

**FUEL RESCUE  
GAUGE STICK  
SQUEEGEE**

PRODUCT DESCRIPTION  
AND  
FIELD TEST RESULTS

Snyder Product Control  
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## Table of Contents

1. Summary
2. Underground Storage Tank Application
3. Environmental & Safety Benefits
4. Saving Product & Supplies (Fuel & Towels)
5. Captured Fuel Data & Graph
6. Photograph

## Summary

The Fuel Rescue UST gauge stick squeegee uses a simple design to provide an easily transportable, yet durable squeegee device to deposit fluid adhering to the gauge stick back into the tank.

- prevents lost product by returning fuel back into the tank
- allows hands-free operation
- easily transportable and storable

The Fuel Rescue UST gauge stick squeegee presents a durable wiping surface, resistant to chemical erosion by oil products that is easily exchanged as needed.

- rigid but lightweight base
- spans the fill opening of underground storage tanks
- squeegee element easily exchanged

The Fuel Rescue UST gauge stick squeegee eliminates the need for absorbent towels and their consequential environmental and safety hazards.

- reduces expenses of purchasing rags or disposable towels
- eliminates fire and safety hazards
- avoids environmental contamination

The Fuel Rescue UST gauge stick squeegee can be used by any entity that stores, markets, regulates, or transports fuel products.

- truckstops & fuel stations
- convenience stores
- fuel transports
- airports
- city, county & State governments
- Federal government
- military operations

- EPA, FFA & other regulators

## Underground Storage Tank Application

In Iowa alone, there are 6,150 active underground storage tanks (UST) in operation. Although some UST's are outfitted with self-reading devices, tank gauge sticks are routinely used for a manual reading of the contents. The contents of the tank, a fuel product, drips from the gauge stick as it is pulled up out of the tank. This action could account for a loss of up to 50 milliliters per sticking. In addition, the lost product falls onto the underlying surface presenting hazardous conditions and potentially litigious situations.

The **Fuel Rescue UST gauge stick squeegee** is designed to avoid lost product and to protect from unnecessary contamination. Without this tool, the people measuring and filling the tanks ordinarily use disposable towels to wipe and absorb the excess fuel off the gauge stick. The solution is to push the excess fuel from the gauge stick, normally absorbed by the towels, back into the tank with the **Fuel Rescue UST gauge stick squeegee**. In turn, the need to clean the gauge stick with towels and address their disposal is eliminated.

Maintaining the supply of disposable towels is an on-going expense. In addition, because they are saturated with fuel, the towels should be handled properly and discarded in an environmentally sound manner. Using the **Fuel Rescue UST gauge stick squeegee** will eliminate the never-ending expense of disposable towel supplies and provides a positive and efficient operational alternative in favor of our environment.

How does this tool eliminate the use of towels and deposit the excess fuel back into the tank? The **Fuel Rescue UST gauge stick squeegee** slides down over the end of the gauge stick and rests on the ground straddling the tank fill hole. By standing on the handle, the squeegee remains in place as the gauge stick is pulled up from the tank. The four-sided squeegee pushes the fuel down the gauge stick, returning it into the tank. And because the gauge stick is now clean, the need for towels is eliminated, and potential contamination is avoided.

To further understand the protection offered by the **Fuel Rescue UST gauge stick squeegee**, an explanation of the fueling process and how the gauge stick is used in that process may be helpful. The transport truck arrives at the station to deliver 7800 gallons of fuel, to be split between two separate tanks. Prior to unloading, the gauge stick (a ten-foot long stick, marked in one-inch increments) is used to measure the depth of fuel in the two tanks. The two tanks are then filled simultaneously with one receiving 4000 gallons and the other receiving 3800 gallons. After the tanks have been filled, the gauge stick is used again to measure the fuel in both tanks and verify delivery. In this process, the gauge stick is used four times total (two times on each tank) per fuel load.

It is during these four sticking actions per load where the **Fuel Rescue UST gauge stick squeegee** saves the station fuel. During 2002, Americans consumed 371.6 million gallons of gasoline each day.<sup>1</sup> This is the equivalent of 47,641 7800-gallon loads. Nation-wide, gasoline retailers could save an estimated 1045 gallons of gasoline every day. (See Appendix C.)

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<sup>1</sup> per Energy Information Agency “Quick Facts” at [www.eia.doe.gov](http://www.eia.doe.gov).

## Safety & Environmental Benefits

Every organization takes steps to mitigate risks and hazards. Risk managers are consulted to identify strategies that minimize an organization's liabilities. They work to reduce employee and customer exposures to critical situations. An organization can demonstrate its focus to control risk and improve safety practices by utilizing the **Fuel Rescue UST gauge stick squeegee**. For example, eliminating the build up of fuel-soaked towels in the workplace is a step taken to limit conditions for a hazardous situation to develop on an organization's premises.

Each year, over 2 billion gallons of fuel<sup>1</sup> are transported throughout the State of Iowa. This figure equates to approximately 265,000 loads. Using the test data (Appendix B) and a calculation of 2 stickings per load, an estimated 2,800 gallons of transported fuel, today thrown away, can be retained within Iowa's fuel industry when the **Fuel Rescue UST gauge stick squeegee** is put to use. Obviously, this would be a financial saving for every fuel retailer. But more important in the long-term, the industry can avoid depositing over 2,800 gallons of fuel into our landfills and absorbed by the environment.

As introduced earlier, 47,641 loads of gasoline were consumed each day during 2002 in the United States. Applying the logic from the previous paragraph, everyday an estimated 1,045 gallons of gasoline can be returned to the fuel tanks and kept away from our land.

Each year, more states are mandating increasingly strict standards on the fuel industry. California was one of the first states to adopt its own gasoline program after the gasoline additive methyl tertiary butyl ether (MTBE) was detected in ground water.<sup>2</sup> Other states also implemented restrictions in 2003 to move away from MTBE. The detection of fuel in our groundwater is a realistic factor for consideration.

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<sup>1</sup> Data Source: Iowa Department of Revenue & Finance; Fuel Tax Summary – Taxable Gallons by Fuel Type, FY92-FY00; total noted includes Gasoline, Gasohol, Diesel. Date of Report: September 20, 2000.

<sup>2</sup> Energy Information Agency website publication; [www.eia.doe.gov/pub](http://www.eia.doe.gov/pub).

## Saving Product & Supplies (Fuel & Towels)

Field tests were conducted to determine how much fuel is saved with the **Fuel Rescue UST gauge stick squeegee**. Field test details can be found in Appendix B. Using the results of the field tests, it is possible to demonstrate the volume of fuel and quantity of disposable towels a model station would save by using the **Fuel Rescue UST gauge stick squeegee** (Appendix B). In this scenario, two connected tanks each measure at 65 inches of fuel prior to the tanks receiving one 7800-gallon load. The post-fill sticking measures 80 inches in the first tank (received 3800 gallons) and 83 inches in the second tank (received 4000 gallons).

By using the **Fuel Rescue UST gauge stick squeegee** for the pre-fill sticking, 33 mL were saved. During the post-fill sticking, 24 mL and 26 mL were saved, respectively. A total 83 mL of fuel was saved while unloading one fuel tanker. Assume the model station receives 15 loads per day, or 5,475 loads per year. At 83 mL per load, this scenario projects to annual savings of 120 gallons.

This scenario does not account for the additional occasions each week that employees of the model station measure the tanks. As already mentioned, the gauge stick is used four separate times when transferring one load of fuel. The amount of fuel saved during the unloading process is significant, but savings would also occur during verification of the tank's contents. The **Fuel Rescue UST gauge stick squeegee** benefits an entity every time a measurement of the tanks is required.

Another significant cost savings would be found by eliminating the need of disposable towels to clean the gauge stick. Commonly used disposable towels cost \$50 per package. Observing the field test, a transport driver commented that its no wonder one towel lasts only 4 swipes – just one load. In this scenario, the model station could save \$1,250 annually in towel savings alone.

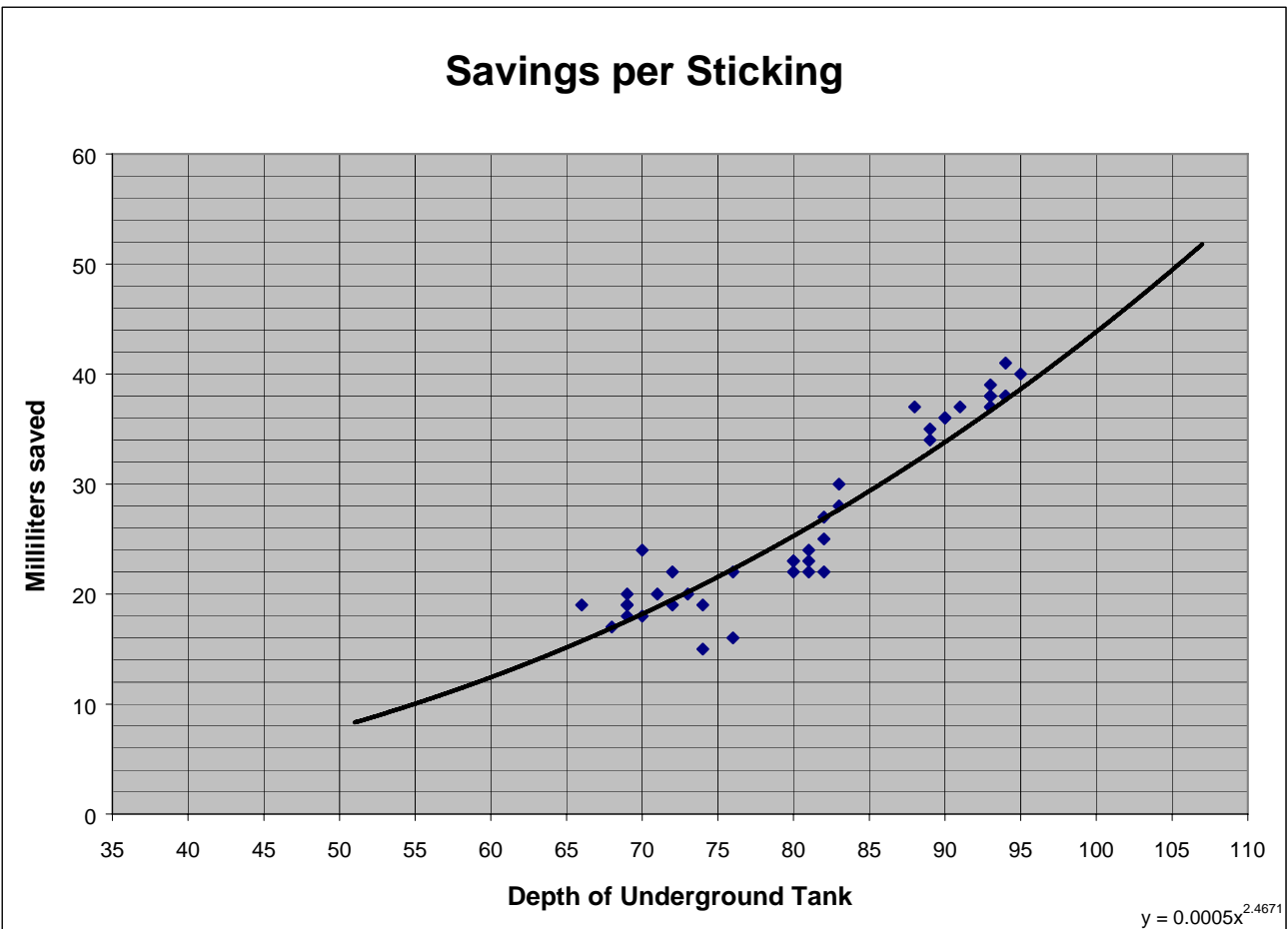
In the above scenario, 120 gallons of fuel are being lost into disposable towels or rags and disposed of in our landfills each year. Not only would the expense of supplying these towels be saved, but also the disposal of the fuel-

saturated towels into the landfills would be eliminated and the unnecessary contamination of our environment would be avoided.

# Captured Fuel Data & Graph

## Phase One

Testing began to determine the volume of fuel saved during the gauging process using the **Fuel Rescue UST gauge stick squeegee**. Several factors impacted the testing process including the wind and the speed at which the tester worked. Although the speed did vary, the tester worked to be consistent, and it was not long before a routine pace set in. Forty-two measurements were taken from a range of depths. The test data has been graphed to illustrate that the **Fuel Rescue UST gauge stick squeegee** saves fuel in a consistent and measurable manner.



## Phase One Test Data

### FIELD TEST #1

TANK LEVEL READING	FUEL CAPTURED FROM GAUGE STICK	TANK	TIME
76	22	A	0:20
74	15	B	0:20
76	16	C	0:20
74	19	A	0:23
73	20	A	0:36
72	22	B	0:36
70	24	C	0:36
72	19	A	0:43
70	18	B	0:43
69	19	A	1:00
66	19	B	1:00
71	20	C	1:00
68	17	A	1:10
69	18	B	1:10
69	19	C	1:10
69	20	A	1:45
82	22	B	1:45
83	30	C	1:45
83	28	C	1:50
82	27	C	1:55

### FIELD TEST #2

TANK LEVEL READING	FUEL CAPTURED FROM GAUGE STICK	TANK	TIME
81	22	A	0:12
95	40	B	0:12
94	38	C	0:12
93	38	C	0:17
80	23	A	0:20
94	38	B	0:20
93	37	C	0:20
80	22	A	0:25
94	41	B	0:25
93	38	C	0:25
80	23	A	0:30
93	39	B	0:30
93	37	C	0:30
81	24	A	0:35
91	37	B	0:35
90	36	C	0:35
81	23	A	0:40
90	36	B	0:40
89	35	C	0:40
82	25	A	0:45
89	34	B	0:45
88	37	C	0:45

February, 2004  
Flying J Truckstop (Clive, Iowa)

## Phase Two

Delivery logs from the test station, Flying J Truck Stop in Clive, Iowa, were analyzed to determine an average tank depth both prior to and after receiving a transport load of fuel. Data from 238 loads into three tanks was reviewed. These averages are a valid basis from which to project the potential fuel savings.

Average Tank Level Readings

	Number of Fills	Reading Pre-Delivery	Reading After Delivery
Tank A	110	68.10	82.32
Tank B	78	68.15	82.89
Tank C	50	63.73	79.28
Average		66.29	81.50

The field test data was gathered with permission of the Flying J Truckstop at Clive, Iowa. The data presented is intended to represent testing trials only and is not intended to represent the business interests of Flying J, Inc.

## Application of Field Test Results to Delivery by Fuel Transport

Steps**	Tank #1		Tank #2		TOTAL SAVED
	GAUGING RESULT	PRODUCT SAVED*	GAUGING RESULT	PRODUCT SAVED*	
PREMEASURE	65 in	16.5 mL	65 in	16.5 mL	33 mL
UNLOAD TRANSPORT	3800 gal		4000 gal		
VERIFY PRODUCT DELIVERED	80 in	24 mL	83 in	26 mL	50 mL
		40.5 mL		42.5 mL	83 mL

\*PRODUCT SAVED BASED ON FIELD TEST RESULTS

\*\*STEPS TO UNLOAD ONE TRANSPORT (7800 GALLONS) SIMULTANEOUSLY INTO TWO CONNECTED UNDERGROND STORAGE TANKS

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### EXAMPLE #1

**Truckstop receives 15 loads per day, or 5,475 in one year. Transport driver wipes 4 stickings with one absorbent towel.**

#### PRODUCT SAVINGS

Total saved per load	83 mL	=	0.0219263 gallon
Loads per day	15		
Product savings per day	1245 mL		
Product savings per year	454425 mL	=	120.0463844 gallon

Note: 1 gallon [US, liquid] = 3,785.4118 milliliter

#### TOWEL SAVINGS

Cost of absorbent towels	\$50 per package (100 count)
Loads absorbed by one towel	1 (4 stickings)
Loads absorbed by one package	100
Loads per year	5475
Packages of Towels per year	55
Towel savings per year	\$2,738

Photograph

# FUEL RESCUE UST GAUGE STICK SQUEEGEE



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Patent Owner: Larry L. Snyder