



Floor Slip Testing

EcoChemPro XL Cleaner Degreaser™
Zep Industrial Purple Degreaser & Cleaner™
Simple Green All Purpose Cleaner™

**Dynamic Coefficient of Friction
(DCOF)**



15th May 2023

Testing completed by Mr. Sean Bryant, B.S., M.S. Consultant,
Forensic Engineering Investigator
Advantage Forensics® Inc.

Introduction

According to the National Floor Safety Institute (www.nsf.org), slip and falls are the leading cause of workers' compensation claims and are the leading cause of occupational injury for people aged 55 years and older.

The Bureau of Labor Statistics (2021) reported 18% of the 1,176,340 nonfatal work injuries resulting in days away from work in 2020 were related to slips, trips, and falls.

EcoChemPro LLC engaged with Advantage Forensics® Inc. to complete a series of studies relating to dynamic coefficient of friction, on floor surfaces within the workplace. Typically dynamic coefficient of friction (DCOF) is completed in line with the American National Standards Institute (ANSI).

In this study EcoChemPro LLC were interested to learn how their product, EcoChemPro XL performed against other leading floor cleaning products.



Determining DCOF Values

The coefficient of friction (COF) is a numeric value that represents the friction between two objects.

DCOF (Dynamic Coefficient of Friction) testing is used to specify the friction of an object that is already in motion. The results of DCOF testing determine the likelihood of whether a surface could contribute to someone slipping and falling.

The equipment recommended for this study was the BOT-3000E, an advanced digital tribometer used for both laboratory and real-world environments. The BOT-3000E is designed to crawl along the floor at a constant speed measuring the resistance to slip of a standardized piece of rubber loaded into the bottom of the device.



BOT-3000E

Scope of Testing

EcoChemPro LLC instructed Advantage Forensics® Inc to compare three products using different floor types. The products chosen were EcoChemPro XL Cleaner Degreaser™, Simple Green All Purpose Cleaner™ and Zep Industrial Purple Degreaser & Cleaner™. All products tested were classified as general cleaner degreasers and all indicate they can be used as effective floor cleaners.

Each cycle of testing involved initially four passes of the BOT-3000E machine (S-N, N-S, W-E & E-W) over an untreated section of flooring. This was followed by repeating the process over a section of flooring cleaned with each product. In addition, on the workshop floor (polished concrete) a further cycle was provided under 'wet conditions', whereby the floor was 'wetted' prior to each pass of the BOT-3000E machine. This last test gives indication as to the coefficient of friction where a spill has occurred.

Results

In February 2022, the American National Standards Institute (ANSI) released a revised version of the Test Method for Measuring Dynamic Coefficient of Friction (DCOF) of Hard Surface Flooring Materials. It advises minimum DCOF values range from 0.42 to 0.55.

	Untreated	Simple Green	Zep	EcoChemPro XL
Concrete Floor Wet	Results	Results	Results	Results
	0.39	0.47	0.40	0.63
	0.39	0.55	0.45	0.68
	0.42	0.55	0.46	0.67
	0.40	0.52	0.48	0.68
	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction
	0.32	0.44	0.37	0.59
Concrete Floor Dry	Results	Results	Results	Results
	0.43	0.44	0.42	0.77
	0.57	0.39	0.40	0.79
	0.56	0.41	0.34	0.80
	0.65	0.45	0.43	0.79
	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction
	0.47	0.34	0.32	0.71
Tiled Office Floor Dry	Results	Results	Results	Results
	0.80	0.75	0.78	0.85
	0.82	0.80	0.62	0.83
	0.79	0.79	0.68	0.87
	0.82	0.79	0.49	0.86
	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction	AVG w/ Correction
	0.73	0.70	0.56	0.77

In each case EcoChemPro XL Cleaner Degreaser outperformed Simple Green™ and Zep™ products. In some cases, particularly with the tiled office floor and the dry concrete floor, the coefficient of friction actually reduced with Zep™ and Simple Green™. We believe this is due to the high pH of the chemistry which can leave a residue, even after cleaning and drying.

Conclusion by Advantage Forensics® Inc.

Following the independent testing of the three products, Advantage Forensics® Inc issued the following statements:

- ***"The EcoChemPro XL product improved the coefficient of friction of the various floor types in all cases".***
- ***"The EcoChemPro XL product resulted in a slip-resistant floor finish in all cases".***
- ***"The EcoChemPro XL product improved the coefficient of friction more than the other competitor's products in all cases".***

About EcoChemPro XL Cleaner Degreaser™

EcoChemPro XL is a safe to use, pH neutral cleaner degreaser with a range of applications. It is considered the new cleaning technology for the 21st century. It is a non-complex formulation, containing no dyes, fragrances, heavy toxins or VOC's. It is biodegradable and the chemistry contains natural and sustainable surfactants. It is considered a highly effective cleaner degreaser which is safer for people, equipment and the environment.



Further Information

Testing was completed on 15th May 2023, at Alabama Paper Products, Tuscaloosa, AL. The testing and equipment was provided by and calibrated by Mr. Sean Bryant, B.S., M.S. Consultant, Forensic Engineering Investigator representing Advantage Forensics® Inc. 2770 Dufferin St., Suite 115, Toronto, ON M6B 3R7. Tel. (416) 630-0700,. Further information on the test results can be obtained by contacting Advantage Forensics® Inc or by contacting EcoChemPro LLC, 1655 McFarland Blvd N PMB 267, Tuscaloosa, AL 35406 Tel. 833-427-7947.

Reference Information.

National Floor Safety Institute (www.nsf.org)
American National Standards Institute (www.ansi.org)
Advantage Forensics® Inc (<https://aforensics.ca/>)
EcoChemPro LLC (www.ecochempro.com)
Simple Green™ (www.simplegreen.com)
Zep™ (www.zep.com)