

# Directive

9180.51 6-19-09

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## INSPECTION OF CONFECTIONARY SUNFLOWER SEED

### 1. PURPOSE

This directive establishes procedures for the factor analysis of confectionary sunflower seeds under the Agricultural Marketing Act of 1946, as amended (AMA).

### 2. REPLACEMENT HIGHLIGHTS

This directive replaces FGIS Directive 9180.51, dated 5/10/02, and is revised to explain moisture content determination utilizing the Dickey-john GAC 2100, Grain Analysis Computer, approximate sample size for the Dickey-john GAC 2100, and other minor editorial changes.

### 3. GENERAL INFORMATION

There are no classes, subclasses, or grades in confectionary sunflower seed. Inspection of confectionary sunflower seed is on a factor-only basis. Factors analyzed are kind of grain, test weight, moisture, dockage, admixture, purity, de-hulled seed, damaged kernels (total), heat-damaged kernels, damaged-by-heat kernels, insect-damaged kernels, mold-damaged kernels, other-damaged kernels, seed size, sclerotinia, odor, heating, infestation, animal filth, glass, dark roast kernels, and unknown foreign substances.

### 4. HOW TO REPORT FACTOR PERCENTAGES

Except for test weight, seed size, and purity, record all percentages in whole and one-tenth percent to the nearest one-tenth percent. Record test weight in whole and one-half pounds, disregarding fractions of a half-pound. Record seed size in whole percentages, disregarding fractions of a percent. Record the percentage of purity to one-hundredth of a percent without rounding.

**5. STANDARD ABBREVIATIONS**

Use the following abbreviations in the analysis of confectionary sunflower seed:

Confectionary sunflower seed		Purity	PUR
	CSF	Insect-damaged kernels	IDK
Damaged kernels (total)	DKT	Seed size	SIZE
Dockage (total)	DKG	Animal filth	ANFL
Heat-damaged kernels	HT	Broken glass	GLAS
Infestation	INF	Unknown foreign substance	FSUB
Moisture	M	Mold-damaged kernels	MDK
Odor	Odor	Musty	MUST
Heating	HTG	Sour	SOUR
Admixture	ADM	Damaged-by-heat kernels	DHK
Dehulled seed	DH	Other damaged kernels	ODK
Test weight	TW	Commercially objectionable	
Dark roast	DARK	foreign odor	COFO
Sclerotinia	SCT		

**6. HOW FACTORS ARE DETERMINED**

**Table No. 1 - Basis of Determination**

Before Removing Dockage	After Removing Mechanically Separated Dockage	After Removing All Dockage (total)
Moisture	Test weight	Dark roast
Admixture	Dehulled seed	Insect-damaged kernels
Kind of grain	Sclerotinia	Damaged kernels (total)
Infestation	Seed size	Heat-damaged kernels
Purity	Odor	Mold-damaged kernels
Odor		Damaged-by-heat kernels
Dockage		Other damaged kernels
Animal filth		Odor
Glass		
Unknown foreign substances		

## 7. DEFINITION OF CONFECTIONARY SUNFLOWER SEED

**Confectionary sunflower seed** (Helianthus annuus L.) consists of 50.0 percent or more of whole confectionary sunflower seed before removing dockage.

Except for the definition of admixture (refer to section 14), a hull **does not** constitute a confectionary sunflower seed.

A confectionary sunflower seed can be either the hull and kernel (the size of either is irrelevant as long as they are connected), or just the kernel.

Confectionary sunflower seed is grown for non-oil purposes and includes samples of lots comprised of mixtures of confectionary and oil type seeds or pure oil type seeds, provided that the sample or the lot is presented for inspection as sunflower seed to be marketed for non-oil purposes.

**Basis of Determination.** A visual appraisal of the sample is sufficient to determine if it meets the definition of confectionary sunflower seed. However, if analysis is necessary, make the determination before removing dockage on a portion of approximately 60 grams.

The following definitions apply when identifying confectionary sunflower seed:

- a. Hull (husk) is the ovary wall of the confectionary sunflower seed.
- b. Kernel (meat) is the interior contents of the confectionary sunflower seed that are surrounded by the hull.
- c. Whole seed includes seeds and broken seeds with kernels. Seeds that do not contain kernels are not considered as whole confectionary sunflower seeds.

## 8. INSECT INFESTATION

Infestation refers to confectionary sunflower seed that is infested with live weevils or other live insects injurious to stored grain according to procedures in Federal Grain Inspection Service (FGIS) instructions.

The presence of any live weevil or other live insect injurious to stored grain indicates the probability of infestation and warns you to carefully examine the confectionary sunflower seed to determine if it is infested. In such cases, examine the work sample and the file sample before reaching a conclusion as to whether the confectionary sunflower seed is infested. Do not examine the file sample if the work portion is insect-free.

Live weevils include rice weevils, granary weevils, cowpea weevils, and lesser grain borers. Other live insects injurious to stored grain include grain beetles, sunflower moths, banded sunflower moths, Indian meal moths, grain moths, vetch bruchids, and larvae. (See Grain Inspection Handbook, Book I, Chapter 1, General Information, Section 1.2, Visual Grading Aids.)

Larvae of the red or gray sunflower seed weevil (*Smicronyz* spp.) are small, white, legless grubs approximately 1/8 inch in size. They chew out from inside the confectionary sunflower seed and cannot reinfest the seed in storage. Consequently, lots containing sunflower seed weevil larvae are not considered infested. Sunflower seed weevil larvae are considered to be foreign material.

**Basis of Determination.** Determine infestation on the lot as a whole and/or sample as a whole (1-1/8 to 1-1/4 quarts or an equivalent number of grams). For specific guidelines, see Table No. 2 and the Grain Inspection Handbook, Book I, Grain Sampling.

**Table No. 2 - Insect Infestation**

<p><i>Samples meeting or exceeding any one of these tolerances are infested: 2 lw, or 1 lw + 5 oli, or 10 oli</i></p>
<p>I. 1,000-Gram Representative Sample <u>1</u>/ (+ file sample if needed) - Submitted Samples - Probed Lots - D/T Sampled Landcarriers</p>
<p>II. Lot as a Whole (Stationary) - Probed Lots (at time of sampling)</p>
<p>III. Online Sample (In-Motion) <u>2</u>/ - Railcars Under Cu-Sum - Subsamples for Sacked Grain Lots - Components for Bargelots <u>3</u>/ - Components for Shiplot <u>3</u>/</p>
<p><u>1</u>/ Examine work portion and file sample if necessary. Do not examine file sample if work portion is insect free. <u>2</u>/ Minimum sampling rate is 500 grams per 2,000 bushels. <u>3</u>/ Minimum component size is 10,000 bushels.</p> <p>Key: lw = live weevil Oli = other live insects injurious to stored grain</p>

**Certification.** When applicable, record the word “infested” on the work record and the certificate.

**9. HEATING SEED**

Seed developing a high temperature from excessive respiration is considered heating. Heating seed in its final states usually produces a sour or musty odor. Do not confuse seed that is heating with seed that is warm and moist because of storage in bins, railcars, or other containers during hot weather.

**Basis of Determination.** Determine heating on evidence obtained at the time of sampling.

**Certification.** When applicable record the word “heating” on the work record and certificate.

**10. ODOR**

**Basis of Determination.** Determine odor on evidence at the time of sampling, on the sample either before or after removing dockage. Show on the work record odors detected at the time of sampling. However, make the final determination for odor in the laboratory.

**Table No. 3 - Odor Classification Examples**

Sour	Musty	Commercially Objectionable Foreign Odors
Boot Fermenting Insect (acrid) Pigpen Smoke *	Ground Insect Moldy	Animal hides Decaying animal and vegetable matter Fertilizer Fumigant Insecticide Oil products Skunk Smoke (evidence of fire-burnt material) Strong weed
* Consider smoke odors as sour unless there is evidence of fire-burnt material.		

Commercially Objectionable Foreign Odors are odors entirely foreign to confectionary sunflower seed that render it unfit for normal commercial usage.

Fumigant or insecticide odors are considered commercially objectionable foreign odors if the odors linger and do not dissipate.

When a sample of confectionary sunflower seed contains a fumigant or insecticide odor that prevents a determination as to whether any other odor(s) exists, apply the following guidelines:

- a. Original Inspections. Allow the work portion to aerate in an open container for 4 hours, or less, if the odor dissipates in less time.
- b. Reinspections, Appeal, and Board Appeal Inspections. Allow unworked file samples and new samples to aerate in an open container for 4 hours, or less, if the odor dissipates in less time. The 4 hour aeration requirement does not apply when the original work portion was aerated and retained as the final file.

Consider the sample as having a commercially objectionable foreign odor if the fumigant or insecticide odor persists based on the above criteria.

**Certification.** Record the words “Musty,” “Sour,” or “Commercially Objectionable Foreign Odor” on the work record and the certificate.

## 11. ANIMAL FILTH, GLASS, AND UNKNOWN FOREIGN SUBSTANCES

**Basis of Determination.** Determine animal filth, glass, and unknown foreign substances on the basis of the sample as a whole (1-1/8 to 1-1/4 quarts).

**Certification.** Record the number of pieces of animal filth, glass, and unknown foreign substances on the work record and the certificate.

## 12. TEST WEIGHT

Test weight is the weight per Winchester bushel (2,150.42 cubic inches) as determined using an approved device according to procedures prescribed in FGIS instructions.

The procedure for performing test weight is in the Grain Inspection Handbook, Book II, Chapter 1, Section 1.11.

**Basis of Determination.** Determine test weight on a representative portion of sufficient quantity to overflow the kettle after removing the mechanically separated dockage.

**Certification.** Record the test weight on the work record and the certificate in whole and one-half pounds. Disregard fractions of less than one half-pound.

### 13. MOISTURE

Moisture is the water content of confectionary sunflower seed as determined by the GAC 2100 moisture instrument using the approved calibration (see FGIS Directive 9180.61).

**Basis of Determination.** Determine moisture before the removal of dockage on a portion of approximately 225 grams.

**NOTE:** If confectionary sunflower seed has undergone rapid drying of the hull surface, the moisture may be lower than the true moisture content. As a result, equilibration time is required for moisture in the internal part of the seed to diffuse to the hull surface. Equilibration can be accomplished by placing the seed in a sealed jar for at least 4 hours and preferably up to 24 hours.

**Certification.** Record the percentage of moisture on the work record and the certificate to the nearest one-tenth percent.

### 14. DOCKAGE

All material other than whole confectionary sunflower seeds containing kernels that you can remove by using an approved device and by handpicking a portion of the sample.

**Basis of Determination.** Determine dockage on a representative portion of approximately 1-1/8 to 1-1/4 quarts cut from the original sample.

Procedure. Determine dockage in two steps: Mechanically separated and handpicked.

**STEP 1.** Determine Mechanically Separated Dockage using Carter Dockage Tester.

When running samples through the Carter Dockage Tester, insert the appropriate sieves and set the air and the feed controls to the proper position.

**Note that the Carter Dockage Tester must be at zero energy anytime you insert or remove sieves.**

	Air	Feed	Riddle	Top	Middle	Bottom
Confectionary Sunflower Seed	5-1/2 <sup>1/</sup>	7-1/2	---	3 <sup>2/</sup>	---	10/64" round hole <sup>3/</sup>

<sup>1/</sup> Set the air control at a setting of approximately 5-1/2. You may need to adjust the air setting to assure the removal of blank seeds. When you use a 14/64-inch round-hole sieve in the top sieve carriage, you may find a feed of 8-1/2 to 9 is more appropriate.

<sup>2/</sup> Upon request, use a 14/64-inch round-hole sieve in the top sieve carriage (note on the work record and the certificate that a 14/64-inch round-hole sieve was used in determining dockage).

<sup>3/</sup> Upon request, use a 12/64-inch round-hole sieve in the bottom sieve carriage (note on the work record and the certificate that a 12/64-inch round-hole sieve was used in determining dockage). When you use a 14/64-inch round-hole sieve in the top sieve carriage, do not place any sieve in the bottom sieve carriage.

**NOTE:** Mechanically separated dockage consists of:

- a. Material removed by aspiration (air collection pan).
- b. Material that passed through the 10/64-inch round-hole sieve (bottom collection pan).

**STEP 2.** Determine Handpicked Dockage.

The material that passed over the Number 3 sieve and the 10/64-inch round-hole sieve is combined to form the mechanically separated dockage-free work sample (this is the cleaned sample).

- a. Cut down the cleaned sample to a portion of approximately 60 grams.
- b. Handpick the 60-gram portion for all matter other than whole confectionary sunflower seeds.

**Total dockage is all mechanically separated dockage and handpicked dockage.**

How to Compute Dockage. Compute the percentage of total dockage as follows:

- a.  $(\text{Weight of mechanically separated dockage} \div \text{original sample weight}) \times 100 =$   
percent of mechanically separated dockage



- b.  $(100 \text{ percent} - \text{percent of mechanically separated dockage}) \div 100 = \text{change of base factor}$
- c.  $(\text{Weight of handpicked dockage} \div \text{weight of handpicked portion}) \times 100 = \text{percent of handpicked dockage}$
- d.  $\text{Percent of handpicked dockage} \times \text{change of base factor} = \text{adjusted percentage of handpicked dockage}$
- e.  $\text{Percent of mechanically separated dockage} + \text{adjusted percentage of handpicked dockage} = \text{percent of dockage (total)}$

Example for Computing Dockage:

Original sample weight <u>1/</u>	650.00-grams
Weight of mechanically separated dockage	50.00-grams
Weight of handpicked portion	75.20-grams
Weight of handpicked dockage	0.45-grams

- a.  $(50.0 \text{ grams} \div 650 \text{ grams}) \times 100 = 7.69\% \text{ mechanically separated dockage}$
- b.  $(100\% - 7.69\%) \div 100 = 0.92 \text{ change of base factor}$
- c.  $(0.45 \text{ grams} \div 75.2) \times 100 = 0.59\% \text{ handpicked dockage}$
- d.  $0.59 \times 0.92 = 0.54\% \text{ adjusted percentage of handpicked dockage}$
- e.  $7.69\% + 0.54\% = 8.23\% \text{ dockage (total)}$

**Certification.** Record the percentage of dockage (total) on the work record and the certificate to the nearest one-tenth percent.

## 15. ADMIXTURE

Admixture consists of all material other than confectionary sunflower seed that you can remove from a test portion by handsieving and handpicking. Consider empty hulls and parts of seed as confectionary sunflower seed.

The major difference between admixture and dockage is that hulls and pieces of hulls are not included in admixture. Consequently, the percentage of admixture is lower than the percentage of dockage.

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1/ Original sample weight may vary depending on seed size. Use 1-1/8 to 1-1/4 quarts.

**Basis of Determination.** Determine admixture on a portion of approximately 60 grams cut from the original sample (before removing dockage). 1/

Procedure. Determine admixture as follows:

**STEP 1.** Place the 60-gram portion on the upper edge of a 5/64-inch sieve (inscribed circle; equilateral triangular perforations). 1/

**STEP 2.** Hold the sieve at a 10 to 20 degree angle and gently work the material down over the sieve with a side-to-side motion.

**STEP 3.** After sieving, handpick all material other than sunflower seed from the material remaining on top of the hand sieve and add it to the material that passed through the hand sieve.

**NOTE:** **Admixture consists of all material which passed through the hand sieve and all material other than confectionary sunflower seed handpicked from the material remaining on top of the hand sieve.**

**Certification.** Record the percentage of admixture on the work record and the certificate to the nearest one-tenth percent.

## 16. PURITY

Purity refers to the total percentage of confectionary sunflower seed minus admixture.

**Basis of Determination.** Determine purity on a portion of approximately 60 grams cut from the original sample (before removing dockage).

Procedure. The procedure for determining admixture will provide the information to calculate purity.

How to Compute Purity. Compute the percentage of purity as follows:

Weight of portion - weight of admixture = weight of pure seeds

(Weight of pure seeds ÷ weight of portion) x 100 = percent of purity

**Certification.** Record the percentage of purity on the work record and the certificate in hundredth of a percent without rounding (e.g., 98.997 = 98.99 percent).

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1/ When corn and/or soybeans are present, use approximately 600 grams.

## 17. DEHULLED SEED

**Dehulled seeds** are confectionary sunflower seed which have the hull completely removed from the kernel.

**Basis of Determination.** Determine dehulled seed on a portion of approximately 60 grams after removing the mechanically separated dockage.

Procedure. Handpick the 60-gram portion for dehulled seed.

**Certification.** Record the percentage of dehulled seed on the work record and the certificate to the nearest tenth percent.

## 18. DAMAGED SEED

- a. Damaged. Seed and pieces of seed that are heat-damaged, sprout-damaged, frost-damaged, badly weather-damaged, mold-damaged, diseased, insect-damaged, or otherwise materially damaged or immature.
- b. Heat-Damaged. Seed and pieces of seed which have been discolored and damaged by heat. Heat-damaged seeds are included in total percentage of damaged seeds (Reference: Visual Reference Image (VRI) - [SS-2.0 Heat Damage](#)).
- c. Damaged-by-Heat. Seed and pieces of seed that are slightly discolored as a result of heating (Reference: VRI - [SS-1.0 Damage by Heat](#)).
- d. Mold-Damaged. Seed and pieces of seed which contain mold. The mold damage may affect the exterior or the interior of the seed. Surface mold growth can be assessed by visual appraisal and comparison to VRI - [SS-3.0 Surface Mold](#). Interior mold growth (invaded-by-mold) can only be assessed after removing the hull from the seed.
- e. Insect-Damaged. Seed and pieces of seed which are insect-bored resulting in damaged meats. Exterior insect damage can be assessed by visual appraisal (there must be exterior evidence of insect boring: (i.e., pinhole). Interior insect damage can only be assessed after removing the hull from the seed.

**Basis of Determination.** Determine all types of damage on a representative portion of approximately 30 grams cut from the work sample after removing the mechanically separated dockage and the handpicked dockage.

Damage must be distinct. Consider a kernel as damaged when the damage is distinctly apparent and of such character that it is recognized as damaged for commercial purposes.

Procedure. Determine all types of damage as follows:

- STEP 1.** Remove all foreign material from the 30-gram portion.
- STEP 2.** Remove all visibly damaged confectionary sunflower seeds from the remainder of the 30-gram portion.
- STEP 3.** Compute the percentage for the visibly damaged seeds removed.
- STEP 4.** Remove the hull from the seed of the remainder of the 30-gram portion using an approved method or device (e.g. hand, barley pearler, pneumatic dehuller, etc.). You will use this dehulled portion to determine interior seed damage, so make sure that the method or device that you use does not destroy the evidence of interior damage.
- STEP 5.** Weigh the dehulled portion.
- STEP 6.** Separate seeds that are heat-damaged, damaged-by-heat, insect-damaged (interior), and invaded-by-mold (interior mold growth) from the sound dehulled seeds.
- STEP 7.** Calculate the percentage of the various damages.

To obtain the percentage of mold-damaged seeds, add the percentage of seeds which exhibited surface mold growth and which were invaded-by-mold.

To obtain the percentage of insect-damaged seeds, add the percentage of seeds which exhibited both exterior and interior insect damage.

How to Compute Total Damaged Kernels. Obtain the percentage of damaged kernels by adding the percentage of other-damaged kernels, heat-damaged kernels, damaged-by-heat, mold-damaged, and insect-damaged kernels. Add the results, as shown in the following example, in hundredths (disregard thousandths) and round the sum to the nearest tenth percent.

- a.  $(\text{Weight of other-damaged kernels} \div \text{weight of representative portion after removing dockage}) \times 100 = \text{percent of other-damaged kernels}$
- b.  $(100 \text{ percent} - \text{percent of other-damaged kernels}) \div 100 = \text{change of base factor}$
- c.  $(\text{Weight of heat-damaged kernels} \div \text{weight of de-hulled portion}) \times 100 = \text{percent of heat-damaged kernels}$

- d. Percent of heat-damaged kernels x change of base factor = adjusted percent of heat-damaged kernels
- e.  $(\text{Weight of damaged-by-heat kernels} \div \text{weight of de-hulled portion}) \times 100 =$  percent of damaged-by-heat kernels
- f. Percent of damaged-by-heat kernels x change of base factor = adjusted percent of damaged-by-heat
- g.  $(\text{Weight of invaded-by-mold kernels} \div \text{weight of de-hulled portion}) \times 100 =$  percent of invaded-by-mold kernels
- h. Percent of invaded-by-mold kernels x change of base factor - adjusted percent of invaded-by-mold kernels
- i.  $(\text{Weight of interior insect-damaged kernels} \div \text{weight of de-hulled portion}) \times 100 =$  percent of insect-damaged kernels (interior)
- j. Percent of interior insect-damaged kernels x change of base factor = adjusted percent of insect-damaged kernels (interior)
- k.  $(\text{Weight of mold-damaged kernels (surface mold)} \div \text{weight of representative portion after removing dockage}) \times 100 =$  percent of mold-damaged kernels (surface mold)
- l. Percent of mold-damaged kernels (surface mold) + adjusted percent of invaded-by-mold kernels = adjusted percent of mold-damaged kernels
- m.  $(\text{Weight of exterior insect-damaged kernels} \div \text{weight of representative portion after removing dockage}) \times 100 =$  percent of insect-damaged kernels (exterior)
- n. Percent of insect-damaged kernels (exterior) + adjusted percent of insect-damaged kernels (interior) = adjusted percent of insect-damaged kernels
- o. Percent of other-damaged kernels + adjusted percent of heat-damaged kernels + adjusted percent of damaged-by-heat kernels + adjusted percent of mold-damaged kernels + adjusted percent of insect-damaged kernels = percent of damaged kernels (total)

Example for Computing Total Damaged Kernels:

Weight of representative portion after removing dockage	30.58 grams
Weight of other-damaged kernels	0.60 grams
Weight of insect-damaged kernels (exterior)	0.23 grams
Weight of mold-damaged kernels (surface)	0.11 grams
Weight of dehulled portion	15.78 grams
Weight of heat-damaged kernels	0.16 grams
Weight of damaged-by-heat kernels	1.50 grams
Weight of invaded-by-mold kernels	0.15 grams
Weight of insect-damaged kernels (interior)	0.14 grams

- a.  $(0.60 \text{ grams} \div 30.58 \text{ grams}) \times 100 = 1.96$  percent of other-damaged kernels
- b.  $(100\% - 1.96\%) \div 100 = 0.98$  change of base factor
- c.  $(0.16 \text{ grams} \div 15.78 \text{ grams}) \times 100 = 1.01$  percent of heat-damaged kernels
- d.  $1.01 \times 0.98 = 0.98$  adjusted percent of heat-damaged kernels
- e.  $(1.50 \text{ grams} \div 15.78 \text{ grams}) \times 100 = 9.50$  percent of damaged-by-heat kernels
- f.  $9.50 \times 0.98 = 9.31$  adjusted percent of damaged-by-heat kernels
- g.  $(0.15 \text{ grams} \div 15.78 \text{ grams}) \times 100 = 0.95$  percent of invaded-by-mold kernels
- h.  $0.95 \times 0.98 = 0.93$  adjust percent of invaded-by-mold kernels
- i.  $(0.14 \text{ grams} \div 15.78 \text{ grams}) \times 100 = 0.88$  percent of insect-damaged kernels (interior)
- j.  $0.88 \times 0.98 = 0.86$  adjusted percent of insect-damaged kernels (interior)
- k.  $(0.11 \text{ grams} \div 30.58 \text{ grams}) \times 100 = 0.35$  percent of mold-damaged kernels (surface mold)
- l.  $0.35 + 0.93 = 1.28$  adjusted percent of mold-damaged kernels
- m.  $(0.23 \text{ grams} \div 30.58 \text{ grams}) \times 100 = 0.75$  percent of insect-damaged kernels (exterior)
- n.  $0.75 + 0.86 = 1.61$  adjusted percent of insect-damaged kernels
- o.  $1.96\% + 0.98\% + 9.31\% + 1.28\% + 1.61\% = 15.14$  percent of damaged kernels (total) (add in hundredths and round to 15.1%)

**Certification.** Record the percentage of damaged (total), other-damaged, heat-damaged, damaged-by-heat, mold-damaged, and insect-damaged kernels on the work record and the certificate to the nearest one-tenth percent.

## 19. SEED SIZING

Confectionary sunflower seed size indicates the percentage of seeds which will pass through a requested sieve size (i.e., 16/64, 18/64, 20/64, 22/64, 24/64 inch, etc.). A moisture determination must accompany the seed sizing determination (refer to section 13 for details).

**Basis of Determination.** Determine seed size on a representative portion of approximately 100 grams cut from the work sample after removing the mechanically separated dockage.

Procedure. Use a mechanical shaker as follows for determining seed size:

**STEP 1.** Mount the appropriate sieves on the bottom pan (it is appropriate to use a sieve two sizes larger on top to maximize exposure to the bottom sieve).

**STEP 2.** Sieve the 100-gram portion on the mechanical shaker.

**STEP 3.** Set the stroke counter for 60.

**STEP 4.** Consider all the material remaining on top of the sieve as sized confectionary sunflower seed.

**STEP 5.** Return the material lodged in the perforations to the confectionary sunflower seed which remained on top of the sieve (sized seed).

**Certification.** Record the seed size in whole percentages on the work record and certificate. Include the moisture percentage (as determined by the GAC 2100 moisture instrument) in the certification statement.

Example of Certification: \_\_\_\_% remaining on a (specify sieve size) sieve. \_\_\_\_% passing through a (specify sieve size) sieve. \_\_\_\_% moisture.

Official personnel may modify this statement as needed.

## 20. SCLEROTINIA

The fungus S. sclerotiorum causes a stem disease (stem rot) in sunflowers which results in large black growths (sclerotia) on the stem and seeds.

Sclerotia are white at first, later becoming black. The sclerotia are hard on the outside and may vary in size from 2 to 10 millimeters or larger in diameter. The sclerotia are usually more flattened and elongated than spherical.

**Basis of Determination/Procedure.** Determine the presence of sclerotinia on a representative portion of approximately 300 grams cut from the sample after removing the mechanically separated dockage. When determining the presence of S. sclerotiorum, refer to Visual Reference Image (VRI - [OF- Sclerotinia](#)).

**Certification.** Record the percentage of sclerotinia on the work record and the certificate to the nearest one-tenth percent.

## 21. DARK ROAST

Dark roast is a dark discoloration that appears on confectionary sunflower seeds after roasting.

**Definition.** Sunflower meats and pieces of sunflower meats with ½ of the surface area discolored equal to or greater than intensity shown on Visual Reference Image (VRI - [SS-1.0 Damage by Heat](#) after roasting.

**Basis of Determination.** Determine dark roast on a representative portion of approximately 25 grams of dehulled sunflower seed after removing the mechanically separated dockage and the handpicked dockage.

Procedures. Determine dark roast as follows:

**STEP 1.** Size approximately 75 grams of sample over a 16/64 round-hole sieve.

**STEP 2.** Remove the hull from the seed using an approved method or device (e.g. hand, barley pearler, pneumatic de-huller, etc.).

**STEP 3.** Sieve the de-hulled sunflower meats over a 5/64 triangular sieve, and remove all material other than sunflower meats including pieces of hulls adhered to the sunflower meats.

**STEP 4.** Divide the de-hulled sunflower meats to obtain a work portion of approximately 25 grams (+/- 1.5 grams).

**STEP 5.** Preheat and stabilize the oil to 350 degrees F. (+/- 5 degrees).



- STEP 6.** Place the sunflower meats in a metal strainer and submerge in the oil for one minute (60 seconds), remove from the oil and allow the seeds to drain for approximately 15 seconds.
- STEP 7.** Place the roasted meats on a paper towel and blot dry for 2 minutes.
- STEP 8.** Weigh the portion and record the weight on the work record.
- STEP 9.** Remove meats and pieces of meats in which ½ of the surface area is discolored equal to or greater than the intensity shown on Visual Reference Image (VRI - [SS-1.0 Damage by Heat](#)).

**Certification.** Record the percentage of dark roast on the work record and the certificate to the nearest one-tenth percent.

## 22. CERTIFICATION

Certify analysis on a commodity inspection certificate. Issue a commodity submitted sample inspection certificate for a sample submitted by an applicant or an agent.

When an applicant requests analysis for only specific factors, show this sentence on the certificate:

**“Specific factor analysis only.”**

John Giler, Director  
Field Management Division