glassy wax-like appearance are considered frost-damaged. Seeds that are yellow or very pale green are considered sound, even if they are superficially affected by weathering.

Insect damaged kernels are characterized by a perforation of the seed coat in conjunction with a discoloration penetrating into the cotyledon.

Mouldy soybeans are wrinkled and misshapen, and range in colour from medium to dark brown. Large areas of the affected bean are superficially covered with a grey mould. Mouldy beans often have a spongy texture and usually give off an unpleasant odour.

Sprouted are soybeans that whose seed coat splits and the primary root emerges from between the cotyledons.

Purple mottled or stained are soybeans that are discolored by the growth of a fungus; or by dirt; or by a dirt-like substance(s) including nontoxic inoculants; or by other nontoxic substances. If the soybeans are not damaged or discoloured internally, they are considered sound.

Immature damaged soybeans are characterized by a green exterior appearance in conjunction with green discoloration penetrating the cotyledon. Examination of the cotyledons is determined by cutting the soybeans in cross section. For grading purposes, immature damaged soybeans are considered as part of the “Total Damage” grade specification.

Shrivelled are soybeans which are underdeveloped, thin and wrinkled over its entire surface. If the soybean is shrivelled, small and flat, it has no oil value and is considered *Damaged*.

Foreign material is any material that is not soybean grains or fragments of soybean grains.

Splits include split soybeans, broken seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Soybeans of others colors are soybeans that have green, black, brown, or bicolored seed coats. Soybeans that have green seed coats will also be green in cross section. Bicolored soybeans will have seed coats of two colors, one of which is brown or black, and the brown or black color covers 50 percent of the seed coats. The hilum of a soybean is not considered a part of the seed coat for this determination.

3. REFERENCE

Standard and specification for soybeans, soybean oil and soybean meal-American Soybean Association (source: <http://www.asaim-europe.org/backup/pdf/standardsfor.pdf>)

Codex Standard for certain pulses grains (Codex Stan 171-1989, rev. 1-1995).

Canada Grain Commission: Official grain grading guide- Soybeans (<http://www.grainscanada.gc.ca>)

4. PRODUCT SPECIFICATION

4.1 General requirements

- | | |
|-----------------------------|---|
| • Moisture content: | 14.0% max |
| • Organoleptic: | Clean and bright appearance, Natural odour |
| • Heat-damaged kernels: | 0.5% max |
| • Damaged kernels (total): | 3.0% max |
| • Foreign material: | 2.0% max |
| • Splits: | 20.0% max |
| • Soybeans of other colors: | 2.0% max |
| • Live insects: | Nil |
| • Production year: | As per contractual agreement |

4.2 Contaminants and Toxins

Soybeans shall not contain contaminants and toxins in amounts which may represent a hazard to human health. Specific limit of some contaminants and toxins is presented in table 1.

Table 1: Limit of contaminants and toxins

| No | Contaminant and toxin | Limit |
|-------------------------------|--|----------------|
| Heavy metal | | |
| 1 | Arsenic (As) | 0.10 ppm max. |
| 2 | Copper (Cu) | 2.0 ppm max. |
| 3 | Lead (Pb) | 0.10 ppm max. |
| 4 | Cadmium (Cd) | 0.02 ppm max. |
| 5 | Mercury (Hg) | 0.01 ppm max. |
| Pesticide residues | | |
| 6 | Carbamate | < 10 ppb |
| 7 | Organochlorine | < 10 ppb |
| 8 | Organophosphorus | < 10 ppb |
| 9 | Pyrethroid | < 10 ppb |
| Toxic or noxious seeds | | |
| 10 | Crotalaria (Crotalaria spp.) | Free |
| 11 | Corn cockle (Agrostemma githago L.) | Free |
| 12 | Castor bean (Ricinus communis L.) | Free |
| 13 | Jimson weed (Datura spp.) | Free |
| Radiation | | |
| 14 | Radiation (Isotopes of strontium, notably Sr-90) | 750 Bq/Kg max. |
| Mycotoxins | | |
| 15 | Aflatoxin (total B1+B2+G1+G2) | 20 ppb max. |
| 16 | Fumosin | 5 ppb max. |
| 17 | Zearalenone | 100 ppb max. |
| 18 | Ochratoxin A | 5 ppb max. |

5. PACKAGING AND MARKING

As per contractual agreement.

6. STORING

Soybeans must be stored under dry, ventilated and hygienic conditions.

7. SAMPLING REQUIREMENTS

Representative samples can be drawn according to international sampling method standards at the bagging section or in the warehouse.

For packed units, sampling frequency and reference method are showed in *table 2*. One laboratory samples of about 3 kg is required by lot or sub-lot of 500MT maximum.

For the bulk (static and flowing), the sampling must follow the rules described in paragraphs 5.2 of ISO 24333-2009.

Table 2: Sampling rules

| Lot or sub-lot size (MT) | Number of increment | Place of sampling | Reference (or equivalent) |
|---------------------------------|---|--------------------------------|----------------------------------|
| ≤100 | 3 % of bags and minimum 50 bags (e.g. 60 increments for a lot of 100 MT, packed in 50 kg bag) | Warehouse or during production | GAFTA 124-2 |
| 101-200 | 3 % of bags (e.g. 120 increments for a lot of 200 MT, packed in 50 kg bag) | | |
| 201-300 | 3 % of bags (e.g. 180 increments for a lot of 300 MT, packed in 50 kg bag) | | |
| 301-400 | 3 % of bags (e.g. 240 increments for a lot of 400 MT, packed in 50 kg bag) | | |
| 401-500 | 3 % of bags (e.g. 300 increments for a lot of 500 MT, packed in 50 kg bag) | | |

7. ANALYTICAL REQUIREMENTS

The principal analyses/tests in table 3 must be performed in order to check if the quality of the **Soybeans** meets above requirements. Additional analyses shall be defined in case of further quality assessment.

Table 3: List of compulsory analyses/tests and reference method

| No | Analyses/tests | Limit | Reference method (or equivalent) |
|-----------|---------------------------------|---|---|
| 1 | Moisture content | 14.0% max | ISO 665:2000 |
| 2 | Organoleptic | Clean and bright appearance, Natural odour | <i>Organoleptic</i> |
| 3 | Heat-damaged kernels | 0.5% max | <i>Visual</i> |
| 4 | Damaged kernels (total) | 3.0% max | <i>Visual</i> |
| 5 | Foreign material | 2.0% max | <i>Visual</i> |
| 6 | Splits | 20.0% max | <i>Visual</i> |
| 7 | Soybeans of other colors | 2.0% max | <i>Visual</i> |
| 8 | Live insects | Nil | <i>Visual</i> |
| 9 | GMO (<i>only if required</i>) | Negative (<0.9% of GMO material as per EU regulation 1830/2003) | |

A guide for grading is presented in annex 1.

Annex 1: Guide for grading of soybean grain

The grading shall be performed as follow:

- Draw and weight a test portion (about 200g)
- Separate the test portion into component groups
- Weigh materials of the component groups
- Express the amount of material groups in percentage (guide in table 4)

Table 4: Record sheet for grading of soybean grain

| Mass of the test portion (grams)- M gr | | |
|---|----------------------------------|--|
| Component | Mass of component (grams) | Result calculation (expressed in % by mass of the test portion) |
| Heat-damaged kernels | <i>a</i> | $= a \times 100 / M$ |
| <i>Frost-damaged soybean</i> | | |
| <i>Insect damaged kernels soybeans</i> | | |
| <i>Mouldy soybeans</i> | | |
| <i>Sprouted kernels</i> | | |
| <i>Purple mottled or stained soybeans</i> | | |
| <i>Immature kernels</i> | | |
| <i>Shrivelled kernels</i> | | |
| Damaged kernels (total) | | $= (a + b) \times 100 / M$ |
| Foreign material | <i>c</i> | $= c \times 100 / M$ |
| Splits | <i>d</i> | $= d \times 100 / M$ |
| Soybeans of others colors | <i>e</i> | $= e \times 100 / M$ |