

ETV Canada Verified



Elgin Eagle Series FW Waterless Street Sweeper Technology Fact Sheet for Elgin Sweeper Company

Performance Claim

The Elgin Eagle Series FW Waterless Street Sweeper is a truck-mounted mechanical street sweeper, which 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 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).

Environmental Technology Verification

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

The verification was conducted by ORTECH Environmental of Mississauga, Ontario as the Verification Entity using ETV Canada's General Verification Protocol (February, 2007). The verification was based on information supplied by Elgin Sweeper Company, and the performance tests conducted by the TA on the Elgin Eagle Series FW Waterless 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).

What is the ETV Program?

The Environmental Technology Verification (ETV) Program is delivered by ETV Canada under a license agreement from Environment Canada. The ETV Program is designed to support Canada's environment industry by providing credible and independent verification of technology performance claims.

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