

New Release
Desktop App

Minor Version - V3.2.0

2025/08/08

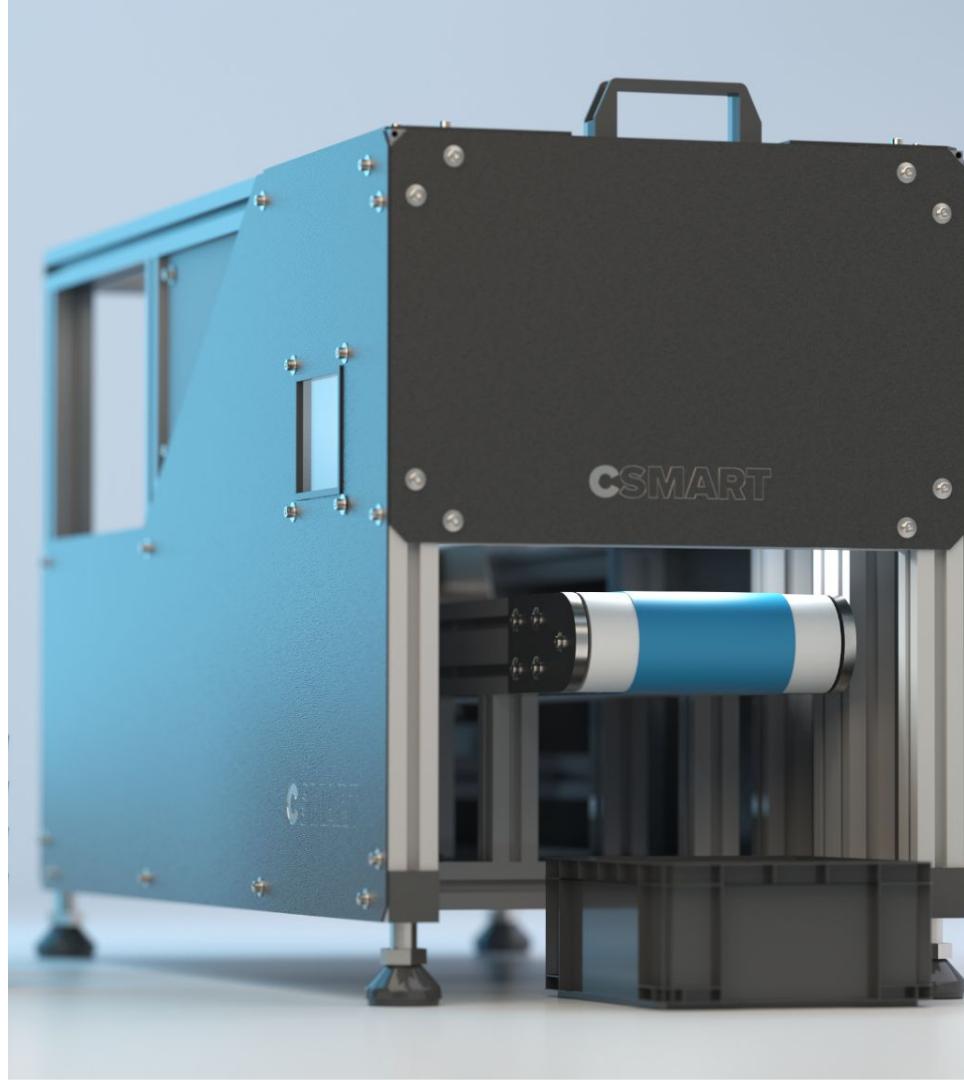
Csmart Digit

v3.2.0

Version 3.2.0 introduces a new method for calculating sample weight directly from image data, replacing the previous approach based on weight-per-class-per-screen-size. The system now uses class-specific density values and shape information stored in the AI model to convert measured areas into precise mass values for each seed and class type.

This enhancement delivers more consistent and representative weight measurements, improving the accuracy of total equivalent defect calculations and other metrics that depend on estimated weight.

For a detailed explanation, click [here](#)





Quality Control

Home

Browse Analyses

Artificial Intelligence

Dashboard

Image Mosaic

Lot Info

Classification Report

Export Data

Export Images

Blend & Compare

Continuous Operation

Live Analysis

Server and API

Upload Analysis

AI Model | Dataset

Edit Model

Evaluate Model

System Configuration

Acquisition Settings

General Settings

File Name
3File Location
C:\csmart\AnalysisLast AI Model
224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_G97

Language

1
English

Português

Español

Home

Welcome to Csmart-Digit

AI-Powered Coffee Seed Analyzer



New Analysis

Create a new analysis file by capturing individual seed images from a coffee sample.

[Create New Analysis >](#)

Open Analysis

Select an existing analysis file to review its results or rerun a model on the stored images.

[Open Existing Analysis >](#)

Browse Analyses

Navigate through all analysis files in the selected folder to review their key information.

[Browse Analyses >](#)

Artificial Intelligence

Select an AI model and run it on a single analysis file or multiple files at once. The model will classify each image into one of the trained classes and grade the coffee sample based on the incorporated methods.

[Classify Using AI >](#)

Live Analysis

Leverage Csmart-Digit's advanced AI models to analyze samples in real-time. Identify specific categories or define descriptive rules to detect objects beyond the model's training data.

[Start Live Analysis >](#)

Knowledge Base

Explore the Csmart-Digit Knowledge Base, a comprehensive resource offering guidance, troubleshooting tips, and detailed information about the Csmart-Digit software.

[Explore Knowledge Base >](#)

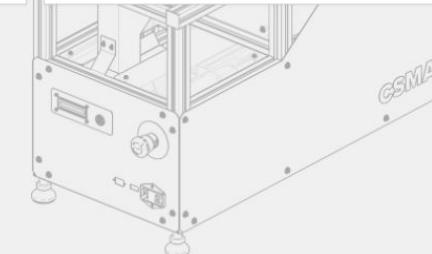
1731

AI Analyses Run



0.09

Recorded Hours



Language

1. The new Language menu in the top bar allows users to switch the app interface between **English**, **Português**, and **Español**; changes apply instantly, and the selected language is saved on the device. Any untranslated text will appear in English without affecting files or analysis data.

Quality Control

-  Home
-  Browse Analyses
-  Artificial Intelligence
-  Dashboard
-  Image Mosaic
-  Lot Info
-  Classification Report
-  Export Data
-  Export Images
-  Blend & Compare

Continuous Operation

-  Live Analysis

Server and API

-  Upload Analysis

AI Model | Dataset

-  Edit Model

-  Evaluate Model

System Configuration

-  Acquisition Settings
-  General Settings

Weight Estimation ?

2

Id	Class	Shape	Reference File	Total Size	Weight	Density*
0	Black	Flat 	 Import File	3	0	g
1	Broken	Flat 	 Import File	0 cm ³	0	g
2	Floater	Flat 	 Import File	0 cm ³	0	g
3	Fox Bean	Flat 	 Import File	0 cm ³	0	g
4	Husk	Flat 	 Import File	0 cm ³	0	g
5	Immature	Flat 	 Import File	0 cm ³	0	g
6	Insect Dam	Flat 	 Import File	0 cm ³	0	g
7	Ok	Flat 	 Import File	0 cm ³	0	g
8	Partial Parch	Flat 	 Import File	0 cm ³	0	g
9	Whole Parch	Flat 	 Import File	0 cm ³	0	g
10	Dried Cherry	Flat 	 Import File	0 cm ³	0	g
11	Shell	Flat 	 Import File	0 cm ³	0	g
12	Sour	Flat 	 Import File	0 cm ³	0	g
13	Stick	Flat 	 Import File	0 cm ³	0	g

Weight Estimation

2. A new density-per-class approach has been implemented. When opening a model in Edit Model, the Weight Estimation panel displays all classes in the model along with their Shape, Reference File, Total Size, Weight, and Density*.
3. The reference file is a standard sample analysis with a known weight, used to calculate the density. To select the file, click Import File under Reference File.

The screenshot shows the Csmart Digit software interface. The top navigation bar includes the logo, file name (BlackRef), file location (D:\Projects\Weights), and last AI model (224_MCL_SEGFORM5_ARA_OFI_V03_H96). The main menu on the left is 'Quality Control' with sub-options: Home, Bi (highlighted), Organize, New folder, Google Drive (G:), Brazil, Validation2025, Analysis, This PC, Local Disk (C:), Dev (D:), Google Drive (G:), and Network. The central area shows a table of items:

ID	Status	Type	Import File	Volume	Weight	Density	Actions
7	Ok	Flat <input checked="" type="checkbox"/> 3D	<input type="button" value="Import File"/>	0 cm ³	0 g	0 g/cm ³	<input type="button"/>
8	Partial Parch	Flat <input checked="" type="checkbox"/> 3D	<input type="button" value="Import File"/>	0 cm ³	0 g	0 g/cm ³	<input type="button"/>
9	Whole Parch	Flat <input checked="" type="checkbox"/> 3D	<input type="button" value="Import File"/>	0 cm ³	0 g	0 g/cm ³	<input type="button"/>
10	Dried Cherry	Flat <input checked="" type="checkbox"/> 3D	<input type="button" value="Import File"/>	0 cm ³	0 g	0 g/cm ³	<input type="button"/>
11	Shell	Flat <input checked="" type="checkbox"/> 3D	<input type="button" value="Import File"/>	0 cm ³	0 g	0 g/cm ³	<input type="button"/>

The 'Weights' section is currently active, showing a file browser window with the path D:\Projects\Weights. The file 'BlackRef' is selected, highlighted with a yellow box and the number '4'.

Weight Estimation

4. Select the desired .hdf5 file corresponding to the class. To properly implement the density map, it is necessary to generate single-class files with a known weight. There is no minimum weight requirement, but it is recommended to use at least 100g.

 Csmart Digit
v.3.2.0
File Name
BlackRef
File Location
D:\Projects\Weights
Last AI Model
224_MCL_SEGFORM5_ARA_OFI_V03_H96
   

Quality Control
Home
Browse Analyses
Artificial Intelligence
Dashboard
Image Mosaic
Lot Info
Classification Report
Export Data
Export Images
Blend & Compare

Continuous Operation
Live Analysis

Server and API
Upload Analysis

AI Model | Dataset
 Edit Model
 Evaluate Model

System Configuration
 Acquisition Settings
 General Settings

Weight Estimation ?
 Import File
413.35 cm³
200 g
0.48 g/cm³

5

 Import File
0 cm³
0 g
0 g/cm³


 Import File
0 cm³
0 g
0 g/cm³


 Import File
0 cm³
0 g
0 g/cm³


 Import File
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0 g
0 g/cm³


 Import File
0 cm³
0 g
0 g/cm³


Weight Estimation

5. When opened, the file displays the total volume of the sample. To calculate density, enter the weight measured on a scale when the sample was acquired, and then click the calculator icon. The density will be displayed in g/cm³.

It is important to note that this is neither the bulk density nor the specific density of the coffee, so standard values should not be used. This implementation relies on a holistic approach to calculate volume.

Repeat this process for all other classes.



File Name BlackRef	File Location D:\Projects\Weights	Last AI Model 224_MCL_SEGFORM5_ARA_OFI_V03_H96	Import Export User Help
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Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info**
- Classification Report
- Export Data
- Export Images
- Blend & Compare

Continuous Operation

- Live Analysis

Server and API

- Upload Analysis

AI Model | Dataset

- Edit Model
- Evaluate Model

System Configuration

- Acquisition Settings
- General Settings

Quality Control

Lot Information

Commercial	Cupping	Producer Info	Botanic	Harvest & Processing	Physical Aspects
Moisture Content (%)	Water Activity (%)	Bulk Density (g/ml)			
Moisture Content	Water Activity	Bulk Density			
Sample Weight (g)			7	Save	8
200					
Reset All Fields					

Weight Estimation

6. To streamline the process, it is possible to save the weight information inside the reference file, under Lot Analysis / Physical Aspects.

7. Enter the sample weight and click Save (8). This keeps all data stored in the same file and helps prevent typing errors.

Now, this weight data will be used to calculate density when the reference file is imported.

 Csmart Digit
v.3.2.0
File Name
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Last AI Model
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Quality Control
Home
Browse Analyses
Artificial Intelligence
Dashboard
Image Mosaic
Lot Info
Classification Report
Export Data
Export Images
Blend & Compare

Continuous Operation
Live Analysis

Server and API
Upload Analysis

AI Model | Dataset
 Edit Model
 Evaluate Model

System Configuration
 Acquisition Settings
 General Settings

Weight Estimation ?

Id	Class	Shape	Reference File	Total Size	Weight	Density*		
0	Black	9	Flat <input checked="" type="checkbox"/> 3D	 Import File	621.36 cm ²	200 g	0.32 g/cm ²	 
1	Broken	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
2	Floater	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
3	Fox Bean	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
4	Husk	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
5	Immature	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
6	Insect Dam	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
7	Ok	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
8	Partial Parch	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
9	Whole Parch	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
10	Dried Cherry	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
11	Shell	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
12	Sour	Flat <input checked="" type="checkbox"/> 3D	 Import File	0 cm ³	0 g	0 g/cm ³	 	
13	Stick	Flat <input checked="" type="checkbox"/> 3D	Import File	0 cm ³	0 g	0 g/cm ³		

Weight Estimation

6. It is also possible to work with planar data for classes that follow a linear relationship between area and weight, such as husks, parchment, and silver skins.

When switching from 3D to Flat, the density is calculated using the area instead, and the unit becomes g/cm².

Make sure to apply this option only to classes that do not grow volumetrically.

 Csmart Digit
v.3.2.0
 File Name
BlackRef
 File Location
D:\Projects\Weights
 Last AI Model
224_MCL_SEGFORM5_ARA_OFI_V03_H96
   

Quality Control
Weight Estimation ?

Id	Class	Shape	Reference File	Total Size	Weight	Density*	Actions
0	Black	Flat <input checked="" type="checkbox"/> 3D	 Import File	413.35 cm ³	200 g	0.48 g/cm ³	 
1	Broken	Flat <input checked="" type="checkbox"/> 3D	 Import File	414.50 cm ³	196 g	0.47 g/cm ³	 
2	Floater	Flat <input checked="" type="checkbox"/> 3D	 Import File	267.77 cm ³	100 g	0.37 g/cm ³	 
3	Fox Bean	Flat <input checked="" type="checkbox"/> 3D	 Import File	154.06 cm ³	90 g	0.58 g/cm ³	 
4	Husk	Flat <input checked="" type="checkbox"/> 3D	 Import File	971.90 cm ²	96 g	0.1 g/cm ²	 
5	Immature	Flat <input checked="" type="checkbox"/> 3D	 Import File	224.16 cm ³	98 g	0.44 g/cm ³	 
6	Insect Dam	Flat <input checked="" type="checkbox"/> 3D	 Import File	336.28 cm ³	133 g	0.4 g/cm ³	 
7	Ok	Flat <input checked="" type="checkbox"/> 3D	 Import File	154.06 cm ³	90 g	0.58 g/cm ³	 
8	Partial Parch	Flat <input checked="" type="checkbox"/> 3D	 Import File	739.15 cm ²	30 g	0.04 g/cm ²	 
9	Whole Parch	Flat <input checked="" type="checkbox"/> 3D	 Import File	327.14 cm ³	100 g	0.31 g/cm ³	 
10	Dried Cherry	Flat <input checked="" type="checkbox"/> 3D	 Import File	253.74 cm ³	101 g	0.4 g/cm ³	 
11	Shell	Flat <input checked="" type="checkbox"/> 3D	 Import File	490.20 cm ³	157 g	0.32 g/cm ³	 
12	Sour	Flat <input checked="" type="checkbox"/> 3D	 Import File	261.89 cm ³	120 g	0.46 g/cm ³	 
13	Stick	Flat <input checked="" type="checkbox"/> 3D	Import File	148.12 cm ³	47 g	0.32 g/cm ³	

Weight Estimation

After opening a reference file for each class and selecting the Shape option for the required classes, the density map is complete. Click save, and the model will be ready to use with the new version.

Note that when importing Reference Files, it is possible to select more than one file to generate an average density reading.

If a reference file is not available, it is also possible to manually enter the density.

Csmart Digit v.3.2.0

File Name: TesteClassificacao | File Location: C:\csmart\Analysis | Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Quality Control | Dashboard | Image Mosaic | Lot Info | Classification Report | Export Data | Export Images | Blend & Compare | Continuous Operation | Live Analysis | Server and API | Upload Analysis | AI Model | Dataset | Edit Model | Evaluate Model | System Configuration | Acquisition Settings | General Settings

Quality Control | **Dashboard**

Total Defects: 27.2% (Weight: 34.0g) | **Defeitos Primarios: 8.4%** (Weight: 10.5g) | **Defeitos Secundario: 17%** (Weight: 21.2g) | **Materia Estranha: 1.8%** (Weight: 2.3g) | **Inspected Seeds: 873** (Total Weight: 125g) | **NY Protocol: Type 7/8** (Defects: 205 ±40) | **Dominant Color: RGB(149, 146, 114)**

Screen Size Distribution

Stacked bar chart showing Weight (g) vs Screen Size (10-19+). The chart includes a cumulative percentage line and an average line. The legend indicates OK (91.0g) in teal and NOK (34.0g) in dark blue.

Screen Size	Weight (g)	Percentage	Cumulative %
Screen10-	3.3g	2.6%	100.0%
Screen11	2.4g	1.9%	97.4%
Screen12	3.7g	2.9%	95.5%
Screen13	6.8g	5.4%	92.6%
Screen14	13.1g	10.5%	87.1%
Screen15	14.7g	11.8%	76.6%
Screen16	23.4g	18.7%	64.9%
Screen17	26.9g	21.5%	46.2%
Screen18	20.4g	16.3%	24.7%
Screen19+	10.5g	8.4%	8.4%

Legend: Ok Defects Both | Min and Max Screen: total-relative | Range: 10 to 19

Save Image | **Generate Plot**

Classes Distribution

Table showing Class, Weight (g), Percentage, and Subset for different coffee types.

Class	Weight (g)	Percentage	Subset
Arábica	2.9g	2.3%	Defeitos Primarios

Weight Estimation

9. After running an analysis with a model that includes a density map, every variable is now expressed on a weight basis. It is still possible to switch back to occurrence %, but the weight-based view aligns better with the standard way of calculating percentages in coffee quality control.

Csmart Digit v.3.2.0

File Name TesteClassificacao **File Location** C:\csmart\Analysis **Last AI Model** 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info
- Classification Report
- Export Data
- Export Images
- Blend & Compare**

Continuous Operation

- Live Analysis

Server and API

- Upload Analysis

AI Model | Dataset

- Edit Model
- Evaluate Model

System Configuration

- Acquisition Settings
- General Settings

Quality Control

Blend & Compare

 **Side-by-Side**

Compare two or more samples across key variables, including defects, screen sizes, and full detailed lot information, all in a clean, side-by-side view.

[Compare Samples >](#)

 **Blend Aggregation**

Simulate the combination of samples by aggregating values across selected lots. Ideal for modeling output in mill processing or post-harvest blending.

[Simulate Blend Aggregation >](#)

 **Proportional Blend**

Simulate blends using samples from different lots by setting blend ratios. A straightforward tool to explore possible outcomes of merging real-world lots.

[Simulate Proportional Blend >](#)

 **Color Difference**

Select two or more samples to instantly calculate how different their colors appear, giving you a clear, precise measure of color variation. Quantify perceptual color variation using industry-standard metrics

[Compare Dominant Colors >](#)

 **Lot Tracking**

Track changes within a single lot over time. Analyze multiple samples from the same lot taken at different stages of processing. Measure how each sample evolves and quantify its deviation from the original or target profile.

[Track a Single Lot Over Time >](#)

 **Compare Multiple Lots**

Compare multiple lots to evaluate consistency and variability. Assess how different lots relate to each other in terms of quality, size, texture, color and more. Identify patterns, similarities, and key differences across lots.

[Explore Multiple Lot Analyses >](#)

Blend & Compare

The improved Blend & Compare section now includes several new features to enhance lot-level analysis, providing macro-scale insights and supporting tasks beyond the classification of green coffee.

New tools include Side-by-Side, Blend Aggregation, Proportional Blend, Color Difference, and Lot Tracking. The Compare Multiple Lots feature was already available in previous versions.

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Help |     

Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info
- Classification Report
- Export Data
- Export Images
- Blend & Compare**
- Continuous Operation
- Live Analysis
- Server and API
- Upload Analysis
- AI Model | Dataset
- Edit Model
- Evaluate Model
- System Configuration
- Acquisition Settings
- General Settings

Quality Control

Side-by-Side Comparison

1. Add analysis files to the comparison list

+ Add Analysis

1	EstudoConsumoTeste1	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
2	EstudoConsumoTeste2	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
3	EstudoConsumoTeste3	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
4	EstudoConsumoTeste4	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	

2. Click 'Compare' to generate comparison table

Compare

< Back to Blend & Compare

Side by Side Comparison

The Side-by-Side tool is designed to present the most relevant variables in a clear, table-style format. Simply select the analyses you want to compare and click **Compare**.

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Print  Export  User  Help 

Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info
- Classification Report
- Export Data
- Export Images
- Blend & Compare

Continuous Operation

- Live Analysis

Server and API

- Upload Analysis

AI Model | Dataset

- Edit Model
- Evaluate Model

System Configuration

- Acquisition Settings
- General Settings

Quality Control

← Side-by-Side Comparison

Show Percentage

Variable	EstudoConsumoTeste1	EstudoConsumoTeste2	EstudoConsumoTeste3	EstudoConsumoTeste4
Summary				
Total Defects (%)	58.3%	20.9% 	81.1% 	80.0%
Defeitos Primarios (%)	23.3%	5.3% 	23.7%	53.3% 
Defeitos Secundario (%)	34.0% 	15.6% 	29.1%	22.2%
Materia Estranha (%)	1.0%	0.0% 	28.3% 	4.5%
Desconsiderada (%)	0.0%  	0.0%  	0.0%  	0.0%  
Average Screen Size	14.7	15.3 	14.5 	15.1
Total Images	973 	628 	950	737
Screen Size Distribution				
Screen10-	4.8%	0.6% 	9.6% 	2.2%
Screen11	6.1%	1.6% 	6.5% 	2.6%
Screen12	9.2%	3.4% 	10.2% 	5.6%
Screen13	9.5%	7.4% 	11.4% 	9.5%
Screen14	13.4%	14.3%	12.5% 	15.9% 
Screen15	15.6%	26.5% 	14.0% 	21.6%
Screen16	16.1%	23.2% 	9.4% 	18.7%
Screen17	14.3%	14.5% 	7.4% 	13.6%
Screen18	8.6% 	6.2%	5.4% 	6.9%
Screen19+	2.5%	2.3% 	13.5% 	3.3%
Class Distribution				
Ardido	4.9%	0.5% 	5.3%	13.8% 

Side by Side Comparison

All the selected files are displayed with variables in individual rows, along with green and red arrows indicating the highest and lowest values among the selected files for each variable.

Quality Control

-  Home
-  Browse Analyses
-  Artificial Intelligence
-  Dashboard
-  Image Mosaic
-  Lot Info
-  Classification Report
-  Export Data
-  Export Images
-  Blend & Compare

Continuous Operation

-  Live Analysis

Server and API

-  Upload Analysis

AI Model | Dataset

-  Edit Model

-  Evaluate Model

System Configuration

-  Acquisition Settings
-  General Settings

File Name
TesteClassificacao
File Location
C:_csmart\Analysis
Last AI Model
224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_197C
   

Quality Control

← Side-by-Side Comparison

Show Weight
10

Variable	Estudo Consumo Teste1	Estudo Consumo Teste2	Estudo Consumo Teste3	Estudo Consumo Teste4
Summary				
Total Defects (g)	62.0g	16.4g ↓	85.0g ↑	68.7g
Defeitos Primarios (g)	24.8g	4.2g ↓	24.9g	45.8g ↑
Defeitos Secundario (g)	36.2g ↑	12.2g ↓	30.5g	19.1g
Materia Estranha (g)	1.1g	0.0g ↓	29.7g ↑	3.9g
Desconsiderada (g)	0.0g ↑ ↓			
Average Screen Size	14.7	15.3 ↑	14.5 ↓	15.1
Total Images	973 ↑	628 ↓	950	737
Screen Size Distribution				
Screen10-	5.1g	0.5g ↓	10.1g ↑	1.9g
Screen11	6.5g	1.3g ↓	6.8g ↑	2.2g
Screen12	9.8g	2.7g ↓	10.7g ↑	4.8g
Screen13	10.1g	5.8g ↓	12.0g ↑	8.2g
Screen14	14.3g ↑	11.2g ↓	13.1g	13.6g
Screen15	16.6g	20.8g ↑	14.7g ↓	18.5g
Screen16	17.1g	18.2g ↑	9.9g ↓	16.1g
Screen17	15.2g ↑	11.4g	7.8g ↓	11.7g
Screen18	9.2g ↑	4.9g ↓	5.7g	5.9g
Screen19+	2.7g	1.8g ↓	14.2g ↑	2.8g
Class Distribution				
Ardido	5.2g	0.4g ↓	5.6g	11.8g ↑

Side by Side Comparison

10. It is also possible to switch between weight and percentage values for each variable.

Quality Control

-  Home
-  Browse Analyses
-  Artificial Intelligence
-  Dashboard
-  Image Mosaic
-  Lot Info
-  Classification Report
-  Export Data
-  Export Images

 Blend & Compare

Continuous Operation

-  Live Analysis

Server and API

-  Upload Analysis

AI Model | Dataset

-  Edit Model
-  Evaluate Model

System Configuration

-  Acquisition Settings
-  General Settings

Quality Control

 Blend Aggregation

1. Add analysis files to the aggregate list

 + Add Analysis

1	EstudoConsumoTeste1	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
2	EstudoConsumoTeste2	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
3	EstudoConsumoTeste3	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	
4	EstudoConsumoTeste4	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C	

 Clear List

2. Click 'Aggregate' to generate the aggregate table

 Aggregate

< Back to Blend & Compare

Blend Aggregation

To use Blend Aggregation, follow the same principle as in side-by-side: select the files to be aggregated and then click aggregate.

Csmart Digit v.3.2.0

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_197C

Quality Control

Home

Browse Analyses

Artificial Intelligence

Dashboard

Image Mosaic

Lot Info

Classification Report

Export Data

Export Images

Blend & Compare

Continuous Operation

Live Analysis

Server and API

Upload Analysis

AI Model | Dataset

Edit Model

Evaluate Model

System Configuration

Acquisition Settings

General Settings

Quality Control

Aggregate Blend

Show Percentage

Variable	Aggregate
Summary	
Total Defects (%)	60.1%
Defeitos Primarios (%)	26.4%
Defeitos Secundario (%)	25.2%
Materia Estranha (%)	8.4%
Desconsiderada (%)	0.0%
Average Screen Size	14.9
Total Weight (g)	375.5g
Total Images	3288
Screen Size Distribution	
Screen10-	4.3%
Screen11	4.2%
Screen12	7.1%
Screen13	9.4%
Screen14	14.0%
Screen15	19.4%
Screen16	16.8%
Screen17	12.5%
Screen18	6.8%
Screen19+	5.4%
Class Distribution	
Ardido	6.1%

Blend Aggregation

The aggregate values are displayed in a single column, averaging the percentages equally among the selected files and summing the weight values for the fields that present weight.

Csmart Digit v.3.2.0

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_197C

Quality Control

Home

Browse Analyses

Artificial Intelligence

Dashboard

Image Mosaic

Lot Info

Classification Report

Export Data

Export Images

Blend & Compare

Continuous Operation

Live Analysis

Server and API

Upload Analysis

AI Model | Dataset

Edit Model

Evaluate Model

System Configuration

Acquisition Settings

General Settings

Quality Control

% Proportional Blend

1. Add analysis files to the blend list and define a proportion for each file

		+ Add Analysis		
1	EstudoConsumoTeste1	3,0	224_MCL_CNVNXT_L_ARA_BRA_MIXE...	✖
2	EstudoConsumoTeste2	2,0	224_MCL_CNVNXT_L_ARA_BRA_MIXE...	✖
3	EstudoConsumoTeste3	1,0	224_MCL_CNVNXT_L_ARA_BRA_MIXE...	✖
4	EstudoConsumoTeste4	5,0	224_MCL_CNVNXT_L_ARA_BRA_MIXE...	✖

Clear List

2. Click 'Blend' to generate the proportional blend table

Blend

< Back to Blend & Compare

Proportional Blend

The last blend tool is the Proportional Blend, similar to Blend Aggregation, but with the option to input absolute proportions for each sample. The calculation is based on a 100 g theoretical sample.

Proportions are absolute values, and the calculation is made by dividing each value by the total sum, avoiding the need to input percentages and sum to 100%. Any value entered will produce results.

Csmart Digit v.3.2.0

File Name: TesteClassificacao

File Location: C:_csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_197C

Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info
- Classification Report
- Export Data
- Export Images
- Blend & Compare**
- Continuous Operation
- Live Analysis
- Server and API
- Upload Analysis
- AI Model | Dataset
- Edit Model
- Evaluate Model
- System Configuration
- Acquisition Settings
- General Settings

Quality Control

% Proportional Blend

Show Percentage

Variable	Proportional
Summary	
Total Defects (%)	63.4%
Defeitos Primarios (%)	33.7%
Defeitos Secundario (%)	24.8%
Materia Estranha (%)	4.9%
Desconsiderada (%)	0.0%
Average Screen Size	15.0
Total Weight (g)	100.0g
Screen Size Distribution	
Screen10-	3.3%
Screen11	3.7%
Screen12	6.6%
Screen13	9.3%
Screen14	14.6%
Screen15	20.2%
Screen16	18.0%
Screen17	13.4%
Screen18	7.1%
Screen19+	3.8%
Class Distribution	
Ardido	8.2%
Branqueado	3.1%

Proportional Blend

The Proportional Blend is displayed in a single column, with values weighted according to the input proportion. The weights are based on a 100 g sample.

Csmart Digit v.3.2.0

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File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Quality Control

Home

Browse Analyses

Artificial Intelligence

Dashboard

Image Mosaic

Lot Info

Classification Report

Export Data

Export Images

Blend & Compare

Continuous Operation

Live Analysis

Server and API

Upload Analysis

AI Model | Dataset

Edit Model

Evaluate Model

System Configuration

Acquisition Settings

General Settings

Quality Control

Color Difference

1. Add analysis files to the comparison list and select the reference sample

+ Add Analysis

1	EstudoConsumoTeste1	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	EstudoConsumoTeste2	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>
3	EstudoConsumoTeste3	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>
4	EstudoConsumoTeste4	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>

Clear List

2. Set the maximum ΔE_{00} threshold for flagging a color difference

- 2 +

3. Click 'Generate Plot' to generate the ΔE_{00} comparison plot

Generate Plot

Color Difference

Color Difference is a new tool that compares the dominant color in each sample and presents results based on the CIEDE2000 perceptual scale.

Similar to previous compare tools, select the samples you wish to compare. In this case, it is necessary to choose a reference sample, against which all other samples will be measured.

Csmart Digit v.3.2.0

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Quality Control

Home

Browse Analyses

Artificial Intelligence

Dashboard

Image Mosaic

Lot Info

Classification Report

Export Data

Export Images

Blend & Compare

Continuous Operation

Live Analysis

Server and API

Upload Analysis

AI Model | Dataset

Edit Model

Evaluate Model

System Configuration

Acquisition Settings

General Settings

Quality Control

Color Difference

1. Add analysis files to the comparison list and select the reference sample

+ Add Analysis

1 EstudoConsumoTeste1	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 EstudoConsumoTeste2	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>
3 EstudoConsumoTeste3	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>
4 EstudoConsumoTeste4	224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	<input type="checkbox"/>

Clear List

2. Set the maximum ΔE_{00} threshold for flagging a color difference

- 2 + 11

3. Click 'Generate Plot' to generate the ΔE_{00} comparison plot

Generate Plot

Color Difference

11. Set the color threshold to compare the samples. The values follow the CIEDE2000 perceptual scale, ranging from 0 to 12, with a standard value of 2 (difference perceptible to trained eyes).

After selecting the samples, choosing the reference sample, and setting the threshold for color similarity, click OK to generate the results.

File Name
TesteClassificacao

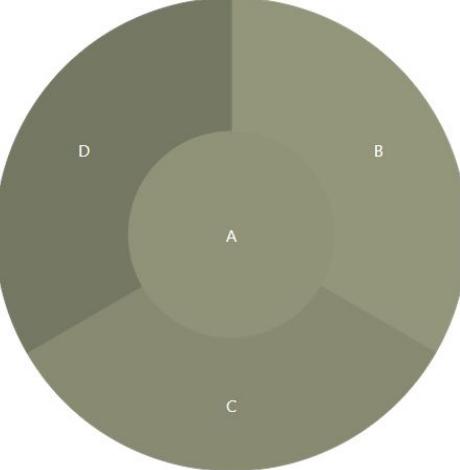
File Location
C:\csmart\Analysis

Last AI Model
224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

?
✖
👤
⟳
?

11
12

Color Circle



Sample	Filename	Delta	Flag
A	EstudoConsumoTeste1	0.0	Reference
B	EstudoConsumoTeste2	1.0	Similar
C	EstudoConsumoTeste3	2.8	Investigate
D	EstudoConsumoTeste4	10.0	Investigate

Perceptual ΔE_{00} Scale
 ΔE_{00} (CIEDE2000)



Δ E_{00} Interpretation Guide

0 to 1:
Nearly imperceptible. Even a trained color specialist would have difficulty noticing any difference.

1 to 2:
Only a trained eye can perceive the difference.

2 to 10:
Slight but obvious difference — the average person would notice the colors are not exactly the same.

Above 10:
Large and clearly visible difference to anyone.

Color Difference

11. The color circle displays the reference sample at the center, connected to all other samples to create a visual assessment tool.

12. The results are also shown in a table format, with a flag based on the CIEDE2000 scale indicating *Reference*, *Similar*, or *Investigate*.

Use this tool with caution, as comparisons between machines that have not been previously color-calibrated may produce deviations in the analysis.

Quality Control

-  Home
-  Browse Analyses
-  Artificial Intelligence
-  Dashboard
-  Image Mosaic
-  Lot Info
-  Classification Report
-  Export Data
-  Export Images

 Blend & Compare

Continuous Operation

-  Live Analysis

Server and API

-  Upload Analysis

AI Model | Dataset

-  Edit Model

-  Evaluate Model

System Configuration

-  Acquisition Settings
-  General Settings

Quality Control

 Lot Tracking

1. Add analysis files to the comparison list and select the baseline sample

 + Add Analysis

1	EstudoConsumoTeste1	 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input checked="" type="checkbox"/>	
2	EstudoConsumoTeste2	 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	
3	EstudoConsumoTeste3	 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	
4	EstudoConsumoTeste4	 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I9...	<input type="checkbox"/>	

 Clear List

2. Set the cutoff threshold for Euclidean Distance

 3 

3. Click 'Generate Plot' to create comparison plot

 Generate Plot

Lot Tracking

Lot Tracking is a new tool designed to measure differences within the same lot at different stages of the processing chain (same lot, different samples).

Using dimensionality reduction techniques, the tool compares multiple variables gathered from individual images and expresses them as a single distance value. An empirical threshold must be set to define whether samples belong to the same group.

To use this tool, select the required samples, set the threshold value, and click Generate Plot.

Csmart Digit v.3.2.0

File Name: TesteClassificacao

File Location: C:\csmart\Analysis

Last AI Model: 224_MCL_CNVNXT_L_ARA_BRA_MIXEDV9_I97C

Quality Control

- Home
- Browse Analyses
- Artificial Intelligence
- Dashboard
- Image Mosaic
- Lot Info
- Classification Report
- Export Data
- Export Images
- Blend & Compare**
- Continuous Operation
- Live Analysis
- Server and API
- Upload Analysis
- AI Model | Dataset
- Edit Model
- Evaluate Model
- System Configuration
- Acquisition Settings
- General Settings

Quality Control

Lot Tracking

Euclidian Distance

Euclidean Distances from baseline (index=0: 'EstudoConsumoTeste1')

Sample	Euclidean Distance
EstudoConsumoTeste1	0.0
EstudoConsumoTeste2	4.5
EstudoConsumoTeste3	4.8
EstudoConsumoTeste4	5.0

< Select Other Samples

Lot Tracking

The plot displays how far each sample is from the baseline (first sample) in a reduced feature space. Lower values indicate samples that are more similar to the baseline, while higher values indicate greater differences.

The shaded area in the chart represents the similarity threshold set previously. This is an empirical value that should be determined using known samples. Samples with distances within this threshold are considered part of the same group, while those above it may indicate changes in quality, processing, or storage conditions.

Csmart Digit v.3.2.0

File Name: 2002932 | File Location: C:\csmart\Analysis | Last AI Model: 224_ARA_VNM_MIXED_CNVNXTL_E84

Quality Control | Artificial Intelligence | Dashboard | Image Mosaic | Lot Info | Classification Report | Export Data | Export Images | Blend & Compare

Continuous Operation | Live Analysis

Server and API | Upload Analysis

AI Model | Dataset | Edit Model | Evaluate Model

System Configuration | Acquisition Settings | General Settings

Quality Control

Artificial Intelligence

1. Select the AI model to classify the analysis file

Select Model

Selected Model: AI model not selected

Model Details ▾

2. Adjust the 'Pixel/cm' in the analysis file

264 Edit this model

Selected File: 2002932

3. Select the AI model to remove connected seeds

Coffee - Default AI

4. Define whether to apply 'Similarity Search' and remove repeated images

Similarity Search **13**

5. Click 'Run AI Analysis' to start classification

Run AI Analysis

Artificial Intelligence

13. A new Similarity Search tool has been implemented to detect repeated seeds in stored images from continuous captures.

Use this tool when you notice repetition in the image mosaic.



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