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
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 its entirety and without modification.

1.4 Standards

<table>
<thead>
<tr>
<th>Title</th>
<th>Class Number</th>
<th>Date</th>
</tr>
</thead>
</table>

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

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:

<table>
<thead>
<tr>
<th>Model</th>
<th>Style</th>
<th>Element</th>
<th>Temperature Ratings</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>VK500</td>
<td>Pendent</td>
<td>Fusible</td>
<td>165 and 205°F (74 and 96°C)</td>
<td>ESFR</td>
</tr>
<tr>
<td>VK520</td>
<td>Upright</td>
<td>Fusible</td>
<td>165 and 205°F (74 and 96°C)</td>
<td>ESFR</td>
</tr>
</tbody>
</table>

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
FACTOR MUTUAL RESEARCH
3012261

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

<table>
<thead>
<tr>
<th>Job Identification</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0B0A4.AH</td>
<td>25 Feb 2000</td>
<td>ESFR Pendant, 165°F (74°C)</td>
</tr>
<tr>
<td>3008464</td>
<td>18 July 2000</td>
<td>ESFR Upright, 165°F (74°C)</td>
</tr>
<tr>
<td>3008862</td>
<td>9 Nov 2000</td>
<td>ESFR Pendant, 165°F (74°C), with kicsspring</td>
</tr>
<tr>
<td>3007275</td>
<td>4 Dec 2001</td>
<td>ESFR Upright and Pendant, 205°F (96°C)</td>
</tr>
</tbody>
</table>

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: Claude Bosio
Senior Engineer
Hydraulics Section

REPORT REVIEWED BY: Richard P. Ferron, P.E.
Technical Team Manager
Hydraulics Section
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


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 T. Franson
Director, Sprinkler Division
210 N Industrial Park Rd
Hastings MI 49058

January 2, 2002

FACTORY MUTUAL RESEARCH CORPORATION

R.L. Martell
Asst. V.P. – Approvals Division

12-18-01
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 VK520
FUSIBLE TYPE
SUPPRESSION MODE (ESFR)
UPRIGHT
AUTOMATIC SPRINKLERS WITH
A NOMINAL DISCHARGE COEFFICIENT OF 14.0 GAL/MIN/(PSI) ½
IN PLAIN 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 3008464 dated July 18, 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.

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The Viking Corporation

Scott Franson
Director, Sprinkler Division
210 N. Industrial Park Rd
Hastings, MI 49058
August 18, 2000

FACTORY MUTUAL RESEARCH CORPORATION

R.L. Martell
Asst. V.P. – Approvals Division

August 9, 2000