

**4717.2850 SAND FILTERS.**

Subpart 1. **Applicability.** The requirements in this part apply to vacuum and pressure sand filters.

A. Pressure sand filters must filter at a maximum rate of three gallons per minute per square foot of bed area at the time of maximum head loss with enough area to meet the rate of flow specified in part 4717.2560.

B. The filtration rate for high-rate sand filters and vacuum sand filters must not exceed 20 gallons per minute per square foot of bed area.

Subp. 2. **Filter material.** Filter material must be screened, sharp filter sand sized between 0.4 and 0.55 millimeters with a uniformity coefficient not exceeding 1.75. Anthracite sized between 0.6 and 0.8 millimeters with a uniformity coefficient not exceeding 1.8, may be used instead of sand.

A. The filter material must be at least 20 inches deep for standard pressure sand filters and at least 12 inches deep for high-rate sand filters.

B. The filter material must be supported by at least ten inches of graded filter gravel. The gravel must distribute water uniformly during filtration and backwashing.

C. A reduction in depth or an elimination of gravel is permitted when equivalent performance and service is demonstrated through compliance with NSF International Standard 50.

Subp. 3. **Underdrain system.** The underdrain system must be corrosion-resistant, enduring, and provide even collection and distribution of the flow during filtration and backwashing. Orifices and other openings must maintain constant area.

Subp. 4. **Freeboard.** Freeboard provided between the upper surface of the filter media and the lowest portion of the pipes or drains which serve as overflows during backwashing must be designed to prevent loss of filter material.

Subp. 5. **Filter system.** The filter system must have influent and effluent pressure gauges or a filter-mounted pressure gauge, backwash sight glass on the waste discharge line, and an air-relief valve at or near the high point of the filter. The filter system must have valves and piping that permit:

- A. filtering to the pool;
- B. individual backwashing of filters to waste at a rate of not less than 15 gallons per minute per square foot of filter area;
- C. isolation of individual filters for repair while other units are in service;
- D. complete drainage of all parts of the system; and

E. maintenance, operation, and inspection.

Subp. 6. **Filter access.** Each pressure filter tank must have an access opening to permit maintenance.

Subp. 7. **Coagulant feed.** Devices with dosage control features must be provided if coagulants are added ahead of filters.

Subp. 8. **Tank.** On pressure filters, the tank and integral parts must have a pressure safety factor of four based on the maximum shutoff head of the pump. For design purposes, the shutoff head must in no case be considered less than 50 pounds per square inch.

**Statutory Authority:** *MS s 144.05; 144.12; 144.123; 145A.02; 157.01*

**History:** *19 SR 1419; 19 SR 1637*

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