



**Underwriters
Laboratories Inc.®**

Northbrook Division
333 Pfingsten Road
Northbrook, IL 60062-2096 USA
www.ul.com
tel: 1 847 272 8800

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REPORT

on

SPRINKLERS, AUTOMATIC AND OPEN

Viking Corporation
Hastings, MI

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The following tests were conducted on the Listed Model M, 1/2 and 17/32 in. orifice and Model M-5, 1/2 in. orifice horizontal sidewall sprinklers for compliance of the new and revised Operation-Cold Soldering test:

1. Examination of Samples
2. Operation-Cold Soldering

The tests and results are contained in Test Record No. 23.

The following tests were conducted on the VK614, 5.6 K-Factor and VK616, 8.0 K-Factor Concealed Pendent Extended Coverage sprinklers. These sprinklers are identical to the currently Listed VK600 and VK602 Extended Coverage Pendent and Recessed Pendent sprinklers except for the addition of the concealed cup assembly. The results for the following tests are recorded in Test Record No. 24.

1. Examination of Samples
2. Operation - Lodgment
3. Response for EC Sprinklers
4. Operation Cold - Soldering
5. Wall Wetting for EC Sprinklers
6. Fire Test for EC Sprinklers

EXTENDED COVERAGE LIGHT HAZARD SPRINKLERS

<u>Model</u>	<u>Maximum Width, ft</u>	<u>Maximum Length, ft</u>	<u>Minimum Flow, gpm</u>	<u>Orifice Size, in.</u>	<u>Temperature Rating, °F</u>
<u>Horizontal Sidewall</u>					
M (3.0 mm)	16	22	36	17/32	135
M (3.0 mm)	16	20	32	1/2, 17/32	135, 155, 175
M (3.0 mm)	16	18	29	1/2, 17/32	135, 155, 175
M (3.0 mm)	14	16	23	17/32	135, 155
<u>Pendent</u>					
M (3.0 mm)	20	20	40	1/2, 17/32	135
M (3.0 mm)	18	18	33	1/2, 17/32	135, 155, 175
M (3.0 mm)	16	16	26	1/2, 17/32	135, 155, 175
<u>Recessed Horizontal Sidewall</u>					
M (3.0 mm) +	16	18	29	1/2, 17/32	135, 155, 175
M (3.0 mm) +	16	20	33	1/2	135
M (3.0 mm) +	16	20	32	17/32	135
M (3.0 mm) #	16	20	32	1/2, 17/32	155, 175
<u>Recessed Pendent</u>					
M (2.8 mm) +	16	16	26	1/2, 17/32	135, 155, 175
M (2.8 mm) +	18	18	33	1/2, 17/32	135, 155, 175
<u>Concealed Pendent</u>					
VK614*	16	16	26	5.6 K	135, 155
VK614*	18	18	33	5.6 K	135, 155
VK614*	20	20	40	5.6 K	135, 155
VK616*	16	16	26	8.0 K	135, 155
VK616*	18	18	33	8.0 K	135, 155
VK616*	20	20	40	8.0 K	135, 155
VK618*	16	16	30	14.0 K	135, 155
VK618*	18	18	33	14.0 K	135, 155
VK618*	20	20	40	14.0 K	135, 155

+ - Utilizes either the E-1 or F-1 escutcheon

#- Utilizes F-1 escutcheon only

* - Utilizes 135°F coverplate

TEST RECORD NO. 26

SAMPLES:

The manufacturer submitted representative production samples of automatic sprinklers, SIN's VK614, 5.6 K and VK616, 8.0 K concealed pendent extended coverage light hazard.

The following tests were conducted in accordance with the Tenth Edition of the Standard for Automatic Sprinklers for Fire protection Service, UL199; and the Canadian Standard for Automatic Sprinklers, C199.

GENERAL:

The test methods and results of the following tests have been reviewed and found to be in accordance with the requirements in the Standards noted above. Test results are valid only for the tested sprinklers.

Based on similarities between the SIN's VK614, 5.6 K and VK616, 8.0 K concealed pendent sprinklers submitted under this investigation and the presently Listed SIN's VK600 and VK602 pendent and recessed pendent sprinklers, only the tests described below were judged necessary.

The following tests were conducted on a representative samples of SIN's VK614, 5.6 K and VK616, 8.0 K concealed pendent sprinklers.

TEST	UL199, Sections/Paragraphs
Sensitivity - room heat test for standard response extended coverage sprinklers	19.4
Sensitivity - room heat test for QR and QR extended coverage sprinklers	19.5
Operation - Lodgment Test	20
Flow Endurance Test	21
Operation - Cold Soldering Test	22
Fire Test for Extended Coverage Sprinklers Intended for Light Hazard Occupancies ceiling, pendent, or upright types	44, 44.1, 44.3, 44.4
Wall Wetting Test for Extended Coverage Sprinklers Intended for Light Hazard Occupancies	45
Marking Review	54
Installation Instruction Review	55

Test Record Summary:

The results of this investigation indicate that the product(s) evaluated comply with applicable requirements, and therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Test Record by:
STEVE WISNIEWSKI
Staff Engineering Associate

Reviewed by:
MICHAEL MCCORMICK
Engineering Group Leader

File Ex643
Project 78NK8884
Project 91NK1369
Project 91NK8921
Project 91NK6712
Project 91NK20429
Project 97NK23564
Project 97NK23619
Project 97NK32051
Project 98NK5103
Project 98NK17623
Project 98NK11873
Project 99NK21033
Project 99NK25817
Project 99NK36385
Project 99NK40795
Project 00NK24313
Project 00NK39796
Project 00NK36004
Project 00NK26085
Project 01NK6252
Project 01NK33
Project 01NK09243
Project 01NK46248
Project 01NK14642
Project 03NK09286
Project 02NK14247
Project 03NK08543
Project 04NK15031
Project 07NK06815
Project 07NK13042
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REPORT
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Hastings, MI

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GENERAL

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PRODUCT COVERED:

Automatic sprinklers incorporating frangible 3, 5, and 3mm XS glass bulbs manufactured by Job GmbH and Norbulb, of the following models, types and temperature ratings.

Sprinklers rated 360°F utilize the 5 mm glass bulb only.

	<u>SIN #</u>	<u>DESCRIPTION</u>
USL, CNL,	VK001, VK002, VK003, VK004, VK100, VK102, VK118, VK120, VK200, VK202, VK550, VK560	2.8, 4.2, 5.6, and 8.0 K. Standard Response Upright, Pendent, Conventional, Concealed and Intermediate
USL, CNL,	VK300, VK302, VK310, VK325, VK327, VK329, VK331, VK350, VK352, VK354, VK556, VK566	2.8, 4.2, 5.6 and 8.0 K. Quick Response Upright, Pendent, Conventional, Concealed and Intermediate
USL, CNL	VK104	5.6 K. Standard Response Horizontal Side Wall
USL, CNL	VK304, VK305, VK333	2.8 and 5.6 K. Quick Response Horizontal Sidewall
USL, CNL	VK600, VK602, VK604, VK605, VK606, VK610, VK612, VK614, VK616	5.6 and 8.0 K. Quick Response and Standard Response Extended Coverage
USL, CNL	VK015, VK021, VK023, VK116, VK122, VK124, VK315, VK317, VK319, VK340, VK342, VK344, VK558	2.8 and 5.6 K. High Pressure Quick Response and Standard Response
USL, CNL	VK130, VK132	5.6 K. Stainless Steel
USL, CNL	VK550, VK556, VK560, VK566	5.6 and 8.0 K. Upright Intermediate Level Standard and Quick Response
USL, CNL	VK338, VK339	5.6 K. Stainless Steel Quick Response

(Table Cont'd)

*

		<u>SIN #</u>	<u>DESCRIPTION</u>
USL, CNL		VK910	5.6 K SR Pendent
<u>SIN #</u>	<u>DESCRIPTION</u>	<u>REMARKS</u>	
All Models	Chrome plated, Bright Brass and Nickel plated quick response.	Ratings - 135, 155, 175, 200 and 286°F, installation indicated by deflector.	
All Models	Wax coated. Standard Response Only.	Ratings - 135, 155, 175, 200 and 286°F+.	
All Models	Lead coated.	Ratings - 135, 155, 175, 200 and 286°F. Installation, pendent and upright.	
All Models	IVC Poly 99 Polyester coated.	Ratings - 135, 155, 175, 200 and 286°F. Installation indicated by deflector.	
All Models	IVC Poly 99 Polyester coated. Quick Response.	Ratings - 135, 155, 175, 200 and 286°F. Installation, upright and pendent only.	
All Models	Teflon coated.	Ratings - 135, 155, 175, 200 and 286°F. Installation as indicated by deflector.	
All Models	Teflon coated quick response.	Ratings - 135, 155, 175, 200 and 286°F. Installation, upright and pendent only.	
All Models	IVC Poly 99 Polyester coated quick response corrosion resistant in all colors.	Ratings - 135, 155, 175, 200 and 286°F. Installation as indicated by deflector.	
VK910		Ratings-135,155,175,200,286, 360°F	
+ - Uses 200°F wax for installation where ambient temperature does not exceed 150°F.			

OBJECT:

The object of this investigation was to determine compliance of the sprinklers with Underwriters Laboratories Inc., Standard for Automatic Sprinklers for Fire Protection Service, UL 199-1981.

*

GENERAL:

The Viking Model M bulb type sprinklers consist of a brass frame, copper pip-cap, teflon covered belville spring, and a heat responsive element. The heat responsive element consists of a glass bulb filled with a temperature sensitive liquid. Sprinkler frames are color coded in accordance with the requirements of UL 199 and NFPA 13. In addition the bulb color code reported under "Ratings" applies.

The Model M intermediate level glass bulb sprinkler may utilize the Model B-1 sprinkler guard (upright) and the Model C-1 sprinkler guard (pendent).

The Model A-1 concealed sprinkler utilizes a mounting base and cover plate constructed of UNS-G10080 steel. The cover plate is equipped with a "memory metal" clip constructed of ternary CuZnAl alloy that fastens to the deflector. Upon operation the memory metal expands enabling the cover plate to drop away from the sprinkler (See Figs. 1 and 2). Also, the cover plate may be factory painted using an alkyde paint manufactured by Automotive Finishes Inc. to a thickness not exceeding 0.008 in. thick.

RATINGS:

Rating Deg F	Color Identification	
	Frame	Bulb
135	Uncolored	Orange
155	Uncolored	Red
175	White	Yellow
200	White	Green
286	Blue	Blue
360	Red	Mauve
500	Orange	Black

USE:

These sprinklers are intended for use with automatic sprinkler equipment as covered by the Standard of the National Fire Protection Association for the Installation of Sprinkler System, NFPA 13.

MARKING:

The manufacturer's name, Viking, and issue designation are cast on the sprinkler frame. The year of manufacture is cast in the sprinkler frame and the temperature rating is stamped on the sprinkler deflector. The Listing Mark is stamped on the deflector. The words "Do Not Paint" shall be stamped on the cover plate for concealed sprinklers.

FOR ENGINEERING CONSIDERATIONS ONLY:

Table 1

<u>SIN</u>	<u>OLD MODEL</u>	<u>STYLE</u>	<u>K-FACTOR</u>	<u>RESPONSE TYPE</u>
VK100	M	Upright	5.6	SR
VK200	M	Upright	8.0	SR
VK001	M	Upright	2.8	SR
VK002	M	Upright	4.2	SR
VK102	M	Pendent	5.6	SR
VK202	M	Pendent	8.0	SR
VK003	M	Pendent	2.8	SR
VK004	M	Pendent	4.2	SR
VK104	M	HSW	5.6	OR
VK116	M-5	HSW	5.6	SR
VK015	M	HSW	2.8	SR
VK104	M	HSW	5.6	SR
VK106	M	VSW	5.6	SR
VK118	M	Conventional	5.6	SR
VK120	M	Conventional	8.0	SR
VK124	M High Pressure	Pendent	5.6	SR
VK021	M High Pressure	Upright	2.8	SR
VK122	M High Pressure	Pendent	5.6	SR
VK023	M High Pressure	Pendent	2.8	SR
VK536	M	Pendent	11.5	SR
VK300	M	Upright	5.6	QR
VK325	M	Upright	2.8	QR
VK327	M	Upright	4.2	QR
VK350	M	Upright	8.0	QR
VK302	M	Pendent	5.6	QR
VK329	M	Pendent	2.8	QR
VK331	M	Pendent	4.2	QR
VK352	M	Pendent	8.0	QR
VK333	M	HSW	2.8	QR
VK304	M	HSW	5.6	QR
VK442	M-5	HSW	5.6	QR
VK306	M	VSW	5.6	QR
VK310	M	Conventional	5.6	QR
VK354	M	Conventional	8.0	QR
VK130	N-2	Upright	5.6	SR
VK132	N-2	Pendent	5.6	SR

TEST RECORD INDEX	
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<u>Description</u>	<u>Test Record</u>
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C O N C L U S I O N

Samples of the products covered by this Report have been found to comply with requirements covering the class and the products are judged to be eligible for Listing and Follow-Up Service. The manufacturer is authorized to use the Laboratories' 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 Laboratories' Mark are considered as Listed by Underwriters Laboratories Inc.

Report by:

Reviewed by:

EDWARD J. KAMINSKI
Project Engineer
Fire Protection Department

GEORGE E. LAVERICK
Engineering Team Leader
Fire Protection Department