



A Specialty Coffee Association Resource

Protocols and Best Practices



Revised 2018



The Specialty Coffee Association (SCA) is a membership-based association built on foundations of openness, inclusivity, and the power of shared knowledge. From coffee farmers to baristas and roasters, our membership spans the globe, encompassing every element of the coffee value chain. SCA acts as a unifying force within the specialty coffee industry and works to make coffee better by raising standards worldwide through a collaborative and progressive approach. Dedicated to building an industry that is fair, sustainable, and nurturing for all, SCA draws on years of insights and inspiration from the specialty coffee community.

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What is a protocol?

A protocol is a specific process recommended by the SCA Standards Committee and Professional Development Department. An SCA protocol is a qualifiable recommended process that the standards committee has agreed upon and may include individual standards.

Green Coffee Grading Protocols

The Grading Green Coffee protocol is based on the SCA Green Arabica Coffee Classification System (GACCS) version Spring 2000 and the SCA Defect Handbook dated April 2, 2004. The Defect Handbook defines what are considered defects for the SCA GACCS. If the coffee imperfection is not found in the Defect Handbook, it is not considered a defect for purposes of Evaluation.

2.1 Grading Principles

The SCA GACCS determines the conversion or equivalent of single defects to full defects.

The numbers of full defects are calculated on a basis of 350 grams of green coffee sample.

Bean imperfections need to have the specific bean characteristics and criteria as they appear on the picture and physical description in the Defect Handbook to be considered a defect.

A full defect can be a Category 1 (primary) or a Category 2 (secondary) defect.

Specialty Grade samples must have zero Category 1 defects and no more than five Category 2 defects.

2.1 Grading Principles (continued)

A full defect is composed of one or more single defects depending on the impact each one has on the cup. Each defect is described in detail in the SCA Defect Handbook.

A full defect cannot be a fraction or a decimal. The correct way to count a defect is to consider defect numbers as integers rounding down instead of up.

In the case that more than one defect is observed in a coffee bean, it shall be counted only as the defect that has the greatest impact on the quality of the cup, (the defects listed first in the SCA Green Arabica Defect Handbook are considered to have the greatest impact on cup quality).

The SCA GACCS only defines two grades of coffee, Specialty Grade and Premium Grade. Other grades need to be defined as "Not classified by SCA GACCS".

In cases where several beans are considered to constitute a full defect (such as 5 broken beans = 1 full defect), the calculation showing the conversion of single defects to the correct amount of full defects must be shown.

A bean is judged to be partial or full sour only if the orange/red color has fully penetrated the body of the bean, but not if the red color is only present on the silverskin (these are otherwise known as a "foxy" bean). A bean is deemed immature only if the silverskin is still firmly attached. To determine this, one may scratch it with a fingernail or rub the bean on a rough surface.

2.2 Green Grading Form

This form may be downloaded from the SCA store and available for free to SCA members here. It is to be filled out completely.

Each grader (primary grader and verification grader) must write their name, date and the Sample identification code number in the space provided.

2.2 Green Grading Form (continued)

Clearly specify the Grade of the coffee in the space provided on the form stating one of the following classifications:

- Specialty Grade
- Below Specialty Grade
- Show the calculation from individual defects to full defect equivalent.
- All final results are based on a 350 gram sample equivalent.
- Summarize the total number of Category 1 and Category 2 defects. This final result must be recorded on the upper right hand corner box of the grading form.
- Evaluation of the total number and type of defects will determine the grade (Specialty/ Below Specialty) of the sample. This result must appear in the box provided for GRADE.
- Each sample must be evaluated for color. Blue-Green, Bluish-Green and Green are the acceptable colors for Specialty Grade. A Greenish or inferior sample would not qualify.
- Each sample must also be evaluated for foreign odors. Graders need to stick their nose into the sample and inhale strongly to detect any foreign odor. Only samples that are completely free of foreign odors can qualify as Specialty Grade.

Cupping Protocols

Roasting Preparation	Environment	Cupping Preparation
Sample Roaster	Well Lit	Balance (Scale)
Agtrong or other color reading device	Clean, no interfering aromas	Cupping glasses with lids
Grinder	Cupping Tables Comforable temperature	Cupping spoons Hot water equipment
		Forms and other paperwork

Cupping Glasses Cupping vessels shall be of tempered glass or ceramic material. They shall be between 7 and 9 fluid ounces (207 ml to 266 ml), with a top diameter of between 3 and 3.5 inches (76 - 89 mm). All cups used shall be of identical volume, dimensions and material of manufacture, and have lids.

3.2 Sample Preparation

Roasting

- The sample should be roasted within 24 hours of cupping and allowed to rest for at least 8 hours.
- The roast level for cupping shall be measured between 30 minutes and 4 hours after roasting using coffee ground to the SCA Standard Grind for Cupping and be measured on coffee at room temperature. The coffee shall meet the following measurements with a tolerance of ± 1.0 units: (next page)

3.2 Sample Preparation (continued)

- Agtron "Gourmet": 63.0
 - Agtron "Commercial": 48.0
 - Colortrack: 62.0
 - Probat Colorette 3b: 96.0
 - Javalytics: same as Agtron measurement using either "Gourmet" or "Commercial" scales
 - Lightells: same as Agtron measurements using "Gourmet" scale
 - RoastRite: same as Agtron measurements using "Gourmet" scale
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- The roast should be completed in no less than 8 minutes and no more than 12 minutes. Scorching or tipping should not be apparent.
 - Sample should be immediately air-cooled (no water quenching).
 - When they reach room temperature (app. 75° F or 20° C), completed samples should then be stored in airtight containers or non-permeable bags until cupping to minimize exposure to air and prevent contamination.
 - Samples should be stored in a cool dark place, but not refrigerated or frozen.

Determining Measurements

- The optimum ratio is 8.25 grams of coffee per 150 ml of water, as this conforms to the mid-point of the optimum balance recipes for the Golden Cup.
- Determine the volume of water in the selected cupping glass and adjust weight of coffee to this ratio within +/- .25 grams.

Cupping Preparation

- Sample should be ground immediately prior to cupping, no more than 15 minutes before infusion with water. If this is not possible, samples should be covered and infused not more than 30 minutes after grinding.

Cupping Preparation

- Samples should be weighed out as WHOLE BEANS to the predetermined ratio (see above for ratio) for the appropriate cup fluid volume.
- Grind particle size should be slightly coarser than typically used for paper filter drip brewing, with 70% to 75% of the particles passing through a U.S. Standard size 20 mesh sieve. At least 5 cups from each sample should be prepared to evaluate sample uniformity.
- Each cup of sample should be ground by running a cleansing quantity of the sample through the grinder, and then grinding each cup's batch individually into the cupping glasses, ensuring that the whole and consistent quantity of sample gets deposited into each cup. A lid should be placed on each cup immediately after grinding.

Pouring

- Water used for cupping should be clean and odor free, but not distilled or softened. Ideal Total Dissolve Solids are 125-175 ppm, but should not be less than 100 ppm or more than 250 ppm.
- The water should be freshly drawn and brought to approximately 200° F (93°C) at the time it is poured onto the ground coffee. Temperature needs to be adjusted to elevation
- The hot water should be poured directly onto the measured grounds to the rim of the cup, making sure to wet all of the grounds. The grounds to steep undisturbed for a period of 3-5 minutes before evaluation.

3.3 Sample Evaluation

Sensory testing is done for three reasons:

- To determine the actual sensory differences between samples
- To describe the flavor of samples
- To determine preference of products

3.3 Sample Evaluation

No one test can effectively address all of these, but they have common aspects. It is important for the evaluator to know the purpose of the test and how results will be used. The purpose of this cupping protocol is the determination of the copper's perception of quality. The quality of specific flavor attributes is analyzed, and then drawing on the copper's previous experience, samples are rated on a numeric scale. The scores between samples can then be compared. Coffees that receive higher scores should be noticeably better than coffees that receive lower scores.

The Cupping Form provides a means of recording important flavor attributes for coffee: Fragrance/Aroma, Flavor, Aftertaste, Acidity, Body, Balance, Uniformity, Clean Cup, Sweetness, Defects, and Overall. The specific flavor attributes are positive scores of quality reflecting a judgment rating by the copper; Defects are negative scores denoting unpleasant flavor sensations; the Overall score is based on the flavor experience of the individual copper as a personal appraisal. These are rated on a 16-point scale representing levels of quality in quarter point increments between numeric values from 6 to 9. These levels are:

Quality Scale

6.00 - Good	7.00 - Very Good	8.00 - Excellent	9.00 Outstanding
6.25	7.25	8.25	9.25
6.5	7.5	8.5	9.5
6.75	7.75	8.75	9.75

Theoretically, the above scale ranges from a minimum value of 0 to a maximum value of 10 points. The lower end of the scale is below specialty grade.

3.3 Sample Evaluation

Evaluation Procedure

Step #1 – Fragrance/Aroma

- Within 15 minutes after samples have been ground, the dry fragrance of the samples should be evaluated by lifting the lid and sniffing the dry grounds.
- After infusing with water, the crust is left unbroken for at least 3 minutes but not more than 5 minutes. Breaking of the crust is done by stirring 3 times, then allowing the foam to run down the back of the spoon while gently sniffing. The Fragrance/Aroma score is then marked on the basis of dry and wet evaluation.

Step #2 – Flavor, Aftertaste, Acidity, Body, and Balance

- When the sample has cooled to 160° F (71° C), in about 8-10 minutes from infusion, evaluation of the liquor should begin. The liquor is aspirated into the mouth in such a way as to cover as much area as possible, especially the tongue and upper palate. Because the retro nasal vapors are at their maximum intensity at these elevated temperatures, Flavor and Aftertaste are rated at this point.
- As the coffee continues to cool (160° F - 140° F), the Acidity, Body and Balance are rated next. Balance is the copper's assessment of how well the Flavor, Aftertaste, Acidity, and Body fit together in a synergistic combination.
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3.3 Sample Evaluation (continued)

Evaluation Procedure

Step #3 – Sweetness, Uniformity, and Cleanliness

- As the brew approaches room temperature (below 100° F) Sweetness, Uniformity, and Clean Cup are evaluated. For these attributes, the copper makes a judgment on each individual cup, awarding 2 points per cup per attribute (10 points maximum score).
 - Evaluation of the liquor should cease when the sample reaches 70° F (21° C) and the Overall score is determined by the copper and given to the sample as "Cupper's Points" based on ALL of the combined attributes.
- Step #2 – Flavor, Aftertaste, Acidity, Body, and Balance

Step #4 – Scoring

- After evaluating the samples, all the scores are added as described in the "Scoring" section below and the Final Score is written in the upper right hand box.

3.4 Individual Component Scores

The attribute score is recorded in the appropriate box on the cupping form. On some of the positive attributes, there are two tick-mark scales.

- The vertical (up and down) scales are used to rank the intensity of the listed sensory component and are marked for the evaluator's record.
- The horizontal (left to right) scales are used to rate the panelist's perception of relative quality of the particular component based upon their perception of the sample and experiential understanding of quality.

Each of these attributes is described more fully as follows:

3.4 Individual Component Scores

- Fragrance/Aroma | The aromatic aspects include Fragrance (defined as the smell of the ground coffee when still dry) and Aroma (the smell of the coffee when infused with hot water). One can evaluate this at three distinct steps in the cupping process: (1) sniffing the grounds placed into the cup before pouring water onto the coffee; (2) sniffing the aromas released while breaking the crust; and (3) sniffing the aromas released as the coffee steeps. Specific aromas can be noted under "qualities" and the intensity of the dry, break, and wet aroma aspects noted on the 5-point vertical scales. The score finally given should reflect the preference of all three aspects of a sample's Fragrance/Aroma.
- Flavor | Flavor represents the coffee's principal character, the "mid-range" notes, in between the first impressions given by the coffee's first aroma and acidity to its final aftertaste. It is a combined impression of all the gustatory (taste bud) sensations and retro-nasal aromas that go from the mouth to nose. The score given for Flavor should account for the intensity, quality and complexity of its combined taste and aroma, experienced when the coffee is slurped into the mouth vigorously so as to involve the entire palate in the evaluation.
- Aftertaste | Aftertaste is defined as the length of positive flavor (taste and aroma) qualities emanating from the back of the palate and remaining after the coffee is expectorated or swallowed. If the aftertaste were short or unpleasant, a lower score would be given.
- Acidity | Acidity is often described as "brightness" when favorable or "sour" when unfavorable. At its best, acidity contributes to a coffee's liveliness, sweetness, and fresh- fruit character and is almost immediately experienced and evaluated when the coffee is first slurped into the mouth. Acidity that is overly intense or dominating may be unpleasant, however, and excessive acidity may not be appropriate to the flavor profile of the sample. The final score marked on the horizontal tick-mark scale should reflect the panelist's perceived quality for the Acidity relative to the expected flavor profile based on origin characteristics and/or other factors (degree of roast, intended use, etc.).

3.4 Individual Component Scores (continued)

- Acidity | Coffees expected to be high in Acidity, such as a Kenya coffee, or coffees expected to be low in Acidity, such as a Sumatra coffee, can receive equally high preference scores although their intensity rankings will be quite different.
- Body | The quality of Body is based upon the tactile feeling of the liquid in the mouth, especially as perceived between the tongue and roof of the mouth. Most samples with heavy Body may also receive a high score in terms of quality due to the presence of brew colloids and sucrose. Some samples with lighter Body may also have a pleasant feeling in the mouth, however. Coffees expected to be high in Body, such as a Sumatra coffee, or coffees expected to be low in Body, such as a Mexican coffee, can receive equally high preference scores although their intensity rankings will be quite different.
- Balance | How all the various aspects of Flavor, Aftertaste, Acidity and Body of the sample work together and complement or contrast to each other is Balance. If the sample is lacking in certain aroma or taste attributes or if some attributes are overpowering, the Balance score would be reduced.
- Sweetness | Sweetness refers to a pleasing fullness of flavor as well as any obvious sweetness and its perception is the result of the presence of certain carbohydrates. The opposite of sweetness in this context is sour, astringency or "green" flavors. This quality may not be directly perceived as in sucrose-laden products such as soft drinks, but will affect other flavor attributes. 2 points are awarded for each cup displaying this attribute for a maximum score of 10 points.
- Clean Cup | Clean Cup refers to a lack of interfering negative impressions from first ingestion to final aftertaste, a "transparency" of cup. In evaluating this attribute, notice the total flavor experience from the time of the initial ingestion to final swallowing or expectoration. Any non-coffee like tastes or aromas will disqualify an individual cup. 2 points are awarded for each cup displaying the attribute of Clean Cup.

- Uniformity | Uniformity refers to consistency of flavor of the different cups of the sample tasted. If the cups taste different, the rating of this aspect would not be as high. 2 points are awarded for each cup displaying this attribute, with a maximum of 10 points if all 5 cups are the same.
- Overall | The "overall" scoring aspect is meant to reflect the holistically integrated rating of the sample as perceived by the individual panelist. A sample with many highly pleasant aspects, but not quite "measuring up" would receive a lower rating. A coffee that met expectations as to its character and reflected particular origin flavor qualities would receive a high score. An exemplary example of preferred characteristics not fully reflected in the individual score of the individual attributes might receive an even higher score. This is the step where the panelists make their personal appraisal.
- Defects | Defects are negative or poor flavors that detract from the quality of the coffee. These are classified in 2 ways. A taint is an off-flavor that is noticeable, but not overwhelming, usually found in the aromatic aspects. A "taint" is given a "2" in intensity. A fault is an off-flavor, usually found in the taste aspects, that is either overwhelming or renders the sample unpalatable and is given an intensity rating of "4". The defect must first be classified (as a taint or a fault), then described ("sour," "rubbery," "ferment," "phenolic" for example) and the description written down. The number of cups in which the defect was found is then noted, and the intensity of the defect is recorded as either a 2 or 4. The defect score is multiplied and subtracted from the total score according to directions on the cupping form.

3.5 Final Scoring

The Final Score is calculated by first summing the individual scores given for each of the primary attributes in the box marked "Total Score." Defects are then subtracted from the "Total Score" to arrive at a "Final Score." The following Scoring Key has proven to be a meaningful way to describe the range of coffee quality for the Final Score.

Total Score Quality Classification

- 90-100 - Outstanding - Specialty
- 85-89.99 - Excellent - Specialty
- 80-84.99 - Very Good - Specialty
- < 80.0 - Below Specialty Quality - Not Specialty

Brewing Best Practices

Coffee-to-Water Ratio: To achieve the Golden Cup Standard, the recommended coffee-to-water ratio is $55 \text{ g/L} \pm 10\%$.

Coffee Preparation Temperature: To achieve the Golden Cup Standard, water temperature, at the point of contact with coffee, is recommended to fall between $200^\circ\text{F} \pm 5^\circ$ & $94.0^\circ\text{C} \pm 2^\circ$.

4.1 Elements and Device

Measurable elements:

- Water: valid when brewing water meets SCA water quality standard
- Ratio of Coffee-to-Water ($55 \text{ g/L} \pm 10\%$)
- Grind/particle size distribution: matches the time of coffee-to-water contact

Equipment/brewing device:

- Time of Coffee-to-water Contact: 1-4 minutes Fine, 4-6 minutes Drip, 6-8 minutes Coarse
- Temperature: $200^\circ\text{F} \pm 5^\circ$ & $94.0^\circ\text{C} \pm 2^\circ$
- Turbulence (mixing action of water flowing through & around the coffee particles to achieve a uniform extraction of soluble material)
- Filter media (least affect to brew flavor, body, time of contact & sediment less than 75 milligrams per 100 milliliters)

Separation of Coffee Products

Separation of coffee products is recognized as an SCA Best Practice in manufacturing, including quality control and product development functions to protect the integrity of coffee products and prevent product contamination. Roasted coffee and raw (green) coffee products shall be separated, also organic and non-organic coffee products shall be further separated.

5.1 Functional Details

The following areas should have provisions for separating green coffee and roasted coffee, organic coffee and non-organic coffee. This list may not be complete for all coffee companies and operational situations.

- Warehouse Storage
- Storage bins
- Re-work bins
- Sample trays



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