



Gas Migration Control Engineering Suite

Risk evaluation and tailored solutions

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The Schlumberger Gas Migration Control Engineering Suite is the effective and reliable answer for cementing wells with potential gas migration problems. The process incorporates two major steps.

- Evaluating gas migration risks, using the innovative GasMigrationAdvisor* software
- Recommending tailored solutions based on gas migration risk severity and bottomhole circulating temperature

The Gas Migration Control Engineering Suite includes the GasMigrationAdvisor software application, a complete portfolio of gas migration additives, and

the implementation of good cementing practices, starting with proper mud removal engineered with WELLCLEAN II* software.

GasMigrationAdvisor

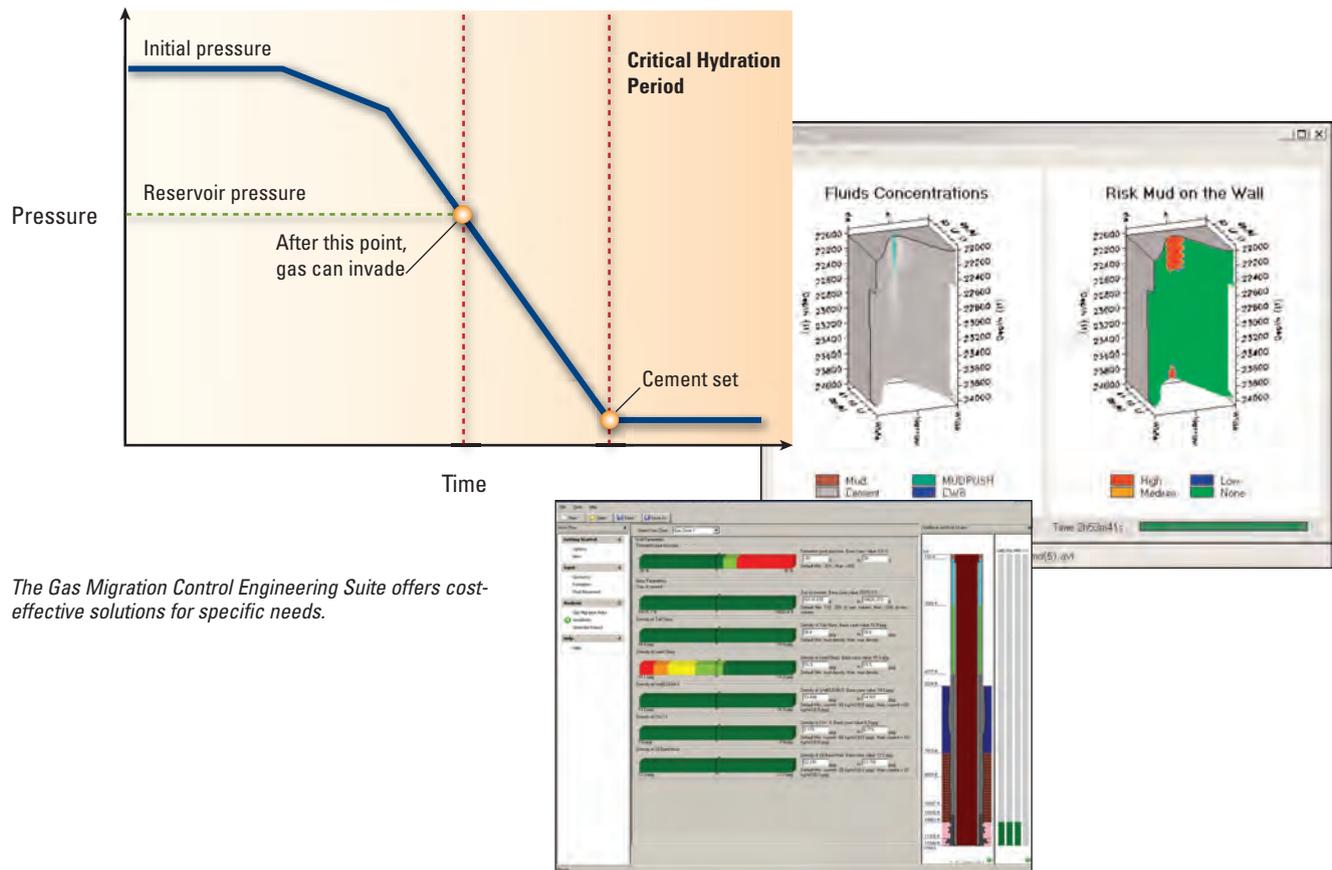
GasMigrationAdvisor software is designed to evaluate gas migration severity based on well geometry, fluid placement, and reservoir properties. It computes a composite risk based on three parameters.

- The pressure decay limit (PDL), which is associated with the loss of hydrostatic pressure until reaching equivalent reservoir pore pressure during cement setting

- The mud removal risk, which is associated with the degree of cement coverage and the possibility of leaving mud on the walls of the wellbore above as well as below the gas zone(s)

- The formation productivity risk, which is associated with the ability of the formation to deliver a critical volume of gas during setting time

Assessing mud removal is a critical element in controlling gas migration issues. Mud left either on the formation wall or as a channel will serve after cement setting as a path for gas migration. Poor mud removal cannot be cured with cement gas migration additives.



The Gas Migration Control Engineering Suite offers cost-effective solutions for specific needs.

Using all available well data, GasMigrationAdvisor software computes a composite gas migration risk severity for each gas zone and for the entire well. It also provides recommendations on how to lower the risk of gas migration.

GasMigrationAdvisor software further performs a sensitivity analysis of the risk of gas migration to possible variations from the design case (e.g., changes in mud property, openhole caliper, etc.). Such sensitivity analysis allows optimizing a solution that will be robust both to poorly known parameters and to changes that can occur between the time the job is designed and the time it is performed.

The GasMigrationAdvisor software recommends solutions adapted to each risk level and temperature range.

Solutions portfolio

Different bottomhole temperatures and gas migration risk levels require different solutions. The GasMigrationAdvisor software recommends solutions adapted to each risk level and temperature range. The SlurryDesigner* computer-aided blended design computes the minimum concentration of the gas migration solution based on solid volume fraction and bottomhole circulating temperature. These solutions have been fully tested, qualified as gas-tight systems in the laboratory for the operating severity and temperature envelope. They have also been field-tested in different parts of the world. These preliminary tests mean the



Schlumberger offers the software, tools, and best practices you need.

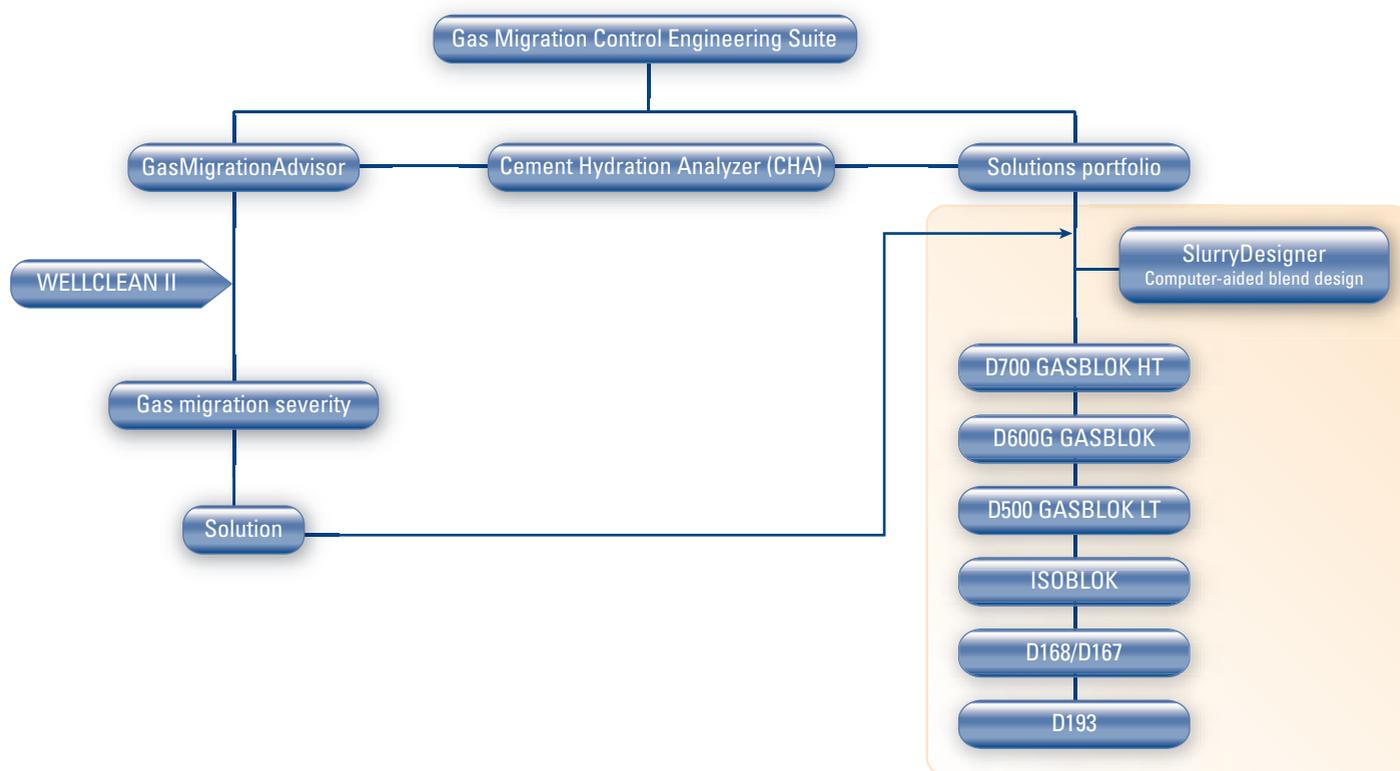
slurry need not be checked for gas-tightness in a particular application. The portfolio comprises the GASBLOK* gas migration control cement additives family (D500, D600G, D700), the ISOBLOK* isolation additives group, and the latest generation of fluid loss additives (D168/D167 and D193).

These solutions are compatible with CemCRETE* cement technology, FlexSTONE* flexible cement technology, and AccuSET* smart cement hydration control technology, as well as standard Schlumberger cement additives. No slurry property is compromised by the use of these tailored solutions.

experience and innovation >>

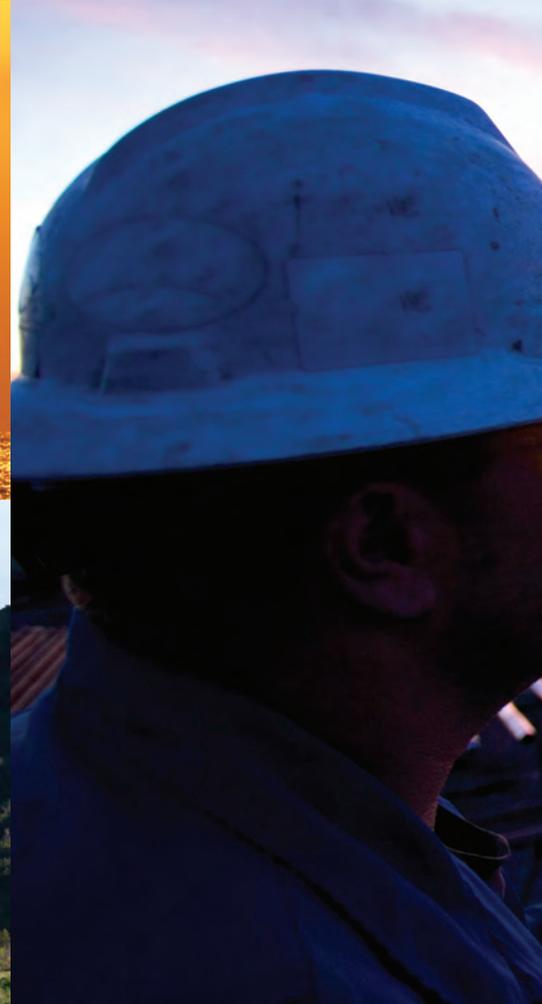
Technical approach, unsurpassed delivery

Schlumberger is the industry leader in gas migration control. For more than 2 decades, we have solved our clients' gas migration issues, providing cost-effective solutions. The new Schlumberger Gas Migration Control Engineering Suite offers customized solutions to fit every well's needs.



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www.slb.com/gasmigrationcontrol

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