

**ROUGH USAGE TEST  
(SECTION 2-7)**

**TEST N**

TEST ORDER	SECTION NO.	TESTING DESCRIPTION	WHO	DATE	RESULTS	SIGN OFF
	<b>2-7</b>	<b>Rough Usage</b>				
	2-7.1	Spray nozzles shall be capable of continued operation after being subjected to the rough handling tests in Section 4-7.	TIM	8/18/99	Pass.	TIM
	<b>4-7</b>	<b>Rough Usage Test</b>				
	<b>4-7.1</b>	The nozzle shall be attached to a length of hose at least 10 ft (3 m) long. The hose shall not be charged. The nozzle shall be dropped from a height of 6 ft (2 m) onto a concrete surface so that it impacts directly or squarely on the discharge end.	TIM	8/18/99	Complete.	TIM
	<b>4-7.2</b>	The nozzle shall be attached to a length of hose at least 10 ft (3 m) long. The hose shall not be charged. The nozzle shall then be dropped twice from a height of 6 ft (2m) onto a concrete surface such that the points of impact are on two different sides of the nozzle. For nozzles equipped with a shutoff handle or lever, one of the points of impact shall be directly on that handle or lever while in the closed position.	TIM	8/18/99	Complete.	TIM
	<b>4-7.3</b>	The nozzle shall be attached to a length of hose at least 10 ft (3 m) long. With the nozzle shut off, the hose line shall be charged with water to a pressure of 100 psi (690 kPa), The nozzle shall be dropped twice from a height of 6 ft (2 m) onto a concrete surface such that the points of impact are on two different sides of the nozzle. For nozzles equipped with a shutoff handle or lever, one of the points of impact shall be directly on that handle or lever while in the closed position.	TIM	8/18/99	Complete.	TIM

NOZZLE SAMPLE INFORMATION:  
MODEL :HM-VPGI  
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	2-7.2	The nozzle shall not deform or break beyond the point where it affects the operational use of the nozzle as defined in the requirements of this standard.	TIM	8/18/99	Pass.	TIM
	2-7.3	All functions such as pattern selection, flush, discharge adjustment, and shutoff shall operate properly as described in Section 2-3. The operating force shall not increase more than 10 percent from that determined before the test.	TIM	8/18/99	Complete.	TIM
	2-3	<b>Spray Nozzle Controls</b>				
	2-3.1	A spray nozzle designed to be used by fire department personnel shall have a water discharge control capable of functions ranging from full discharge to complete shutoff of the nozzle discharge. This control device shall be permitted to be a permanently mounted valve or a break-apart shutoff butt assembly.	TIM	8/18/99	Pass.	TIM
	2-3.2	Nozzles equipped with a lever-operated shutoff handle shall be in the closed position when the handle is closest to the discharge end of the nozzle. Those equipped with a linear acting pattern control lever or handle shall be in the straight stream position when the handle is closest to the discharge end of the nozzle.	TIM	8/18/99	Pass.	TIM
	2-3.3	Rotational controls shall traverse from a wide angle spray pattern to narrow spray, to straight stream, and to shutoff position on nozzles so equipped, in a clockwise manner when viewed from the rear of the nozzle.	TIM	8/18/99	Pass.	TIM

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	2-3.4	Trigger-type lever controls shall be in the "on" position when squeezed and the "off" position when released.	TIM	8/18/99	N/A No trigger.	TIM
	2-3.5	Lever-type controls shall require a force of no more than 16 lbf (71.2 N). of force and no less than 3 lbf (13.3 N) to open or close the shutoff or to adjust the stream pattern when tested in accordance with 4-3.1.	TIM	8/18/99	Pass.	TIM
	<b>4.3.1</b>	<b>Lever-Type Controls.</b>				
	4.3.1.1	The nozzle shall be mounted in the closed position with an inlet pressure of 100 psi (690 kPa). A dynamometer, which records the maximum force reading, shall be attached to the lever or handle where it normally would be held during operation. The shutoff or pattern selection lever or handle shall be moved from the fully closed to fully open position for the full range of pattern adjustment. The maximum force shall be recorded. The inlet pressure shall be adjusted to 100 psi (690 kPa) while in the full discharge position. The dynamometer shall be used when moving the lever through the full range of positions and maximum force again measured and recorded. The maximum force required in both directions shall be recorded.	TIM	8/18/99	OFF – ON 8 lbf  ON – OFF 8 lbf	TIM
	4-3.1.2	The nozzle shall be mounted without any pressure applied to it. The controlling lever shall be placed in the closed or full forward position. The lever shall be moved from the full forward position. The force required to move the lever shall be measured with the dynamometer. The force required to move the lever shall be recorded.	TIM	8/18/99	8 lbf	TIM

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	2-3.6	For rotational-type controls, the operational force required to change the pattern setting and discharge, as well as to just close (sans discharge), fully close, just open (leak), and fully open the valve, shall not exceed 40 lbf (178 N) and shall not be less than 3 lbf (13.3 N) when tested in accordance with 4-3.2 and 4-3.4.	TIM	8/18/99	Pass.	TIM
	<b>4-3.2</b>	<b>Rotational Pattern Control.</b>				
	4-3.2.1	Nozzles equipped with rotational pattern control shall be mounted on a rigid device, and the force required to rotate the pattern sleeve shall be measured while water is discharging at 100 psi (690 kPa).	TIM	8/18/99	Complete.	TIM
	4-3.2.2	A length of twine or string, not to exceed 3/32 in. (2.9 mm) in diameter, shall be wrapped around the nozzle at the point where the nozzle normally would be held while rotating the pattern sleeve. The string shall be of sufficient length to wrap around the nozzle at least six times. The first two turns shall overlap the starting end of the string, and the balance of the turns shall not overlap any other turn. A force gauge, which records the maximum force reading, shall be attached to a loop in the free end of the string. The pattern sleeve shall be rotated by pulling the force gauge perpendicular to the center axis of the nozzle. As the pattern sleeve rotates, the string will unwind so that the force always remains tangential to the pattern sleeve. The pattern sleeve shall be rotated from the straight stream position to the wide spray position or vice versa. If the nozzle is equipped with detents for the pattern settings, this test shall commence with the pattern sleeve in the straight stream or wide spray detent.	TIM	8/18/99	Straight Stream – Full Fog 4 lbf  Full Fog – Straight Stream 5 lbf	TIM

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	4-3.4	<b>Twist Shutoff.</b> A nozzle with a twist shutoff shall be mounted on a device equipped with a relief valve, or other means, to maintain 100 psi (690 kPa) in both the closed position and the fully open position while flowing the rated discharge. The test shall start with the nozzle in the closed position. The force gauge shall be used to twist the shutoff to the fully open position, following the method outlined in 4-3.2.2. The windings on the pattern sleeve shall be reversed and the force gauge used in the same manner as above to rotate the shutoff from the fully open to the fully closed position. In the fully closed position, any leakage shall be measured.	TIM	8/18/99	N/A Lever Shutoff.	TIM
	2-3.8	Nozzles equipped with a full-time swivel, which allows the nozzle to rotate once the swivel is tightened onto a coupling, shall require a minimum force of 10 lbf (44.5 N) to rotate the nozzle when tested in accordance with 4-3.3.	TIM	8/18/99	Complete. Pass.	TIM
	<b>4-3.3</b>	<b>Full-Time Swivel.</b>				
	4-3.3.1	Nozzles equipped with a full-time swivel shall be tested while water is discharging at 100 psi (690 kPa).	TIM	8/18/99	Complete.	TIM
	4-3.3.2	The nozzle shall have a hook or other device added so that a dynamometer, which records the maximum force reading, can be attached and force applied tangentially.	TIM	8/18/99	Complete.	TIM
	4-3.3.3	The pattern sleeve of the nozzle shall be rotated to the end of its travel in the wide spray direction. The force shall be applied tangentially with a dynamometer to determine the force required to rotate the nozzle. This force shall be recorded.	TIM	8/18/99	13 lbf	TIM

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	2-3.8.1	The nozzle is equipped with rotational pattern controls as well as a full-time swivel, the force required to rotate the full-time swivel shall be at least 1 lbf (4.5 N) greater than the force required to rotate the pattern control, as outlined in 2-3.6.	TIM	8/18/99	4 lbf – 13 lbf = 9 lbf 5 lbf – 13 lbf = 8 lbf Pass.	TIM
	2-3.6	For rotational-type controls, the operational force required to change the pattern setting and discharge, as well as to just close (sans discharge), fully close, just open (leak), and fully open the valve, shall not exceed 40 lbf (178 N) and shall not be less than 3 lbf (13.3 N) when tested in accordance with 4-3.2 and 4-3.4.	TIM	8/18/99	Pass.	TIM

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