File EX3836
Project 03CA06609
Project 03NK33586
Project 05NK05068
Project 05CA43687
Project 06NK07613
Project 06NK14337
Project 06CA54461
Project 06NK13655
Project 06NK26160
Project 06NK29843
Project 07NK16274
Project 07NK04786
Project 08CA19810

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REPORT

on

RESIDENTIAL SPRINKLERS

Viking Corporation
Hastings, MI

GENERAL

INTRODUCTION:

This Report describes the investigation of residential sprinklers intended to be installed in accordance with the National Fire Protection Association Standard For Installation Of Sprinkler Systems For One- And Two-Family Dwellings And Mobile Homes, NFPA 13D, Installation Of Sprinkler Systems In Residential Occupancies Up To Four Stories In Height, NFPA 13R and Installation Of Sprinkler Systems, NFPA 13.

OBJECT:

* The object of this investigation was to determine compliance of the residential sprinklers with the Third Edition of the Standard For Residential Sprinklers For Fire Protection Service, UL 1626 and Outline of Investigation for Fire Testing of **Residential** Sprinklers for Use with Smooth, Flat, Sloped Ceilings Having Pitches Not Exceeding 8/12, Subject **1626A, and the requirements for the Investigation of Residential Sprinklers For Fire Protection Service ULC/ORD-C1626-03.**

PLAN:

* The investigation of the residential sprinklers consisted of conducting a design parameter and installation instruction review, construction evaluation and performance testing as described in UL **1626, 4th Edition;** Subject **1626A, Issue No.1; and ULC/ORD-C1626-03, 1st Edition.**

DESCRIPTION

PRODUCT COVERED:

VK435, pendent and recessed pendent style sprinkler, discharge coefficient “K” = 3.1, (3 mm glass bulb type) heat responsive element, 155 and 175 °F temperature rated residential type sprinklers.

VK466, pendent, recessed pendent, and concealed pendent style sprinkler, discharge coefficient “K” = 5.2, (3 mm glass bulb type) heat responsive element, 155 and 175 °F temperature rated residential type sprinklers. The concealed pendent style utilizes a 135°F coverplate assembly.

VK468, pendent, recessed pendent, and concealed pendent style sprinkler, discharge coefficient “K” = 4.9, (3 mm glass bulb type) heat responsive element, 155 and 175 °F temperature rated residential type sprinklers. The concealed pendent style utilizes a 135°F coverplate assembly.

VK450, horizontal sidewall sprinkler, discharge coefficient “K” = 4.2,(3 mm glass bulb type) heat responsive element, 155 and 175°F temperature rated residential type sprinklers.

VK472, pendent and recessed pendent style sprinkler, discharge coefficient “K” = 5.8, (3 mm glass bulb type) heat responsive element, 155 and 175 °F temperature rated residential type sprinklers.

These sprinklers have a maximum pressure of 175 psig for wet systems only for spacing and flow rates as indicated below:

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Maximum Sprinkler Spacing, ft.	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL,CNL	VK435	Pendent, Rec. Pendent	155, 175	3.1	12 by 12	9	8.4
USL,CNL	VK435	Pendent, Rec. Pendent	155, 175	3.1	14 by 14	10	10.4
USL,CNL	VK468	Pendent, Rec. Pendent	155, 175	4.9	16 by 16	13	7.0
USL,CNL	VK468	Pendent, Rec. Pendent	155, 175	4.9	18 by 18	17	12.0
USL,CNL	VK468	Pendent, Rec. Pendent	155, 175	4.9	20 by 20	20	16.7
USL,CNL	VK468	Pendent, Rec. Pendent	155	4.9	16 by 16	13	7.0
USL,CNL	VK468	Pendent, Rec. Pendent	155	4.9	18 by 18	17	12.0
USL,CNL	VK468	Pendent, Rec. Pendent	155	4.9	20 by 20	20	16.7
USL,CNL	VK468	Concealed Pendent	155, 175	4.9	16 by 16	13	7.0
USL,CNL	VK468	Concealed Pendent	155, 175	4.9	18 by 18	17	12.0
USL,CNL	VK468	Concealed Pendent	155, 175	4.9	20 by 20	20	16.7
USL,CNL	VK450 +	HSW, Rec. HSW	155/175	4.2	12 by 12	12	8.2

Table Continued

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Maximum Sprinkler Spacing, ft.	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL,CNL	VK450 +	HSW, Rec. HSW	155/175	4.2	14 by 14	14	11.1
USL,CNL	VK450 +	HSW, Rec. HSW	155/175	4.2	16 by 18	18	18.4
USL,CNL	VK450 +	HSW, Rec. HSW	155/175	4.2	16 by 20	22	27.4
USL,CNL	VK450 +	HSW, Flush HSW	155	4.2	16 by 22	26	38.3
USL,CNL	VK450 ++	HSW, Rec. HSW	155/175	4.2	16 by 18	20	22.7
USL,CNL	VK450 ++	HSW, Rec. HSW	155/175	4.2	16 by 20	25	35.4
USL,CNL	VK466	Pendent, Rec. Pendent	155, 175	5.2	16 by 16	14	7.2
USL,CNL	VK466	Pendent, Rec. Pendent	155, 175	5.2	18 by 18	17	10.7
USL,CNL	VK466	Pendent, Rec. Pendent	155, 175	5.2	20 by 20	20	14.8
USL,CNL	VK466 *	Concealed Pendent	155, 175	5.2	16 by 16	14	7.2
USL,CNL	VK466 *	Concealed Pendent	155, 175	5.2	18 by 18	17	10.7
USL,CNL	VK466 *	Concealed Pendent	155, 175	5.2	20 by 20	20	14.8
USL,CNL	VK466 a	Pendent, Rec. Pendent	155	5.2	16 by 16	14	7.2
USL,CNL	VK466 a	Pendent, Rec. Pendent	155	5.2	18 by 18	17	10.7
USL,CNL	VK466 a	Pendent, Rec. Pendent	155	5.2	20 by 20	21	16.3
USL,CNL	**VK472**	**Pendent, Rec. Pendent**	**155**	**5.8**	**16 by 16**	**16**	**7.6**
USL,CNL	**VK472**	**Pendent, Rec. Pendent**	**155,175**	**5.8**	**18 by 18**	**17**	**8.6**
USL,CNL	**VK472**	**Pendent, Rec. Pendent**	**155**	**5.8**	**20 by 20**	**21**	**13.1**

\# - For installation 4 to 12 in. below the ceiling.

\+ - For installation 4 to 6 in. below the ceiling.

++ - For installation 6 to 12 in. below the ceiling.

* - Utilizes a 135°F coverplate.

a - May be installed in ceilings with beams up to 14 in. deep when installed in accordance with the manufacturer’s Installation Instructions.

This page replaces page 2A

* FOR INSTALLATION **UNDER** SLOPED CEILINGS 2/12 TO 8/12 (IN./IN.) PITCH
* TESTED PER SUBJECT **1626A, ISSUE NO. 1**

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Maximum Sprinkler Spacing, ft	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL	VK466	Pendent, Rec. Pendent	155	5.2	20 by 20	20	14.8
USL	VK466	Pendent, Rec. Pendent	175	5.2	20 by 20	23	19.6
USL	VK466*	Concealed Pendent	155,175	5.2	20 by 20	23	19.6
USL	**VK468***	**Concealed Pendent**	**175**	**4.9**	**18 by 18**	**32**	**42.6**
USL	VK468	Pendent, Rec. Pendent	155	4.9	20 by 20	21	18.4
USL	VK468	Pendent, Rec. Pendent	175	4.9	20 by 20	23	22.0
USL	VK468*	Concealed Pendent	155	4.9	20 by 20	26	28.2

- Utilizes a 135°F cover plate.

**FOR INSTALLATION UNDER SLOPED CEILINGS 2/12 TO 8/12 (IN./IN.) PITCH –
TESTED PER SUBJECT 1626A, ISSUE NO. 1
SPRAY DIRECTED DOWN THE SLOPE**

	SIN	**Style**	**Temperature Rating, °F**	**Nominal K-Factor**	**Deflector to Ceiling, in.**	**Maximum Sprinkler Spacing, ft**	**Minimum Flow, gpm/Sprinkler**	**Flowing Pressure, psig**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**4-6**	**16 by 16**	**18**	**18.4**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**4-6**	**16 by 18**	**18**	**18.4**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**4-6**	**16 by 20**	**22**	**27.4**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**6-12**	**16 by 16**	**20**	**22.7**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**6-12**	**16 by 18**	**20**	**22.7**
USL	**VK450**	**HSW, Rec. HSW**	**155,175**	**4.2**	**6-12**	**16 by 20**	**25**	**35.4**

FOR SLOPED CEILINGS 2/12 TO 4/12 (IN./IN.) PITCH - ACROSS THE SLOPE

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Deflector to Ceiling, in.	Maximum Sprinkler Spacing, ft	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL	VK450	HSW, Rec. HSW	155,175	4.2	4-6	16 by 18	18	18.4
USL	VK450	HSW, Rec. HSW	155,175	4.2	6-12	16 by 18	20	22.7

FOR SLOPED CEILINGS 2/12 TO 8/12 (IN./IN.) PITCH - ACROSS THE SLOPE

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Deflector to Ceiling, in.	Maximum Sprinkler Spacing, ft	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL	VK450**	HSW, Rec. HSW	155,175	4.2	4-6	16 by 16	18	18.4

** – With the sprinkler located along the slope and positioned to discharge across the slope, design for three sprinklers flowing when more than two sprinklers are present in a compartment.

*

FOR SLOPED CEILINGS 2/12 TO 8/12 (IN./IN.) PITCH DOWN THE SLOPE

	SIN	Style	Temperature Rating, °F	Nominal K-Factor	Deflector to Ceiling, in.	Maximum Sprinkler Spacing, ft	Minimum Flow, gpm/Sprinkler	Flowing Pressure, psig
USL	VK450	HSW, Rec. HSW	175/155	4.2	4-6	12 by 12	12	8.2
USL	VK450	HSW, Rec. HSW	175/155	4.2	4-6	14 by 14	14	11.1
USL	VK450	HSW, Rec. HSW	175/155	4.2	4-6	16 by 18	18	18.4
USL	VK450	HSW, Rec. HSW	175/155	4.2	4-6	16 by 20	22	27.4
USL	VK450	HSW, Rec. HSW	175/155	4.2	6-12	16 by 18	20	22.7
USL	VK450	HSW, Rec. HSW	175/155	4.2	6-12	16 by 20	25	35.4

CNL- Indicates Listing to Canadian National Standard ULC/ORD C1626-03.

GENERAL:

The devices are automatic residential sprinklers of the glass bulb element type consisting of a brass frame, deflector, pip cap, compression screw, cap/spring washer gasket assembly and a 3mm heat responsive element. The VK450 has an offset reducing bushing. The VK468 concealed pendent sprinkler utilizes a coverplate assembly.

CONSTRUCTION DETAILS:

The devices have been examined and found to comply with the Standard for Residential Sprinklers in effect as of the date of this Report.

USE:

The residential sprinklers are for use in their intended operating position only in accordance with the National Fire Protection Association Standards For Installation Of Sprinkler Systems, NFPA 13D, NFPA 13R, and NFPA 13; and the manufacturer's installation instructions. (See Fig. 1).

RATING:

The sprinklers are produced in the following temperature ratings:

Rating, °F	(Glass Bulb) Color Identification
155	Red
175	Yellow

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TEST RECORD INDEX

Description	Test Record No.
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SIN VK450 Recess HSW Sprinkler in 4/12 in. in and 8/12 in./in. pitch slope ceilings	3
SIN VK435, 3.1 K Pendent and Recessed Pendent Sprinklers	4
SIN VK468, 4.9 K Pendent, Recessed Pendent, and Concealed Pendent Sprinklers	5
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SIN’s VK435, VK460, VK466, and VK468 Residential Sprinklers Utilizing A Modified Stamped Pipcap and Protective Cover	8
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CONCLUSION

Samples of the product covered by this Report have been found to comply with the requirements and the products are judged to be eligible for Listing and Follow-Up Service. The manufacturer is authorized to use the UL Mark on such products which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the UL Mark are considered as Listed by Underwriters Laboratories Inc.

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