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APPROVAL REPORT

**MODEL VK810, VK811, VK812, VK813, VK814, VK815,
VK816, AND VK817 1/2 INCH NPT OPEN SPRAY
NOZZLES WITH NOMINAL DISCHARGE
COEFFICIENTS OF 1.2, 1.8, 2.3, 3.2, 4.1, 5.6, AND 7.2
GAL/MIN/(PSI)^{1/2}, DISCHARGE ANGLES OF 65, 80, 95,
110, 125, 140, 160, AND 180 DEGREES, WITH BRASS
AND ELECTROLESS NICKEL PLATING FINISHES**

Prepared for:


**The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058**

Project ID: 3020401

Class: 2025

Date of Approval: 5 OCTOBER 2004

Authorized by:


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**MODEL VK810, VK811, VK812, VK813, VK814, VK815, VK816,
AND VK817 1/2 INCH NPT OPEN SPRAY NOZZLES WITH
NOMINAL DISCHARGE COEFFICIENTS OF 1.2, 1.8, 2.3, 3.2, 4.1,
5.6, AND 7.2 GAL/MIN/(PSI)^{1/2}, DISCHARGE ANGLES OF
65, 80, 95, 110, 125, 140, 160, AND 180 DEGREES, WITH
BRASS AND ELECTROLESS NICKEL PLATING FINISHES**

from

**THE VIKING CORPORATION
210 NORTH INDUSTRIAL PARK ROAD
HASTINGS, MI 49058**

I INTRODUCTION

- 1.1 The Viking Corporation requested an Approval examination of their 1/2 inch NPT open spray nozzles with nominal discharge coefficients of 1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2 gal/min/(psi)^{1/2}, discharge angles of 65, 80, 95, 110, 125, 140, 160, and 180 degrees, with brass and ENP (electroless nickel plating) finishes. These spray nozzles are also known as The Viking Corporation's Model E open spray nozzles.
- 1.2 This report is limited to the examination of the spray nozzles described in Section II, in accordance with the standards listed below:

Title	Class Number	Date
Automatic Sprinklers for Fire Protection	2000	May 1998
Automatic and Open Water-Spray Nozzles for Installation in Permanently Piped Systems	2021, 2025	February 1966
Underwriters Laboratories, Spray Nozzles for Fire-Protection Service	UL 2351	July 10, 2000

- 1.3 This report may be freely reproduced only in its entirety and without modification.
- 1.4 The Model E open spray nozzles will appear in Chapter 5, Fixed Extinguishing Systems, of the FM Approval Guide, under the heading "Water-Spray Systems," as follows:

The Viking Corporation, 210 North Industrial Park Road, Hastings, MI 49058
Model E open spray nozzles, VK810, VK811, VK812, VK813, VK814, VK815, VK816, and VK817. Available in 65°, 80°, 95°, 110°, 125°, 140°, 160°, and 180° spray patterns, and nominal K-factors of 1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2 gal/min/(psi)^{1/2}. Nozzles are available in brass and electroless nickel plating.

II DESCRIPTION

- 2.1 The Viking Corporation Model E 1/2 inch NPT open water spray nozzles are intended to protect specific hazards which cannot be adequately protected by a conventional sprinkler system. Each system is designed and calculated for the hazard, and each nozzle is chosen for its specific discharge capacity and spray angle. Water spray nozzles shall maintain a constant spray pattern within the pressure and orientation parameters, as stated by the manufacturer. The spray nozzles

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are rated for a minimum and maximum system pressure of 10 psi (69 kPa) and 175 psi (1207 kPa), respectively. The nozzles are further described in the attached manufacturer's drawings.

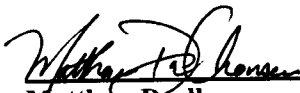
2.2 The spray nozzles were evaluated for Approval under this examination in accordance with the following list only:

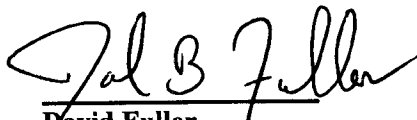
Model	Spray Angle	K-factor [gal/min/(psi) ^{1/2}]	Installation Angle
VK810	65°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK811	80°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK812	95°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK813	110°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK814	125°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK815	140°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK816	160°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°
VK817	180°	1.2, 1.8, 2.3, 3.2, 4.1, 5.6, and 7.2	0°, 30°, 45°, 60°, 90°, 120°, 135°, 150°, and 180°

VIII CONCLUSION

The open spray nozzles described in Section II meet FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

EXAMINATION AND TESTING BY:	Frank Coles, FM Approvals Jim Horn, FM Approvals Matthew Daelhousen, FM Approvals The Viking Corporation personnel
PROJECT DATA RECORD:	P.I. 3020401
ORIGINAL TEST DATA:	P.I. 3020401
ATTACHMENTS:	Appendix I – Documentation File (2 pages) Appendix II – Appendix Tables (1 page)
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