

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Elgin Eagle® Series FW Waterless Street Sweeper

Developed by Elgin Sweeper Company
Elgin, Illinois, USA

Registration: GPS-ETV_VR2021-05-31_EE

In accordance with

ISO 14034:2016

**Environmental Management —
Environmental Technology Verification (ETV)**



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May 31, 2021
Vancouver, BC, Canada



Verification Body
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Performance Claims

The Elgin Eagle® Series FW Waterless Street Sweeper truck-mounted mechanical street sweeper was operated by a Vendor's representative at an average speed of $5.3 \text{ km}\cdot\text{h}^{-1}$ in a controlled space where no water or any other liquids were permitted. No water spray was used in the testing. The sweeper was operated with both side brooms (gutter brooms) and the main pick-up broom operating. In addition, the standard Waterless Eagle flexible dust skirts were in place during testing with the standard curb-side flaps set for curb sweeping with skirt flaps on both sides fastened in the elevated position to allow the side broom to engage directly with the curb.

The final average performance indicators – at the 95% confidence interval – of the Elgin Eagle Series FW Waterless Street Sweeper, are as follows:

1. Maximum concentration of PM_{10} air contamination of $0.005 \pm 0.006 \text{ mg}\cdot\text{m}^{-3}\cdot\text{kg}^{-1}$;
2. Total concentration of PM_{10} air contamination of $2.63 \pm 0.72 \text{ mg}\cdot\text{m}^{-3}\cdot\text{kg}^{-1}$;
3. Maximum concentration of $\text{PM}_{2.5}$ air contamination of $0.002 \pm 0.002 \text{ mg}\cdot\text{m}^{-3}\cdot\text{kg}^{-1}$;
4. Total concentration of $\text{PM}_{2.5}$ air contamination of $1.44 \pm 0.28 \text{ mg}\cdot\text{m}^{-3}\cdot\text{kg}^{-1}$;
5. A removal efficiency of test material from surface of $88.1\% \pm 2.9\%$; and
6. Deposit of test material on sidewalk of $0.06\% \pm 0.09\%$;

Technology Application

The Elgin Eagle® Series FW Waterless Street Sweeper can efficiently clean large paved areas like streets, highways, and construction sites. The Eagle FW provides variable height dump. Side brooms and a main broom help bring debris out of the gutter and onto a mechanical conveyor.

Performance Conditions

The Elgin Eagle® Series FW Waterless Street Sweeper was tested at the Prairie Agricultural Machinery Institute (PAMI) facility (Test Agent, TA) in Humboldt, Saskatchewan over three test days in July of 2008. The test facility was an enclosed tent about 80m x 11m. The test material was Camel-Wite®, manufactured by Debro Chemicals and Pharmaceuticals, a calcium carbonate-based powder with a mean diameter of about three microns. A total of 272 ± 1 (at 95% confidence level) kg were applied to the test track, which consisted of two strips that were 2.75 m x 30 m each. The TA conducted the testing and measurement according to the "PM₁₀ and PM_{2.5} Street Sweeper Efficiency Test Protocol. Version 1" (City of Toronto, April 2008).

Technology Description

The Elgin Eagle® Series FW Waterless Street Sweeper is a truck-mounted, mechanical sweeper that incorporates a patented waterless dust control system. The sweeper uses rotating side broom(s) to move material into the path of a rotating, horizontal main broom. The main broom scrubs the surface and lifts material onto a mechanical conveyor which carries and deposits the swept materials into a debris collection hopper.

The dust control system employs a powerful vacuum fan to create an air stream through the debris hopper, conveyor and broom areas. The air moving into the system captures and carries airborne dust into the debris hopper where it settles with the swept debris. The system features flexible main and side broom skirting to enhance dust capture while providing partially-exposed side broom(s) for engagement

with curbs. A dry filter element is positioned immediately prior to the vacuum fan to separate unsettled dust from the air stream before it is exhausted from the sweeper. This filter element is selectively cleaned to maintain effective air volume. The technology employed in the Elgin Eagle® Series FW Waterless Street Sweeper is claimed under US Patent number 7,281,296 B2.

Verification

This verification was first completed in February 2009 and has been considered valid for subsequent renewal periods every three (3) years thereafter. The verification was based on information supplied by Elgin Sweeper Company, and the performance tests conducted by the Test Agent on the Elgin Crosswind® NX Street Sweeper in July of 2008 according to the “PM₁₀ and PM_{2.5} Street Sweeper Efficiency Test Protocol Version 1” (City of Toronto, April 2008).

The original verification was completed by ORTECH Environmental of Mississauga, Ontario as the Verification Expert, using the Canadian ETV Program’s General Verification Protocol (February, 2007). This ETV renewal is considered to meet the equivalency of an ETV verification completed using the International Standard *ISO 14034:2016 Environmental management – Environmental technology verification (ETV)*.

What is ISO 14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization (ISO)*. The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Elgin Eagle® Series FW Waterless Street Sweeper please contact:

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Limitation of verification: Registration: GPS-ETV_VR2021-05-31_EE

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