

Grease Thief - COLORIMETER

USER MANUAL

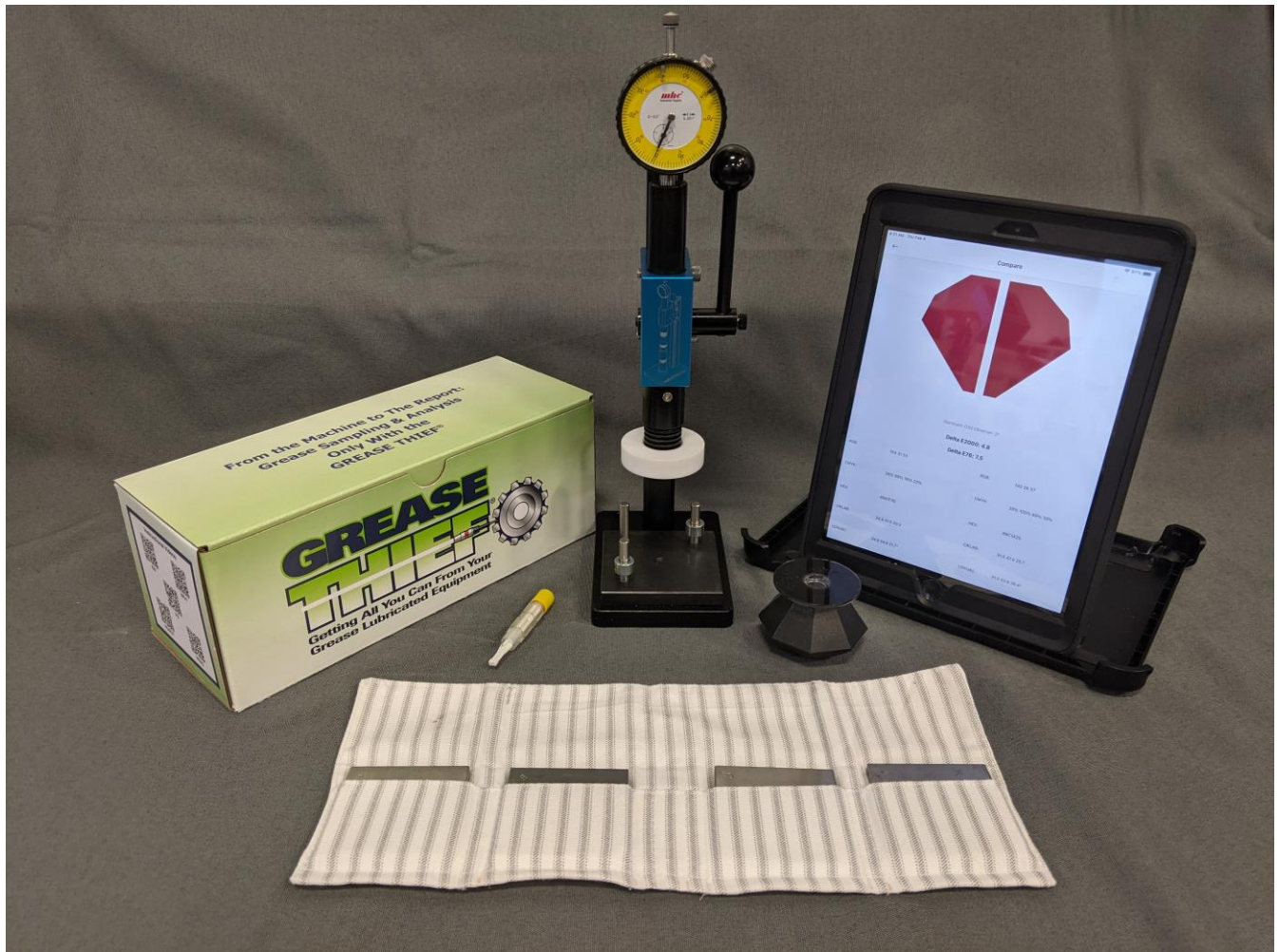


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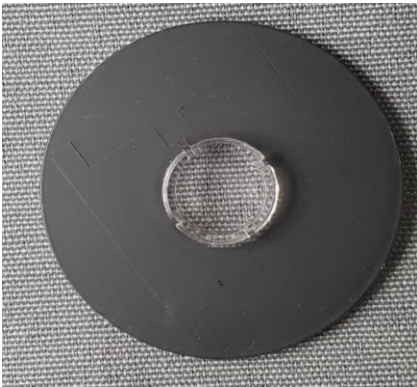
Parts



Spacers (A, B, C, D)



GT Colorimeter Sensor



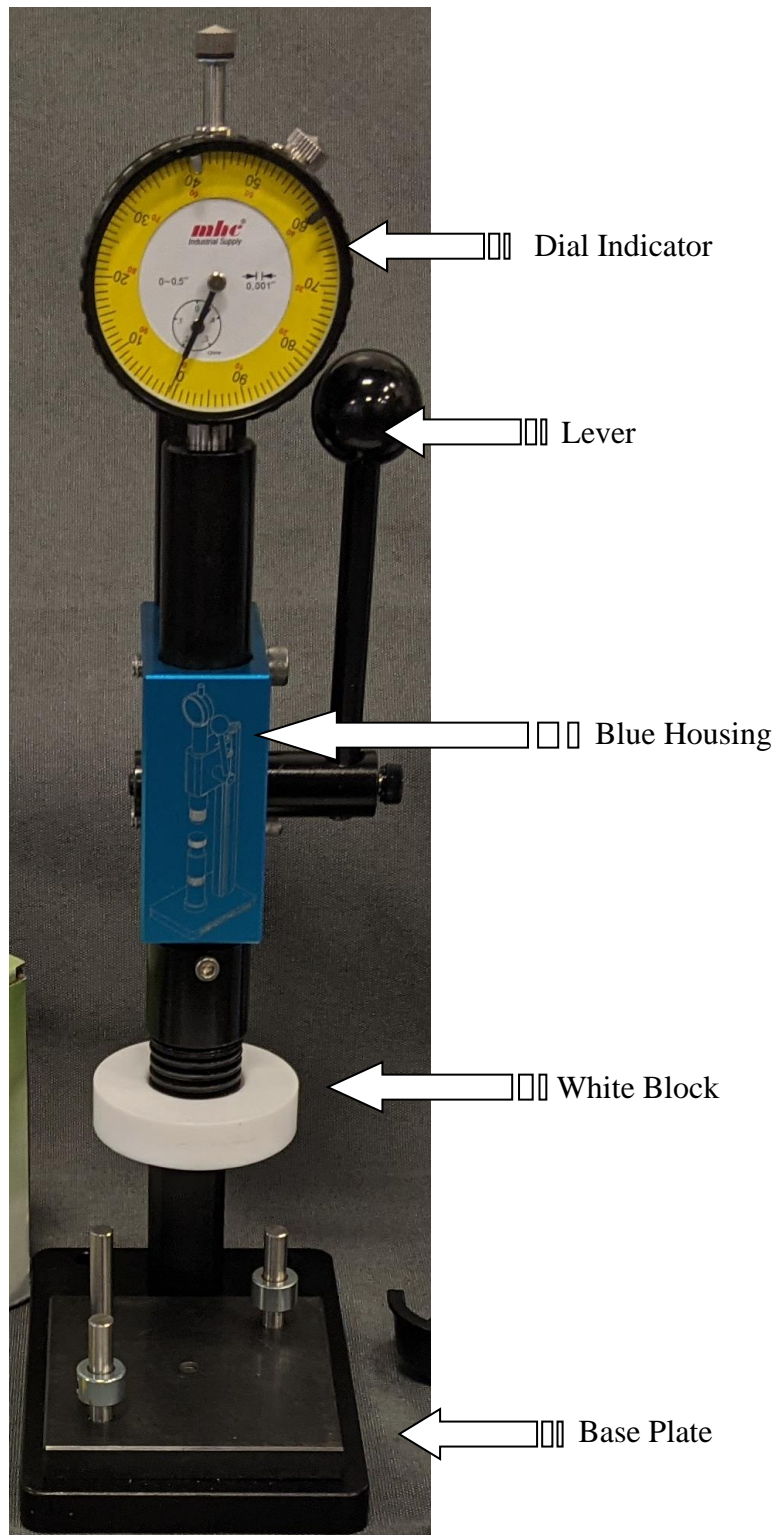
Flat Adapter



Dial Indicator



Allen-wrench



Set Up Procedures

Check Spacer Stack

Install and zero the dial indicator in the hole in the top of the ram arm and screw into place as shown in figure 1. Verify that at full-travel limit that the dial indicator deflection is less than 0.001”.

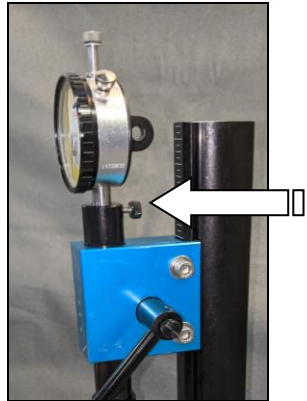


Figure 1

Carefully check and wipe clean each Spacer using a lint free wipe. Place all four together as a stack. Using a Dial Indicator, verify the total stack thickness within $0.948'' \pm 0.002''$; if the stack fails this check, contact MRG Labs to schedule reconditioning or obtain replacement spacers if necessary.

Taring Arbor Press

The arbor press is designed to compress the grease to various thicknesses (0.035”, 0.010”, and 0.005”). Spacer A is the thickest and used to zero out the distance between the press white block and the flat adapter.

Remove all Spacers (A, B, C, D) from Grease Thief pouch. Feel for presence of debris, grit, or other interferences to flatness of base, including dents and/or dings on the metal surface. Wipe clean with clean hands. Check and wipe clean Spacer A and carefully lower Spacer A onto the colorimeter base with the cut corner aligned to the arbor press tower as shown in figure 2.



Figure 2

Place the Flat Adapter into the optical channel hole on the GT Colorimeter Sensor and firmly seat the adapter. If necessary, clean the flat adapter window of any debris and/or smudges with lint free wipe. Place the GT Colorimeter Sensor, with the Flat Adapter facing up, under the arbor press. The sensor should nest between the three pins and sit flat on Spacer A.

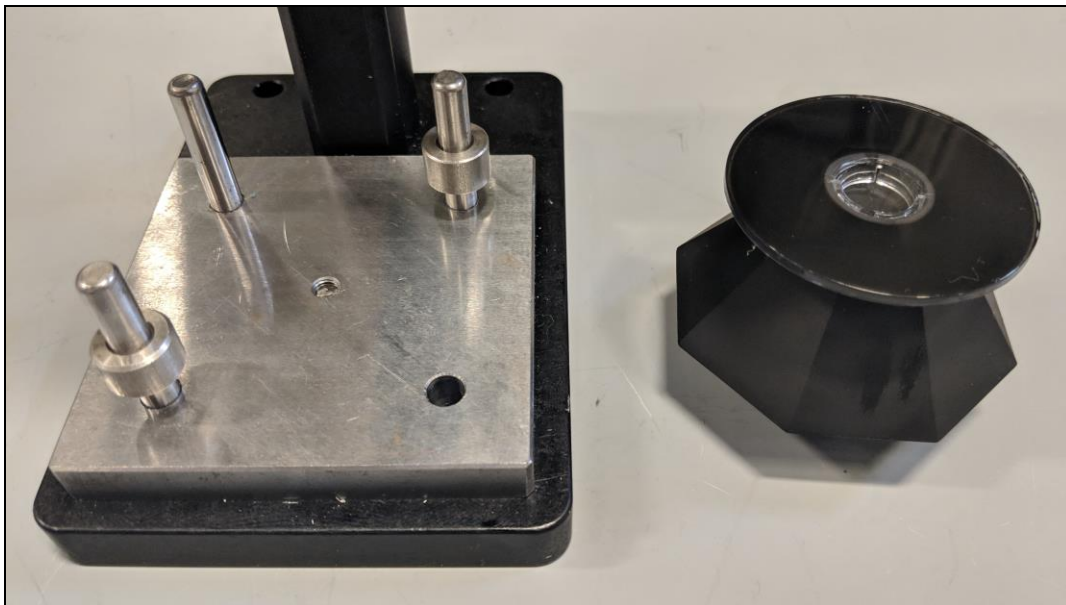


Figure 3

Holding the blue lever housing securely, loosen both cap screws with an Allen-wrench and lower the Teflon block into contact with the Flat adapter. With the block in contact with the Flat

Adapter window, pull the press lever down as far as it will go, as this will raise the blue housing to the appropriate height. Moving the press lever downward as far as it will go is called the full-travel limit of the arbor press as shown in figure 4.

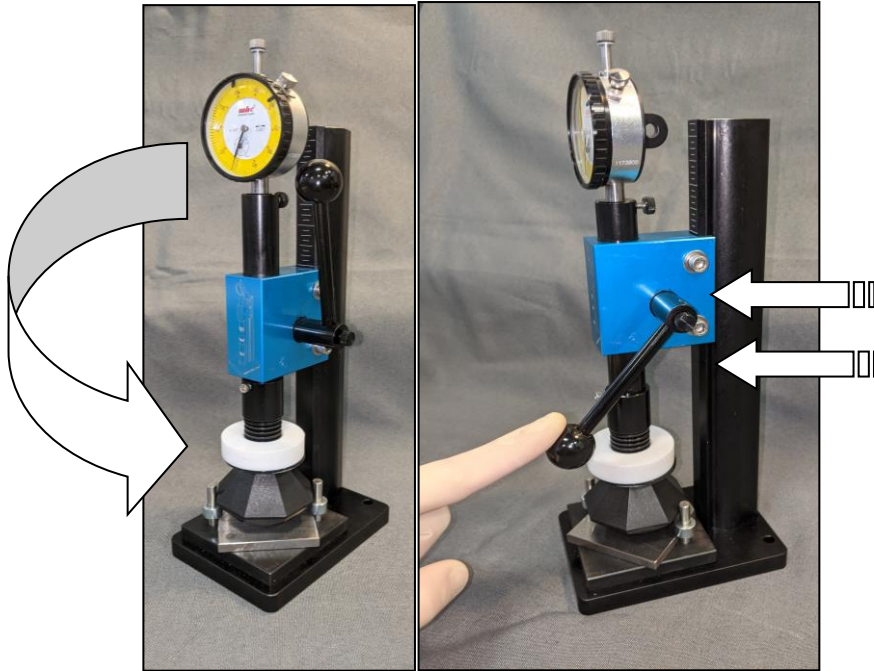


Figure 4

While holding the lever securely in this full-travel limit position, snug each cap screw and then alternate increasing the torque on each screw until they are both firmly seated to secure the blue lever housing.



Figure 5

Final Press Checks

Remove the GT Colorimeter Sensor and Spacer A from base of the press. Handle all Spacers carefully and ensure Spacers are in protective holders if not in use. Check and wipe clean Spacer D and carefully slide onto base. Place GT Colorimeter Sensor with Flat Adapter facing up on top of the Spacer as shown in figure 5.

iPad Setup

If not using a smart phone, the supplied iPad will be used. Charge the iPad prior to setup with the charging cable to a USB or wall outlet supplied power source. To access the application store for downloads of the required applications, an Apple ID will need to be created for this iPad. Refer to the website <https://support.apple.com/apple-id> for login and password support.

Select appropriate Language, Region, and connect to a Wi-Fi Network. Do not set up the Touch ID as this may lock out other users. On the Passcode screen select “*Passcode Options*” and “*Don’t Use Passcode*”. Set Up as *New iPad*. Enter appropriate personal or business information. Select security question/answers. Enter the app store and search “Nix color” to find

the *NIX Pro Color Sensor* application. When first downloading any application, the iPad will prompt to further fill out additional business information to complete the log in process. Once log in is finalized, access the *App Store* to download the *Nix Pro Color Sensor* application to the iPad.

iPad Email/Mail Accounts

To first setup an iPad email, select the Mail icon on the iPad. From the list, select the email hosting options and enter the email information and select *Next*. To create an email, select *iCloud* from the list and on the spot create an email/password for the iPad.

To add an email address to the iPad, first select the *Setting* icon. Select *Mail, Contacts, Calendars*. Select *Add Account*, and finally select *Other*. Enter the information for the additional email address along with Name, Address, Password, and Description. Select *Save* to finish the process.

Sampling Procedure

RGB Values and CIE L*a.b. Values

The *Nix Pro Color Sensor* application is used to determine the RGB Values and the CIE LAB* Values of grease references and samples. These values calculate the Delta-E2000 for difference in color-space and Delta-E2000 may be used as a determining limit for analysis.

For a proper threshold of data and accurate RGB and CIELAB values, at least one RGB color value must be greater than 100. If not achieved with Spacer D (0.035”), continue sampling with Spacer C (0.010”) and then subsequently Spacer B, should Spacer C also not return an RGB color value above 100. This action closes the gap between the press and the window, thinning the grease sample. Thinner grease allows for more light to reflect to the sensor and more accurately indicate the grease’s color.

Getting Started

Prior to sampling, ensure the *Nix Pro Color Sensor* application is downloaded to the iPad, smart phone, or other device via the corresponding app store. The device must be set up prior to download. For instructions on setting up the supplied iPad, refer to section iPad Setup for details. For specific use of the *Nix Pro Color Sensor* application, refer to the Nix Pro Sensor Application section; or for additional information, visit <https://www.nixsensor.com/>.

Nix Pro Sensor Application

Sampling with Nix Pro Sensor App

Open the *Nix Pro Sensor* application. Select *Connect to Nix Pro*. Select the appropriate Nix sensor unit. More than one unit can be displayed if they are in Blue-tooth range.

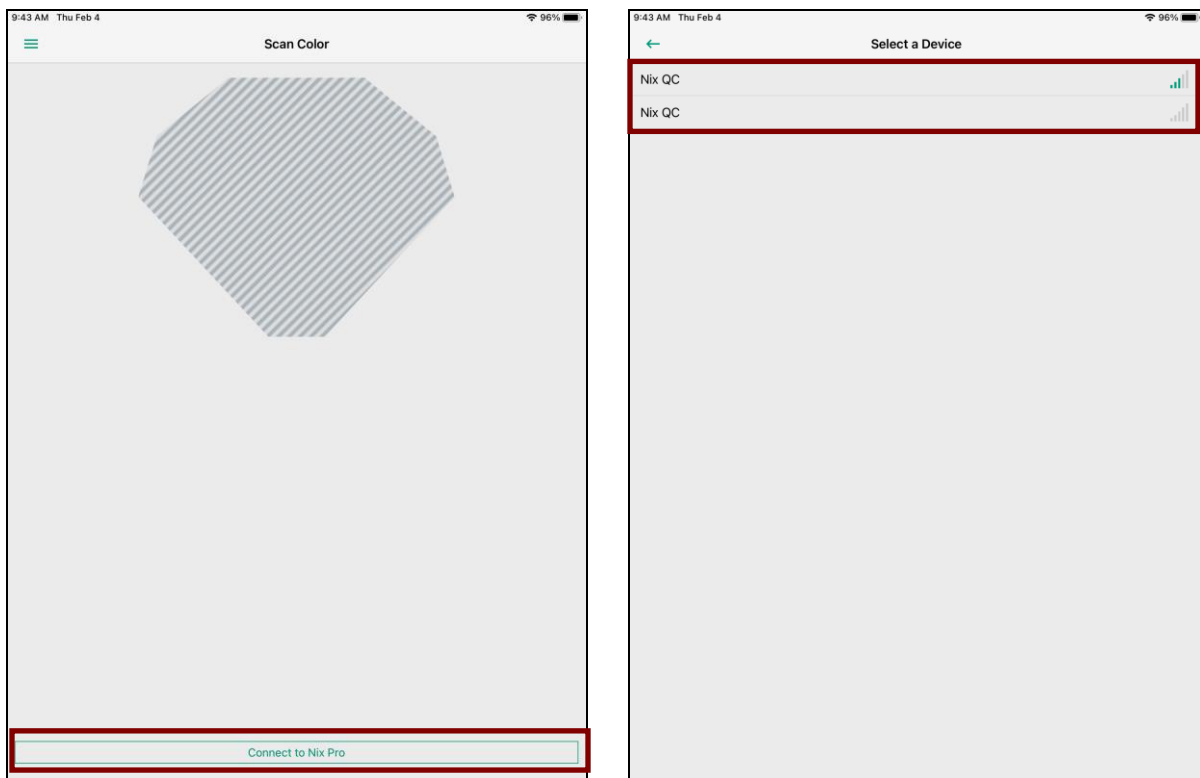


Figure 6

Once Nix Sensor is connected to iPad via Bluetooth, prepare the grease sample for testing.

Sampling Grease Overview

Apply grease sample to cover center window of sensor as shown in figure 6.

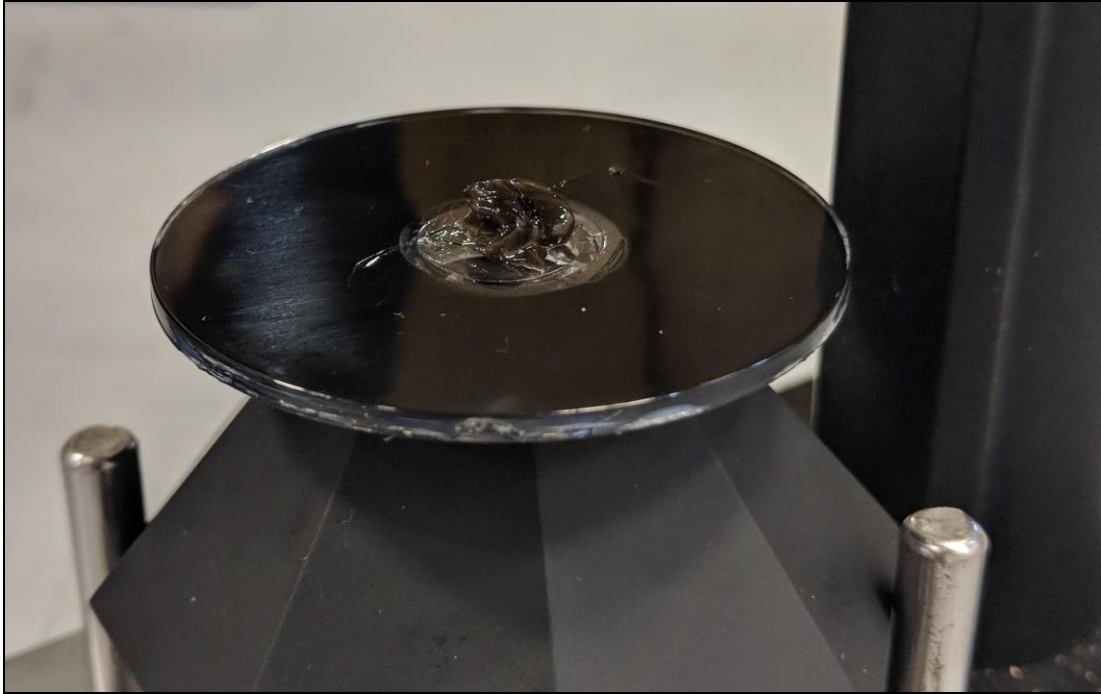


Figure 7

To sample grease at first spacer, Spacer D (0.035"), pull arbor press lever to its full-travel limit to press the grease to the corresponding thinness.

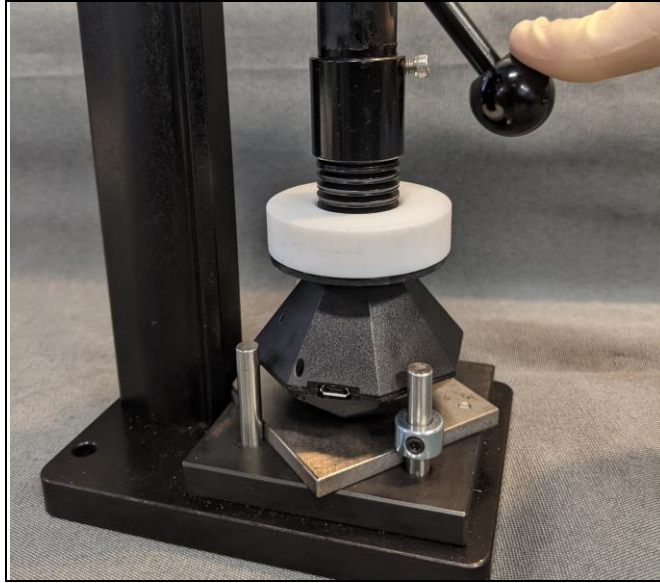


Figure 8

Use the lever to lift the column press and ensure the grease imprint is covering the entire sensor window as shown in figure 8. If necessary, apply additional sample grease and press again to ensure full coverage. With the press at full-travel limit and with proper sensor window coverage, select *Scan with Nix Pro* on the app screen as shown in figure 9. Once data shows in phone app, secure the sensor with a free hand, and slowly release the lever.

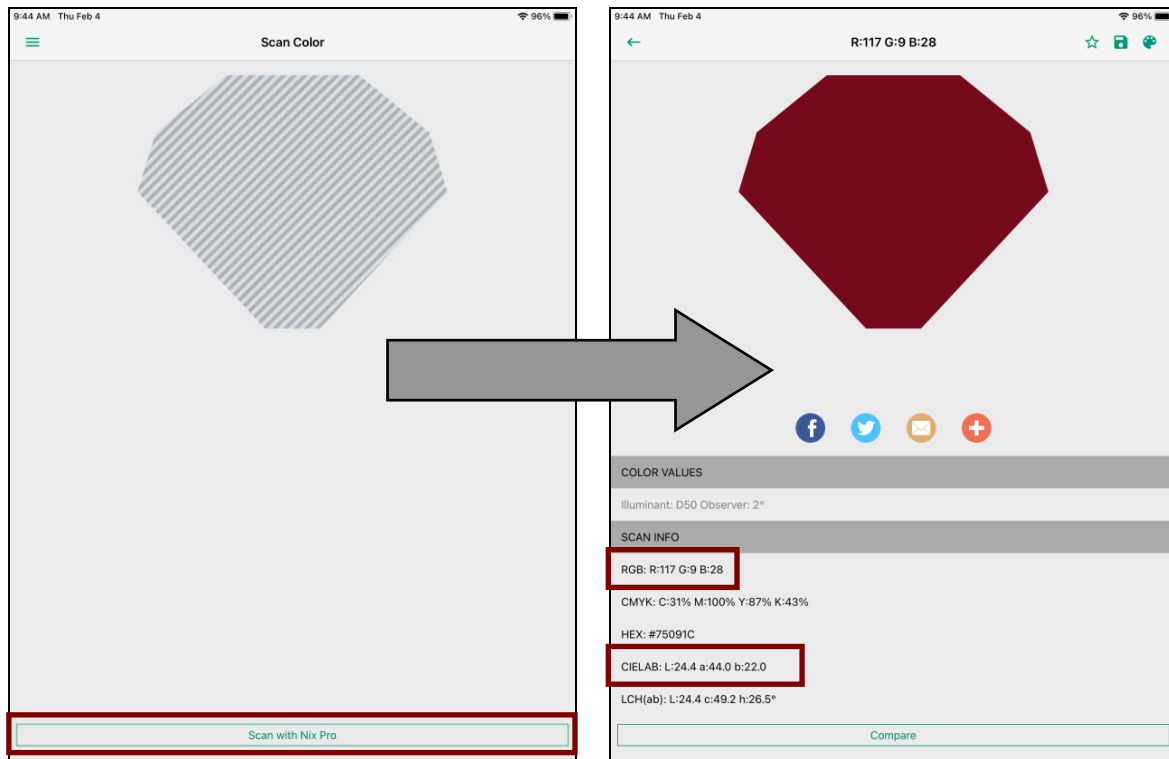


Figure 9

The *Nix Pro Sensor* has the functionality to label a sample, add description, and add a folder to save on the device as shown in figure 10. To finish, select *OK*.

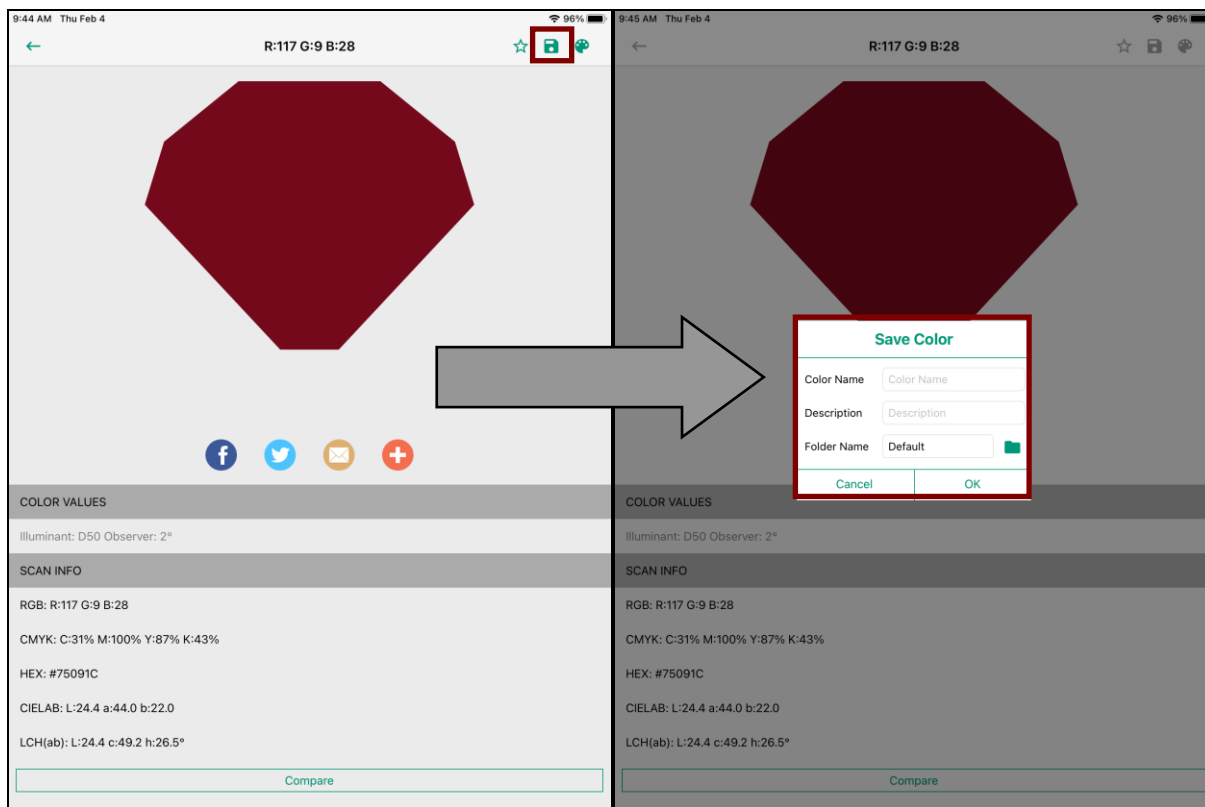


Figure 10

To clean Flat Adapter between grease samples, remove GT Colorimeter Sensor from arbor press base. Use lint free wipes to remove the grease and wipe clean the GT Colorimeter Flat Adapter window. Over time, if the Flat Adapter window or the white block appear dirty after wiping with lint free wipes, an alcohol wipe can be used to carefully clean up any leftover grease or smudges.

Using Other Spacers


If a grease is dark in color or the GT Colorimeter Sensor is not reading the correct color. It is recommended to use the next spacer.

Replace Spacer D with Spacer C as shown in figure 2. Remember to handle Spacers with care. Install Spacer C on the base with the C etching opposite the arbor press tower. Replace the cleaned GT Colorimeter Sensor onto Spacer C with Flat Adapter window facing up as shown in figure 5. The grease is ready to be sampled at 0.010”.

If there the GT Colorimeter Sensor is not reading the correct color. Remove Spacer C and replace with Spacer B as shown in figure 2. Replace the cleaned GT Colorimeter Sensor onto Spacer B with Flat Adapter window facing up a as shown in figure 5. With Spacer B in place, the grease is ready to be sampled at 0.005”. Once grease has been sampled and data saved, remove Spacer B, and replace with Spacer D for the next grease sample. Replace the cleaned GT Colorimeter Sensor onto Spacer D with Flat Adapter window facing up as shown in figure 5.

Two Grease Comparisons with Nix Pro Sensor App

The Nix Pro Sensor App has the capability to compare samples of grease after they are labeled and saved to the device.

Open the menu, via tapping the 3 horizontal lines  in top left-hand corner of the app screen. Select the *Compare* option. This will open the two-color comparison screen as shown in figure 11.

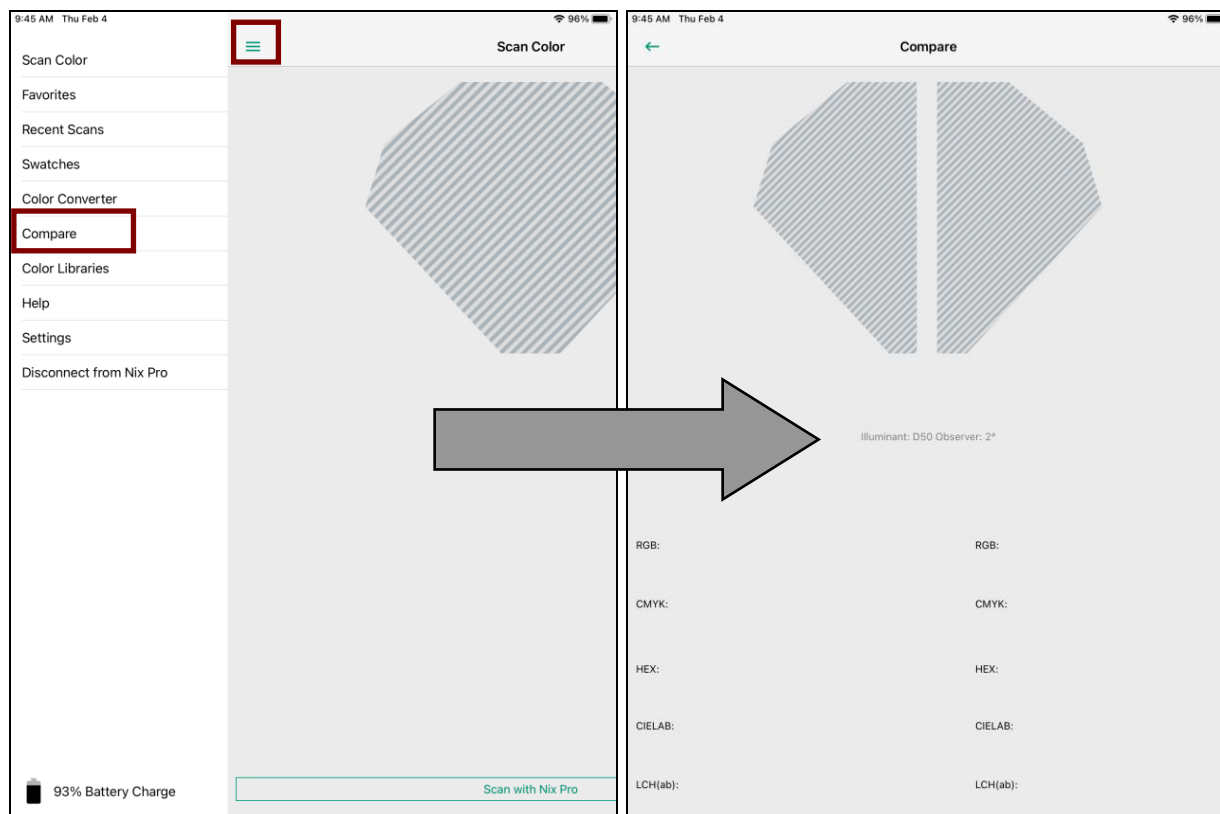


Figure 11

In the two-color comparison screen tap, the LEFT space and choose to either sample new grease now by tapping *Scan with Nix Pro* or pull a prior grease sample from saved samples with *Saved Color*. The ability to hand enter RGB or LAB* values is also possible by selecting *Enter Manually* as shown in figure 12.

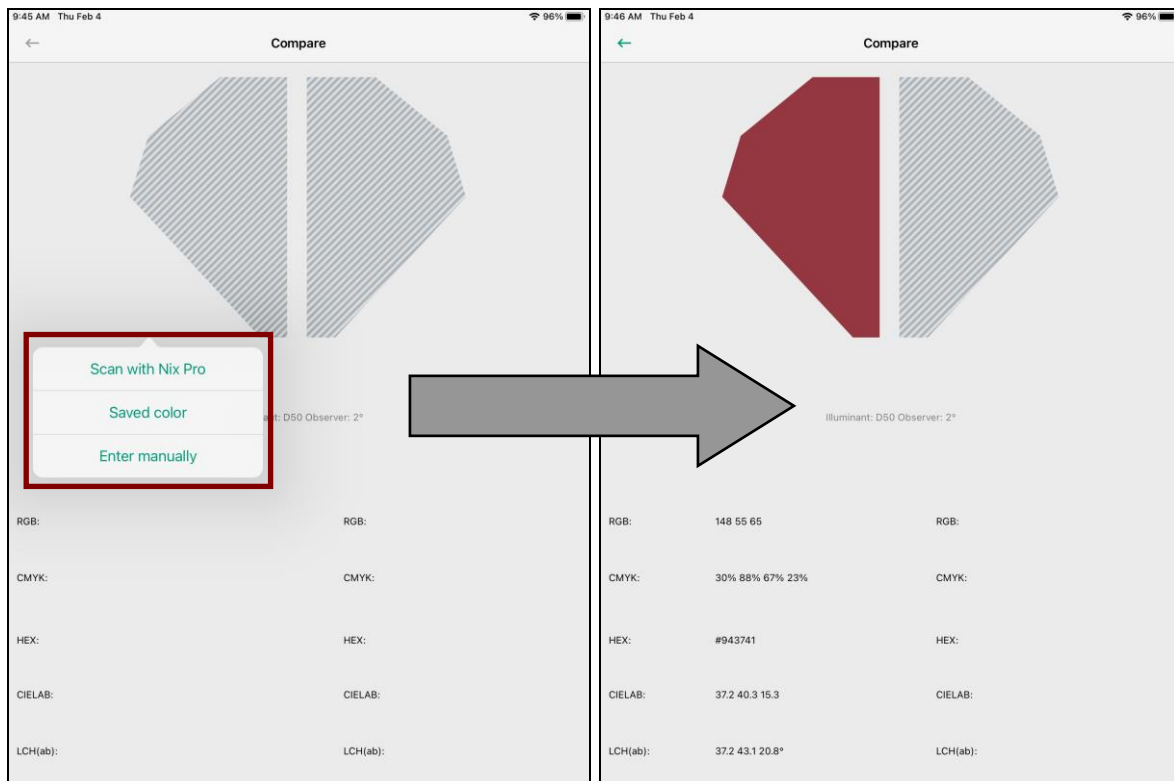


Figure 12

Once the first sample is populated into the screen, select the second sample or reference for comparison by tapping the RIGHT side. Select the sample again from either the saved or previous samples, or through taking a new grease sample as shown in figure 13.

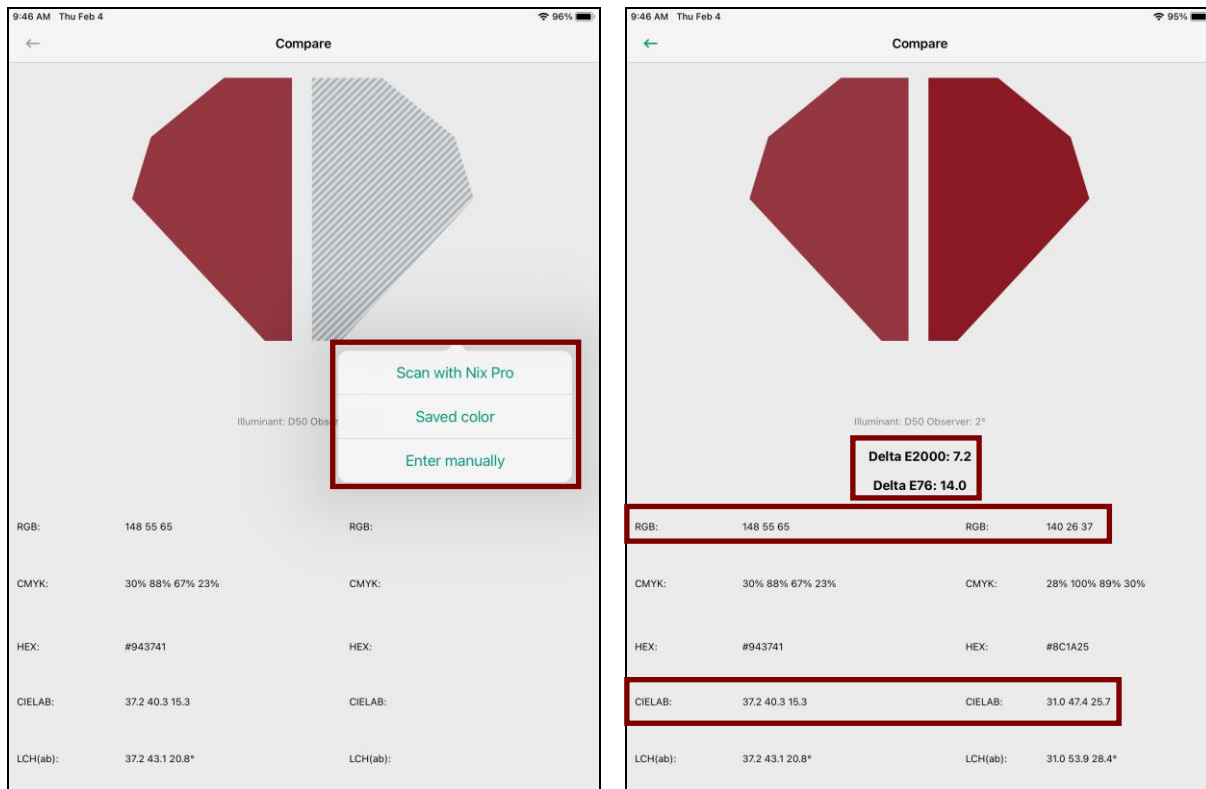



Figure 13

The screen will visually display the color differences above the data in the diamond shaped boxes. The data for each color is displayed below. The RGB and LAB* values of each color can be compared and Delta-E2000 values may be used to determine sample acceptability as shown in figure 13.

Exporting Data with Nix Pro Sensor App

The Nix Pro Sensor app exports data by means of previously made folders. To export a data set together, all samples of that data set must be run and saved under the same folder name within the Nix Pro Sensor application prior to exporting.

To begin exporting a data set, first select the 3-Bar Icon  to open the menu and select *Settings* as shown in figure 14.

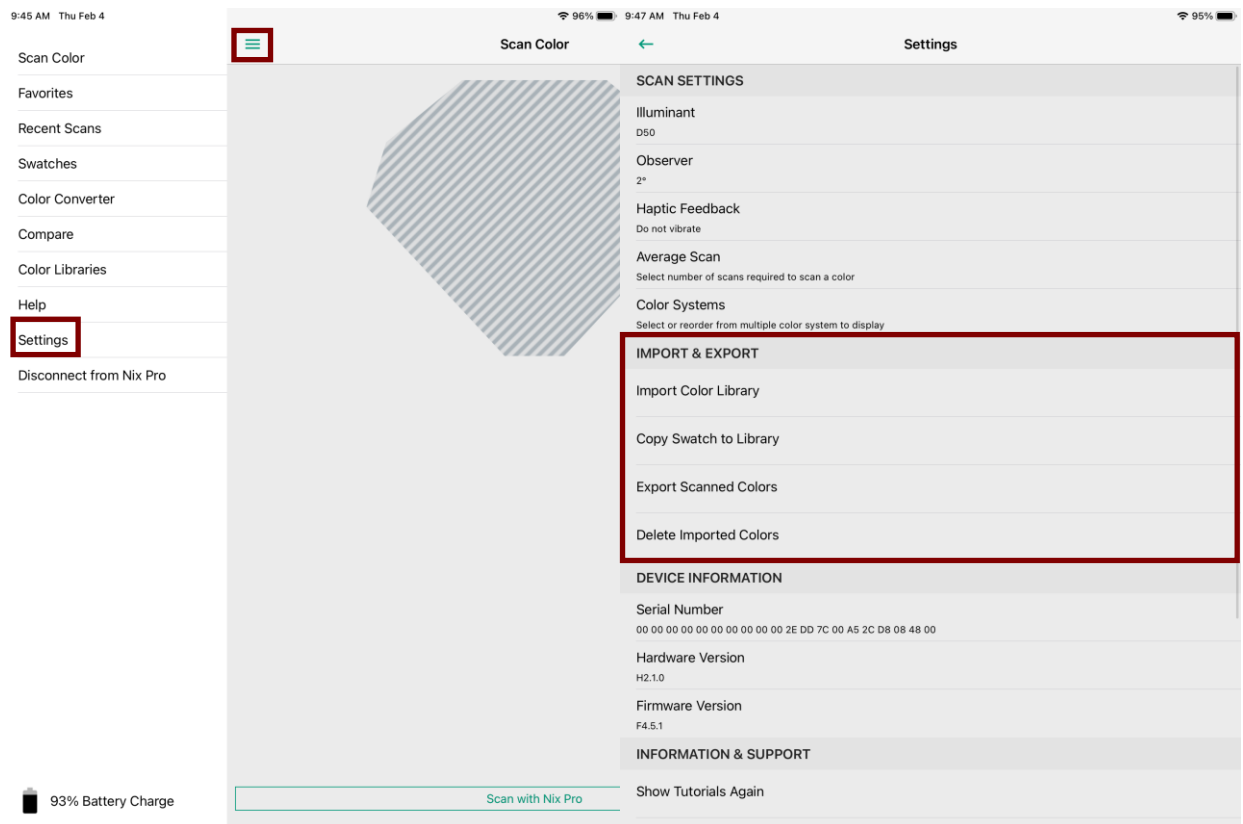


Figure 14

Under IMPORT & EXPROT, select *Export Scanned Colors* to bring up the current selection of user made folder swatches as shown in figure 15.

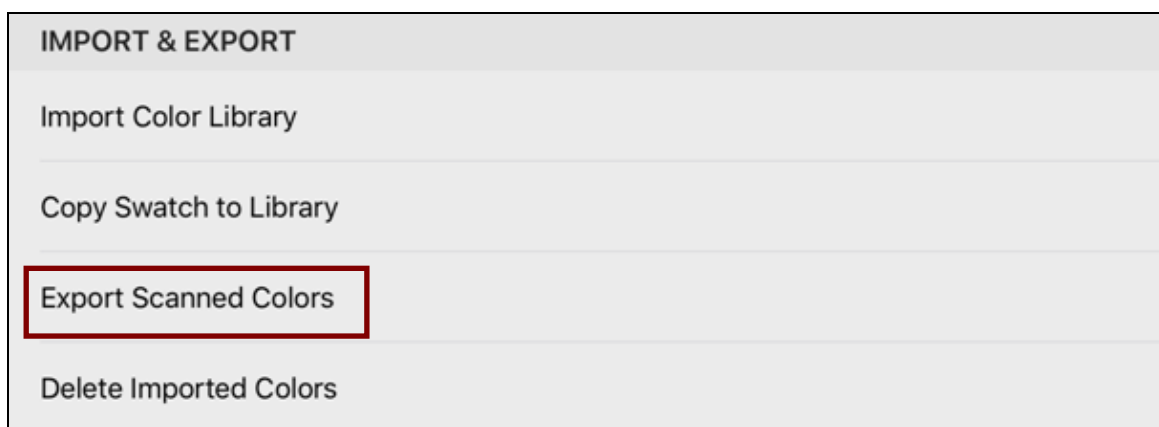


Figure 15

Select the folder of swatches (data set) to export.

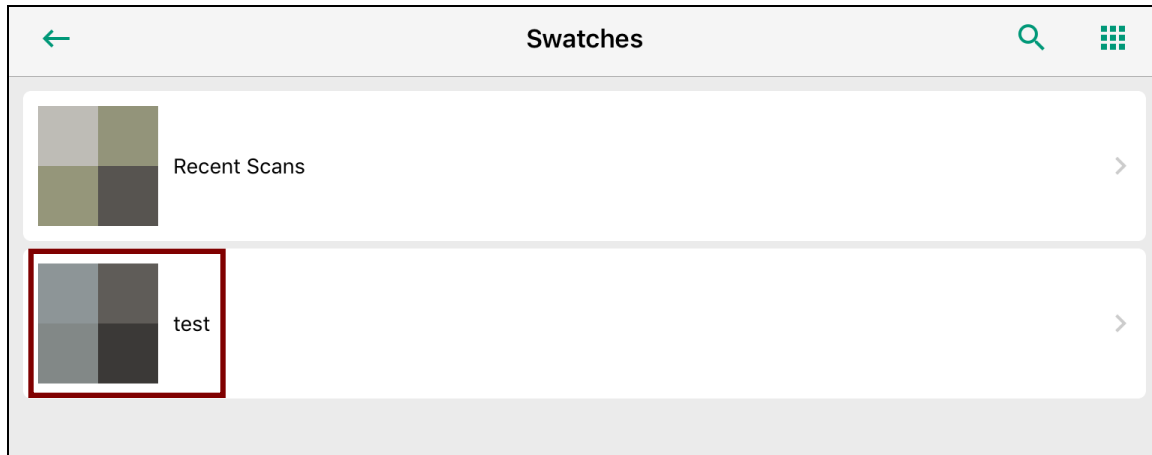


Figure 16

Select the *Mail* icon as shown in figure 17

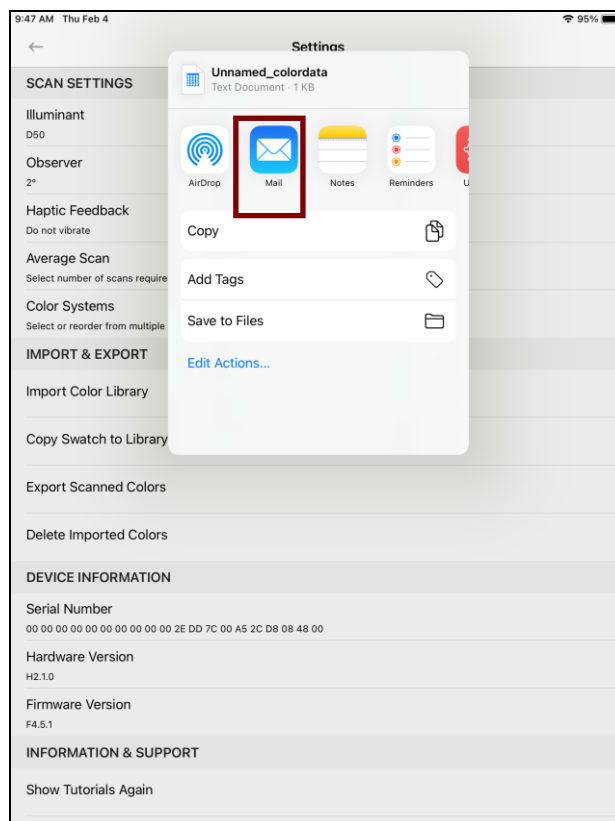


Figure 17

Enter email address, subject, and body of text for receiver.

Figure 18

The CSV file can be opened via Microsoft Excel.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Color Name	Description	Time Stamp	L	A	B	L	C	H	X	Y	Z	R	G	B
2	lab desk	1	1/4/2019 9:14	61	-2.41	-2.44	61	3.43	225.35	27.6	29.25	25.5	141	149	151
3	spacer cloth	2	1/4/2019 9:16	39.1	0.81	2.57	39.1	2.7	72.47	10.44	10.72	8.15	95	92	88
4	grey tape	3	1/4/2019 9:17	56.29	-2.7	0.09	56.29	2.71	178.02	22.74	24.2	19.93	130	136	135
5	pluck foam	4	1/4/2019 9:18	24.05	0.83	1.4	24.05	1.63	59.32	4.03	4.12	3.19	59	57	55
6															
7	App Version	2.6.3													
8	Folder Name	test													
9	Illuminant	D50													
10	Observer	2													

Figure 19

Note: *Nix Pro Sensor* does not export or measure the Delta-E2000 values for the samples against any references. A sample must be measured individually against a baseline reference using the *Compare* option to obtain its Delta-E2000 value, refer to the *Two Grease Comparisons* section.

Grease Thief Colorimeter - Oil Analysis

Oil analysis follows ASTM D7843-16 procedure for membrane patch preparation prior to Grease Thief Colorimeter measurements.

Specifications	
Approx. Size (length x width x height)	5 x 3.5 x 13.5 in (12.7 x 8.9 x 34.3 cm)
Weight	4.7 lbs. (2.1 kg)
Power Requirement (Charging purposes only)	110 VAC; 60 Hz; 5.8 A 240 VAC; 50 Hz; 2.7A
Data output	Wi-Fi

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Grease Thief is a registered trademark of York Laboratories, LLC, and is protected by US patent 7,984,661. The Grease Thief complies with ASTM D7718 Standard Practice for Obtaining In-Service Samples of Lubricating Grease, ASTM D7918 Standard Test Method for Measurement of Flow Properties and Evaluation of Wear, Contaminants, and Oxidative Properties of Lubricating Grease by Die Extrusion Method and Preparation, and AWEA Recommended Practice RP-813 and RP-814. ©2013