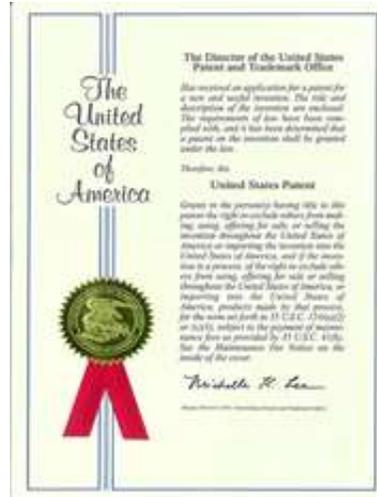




# TRACERMAX

**Tracermax technology is  
protected under  
PCT/CA2010/09/16, US Patent  
Number 8,674,290 B2  
(Published March 18, 2014)**



**INTEGRA-TRACE™ IS NEXT GENERATION OILFIELD TECHNOLOGY  
FOR INTELLIGENT DRILLING AND COMPLETIONS**

# TRACERMAX

## ABOUT

**ROBERT (BOB) M. MASNYK**  
**PRESIDENT AND CEO**  
**TRACERMAX SCIENTIFIC, INC.**



Mr. Masnyk is an Alberta businessman that is a strong advocate of occupational health safety and the preservation of the environment. He has developed a patented green technology that mitigates risk and is focused at providing definitive information for upstream petroleum drilling and completion operations, while eliminating the use of dangerous open source nuclear substances currently used as tracer materials in certain oilfield applications.

Mr. Masnyk has over 40 years of related industry experience and has worked in various technical and administrative capacities at corporate, laboratory and field levels; including the physical testing of oil well cement, calibration of nuclear gauging and measurement systems, as well as, the chemical synthesis of high performance radioactive tracers used for production logging and inter well tracer studies. He has acted extensively as a consultant conducting numerous industrial hygiene, decommissioning and environmental assessments.

The technology will prove well integrity in completions operations and promises to give significant economic benefits and solutions to problems that lead to wasted rig time and expensive remedial interventions.



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## SERVICES

**TRACERMAX** **INTEGRA-TRACE™** technology gives definitive well data in the following oilfield applications:

- Frac height definition for hydraulic fracturing stimulations (HS) and well integrity.
- The radial placement of light weight or nitrified cement slurries (<math><1500 \text{ kg/m}^3</math>).
- Depth correlation of downhole jewelry ( float shoes, collars, etc.).
- The identification of cement tops and lost circulation zones.
- Production logging and subsurface tracer studies.



**INTEGRA-TRACERS** replace the use of dangerous open source radiotracers for certain oilfield applications. **INTEGRA-TRACERS** are non-contaminating and do not require special licensing for possession or handling. **INTEGRA-TRACERS** are not dangerous goods and can be easily transported by any mode of transport.



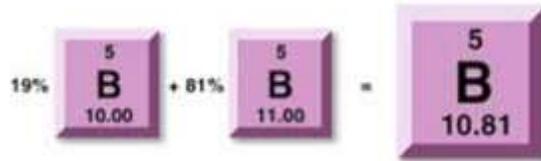
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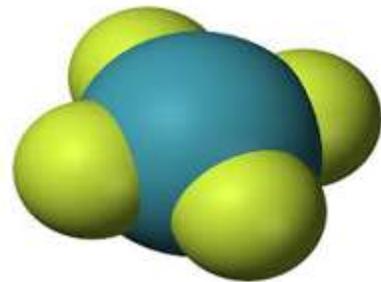
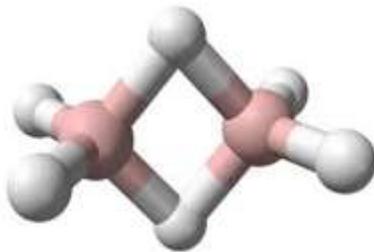
## PRODUCTS

### BORON CARBIDE (CB<sub>4</sub>)

CB<sub>4</sub> is a ceramic compound that is 75% Boron by weight. It is chemically inert and will not react or breakdown under typical conditions of HS or cementing operations. CB<sub>4</sub> will not interfere with cross-linking or gel breaker chemical agents used with HS propellants. CB<sub>4</sub> will not adversely affect the chemical or physical characteristics of cement slurries at required concentrations.



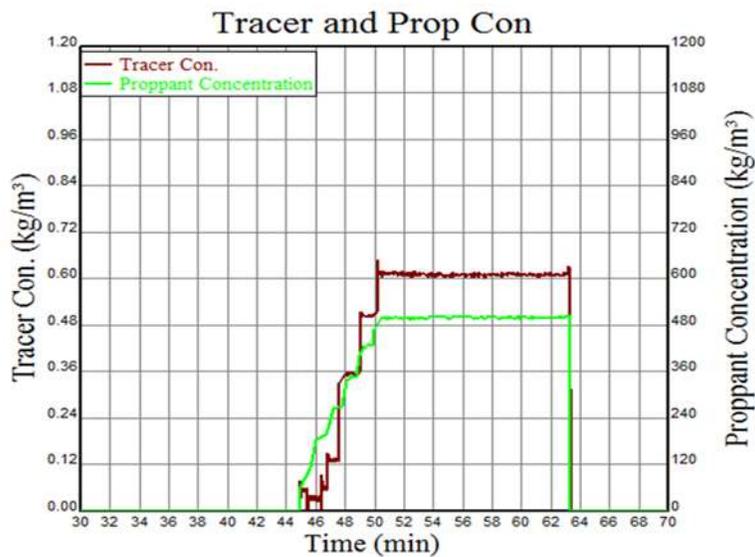
CB<sub>4</sub> has similar density (2.5 g/cm<sup>3</sup>) to Silica, the most commonly used proppant in HS operations. CB<sub>4</sub> has a compressive strength of approximately 50 GPa and is the second hardest material (Mohs Hardness Scale: 9.3) behind diamonds. CB<sub>4</sub> is available in similar particle sizing to fracturing proppants and Silica flours mixed in cement powders (minimum 30%). It is also compatible with sintered Bauxite or Alumina based fracturing proppants under tested conditions. CB<sub>4</sub> will travel uniformly with fluid displacements for a representative tracer study. CB<sub>4</sub> does not render any radioactive or toxic substances under Neutron activation.



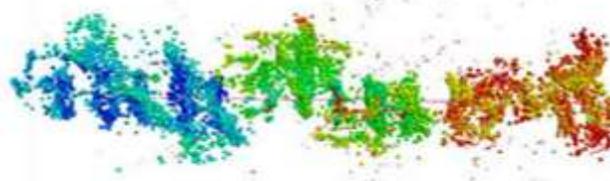
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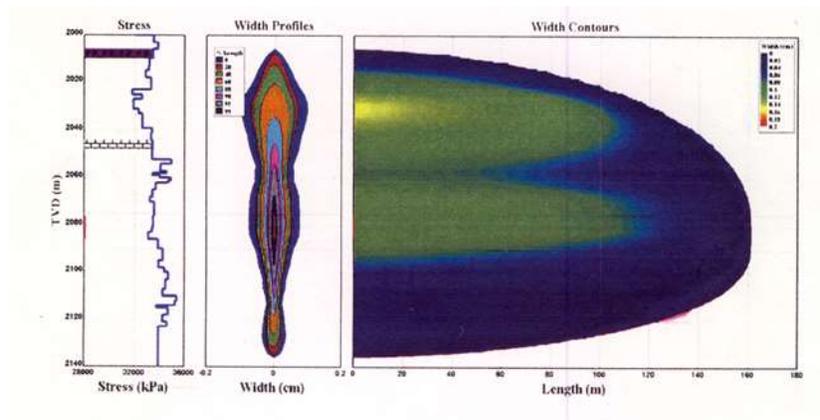
**INTEGRA-TRACERS** can be added directly into frac blending or cementing equipment by onsite personnel with dry add feeder systems using standard PPE. No specialized tracer technician is required. A strip chart can be generated with data collection equipment to insure timed tracer addition vs fluid displacement to validate tracer concentration for quality control.



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**INTEGRA-TRACE** frac height definition can be used to calibrate growth propagation models making it possible to accurately calculate stimulated reservoir volume (SRV). Microseismic (VSP) tools can be deployed in the HS wellbore without the need of an exploratory well.

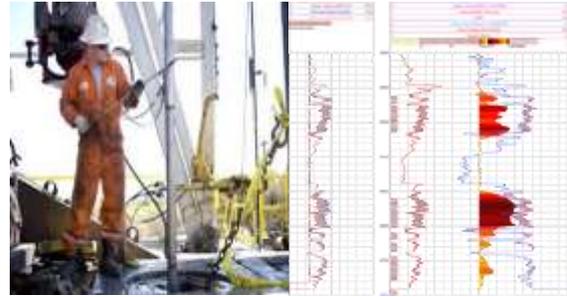


## Economic benefits for HS tracing operations include:

- No tank rentals required to retain contaminated well flow back effluents tagged with radiotracers.
- No site or equipment decommissioning required for radiotracer contamination.
- No detrimental radioactive contamination, exposures or burdens on personnel or the environment.

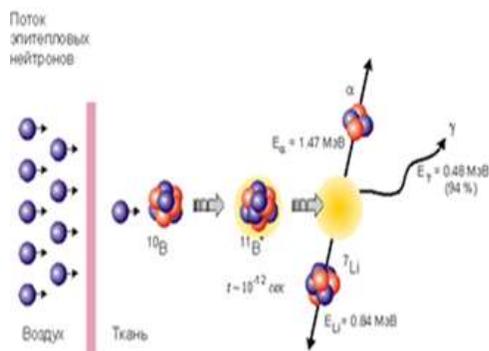


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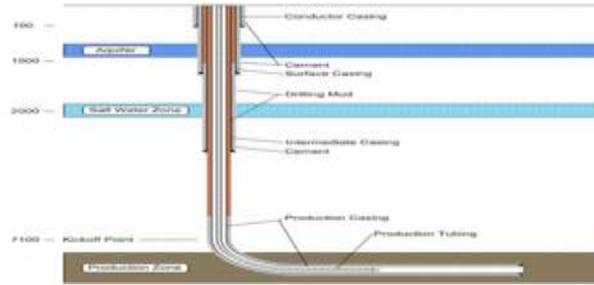
**INTEGRA-TRACERS** are validated by plotting digital CH-LAS against OH-LAS in a single CH logging pass on tracer log overlays using normalization processing techniques. Descending Neutron-Neutron (N-N) and the ascending capture Gamma (N-G) energy (477 keV, 93% abundance by transitional probability) count rate result from the Neutron activation of the  $^{10}\text{B}$  isotope. The character of the Neutron curves on any well log; for any well, are repeatable with any Compensated Neutron Log (CNL) and/or certain geophysical accelerators.

Various logging tools can measure the nuclear characteristics of  $^{10}\text{B}$ .  $^{10}\text{B}$  transmutes by Alpha ( $\alpha$ ) decay to  $^7\text{Li}$  under neutron activation. The neutron activation of  $^{10}\text{B}$  is shown in the formula:  $^{10}\text{B} + (\text{n}) \rightarrow ^{11}\text{B} \rightarrow (\alpha \text{ decay } \gamma = 477 \text{ keV}) \rightarrow ^7\text{Li}$



All major oil service providers offer well conveyance and Neutron logging tools. Neutron tools, log processing software and log presentations are not created equal.

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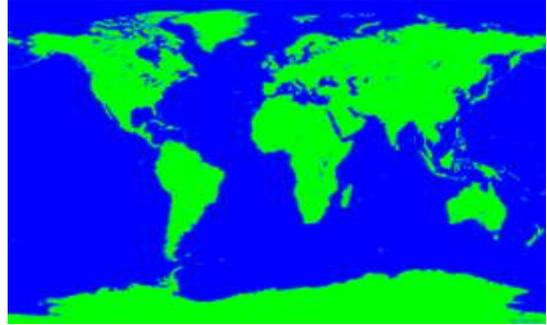


## INTEGRA-TRACE™ ADVANTAGES FOR WELL INTEGRITY

- **INTEGRA-TRACE** will prove well integrity for the hydraulic isolation of cement placements and the ongoing status of barriers over HS completions; quality cement completions during well construction will prevent vent flow and seeps into non-saline aquifers.
- **INTEGRA-TRACE** can detect light weight or nitrified cement slurries (<math><1500 \text{ kg/m}^3</math>).
- **INTEGRA-TRACE** cement placements can be logged immediately saving from 36 to 72 hours of rig time.
- **INTEGRA-TRACE** can identify cement “tops” or lost circulation zones in drilling and completions operations.
- **INTEGRA-TRACE** can be proven with a single CH Neutron logging pass using log overlays and processing with normalization techniques.
- **INTEGRA-TRACERS** can be blended directly into proppants or cement powders with dry add feeder systems (on or offsite). Validation of tracer addition and concentration can be graphed for quality assurance.
- **INTEGRA-TRACE** CB<sub>4</sub> is a non-toxic ceramic chemical compound that is compatible with Alumina and Silica fracturing proppants, as well as, cement powders. CB<sub>4</sub> will not interfere with physical or chemical characteristics of cement slurries under test conditions (Lafarge Physical Testing Laboratory, Joppa, Illinois API, RP 10 accreditation for; Type G, H, oil well cements)
- **INTEGRA-TRACE** is most beneficial in offshore drilling, where operations are expensive, pressure controls for hydraulic isolation are critical; and hydrocarbon seeps or vent flows are detrimental to sensitive maritime eco-systems.



# ***TRACERMAX***



## **CONTACT US**

Tracermax products and services are available on a global basis. If you require specific information with respect to your application, please contact us at the numbers below:

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