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APPROVAL REPORT

**MODEL VK500 FUSIBLE TYPE SUPPRESSION MODE
(ESFR) PENDENT FAST RESPONSE AUTOMATIC
SPRINKLERS WITH A NOMINAL DISCHARGE
COEFFICIENT OF 14.0 GAL/MIN/(PSI)^{1/2} WITH AN
ALTERNATE PIP CAP, EJECTION SPRING, TRIGGER,
AND SUPPORT (ALTERNATE ASSEMBLY)**

Prepared for:

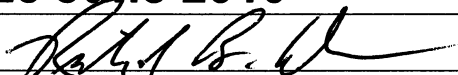
**The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058**

Project ID: 3039814

Class: 2008

Date of Approval: 25 June 2010

Authorized by:


Richard B. Dunne, Manager-Hydraulics Group

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

**MODEL VK500 FUSIBLE TYPE SUPPRESSION MODE (ESFR)
PENDENT FAST RESPONSE AUTOMATIC SPRINKLERS WITH
A NOMINAL DISCHARGE COEFFICIENT OF 14.0
GAL/MIN/(PSI)^{1/2} WITH AN ALTERNATE PIP CAP, EJECTION
SPRING, TRIGGER, AND SUPPORT (ALTERNATE
ASSEMBLY)**

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 Model VK500 fusible type suppression mode (ESFR) pendent fast response automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi)^{1/2} with an alternate pip cap, ejection spring, trigger, and support (alternate assembly).
- 1.2 This Report is limited to the examination of the sprinklers in accordance with the standards listed below as described in Section II of this Report.
- 1.3 This Report may be freely reproduced only in its entirety and without modification.
- 1.4 **Standards**

Title	Class Number	Date
Suppression Mode [Early Suppression – Fast Response (ESFR)] Automatic Sprinklers	Class Series 2008	October 2006

- 1.5 **Listing:** The Approval Guide listing was unaffected by the results of this examination.

II DESCRIPTION

- 2.1 The Viking Corporation Model VK500 automatic sprinklers utilize a fusible type heat responsive element which operates within a predetermined temperature range, allowing water to flow at a specified rate and in a particular distribution pattern for a given supplied water pressure. The sprinklers are designed for use in automatic sprinkler fire protection systems as a means of fire suppression and are rated for 175 psi (12.1 bar) maximum system pressure. This model is further described in the attached manufacturer's drawings.
- 2.2 The sprinklers were evaluated for Approval under this examination in accordance with the following list only:

Model	K	Type	Resp.	Element	NPT (in.)	Finishes	Temp. Ratings °F (°C)
VK500	14.0	ESFR	FR	Fusible	3/4	Brass	165°, 205°F (74°, 96°C)

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2.3 The scope of this examination is limited to the Model VK500 sprinklers with an alternate pip cap, ejection spring, trigger, and support (alternate assembly). These sprinklers are otherwise identical to the currently Approved Model VK500 automatic sprinklers which are further described in the following Approval Reports:

Project ID	Date	Description
0B0A4.AH	02-25-2000	Model S-1 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi) ^{1/2} in a brass finish in a nominal temperature rating of 165°F (74° C).
3008862	11-09-2000	Model VK500 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi) ^{1/2} with plain brass finish in a nominal temperature rating of 165°F (74°C) with a kick spring.
3007275	12-14-2001	Model VK500 and VK520 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent and upright automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi) ^{1/2} in a nominal temperature rating of 205° F (96° C).
3012261	03-08-2002	Model VK500 and VK520 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent and upright automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi) ^{1/2} with design modifications.
3021933	11-17-2005	Model VK500 and VK520 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent and upright automatic sprinklers with a nominal discharge coefficient of K14.0 gal/min/(psi) ^{1/2} as manufactured in Holland, Michigan.
3029929	02-25-2008	Model VK500 and VK503 fusible type suppression mode [Early Suppression – Fast Response (ESFR)] pendent automatic sprinklers with nominal discharge coefficients of K14.0 and K16.8 gal/min/(psi) ^{1/2} with modification.
3026351	6-15-2009	Model VK102, VK104, VK108, VK110, VK112, VK150, VK152, VK156, VK160, VK200, VK202, VK204, VK206, VK500, VK510, VK552, and VK562 automatic sprinklers with modification.

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Project ID: 3039814

Drawing No.	Description	Rev. Level
10713	Screw, Compression, Sprinkler, ESFR	10
10766	Paint, Black Acrylic	0
11263	Ejector Spring, Pendent, ESFR	2
11350	Sprinkler Ass'y, Pendent, 3/4" NPT, ESFR, 14K	4
11551	ESFR Pendent Pipcap	2
11552	ESFR Trigger	4
11553	Support, ESFR	5
11554	Pipcap Ass'y, Sprinkler, ESFR	0
11608	Deflector, Pendent, Sprinkler, ESFR	2
11661	Cap, Protector, Sprinkler, ESFR	3
F_060198	ESFR Pendent Sprinkler VK500 (K14.0)	07May10

IX CONCLUSION

The sprinklers 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.

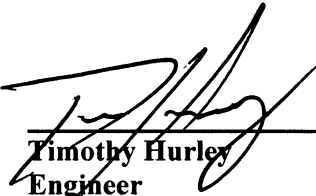
EXAMINATION AND TESTING BY: Hydraulics Laboratory personnel

PROJECT DATA RECORD: P.I. 3039814

ORIGINAL TEST DATA: P.I. 3039814

ATTACHMENTS: Manufacturer's Drawings (26 pages)

REPORT BY:


Timothy Hurley
Engineer
Hydraulics

REPORT REVIEWED BY:


Claude Bosio
Technical Team Manager
Hydraulics

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APPROVAL REPORT

**MODEL VK500 AND VK520 FUSIBLE TYPE
SUPPRESSION-MODE (ESFR) PENDENT AND
UPRIGHT AUTOMATIC SPRINKLERS WITH A
NOMINAL DISCHARGE COEFFICIENT OF 14.0
GAL/MIN/(PSI)^{1/2} WITH DESIGN MODIFICATIONS**

Prepared for:

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

**Project ID. 3012261
Class 2008
Date: 8 March 2002**

Factory Mutual Research Corporation
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

**MODEL VK500 AND VK520 FUSIBLE TYPE
SUPPRESSION-MODE (ESFR) PENDENT AND UPRIGHT
AUTOMATIC SPRINKLERS WITH A NOMINAL DISCHARGE COEFFICIENT OF
14.0 GAL/MIN/(PSI)^{1/2} WITH DESIGN MODIFICATIONS
(MODIFICATION)
8 March 2002**

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 Model VK500 and VK520 fusible type suppression-mode (ESFR) pendent and upright automatic sprinklers with a nominal discharge coefficient of 14.0 gal/min/(psi)^{1/2} with design modifications.
- 1.2 This Report is limited to the examination of the sprinklers in accordance with the standard listed below as described in Section II of this Report.
- 1.3 This Report may be freely reproduced only in it's entirety and without modification.
- 1.4 **Standards**

Title	Class Number	Date
Early Suppression Fast Response (ESFR) Automatic Sprinklers	2008	August 1996

- 1.5 **Listing:** The Approval Guide listing was unaffected by the results of this examination.

II DESCRIPTION

- 2.1 The Viking Model VK500 and VK520 automatic sprinklers utilize a fusible type heat activated element which ruptures within a predetermined temperature band, allowing water to flow at a specified rate and in a particular distribution pattern for a given supplied water pressure. The sprinklers are designed for use in automatic sprinkler fire protection systems as a means of fire control and are rated for 175 psi (1207 kPa) maximum system pressure. These models are further described in the attached manufacturer's drawings.
- 2.2 The sprinklers were evaluated for Approval under this examination in accordance with the following list only:

Model	Style	Element	Temperature Ratings	Application
VK500	Pendent	Fusible	165 and 205°F (74 and 96°C)	ESFR
VK520	Upright	Fusible	165 and 205°F (74 and 96°C)	ESFR

- 2.3 The scope of this examination is limited to the Model VK500 and VK520 sprinklers with modified components. These sprinklers are otherwise identical to the currently Approved

FACTORY MUTUAL RESEARCH
3012261

Model VK500 and VK520 automatic sprinklers which are further described in the following Approval Reports:

Job Identification	Date	Description
0B0A4.AH	25 Feb 2000	ESFR Pendent, 165°F (74°C)
3008464	18 July 2000	ESFR Upright, 165°F (74°C)
3008862	9 Nov 2000	ESFR Pendent, 165°F (74°C), with kickspring
3007275	4 Dec 2001	ESFR Upright and Pendent, 205°F (96°C)

IX CONCLUSION

The sprinklers described in Section II meet Factory Mutual Research requirements. Approval is effective when the Approval Agreement is signed and received by Factory Mutual Research.

EXAMINATION AND TESTING BY: Hydraulics Laboratory personnel

PROJECT DATA RECORD: J.I. 3012261

ORIGINAL TEST DATA: J.I. 3012261

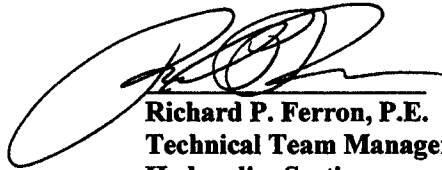
ATTACHMENTS: Appendix Tables, Manufacturer's Drawings

REPORT BY:

REPORT REVIEWED BY:



Claude Bosio
Senior Engineer
Hydraulics Section



Richard P. Ferron, P.E.
Technical Team Manager
Hydraulics Section

1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062 USA
T: (781) 762-4300 F: (781) 762-9375

APPROVAL AGREEMENT

The Agreement is made by and between Factory Mutual Research Corporation (herein called Factory Mutual Research) and **The Viking Corporation, Hastings, MI 49058**

(herein called the Client). The Client is making a product or providing a service known and described as:

**MODEL VK500 AND VK520
FUSIBLE TYPE SUPPRESSION MODE (ESFR)
PENDENT AND UPRIGHT AUTOMATIC SPRINKLERS
WITH A NOMINAL DISCHARGE COEFFICIENT OF 14.0
GAL/MIN/(PSI)^{1/2} IN A NOMINAL TEMPERATURE
RATING OF 205°F (96°C)**

This product or service has been examined by Factory Mutual Research as described in a report bearing Job Identification **3007275** dated **December 14, 2001**.

In consideration of Factory Mutual Research Approval of the product or service, the Client is authorized to indicate such Approval, as stated by the above report, and agrees to the following and terms stated on the reverse side of this Agreement:

1. The Client shall place a unique identification mark (i.e. model or type number) on the product as stated in the above report and shall not place this mark on any other product unless covered by a separate Agreement with Factory Mutual Research.
2. The Client shall use the Factory Mutual Research Approval Mark on the product, but shall not use this mark on any other product unless such other product is covered by separate Agreement with Factory Mutual Research.
3. The Client shall not use, reproduce or distribute the above referenced report by Factory Mutual Research except in its entirety without any change, deletion or addition thereto. The Client agrees that Factory Mutual Research may distribute the referenced report and related information within FM Global.

The Viking Corporation
 _____ Client
Scott T. Franson Signature
 Scott T. Franson Name
 _____ Name
 Director, Sprinkler Division Title
 210 N Industrial Park Rd Title
 Hastings MI 49058 Address
 _____ Address
 January 2, 2002 Date
 _____ Date

FACTORY MUTUAL RESEARCH CORPORATION

R.L. Martell Signature
 R.L. Martell Name
 _____ Name
 Asst. V.P. – Approvals Division Title
 _____ Title
 12-18-01 Date
 _____ Date

1151 Boston-Providence Turnpike
 P.O. Box 9102
 Norwood, MA 02062 USA
 T: (781) 762-4300 F: (781) 762-9375

APPROVAL AGREEMENT

The Agreement is made by and between Factory Mutual Research Corporation (herein called Factory Mutual Research) and **The Viking Corporation, Hastings, MI 49058**

(herein called the Client). The Client is making a product or providing a service known and described as:

**MODEL VK500
 FUSIBLE TYPE
 SUPPRESSION MODE (ESFR)
 PENDENT
 AUTOMATIC SPRINKLERS WITH
 A NOMINAL DISCHARGE COEFFICIENT OF 14.0 GAL/MIN/(PSI)^{1/2}
 WITH PLAIN BRASS FINISH
 IN A NOMINAL TEMPERATURE RATING OF 165°F (74°C)
 WITH A KICKSPRING (ALTERNATE ASSEMBLY)**

This product or service has been examined by Factory Mutual Research as described in a report bearing

Job Identification **3008862** dated **November 9, 2000.**

In consideration of Factory Mutual Research Approval of the product or service, the Client is authorized to indicate such Approval, as stated by the above report, and agrees to the following and terms stated on the reverse side of this Agreement:

1. The Client shall place a unique identification mark (i.e. model or type number) on the product as stated in the above report and shall not place this mark on any other product unless covered by a separate Agreement with Factory Mutual Research.
2. The Client shall use the Factory Mutual Research Approval Mark on the product, but shall not use this mark on any other product unless such other product is covered by separate Agreement with Factory Mutual Research.
3. The Client shall not use, reproduce or distribute the above referenced report by Factory Mutual Research except in its entirety without any change, deletion or addition thereto. The Client agrees that Factory Mutual Research may distribute the referenced report and related information within FM Global.

_____	Client	FACTORY MUTUAL RESEARCH CORPORATION	
<i>Scott J. Larson</i>	Signature	<i>J. Rennie</i>	Signature
_____	Name	J. Rennie	Name
_____	Title	V.P. – Approvals Division	Title
_____	Address	December 4, 2000	Date
<i>12-19-00</i>	Date		

1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062 USA
T: (781) 762-4300 F: (781) 762-9375

APPROVAL AGREEMENT

The Agreement is made by and between Factory Mutual Research Corporation (herein called Factory Mutual Research) and **The Viking Corporation, Hastings, MI 49058**

(herein called the Client). The Client is making a product or providing a service known and described as:

**MODEL S-1
FUSIBLE TYPE
SUPPRESSION MODE
PENDENT
EARLY SUPPRESSION FAST RESPONSE (ESFR)
AUTOMATIC SPRINKLERS WITH
A NOMINAL DISCHARGE COEFFICIENT OF 14.0 GAL/MIN/(PSI) 1/2
AND BRASS FINISH
IN A NOMINAL TEMPERATURE RATING OF 165°F (74°C)**

This product or service has been examined by Factory Mutual Research as described in a report bearing

Job Identification **OB0A4.AH**

dated **February 25, 2000.**

In consideration of Factory Mutual Research Approval of the product or service, the Client is authorized to indicate such Approval, as stated by the above report, and agrees to the following and terms stated on the reverse side of this Agreement:

1. The Client shall place a unique identification mark (i.e. model or type number) on the product as stated in the above report and shall not place this mark on any other product unless covered by a separate Agreement with Factory Mutual Research.
2. The Client shall use the Factory Mutual Research Approval Mark on the product, but shall not use this mark on any other product unless such other product is covered by separate Agreement with Factory Mutual Research.
3. The Client shall not use, reproduce or distribute the above referenced report by Factory Mutual Research except in its entirety without any change, deletion or addition thereto. The Client agrees that Factory Mutual Research may distribute the referenced report and related information within FM Global.

The Viking Corporation
Scott Franson
 Signature
Scott Franson
 Name
Director, Sprinkler Division
 Title
210 N. Industrial Park Rd
 Address
Hastings, MI 49058
March 21, 2000
 Date

FACTORY MUTUAL RESEARCH CORPORATION
R.L. Martell
 Signature
R.L. Martell
 Name
Asst. V.P. - Approvals Division
 Title
March 10, 2000
 Date





Certificate of Compliance

This certificate is issued for the following equipment:

Model	K	Type	Resp.	Element	NPT (in.)	Finishes	Temperature Ratings °F (°C)
VK500	14.0	ESFR	FR	Fusible	3/4	Brass	165°, 205°F (74°, 96°C)

Prepared for: The Viking Corporation, 210 North Industrial Park Road, Hastings, MI 49058

Manufacturing Locations: The Viking Corporation, 210 North Industrial Park Road, Hastings, MI 49058 and The Viking Corporation, 11305 James Street, Holland, MI 49424

FM Approval Class: 2008

FM Approval Standard: Class Series 2008 (October/2006)

Project Identifier: 3039814 Date of Approval: June 25, 2010

Said Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

For more than 160 years FM Approvals has partnered with business and industry to reduce property losses.

A handwritten signature in black ink, appearing to read 'Richard B. Dunne'.

Richard B. Dunne, Manager
Hydraulics Group
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062

June 28, 2010



Member of the FM Global Group



Certificate of Compliance

Automatic Control Mode Sprinklers for Fire Protection

This certificate is issued for the following equipment:

Model	K	Type	Resp.	Element	NPT (in.)	Finishes	Temperature Ratings °F (°C)
VK500	14.0	ESFR Pendent	FR	Fusible	3/4	Brass	165°, 205°F (74°, 96°C)


Manufactured by: The Viking Corp, 210 N Industrial Park Rd, Hastings, Michigan 49058

Manufacturing Location: The Viking Corp, 210 N Industrial Park Rd, Hastings, Michigan 49058

FM Approvals confirms that the items have been found to comply with the following standard:

FM Approvals Standard 2008 (October 2006)

Project Identifier: 3026351 Date of Approval: May 5, 2009


Richard B. Dunne
Group Manager - Hydraulics


Date



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