



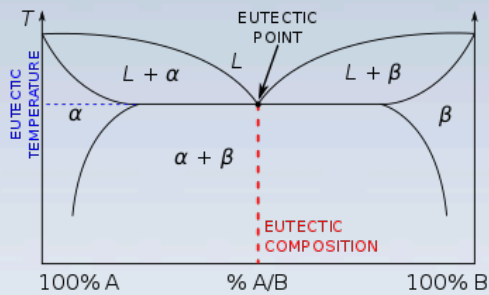
October 24<sup>th</sup>, 2019

- What is BiSN's Wel-lok M2M Technology?
- Properties of Bismuth
- Modified Thermite
- Applications of Wel-lok M2M
- Deployment History
- Qualification Testing
- Tool Examples



***M2M Sealing Solutions***

# Unique Properties of Bismuth



Eutectic Metal



Expands like ice



Viscosity similar to water



Corrosion resistant



Dense – SG 10



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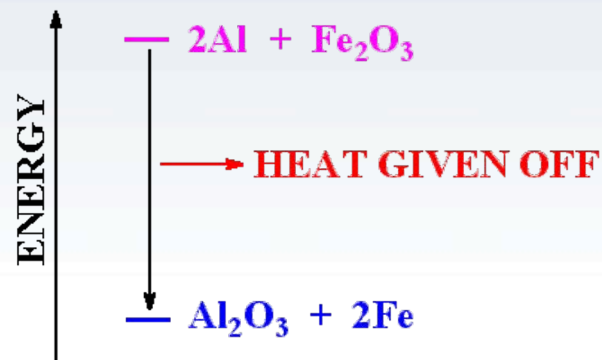
# Alloy Viscosity & Expansion



# The Thermite Reaction



**AN EXOTHERMIC REACTION**



# ***Wel-lok M2M*** in Glass Casing



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# Current Applications

***Wel-lok M2M™ WSO***

Shutting off lower water producing zones

***Wel-lok M2M™ TS***

Tubing seal for bridge plug applications

***Wel-lok M2M™ TDAP***

Annular seal run as part of the casing string

***Wel-lok M2M™ CLS***

Sealing casing leaks, can be milled for full bore

***Wel-lok M2M™ CRT***

Sealing leaking cement in the annulus

***Wel-lok M2M™ STC***

Sealing through casing in multiple annuli

***Wel-lok M2M™ MXD***

Maximum Drift for thru tubing applications

***Wel-lok M2M™ Perf-lok***

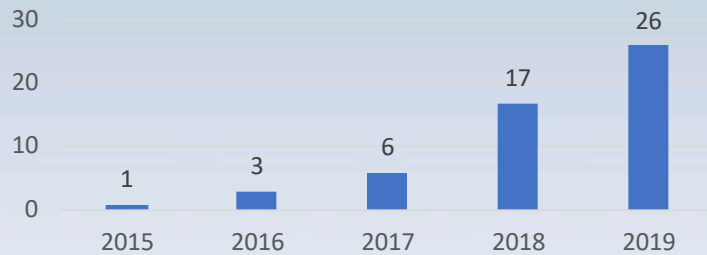
Sealing production perforations



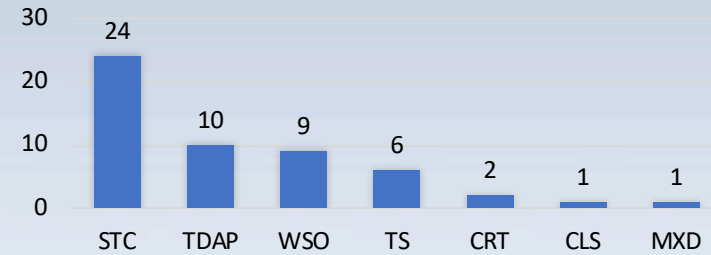
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# BiSN Wel-lok M2M Field Deployments

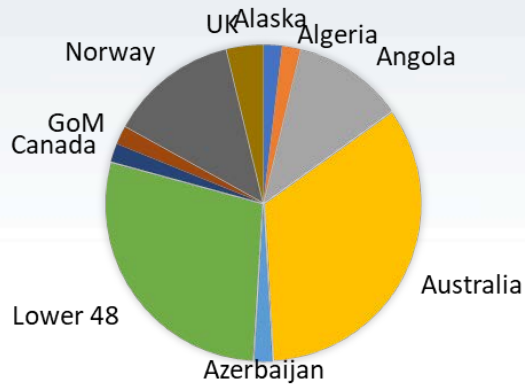
Tool Deployment by Year



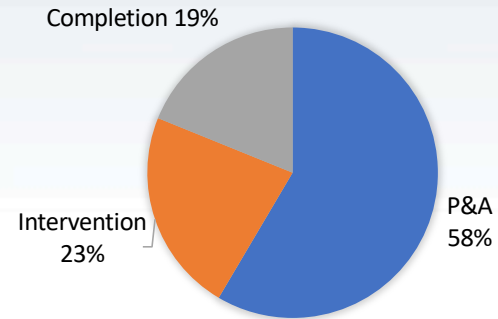
Tool Deployment by Application



Tool Deployment by Country

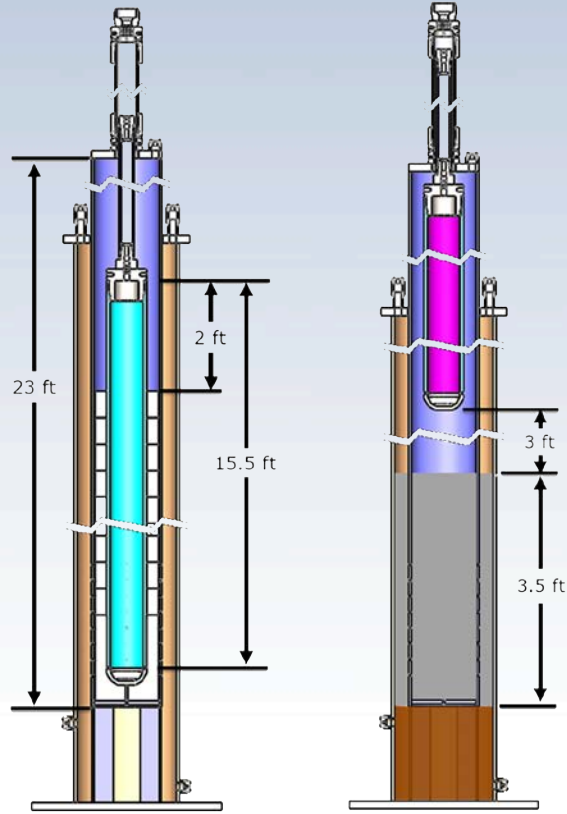


Tool Deployment by Well Phase



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# Typical Test Set Up



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# **Wel-lok M2M STC™**



24  
Commercial  
Deployments



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# **Wel-lok M2M CRT™**



Gas tested to 2,500 psi  
with nitrogen for 24  
hours with no bubbles



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# **Wel-lok M2M TS**



75° Deviation



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# **Wel-lok M2M MXD™**



- Run through tubing or restriction
- Seals inside a large diameter casing or open hole
- Alloy in pellet form, deployed downhole in a bailer
- One-trip deployment



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# ***Wel-lok M2M TDAP***



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*Thank You*

*Questions*



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