

2011 Revision
Private Water Systems Rules
OAC Chapter 3701-28

Rule 3701-28-09
Materials used in the drilling and
construction of wells

3701-28-09 (A)

Changes in this rule:

- Drilling fluids, additives and lubricants may be used if they meet NSF standard 60, 61 or are **food grade quality**.
- Water used for drilling purposes **shall be from an approved private or public water system**.
- **Drill cuttings must be controlled and shall not be placed into a well or into surface water.**

3701-28-09 (B)(1)

Steel casing

- Requirements for steel casing apply to either Primary or **Secondary** casing.
- In addition to ASTM standards, steel pipe or tubing in compliance with either API specification **5L or 5C** is acceptable.
- Steel casing does not need to be labeled if there is **written documentation from the manufacturer** that it meets the requirements.
- Both sections of steel casing that will be joined by butt welding must be **beveled**.

3701-28-09 (B)(2)

Thermoplastic casing

- Requirements for thermoplastic casing apply to either Primary or **Secondary** casing.
- SDR standard of twenty-one or heavier **does not apply to** thermoplastic pipe used as a **liner**.
- **Screws may be used to join thermoplastic casing but:**
 - they must not penetrate the inner piece of casing
 - must not be larger than #10 size
 - Must be centered where the casing ends overlap
 - Requires pilot holes to be predrilled prior to joining casing and only in outermost casing end.

3701-28-09 (B)(3)

Fiberglass casing

- Larger diameter corrugated fiberglass pipe used as primary or secondary casing
 - must meet NSF standard 61
 - have a minimum thickness of 0.18 inches,
 - have a vertical load bearing capacity of 30,000 pounds and a horizontal load capacity of 60 pounds PSI,
 - have a bell and spicket joint fastened per the manufacturer's instruction and sealed using NSF approved sealant to provide watertight seal

3701-28-09 (B)(3)

Fiberglass casing Cont.

- have a well cap from the same manufacturer and secured per their instructions.
- Caps on buried seal applications to form a water tight seal to the primary casing and any casing extension.
- Casing extensions are to be a minimum of 6 inches in diameter.
- Flow sleeves shall be installed over the bottom of pumps placed in large diameter wells as needed.

3701-28-09 (D)

Couplings used to join casings of dissimilar materials and sizes shall conform to the following criteria:

- Have the same or better strength and rigidity as the well casings being joined.
- Be composed of cast steel and joined by 4 steel bolts spaced uniformly around the circumference of the coupling.
- Use a ramped compression gasket seal between the upper and lower pieces of the coupling so a water tight seal is formed.
- Ensure that a minimum of 2 inches of the top and bottom pieces of casing extends into both the top and bottom pieces of the coupling.

3701-28-09 (D) Continued

- Ensure that a minimum of 2 inches of both the top and bottom pieces of casing extend into the top and bottom pieces of the coupling.
- Ensure that the coupling is centered over the casing joint.
- Other products may be approved by the director.

3701-28-09 (E)

Manufactured drive shoes are to be used on the end of the initial section of driven steel casing.

3701-28-09 (F)(1)

Cement grout used for sealing annular spaces or for abandoning wells.

- They include Types I, II, III, IV and V
- Types II, III, IV and V have specific characteristics that dictate under what conditions they should be used.
- All cement grouts shall meet ASTM Standard C150 and NSF Standard 60.
- Concrete grout may be used for special sealing conditions identified in rule 3701-28-17 OAC

3701-28-09 (F)(2)

- Cement grouts are to be placed in conformance with rule 3701-28-10.
- Cement grouts are to be mixed with potable water at the following rates:
 - Types I,II IV and V at 5.2 gallons per 94 pound bag,
 - Type III at 6.3 to 7.0 gallons per 94 pound bag.

3701-28-09 (F)(2) Cont.

- Concrete shall be mixed at a rate of no more than 6 gallons of water per 94 pound bag of cement and an equal amount of sand.
- Cement which will have calcium chloride added to accelerate curing shall have no more than 2 to 4 pounds of calcium chloride and 6 gallons of water added to each 94 pounds of cement.

3701-28-09 (F)(2) Cont.

- No more than 5% bentonite may be added to cement grout.
- Bentonite being added to cement grout shall not contain any polymer additives.
- Cement grouts shall be placed by pressure grouting methods or by gravity if no water is present in the well or borehole.
- Cement grout shall set a minimum of 24 hours if type I or II or when calcium chloride has been added.
- Type III cement grout shall set a minimum of 12 hours.

3701-28-09 (G)

Bentonite grout used for sealing annular spaces or for abandoning wells.

- Shall meet NSF std. 60 and be;
- High solids, powdered if used for drilling fluids
- Granular for mixing as a slurry for pressure grouting
- Granular for dry pouring or driving in annular space or when abandoning wells or boreholes
- Coarse grade or pelletized for dry pouring in an annular space or when abandoning wells or boreholes

3701-28-09 (G), Cont.

When using bentonite grout:

- As a slurry, mixed according to manufacturers instructions to achieve a minimum 20% solids by weight
- Synthetic organic polymers that meet NSF Std. 60 may be added to suppress hydration of bentonite
- Slurry mixtures to be placed by pressure grouting

3701-28-09 (G), Cont. 2

Bentonite slurry grout shall not be used when:

- The total dissolved solids (TDS) of the water in the annular space to be grouted exceeds 1500 milligrams per liter unless,
 - the dissolved iron levels are less than 15 milligrams per liter (ppm),
 - the chloride levels are less than 500 milligrams per liter (ppm) and
 - the calcium levels are less than 500 milligrams per liter (ppm).

3701-28-09 (G), Cont. 3

Coarse grade or pelletized bentonite shall not be used when:

- The total dissolved solids (TDS) of the water encountered exceeds 1500 milligrams per liter (ppm)

Water used for mixing bentonite shall have any excess minerals that may interfere with hydration removed.

3701-28-09 (H)

Coarse grade and pelletized bentonite used for sealing an annular space or abandoning a well shall:

- Total volume of sealing materials used shall not be less than 80% of the total volume of grout required

3701-28-09 (H), Cont.

Coarse grade or pelletized bentonite being poured shall:

- be screened to allow “fines” to fall out
- be poured at a continuous rate no faster than 3 minutes per bag
- periodically be checked for depth and tamped as necessary to avoid bridging
- be periodically hydrated per the manufacturers instruction if the borehole is dry.

3701-28-09 (I) & (J)

- Clean clay, sand and gravel may only be used for abandoning wells in accordance with rule 3701-28-17 OAC.
- Other materials may be approved by the director for the sealing of annular space or for sealing wells or boreholes.

3701-28-09 (K)

Well screens shall:

- Be factory manufactured.
- Have uniform openings and be of sufficient length to provide a 0.1 feet per second entrance velocity.
- Slot sizes properly sized to facilitate proper well maintenance and development, and minimize entrance of fine materials
- With the exception of fiberglass casing, hand drilled holes, hand cut slots, torch cut or burned slots are not permitted.

3701-28-09 (K), Cont.

- Screens shall be attached to casing by welding, threading, coupling or by K packer.
- Screens shall be fitted with a solid cap at the bottom unless the screen is joined to casing beneath the screen.
- Screens placed by telescoping must have a sealed bottom.

3701-28-09 (L)

Filter packs and formation stabilizers

installed in an annular space shall be:

- 95% siliceous (quartz, sand, flint, agate, and many other minerals) in composition
- disinfected using liquid sodium hypochlorite prior to placing
- stored to prevent contamination prior to placement