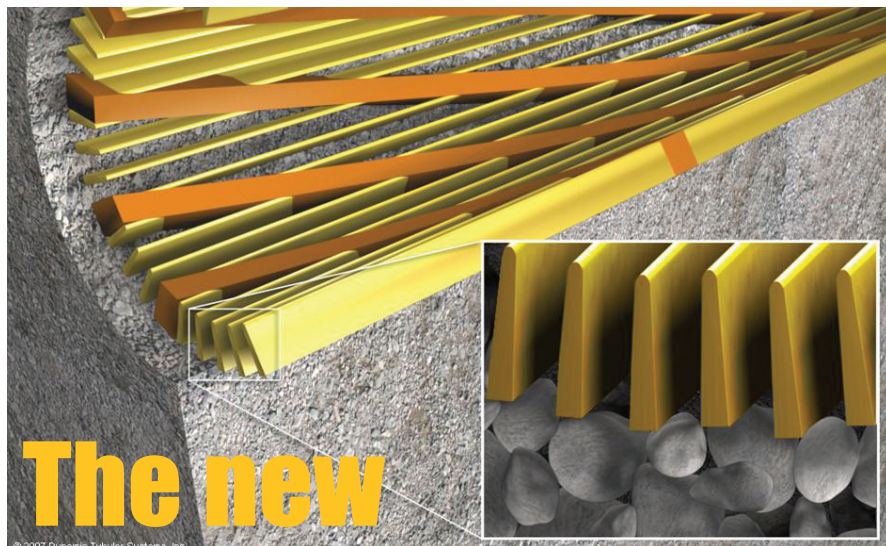


Expanding Horizons

Issue Two – Autumn 2007



The new generation of expandables

Jeff Spray – Dynamic Tubular Systems, Inc.

As expandable sandscreen technology matures, substantially better capabilities are being developed which will open new market areas. An emerging, 'self-expansion' process has been applied to sand-control product development which is demonstrating many significant new properties.

Self-expansion is a high-ratio, elastic-compression and recovery process of oversized tubulars which is being developed for a variety of downhole applications. The method is opposite traditional plasticizing approaches, requiring no expansion tooling or related rig time. Self-expansion for sandscreens occurs by exposure to specific chemistry or other conditions that release the compressed cells comprising the overall structure. Alternatively, mechanical expansion methods can be used.

In order to develop this technology, Dynamic Tubular Systems (DTS) entered into agreements with the USDOE microhole program and also collaborated with a major IOC, highly experienced with expandables and sand-control development. In addition to enhancing current industry standards, a set of more critical specification areas was created to emphasize four ideal conditions:

Ultimate collapse, or assurance of minimum intervention diameter	>2000 psi
Flexible formation compliance, or 'cigarette paper' effect	>200psi
High flow-through at minimum diameter	Maximise
Particle retention for all formation types	50µ - 250µ

Each of the criteria was met or exceeded many times over by the design and construction of the single-layer, helical, lattice-type structure (see figure). The innovative device consists of profile-shaped straining members, arranged longitudinally and integrated by elastic support-helices. Typically, the strainer and aperture widths are the same, resulting in 50% flow-area; the normal range is 35% - 60%. Spacing between the strainer members is maintained by precise lamination techniques used during manufacture. The screens can be made to any size, wall-thickness,

and material-type. Because one-half of the tubular is air-space and the actual structural members are made from inexpensive rolled-sheet, even advanced materials (providing higher strength & corrosion and abrasion resistance) can be used very economically in the construction of this type of screen. Since the ID and OD are smooth and the actual dimensions and structure approximate that of solid pipe, similar mechanical properties are realized. Based on construction with 304 stainless and P110 materials, the following results (see table below right) have been obtained for 4" microhole and 7" x 10.5" diameter elastic-sandscreens:

Moving the New Technology Forward

There are many other applications for the system, including uses as high-strength isolation sleeves and lost-circulation patches. More important, however, is the inherent capability for drilling. The technology's properties and configuration lend themselves to light-duty drilling operations. Development of drilling with the self-opening function will make for very economical re-entry and multi-lateral completions. A proactive, sand-prevention system is also under development with the goals of increasing well productivity and relocating sand movement far away from the main-bore. Because of a high-strength microhole capability,

WELCOME

to the second edition of "Expanding Horizons" the Expandable Technology Forum (ETF) newsletter and thank you to Baker Hughes for sponsoring this edition.

Shreekant Mehta & Sally Marriage – OTM Consulting;

The ETF exists to share knowledge & experience, increase acceptance and raise awareness of drilling and completion expandable technology by making sure the well engineering community is aware of the solutions expandables are capable of – ultimately increasing uptake of this groundbreaking technology. The last ETF meeting in Singapore had introductory presentations on expandable technology which did a great job of raising awareness of this exciting technology. The presentations are available to member companies from the ETF website (www.expandableforum.com).

We at OTM are also working on updating the functional ETF website to make it an industry portal and ensure that information is available to engineers globally who are interested in learning about expandable technology and what it can do for them.

This technical newsletter is based along the same lines as the ETF and is designed to ensure expandable technology understanding is widespread and the message goes global. There will be 2 editions produced each year; this second edition has been sponsored by Baker Hughes. If your organisation is interested in sponsoring the next edition, please do contact us.

The next ETF meeting is being sponsored by V&M Tubes in France on the 30th and 31st October 2007.

For information on the ETF please visit <http://www.expandableforum.com> or contact shreekant.mehta@otmnet.com

inexpensive laterals are possible which enhance or replace charged perforations by extending small diameter, self-completing 'shots' indefinitely into the reservoir. The goal of such a method is to construct micro-laterals in plentiful quantities to the point of their becoming disposable - less-expensive to drill and complete than to remediate.

Ultimate collapse	>8,000-psi
Flexural compliance	>800-psi
Flow-through at minimum diameter, open-area	18%
Particle retention range	50µ - 250µ
Expansion ratio	to 170%
Open area percentage	to 60%
Plug prevention	Profile aperture shaping
Orifice geometry detail	Single-digit micron-scale
Cleanup	Direct flow path between OD/ID
Construction materials	Any