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Eljen GSF Approved Sizing for Pitkin County, Colorado

Eljen GSF has been granted approval for GSF A42 Modules in Pitkin County, Colorado by the Pitkin County Environmental Health and Natural Resources (EH/NR) Department.

TABLE 1: A42 Modules based on percolation rate.

PERC RATE (mpi)	Number of Modules per Bedroom
1-5*	7
6-10	7
11-20	8
21-30	8
31-40	9
41-60	10
>60**	12

TABLE 2: A42 Modules based on soil texture and LTAR.

Soil Texture (mpi)	Max LTAR. Gpd/sf.	Number of Modules per Bedroom
Coarse to Medium Sand*	1.3	7
Fine Sand to Loamy Sand	1.2	8
Sandy Loam to Loam	0.72	9
Loam	0.50	12
Loam to Silty Loam	0.40	13
Clay Loam to Clay**	0.30	14
Silty Clay Loam/Silty Clay**	0.20	15

NOTES for TABLES 1 & 2:
*For coarse to medium sand native soil, dosing is recommended.
**Clay must not be expansive.

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Approval with specific criteria:

- All GSF system designers and installers shall be trained by Eljen or their authorized representative.
- All systems shall use 6 inches of ASTM C-33 sand with less than 5% passing #200 sieve below the modules. A sieve analysis of the sand utilized in the installation must be provided to the Pitkin County EH/NR Department prior to final approval.
- All home owners shall be given an operation and maintenance manual and shall follow these requirements.
- GSF modules will be considered "secondary treatment" and may use a P_{LF} of 1.0. Criteria for classification as secondary treatment confirmed by third party testing from the Massachusetts Alternative Septic System Test Center (MASSTC).

Eljen GSF A42 Module Dimensions:
4 feet long x 2 feet wide x 7 inches tall

Eljen GSF Absorption Area Sizing Example:
Based on percolation rate from Table 1: $A = P_{LF} \times Q_D \times (\sqrt{t}) / 5$
or
Based on soil texture and LTAR from Table 2: $A = Q_D / (LTAR)$

Where:
A = Absorption area in square feet
LTAR = Maximum Loading Rate from Table 2
Q_D = Design Flow
P_{LF} = 1.0 for Secondary Treatment
t = percolation rate in minutes per inch

Example 1 (TABLE 1): 4 bedroom home (< 6000 sq ft)
Perc rate = 30 mpi (Table 1)
System design specifies dosing
P_{LF} = 1.0

4 bedrooms x 8 modules/bedroom = **32 modules**
Design Flow (Q_D) = 1.5 x 75 gal/person x 4 bedrooms x 2 people per bedroom = 900 gpd
A = 1.0 x 900 x (√ 30) / 5 = 986 sq ft
A = 986 – 20% for dosing = 789 sq ft
GSF Layout = 4 rows of 8 modules = 32 A42 Modules
Length = 4 ft/ module x 8 modules + 1 foot (6" sand at ends) = 33 feet
Width = Area/Length = 789 / 33 feet = 24 feet
Row Center Spacing = Width / Number of Rows = 24 / 4 = 6 feet on center (pipe center spacing between rows with perforated pipe centered above the module)
Bed size = 33 feet long x 24 feet wide

Example 2 (TABLE 2): 3 bedroom home (< 6000 sq ft)
Coarse to Medium Sand and LTAR 1.3 (Table 2)
Dosing required
P_{LF} = 1.0

3 bedrooms x 7 modules/bedroom = **21 modules**
Design Flow (Q_D) = 1.5 x 75 gal/person x 3 bedrooms x 2 people per bedroom = 675 gpd
A = 1.0 x (675 / 1.3 LTAR) = 519 sq ft
A = 519 – 20% for dosing = 415 sq ft
GSF Layout = 3 rows of 7 modules = 21 A42 modules
Length = 4 ft/ module x 7 modules + 1 foot (6" sand at ends) = 29 feet
Width = Area/Length = 415 / 29 feet = 14.3 feet
Row Center Spacing = Width / Number of Rows = 14.3 / 3 = 4.76 feet on center (pipe center spacing between rows with perforated pipe centered above the module)
Bed Size = 29 feet long x 14.3 feet wide