



## **Patented Oilfield Inventions**

*“Where Engineering Meets Ingenuity”*

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*Today, oil production conditions vary so dramatically that designs of the past may be inefficient or obsolete. At Breakthrough Engenuity we are committed to eliminate those inefficiencies, to innovate, and to fight obsolescence. We do this with a vigorous level of 21<sup>st</sup> century engineering rooted in proven performance. We know that it’s necessary to stay ahead of the industry’s needs; to produce innovations that actually make sense and add value.*

*It’s no secret that old production methods are obsolete in today’s shale oil environment. Shale oil production presents new challenges, issues never before experienced in the domestic oilfield or by most of today’s oilfield engineers. We’re lowing new ground. Change is in the air ... and it’s a must!*

*Many older oilfield systems no longer perform. Breakthrough Engenuity is committed to turning this around by developing new and appropriate IP. The list below highlights represents some of our latest IP in the form of our most recent patents. These offer the industry unique alternate technologies, new systems to change past paradigms.*

**KOTREAT<sup>®</sup> Combination Pressure Vessel:** *This is a unique vessel designed to separate bulk “free” water from oil, and then to dehydrate the oil by removing remnant water, all in a single pressure vessel. It is truly the marriage of a free water knockout (AKA FWKO) and a horizontal heater treater. By building both into one vessel installation costs are reduced by 50%. These were tested in 2015 and proved to perform as expected. Both water quality and oil quality were exceptional. This unique vessel is patent pending. The patent should issue in 2017 or 2018.*

**Condensate Separation and Collection System (aka MorOil<sup>™</sup>):** *The MorOil<sup>™</sup> System is in the patent pending status. Filed early in 2012, this patent application passed all tests for prior art, and expected to be issued in 2016. The MorOil<sup>™</sup> System is a wellhead rich gas condensation and separation system designed to condense C5+ fractions from rich gas streams, separate them in the liquid phase, and to provide a conduit to local crude oil storage facilities to enhance both oil gravity and volume, thus adding a new revenue stream while minimizing well site air pollution. Every 10°F of temperature reduction produces another 50% recovery of the C5+ fractions, maximizing lease based BOPD equivalency.*

**Lease Portable Oil Dehydrator (aka L-POD<sup>®</sup>):** *Off-spec oil is successfully processed through this patented system. Patent Number 9,157,035 B1 is both a method and apparatus patent covering this amazing technology applied to resolve difficult emulsions inherent in off-spec oil accumulated at pipeline terminals. The use of L-POD<sup>®</sup> eliminates the need for added off-spec oil storage, the typical labor intensive “blend-off” effort and cost, and means that contaminants are removed rather than simply being diluted into higher quality crude oil streams.*

### **ABOUT BREAKTHROUGH ENGENUITY’S OWNER/INVENTOR**



*Bill Ball is the founder and owner of Breakthrough Engenuity LLC. He has a distinguished history of oilfield separation system designs, and a comprehensive list*

*of related patents. Bill's hands-on oilfield experience and career portfolio, make him one of the industry's leading separation authorities today. After his university studies he launched his career in a 1,000,000 b/d waterflood operation where he was responsible for the evaluation and performance improvement of all surface facilities. He spent most of his work days crawling through the process equipment of the day, making improvements wherever possible.*

*This hands-on experience was the foundation Bill needed to improve, develop, and advance the technologies necessary to improve process equipment efficiencies across the board. In the early years Bill learned what works, and what doesn't! In the decades since his accumulated separation knowledge and experience led to his many patents, each of which speaks for itself.*

*The result is a unique approach; one where, "Engineering meets ingenuity!"*

*Bill's efforts continue to innovate improvements like the patent pending combination free water knockout- heater treater in one vessel. It's called "KOTREAT®". Each new KOTREAT® eliminates the time and expense of installing two separate vessels. And, through the use of highly efficient internals, KOTREAT® is a game changer when it comes to performance. Another example of ingenious innovation is the MorOil™ system. MorOil™ is a patent pending system designed to condense the valuable C4+ hydrocarbon liquids from produced natural gas streams to generate a new producer stream of cash flow in the form of saleable, highly valued NGLs.*

*These are just a few of Breakthrough Engenuity's unique contributions.*

*Today, Breakthrough Engenuity is one of the industry's leading low-cost engineering and design firms. We specialize developing designs for the industry's most efficient high and low pressure, two and three phase heated and unheated separators, as well as providing general engineering services geared to specialty subjects like:*

- *Natural gas handling to optimize income and liquids recovery.*
- *Proper line sizing to avoid turbulence, erosion-corrosion, and mixing energies.*
- *Specialty vessel internals designed to maximize separation performance.*
- *The application optimization of oilfield chemicals geared to reduce cost and improve performance.*
- *3D modelling to avoid costly facility installation delays.*

*Now, more than ever, Breakthrough Engenuity can be found in every sector of the oil and gas industry, adding cash flow to operators and efficiency to their operations. We're a full service engineering firm. We pledge to meet and exceed every client expectation.*

## **CONTACT US**

*If all else fails, or if you just have a question, don't hesitate to call Bill Ball at Breakthrough Engenuity for assistance. You can reach Bill at the office at 918-298-6841, or on his cell phone at 918-231-9698.*

