



**Highly economical solutions to conventional ESS issues. Unrestricted well productivity.**



## SMALL PARTICLES, BIG PROBLEMS

When oil and gas wells are produced from poorly consolidated rock, sand particles become entrained in produced fluids, flow into the well and, if not intercepted, on into surface infrastructure. The result may be premature plugging and reduced well inflow, destruction of downhole hardware, and damage to handling and pipeline facilities. Cleanouts due to sand presence cause frequent or even permanent shutdowns. Increasing well flow only accelerates critical sand problems. However, a balanced, or "managed" sand production is beneficial to some oil and gas production.

## FASTER PARTICLES, PROBLEMS FASTER

Well completions often must prevent any sand production because abrasive particles moving at high speeds will impact and erode equipment. Catastrophic failure may occur within a matter of hours. Engineers deploy expensive downhole filtration devices utilizing combinations of wire mesh, particle consolidating chemicals, and specially designed "gravel-pack" media towards prevention. The various media may have openings smaller than 0.001", as necessary to exclude all sand in highly destructive settings. A big opportunity cost to operators is then caused by restricted production. Despite all efforts, operators still eventually suffer the costs of shutdown and repairing plugged or damaged sand-control equipment.

## CERTAIN SINKING

# \$1 Billion

Spent by producers on  
SUBSIDENCE PROBLEMS



Sand production may also lead to compaction around the well that can destroy downhole equipment and even crush or shear well casing.

There are no commercially available sand-control systems able to withstand such massive forces and destruction.

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## MARKET OPPORTUNITY

Designed according to six previously unattainable performance goals specified by major oil and gas producers, DTS Elastic Sandscreen Technology resolves traditional expandable strength and reliability limitations while improving upon flow, particle retention, and plugging rates. This premium DTS Technology application is priced to be highly economical for use in even standard gravel pack, standalone, thermal, and other completions.

A minimum \$100mm direct annual revenue opportunity is available for this particular application of DTS technologies, as enabled by the following exclusive capabilities:

- Exceptionally high fluid-inlet area in excess of 50% that can increase production as much as 70%. 20% producible open area is supplied in the sandscreen's pre-expanded condition.
- Diametric expansion ratio to 70%, also capable of thru-tubing deployment with no rig expense needed.
- Collapse strength to 8,000 psi and higher, 10, 20 or even 40 times more than current products.
- Exerts "spring bias" support to the wellbore up to 1000psi force that continually adjusts to downhole conditions, thereby optimizing fluids and sand production.
- Adapts to 10% vertical geologic compaction while remaining functional.
- Configurable for retrieval, allowing recompletions according to changes over well life without re-drill.
- Retains particles as small 50-micron, with the highest fluid efficiencies available for any sand control product.
- Inward opening, plug resistant apertures allow passage of sand particles, reducing cleanout shutdowns.
- Manufacturing materials weight cost is 1/2 conventional products, allows economic use of high performance alloys.
- Is well suited for use in high temperatures, thermal variation, corrosion, and high-bend settings.
- Technology can be utilized for other purposes, such as high expansion water isolation sleeves, basepipe or borehole strengthening liners.

Operators need more productive and more reliable sand-control systems. As just one of more than fifty DTS Downhole Technology applications, DTS Sandscreen products fulfill such needs.

## PRODUCT BUILDOUT – INVESTMENT PROGRAM

DTS has developed unique and proprietary technology focused on elastically expandable tubular products for use in well construction, stimulation, and production. High strength expandable sandscreens are one of dozens of applications under the company's "self-expansion" technology portfolio which includes both solid and non-solid tubulars. Dynamic Tubular Systems is currently discussing individual product build out investment programs with investors who are interested in key applications of DTS Technology.

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# DTS HIGH-STRENGTH EXPANDABLE SANDSCREEN TECHNOLOGY



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## SOME PROGRESS

Given these complex problems and the potential rewards, operators continually seek ways to balance oil and gas production and sand-related costs. One relatively new approach is to install "expandable" screens that are sent into the producing interval as a smaller diameter assembly and then is forced open by yielding, or stretching their soft steel construction to become the same size as the wellbore. Such devices line and partially support the wellbore interior without the need for other media. This approach increases oil and gas production, sometimes dramatically so. But, primarily because of low radial collapse strength, widespread uptake of first generation expandable screens has not occurred.

## DTS INNOVATION

An alternative expansion approach is emerging that operates, not by stretching soft steel, but by causing high strength steel to act as a spring, elastically compressing and recovering screen diameter. This next-generation, "self-expansion" technology resolves the strength, reliability, and performance limitations of earlier products. Entirely new performance expectations are created.

By compressing the "cells" that comprise the screen's openings, the amount of diameter change during expansion is 2 to 3 times greater than current products. This means that substantially more wellbore area may be lined. Increased expansion also means that excess "spring energy" may be used to actively support the wellbore in order to maximize fluids while minimizing sand.

### **HIGH COLLAPSE STRENGTH - 20 TIMES GREATER THAN CURRENT SYSTEMS**

is achieved by DTS designs and use of high strength steels that adjust elastically to large stresses, rather than folding or buckling.

### **DTS ELASTIC SANDSCREEN TECHNOLOGY**

can be crushed by even massive rock compaction forces and remain functional.

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