

## Use and Maintenance Instructions

### Introduction

The Ranger mobile fiber dispenser efficiently and easily adds Surface-EXT™ fibers to a micro surfacing or slurry seal process.

The Ranger mobile fiber dispenser must be properly installed on a micro surfacing or slurry seal truck before it can be operated. If your Ranger is not already installed, refer to the separately supplied “[Installation Instructions](#)” for instructions on installing your Ranger.

These instructions outline the necessary steps to operate and maintain the Ranger mobile fiber dispenser. If technical assistance is necessary, some assistance is available by telephone consultation with FORTA Corporation Operations Department. For more in-depth assistance, on-site technical services are available through FORTA Corporation at a cost of the technician’s travel, lodging, and time on site. Contact FORTA Corporation for details.

#### For Use With



#### **Important**

*Failure to follow the within instructions, and any other supplied instructions, may void any applicable warranty.*

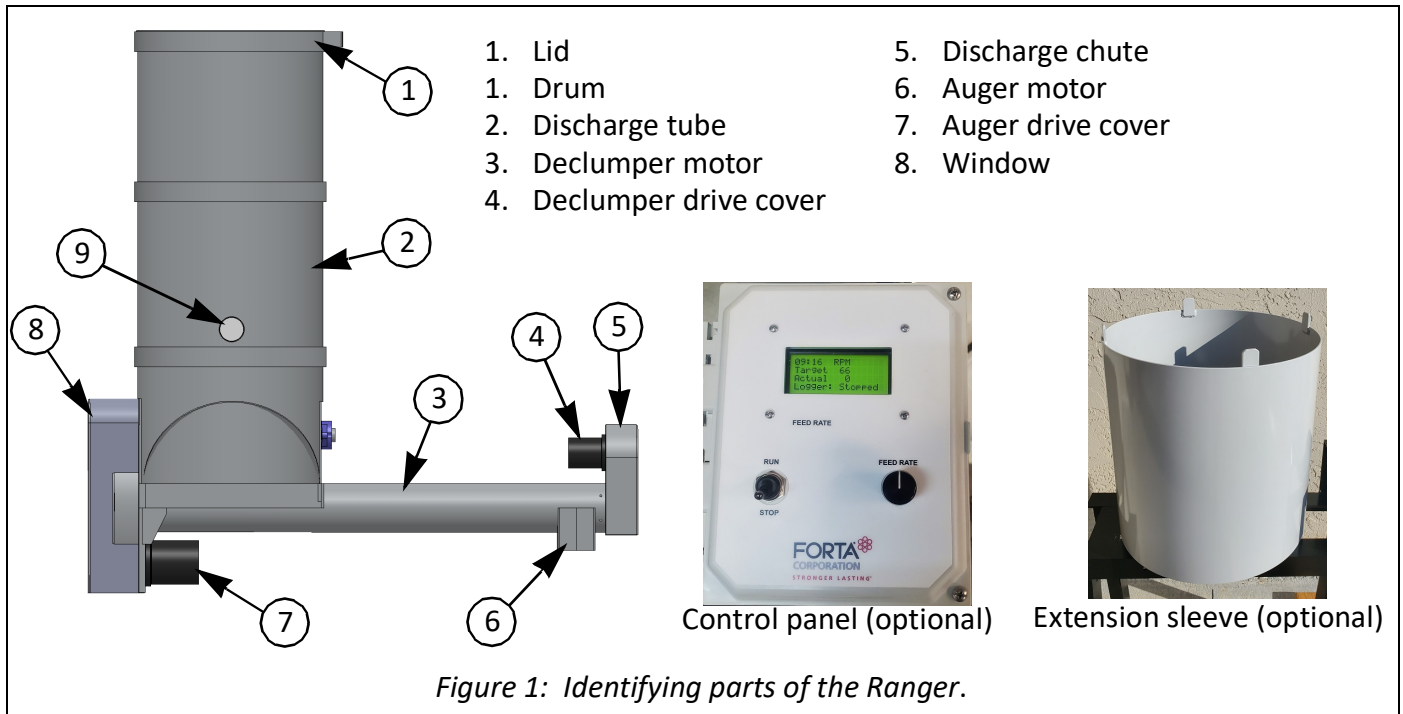


#### **CAUTION!**

*The Ranger mobile fiber dispenser is designed for use with Surface-EXT™ fibers only. The use of any other glass fiber, including E glass may harm or shorten the life of certain components. The use of any fiber other than Surface-EXT™ fiber will void any applicable warranty.*

## Identifying parts of the Ranger

It is important to be able to identify the correct parts of the Ranger as you read through these instructions. Refer to [Figure 1](#) below.



## Optional extension sleeve(s)

When purchased, extension sleeves increase the capacity of the Ranger by extending the height of the Ranger. Each extension sleeve increases the drum's capacity by approximately 40 lb and its height by 16 in.

Extension sleeves should only be installed while the Ranger is in use. Each extension sleeve has 4 tabs that fit inside the top of the Ranger; extension sleeves are only held on by friction-fit. To install a sleeve, remove the lid of the Ranger and insert all 4 tabs inside the top of the drum. **All extension sleeves must be removed when the Ranger is not in use, particularly if the top of the extension sleeve is higher than any other part of the truck.** This is to prevent damage that could be caused during motion of the truck. Any damage caused by leaving an extension sleeve on the Ranger when the system is not in use is NOT covered under warranty.

## Loading the Ranger

To load fiber into the Ranger, remove the lid from the drum and simply dump bags or boxes of Surface-EXT™ fiber into the drum. The drum can hold approximately 80 lb of Surface-EXT™ fiber. If extension sleeves have been installed, each extension sleeve increases the drum's capacity by approximately 40 lb (see "[Optional extension sleeve\(s\)](#)" above).

As fiber is dispensed, periodically add more fiber into the drum - particularly when the level of the fiber in the drum reaches the window on the side of the drum (9, [Figure 1](#)). When the level of the fiber in the drum reaches the window, more fiber should be added to the drum.

## Ranger calibration

Factory calibration tests were performed on the Ranger for both 1/4 in and 1/2 in long fibers. Those tests provide a base-line feed rate of fiber from the dispenser at a given motor speed (RPM) and fiber length. The relationship between motor speed and fiber feed rate is linear.

The base-line feed rates derived from factory calibration tests can be put into the following simple equations (dependent on fiber length):

(Eq. 1) For 1/4 in fiber:  $RPM = FR / 0.15$

(Eq. 2) For 1/2 in fiber:  $RPM = FR / 0.11$

Where: **RPM** = motor speed (RPM)

**FR** = feed rate (lb/min)

These equations can be used to give you a starting motor speed to attain a desired feed rate from your Ranger. We highly recommend that you run several calibration tests on your dispenser with your truck to confirm its actual yield for a given fiber length. Performing this calibration procedure at multiple motor speeds for a given fiber length will give you data to customize the appropriate equation above for your equipment. It is typically only necessary to perform this calibration once for a given motor speed and fiber length, but can be done as often as requirements dictate.

1. You will need:

- ☐ A 5 gallon bucket (or similar) to collect fibers
- ☐ A scale with capacity of 20 lb and accuracy of 0.1 lb (or better) to weigh the collected fibers
- ☐ A stopwatch or watch with a second hand

2. Fill the drum of the Ranger with fiber.

3. Weigh the empty bucket and record the weight, or if your scale has the ability to zero out the weight of the bucket, place the empty bucket on the scale and zero the scale.

4. Determine a specific length of time and motor speed/rate to run the dispenser for the calibration test (for example: run for 30 seconds at 60 RPM).

5. Turn on the Ranger and adjust the potentiometer to set it at the motor speed decided in [step 4](#).

6. Simultaneously start the stop watch and put the bucket under the discharge chute to collect fibers as they are dispensed. Once the predetermined amount of time has passed, turn off the Ranger and remove the bucket from under the discharge chute.

7. Weigh the bucket with fibers, calculate the weight of the fibers and record the weight. If the results are not the yield you were looking for, adjust the potentiometer and repeat steps 2 through 7. Adjust the potentiometer until you achieve your desired yield.

8. Repeat steps 2 through 7 several times at the same potentiometer setting to verify results. It is important to refill the drum each time.

9. Once the potentiometer setting is determined for a desired yield, record the motor speed and resultant fiber feed rate.

As desired, repeat the above calibration procedure for other feed rates. With the recorded data from multiple motor speed/feed rate tests, you can make adjustments to the appropriate equation above to customize it for your equipment.

## Determine feed rate



### Important

The equations provided in “[Ranger calibration](#)” on page 3 should be used as a starting point to help you pinpoint the necessary motor speed to produce a desired feed rate. We highly recommend that you run several calibration tests on your Ranger dispenser with your truck to confirm its actual yield; see “[Ranger calibration](#)” on page 3.



### Important

Make sure that your truck has been calibrated so that you know its rate of discharge.

1. Determine the amount of dry aggregate that will be discharged in pounds per minute and the percentage of fiber specified in your mix design.
2. In [Table 1](#), find the rate of dry aggregate discharge in column 1 (blue column), then read across to the correct column for the specified percentage of fiber. This will give you the feed rate of fiber required for you job.
3. Use [Eq. 1](#) or [Eq. 2](#) (or your equation based on values attained by calibrating the Ranger) to determine an approximate auger motor speed to achieve the required feed rate of fiber. This should be your starting point; you should perform a few tests to confirm the actual yield and make adjustments to the potentiometer setting as necessary.



### Note

#### For example:

- You are using 1/4 in long Surface-EXT™ fiber.
- Your rate of dry aggregate discharge is 4000 lb/min and the percentage of fiber specified for your mix is 0.20%.
- From [Table 1](#) the feed rate of fiber needed is 8.0 lb/min.
- Use [Eq. 1](#) to determine approximate motor speed:  $8.0 / 0.15 = 53 \text{ RPM}$ . Use 53 RPM as a starting point.

Table 1: Feed rate of fiber based on aggregate discharge and fiber dosing requirements.

| Rate of dry aggregate discharge | Fiber as a percentage of dry aggregate |             |             |             |
|---------------------------------|--|-------------|-------------|-------------|
|                                 | 0.15%                                  | 0.20%       | 0.25%       | 0.30%       |
|                                 | Feed rate of fiber needed              |             |             |             |
| 2000 lb/min                     | 3.0 lb/min                             | 4.0 lb/min  | 5.0 lb/min  | 6.0 lb/min  |
| 2500 lb/min                     | 3.8 lb/min                             | 5.0 lb/min  | 6.3 lb/min  | 7.5 lb/min  |
| 3000 lb/min                     | 4.5 lb/min                             | 6.0 lb/min  | 7.5 lb/min  | 9.0 lb/min  |
| 3500 lb/min                     | 5.3 lb/min                             | 7.0 lb/min  | 8.8 lb/min  | 10.5 lb/min |
| 4000 lb/min                     | 6.0 lb/min                             | 8.0 lb/min  | 10.0 lb/min | 12.0 lb/min |
| 4500 lb/min                     | 6.8 lb/min                             | 9.0 lb/min  | 11.3 lb/min | 13.5 lb/min |
| 5000 lb/min                     | 7.5 lb/min                             | 10.0 lb/min | 12.5 lb/min | 15.0 lb/min |

## Optional control panel

The optional control panel ([Figure 2](#)) provides complete control of the Ranger with simple controls. When power is supplied to the control panel, the LED display will show a *Logger* status of:

- *Stopped* when the RUN/STOP switch is in STOP position - the Ranger is not operating and it's data logger is not recording data
- *Ready* when the RUN/STOP switch is in RUN position and the FEED RATE dial is set to zero - the Ranger is ready to operate (see Inset A of [Figure 2](#))
- *Running* when the RUN/STOP switch is in RUN position and the FEED RATE dial is set to a value greater than zero - the Ranger is operating to attain the set *Target* RPM (see Inset B of [Figure 2](#))

The recommended sequence of operation is as follows:

1. Adjust the FEED RATE dial so that the *Target* RPM is at the motor speed determined in “[Determine feed rate](#)” on page 4.
2. As the truck begins to operate, turn the control panel's RUN/STOP switch to RUN. The *Actual* RPM will increase and match the *Target* RPM (this can typically take 6-9 seconds). Also, the *Logger* will indicate that it is *Running* (recording data).

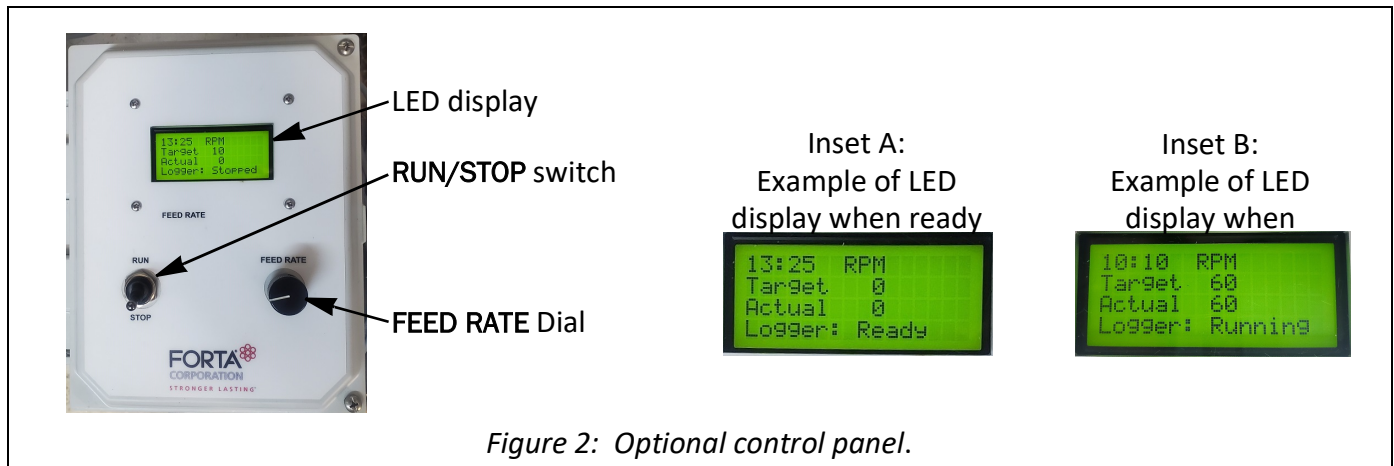


Figure 2: Optional control panel.

## Data logging

The optional control panel is equipped with a micro SD card for data storage (see [Figure 3](#)). The card is located inside the control panel. The system records the following data to a “.csv” file, approximately once each second, while the RUN/STOP switch is set to RUN:

- Date (yyyy/mm/dd)
- Time (24 hour clock - HH:MM:SS)
- Target RPM
- Actual RPM

The name of the “.csv” file on the card is “FORTA.csv”. DO NOT remove or rename the file. The system is looking for this file when it records data. If it can not find the file, it will not record any data.

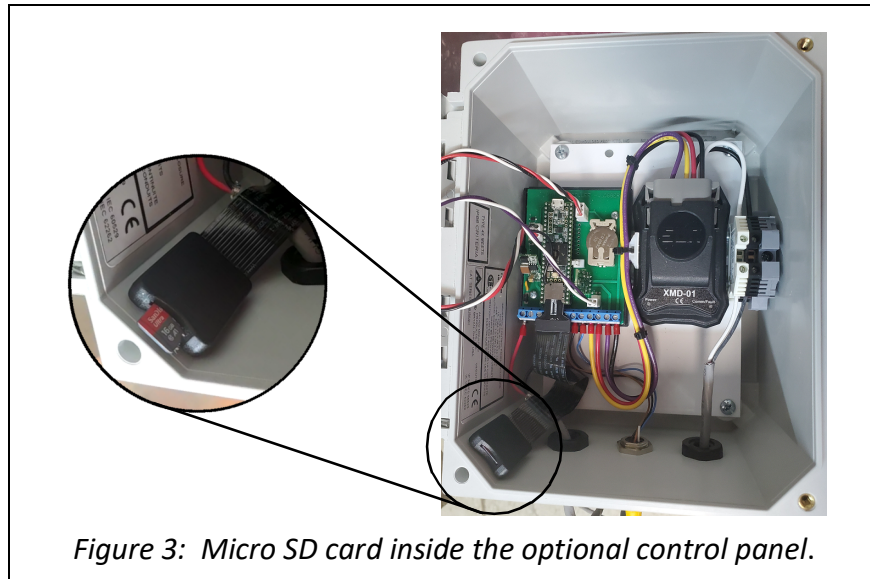


Figure 3: Micro SD card inside the optional control panel.

## Accessing the micro SD card

To access the micro SD card:

1. The system should not be running, ensure that the RUN/STOP switch is set to STOP.
2. Open the door of the control panel.
3. Locate the micro SD card drive in the bottom left corner of the box as shown in [Figure 3](#).
4. Use a small screwdriver or your finger/finger nail to gently push in on the micro SD card and then release it, so that it ‘clicks’ and ejects itself from the housing. Carefully pull the card from the housing.
5. Insert the micro SD card into an adapter suitable for use with your computer (or card reader) and then insert the adapter into your computer. Locate the “FORTA.csv” file on the card and then **save a copy** of it onto your computer.



### Important

*Do not remove or rename the “.csv” file on the micro SD card. The system is looking specifically for this file when it records data. If it can not find the file, it will not record any data.*

6. Once the file is copied, eject and remove the adapter from the computer and then the card from the adapter.



7. Reinstall the micro SD card into the housing in the control panel. Make sure the card is inserted properly, with the copper contacts facing the back of the housing (see inset of [Figure 3](#)). Gently push the card in until you feel a click.

## Evaluating the data

Once the "FORTA.csv" file is on a computer, it can either be imported into an Excel spreadsheet or opened directly using Excel. The four "data columns" will actually be in one Excel column with each "data column" separated by the vertical bar symbol ( | ). These four "data columns" can be re-formatted so that each column of data is in its own Excel column, then the data can more easily be evaluated and manipulated to provide desired information.

When evaluating the data, you will see that it takes approximately 6 to 9 seconds for the PID loop to attain the target motor speed; this is normal.

With some simple calculations, you can use the data to determine the amount of fiber dispensed over a given amount of time or for an entire job.

## Troubleshooting

Table 2: Troubleshooting chart.

| Indications                 | Possible Problem  | Solution  |
|-----------------------------|---|---|
| Declumper motor leaking oil | Blown seals at port R due to over-pressurization of oil (back pressure) | Either continue to operate with the leak, or replace the motor. Contact FORTA Corporation.<br>To monitor oil pressure at port R of the declumper motor, install a tee connection with a pressure gauge at the port. |

## Maintenance

### 1. Daily visual inspection and maintenance

Before startup each operating day, perform a visual inspection of the Ranger:

- ☐ Ensure that the drum is full of fiber.
- ☐ Ensure that the inside and outside of the discharge chute is clean, in particular make sure that there is no emulsion on the end of the chute.
- ☐ Remove auger and declumper drive covers; see "[Removing drive covers](#)" on [page 8](#). Ensure that the chains and gears of each drive are clean. Replace the drive covers.

The following maintenance should be done on a daily basis, during cleanup at the end of each operating day:

- ☐ Clean the inside and outside of the discharge chute, in particular be sure to remove any build up of emulsion.
- ☐ Clean the area around the auger and declumper motors.
- ☐ Remove auger and declumper drive covers; see "[Removing drive covers](#)" on [page 8](#). Clean and lubricate the chains and gears. Use a standard chain lubricant. Replace the drive covers.

## 2. Quarterly maintenance

The following should be done on a quarterly basis:

- ☐ Remove auger and declumper drive covers; see "[Removing drive covers](#)" on [page 8](#). Grease all bearings for each drive (3 for auger drive and 2 for declumper drive).

## 3. Annual maintenance

The following maintenance should be done on an annual basis, during the truck's annual servicing:

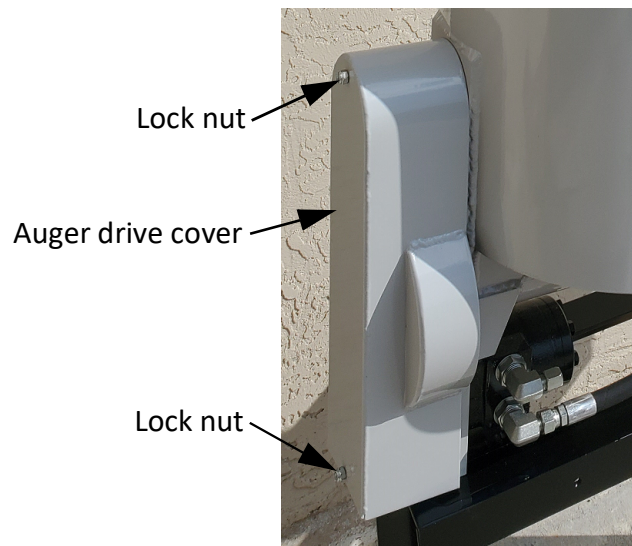
- ☐ Clean the inside and outside of the discharge chute, in particular be sure to remove any build up of emulsion.
- ☐ Clean the area around the auger and declumper motors.
- ☐ Clean and inspect all hoses for damage and leaks; replace hoses as necessary.
- ☐ Remove auger and declumper drive covers. Clean and inspect the chains and gears of both drives; replace as necessary. Apply standard chain lubricant to the chains and gears. Replace the drive covers.

## Removing drive covers

When directed to do so for maintenance of the Ranger, perform the following to remove the auger drive cover and/or the declumper drive cover:

Remove the auger drive cover (8, [Figure 1](#)) by removing the two 1/4 in-20 lock nuts that secure it in place (see image at right).

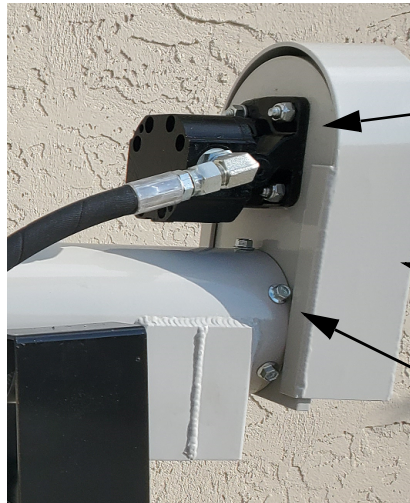
To replace the auger drive cover, align the cover with the two mounting bolts and secure in place using the two 1/4 in-20 lock nuts.





Remove the declumper drive cover (5, [Figure 1](#)) by sliding it up off of its mounting block (see image at right).

To replace the declumper drive cover, slide it down over its mounting block by aligning the channel tabs with the mounting block.



Mounting block

Declumper drive cover

Channel tabs

## Contact FORTA Corporation

If it is necessary to contact FORTA Corporation, you can do so by the following:

Mail: FORTA Corporation  
100 Forta Drive  
Grove City, PA 16127-5221  
Phone: 1-800-245-0306 or 1-724-458-5221  
Fax: 1-724-458-833  
Web: [www.fortacorp.com](http://www.fortacorp.com)