



CODE TOPICS

2017 FBC 6th ED SECTION 454.2 RESIDENTIAL SWIMMING POOLS

ANSI 5, 15 AND 7 --DIFFERENT FLOWS

TOPIC BACKGROUND

Each ANSI standard has its own method of determining the applicable flow and how that flow is applied to criteria in that standard. There is no cross application of flows from one standard to another.

WHAT THE CODE SAYS

1. Applicable codes: FBC 454.2 & R4501, with ANSI 5, 7 and 15 adopted standards. FBC 454.2 and R4501 are identical, and we will reference only 454.2 sections. The FBC has no words for determining what flow is required for a pool. The various standards contain flow criteria that are determined by DIFFERENT methods and that flow is only compared to criteria within that standard for compliance. FBC 454.2.6.3 has reference to pressure and suction velocity and reference to "suction outlet velocity" (not pipe) based on ANSI 7.
2. First, FBC Section 454.2.2.20 and ANSI 5 Section 9.1.3 require at least a 12 hour (HR) turn-over. That defines the minimum circulation/ filtration flow and ANSI 5 says suction and pressure piping to be sized on 8 fps (feet per second) of the ANSI 5 flow. For plan review, there only needs to be pump, filter and piping capable of providing at least the 12 HR turnover. Given the FBC Section 454.2.6.3 pipe velocities of 10 fps pressure and 8 fps suction, the ANSI 5 is actually more restrictive at 8 fps for pressure.
3. Next, ANSI 15 and sections of the FBC energy code require a pump to have a low speed capable of flow less than the 6 hour turnover (listed pumps with stated listed ANSI 15 flows). ANSI 15 also wants the filter properly sized at that ANSI 15 flow. However the builder can set the ANSI 15 flow lower, say an 8 hr turnover, and use smaller filter and piping.
4. For pipe sizing, ANSI 15 Section 5 .5 limits maximum velocity to 8 fps in returns and 6 fps in suction piping. These criteria are the code that typically controls the pipe sizing. This represent the minimum line sizes that meet all parts of the code, since pipe velocity and sizing was removed from ANSI 7. Further, ANSI 15 only applies to the filtration pump, so single speed auxiliary flow pumps can be used with "any" pipe size.
5. Finally, the new ANSI 7-2013 is without required or minimum pipe sizing with the possible exception of a branch pipe size named in the testing and listing of the maximum flow of a specific Suction Outlet Fitting Assembly (SOFA). While the ANSI 7 listings include a velocity through the open area, as referenced in the FBC section above, it is the approved flow that is the useful criterion. ANSI 7 now allows **only** the complete TDH method for establishing the maximum flow for a given (new construction) system that is used to compare to the listed flow of the SOFA. The ANSI 7 maximum possible flow is **ONLY** to be used to determine compliance with ANSI 7, suction entrapment criteria.

SUMMARY

FBC 454.2- No criteria defining minimum or maximum flow. Only reference to ANSI 5, 15 and 7.
ANSI 5 Flow- 12 HR turnover- minimum- not really a factor in pipe sizing.
ANSI 15 Flow- 6 HR turnover- max flow on lower speed of filter pump- defines minimum pipe sizes.
ANSI 7 Flow- TDH calculation - maximum flow to compare to SOFA flow (suction outlet only).