

Ultra Thin Elastomer Power Sections

Presented by Raul Merino | BICO Drilling Tools

SPEAKER INFORMATION



Raul Merino

Engineering Manager

BICO Drilling Tools

- **20+ years** designing drilling motors and downhole equipment
- Former Engineering Manager at Hunting
- Former Director of Reliability at NOV
- Engineering Manager at BICO Drilling Tools



About BICO Drilling Tools

BICO Drilling Tools is a Houston-based global leader in high-performance drilling products and a subsidiary of Schoeller-Bleckmann Oilfield Equipment (SBO AG). For more than 25 years, BICO has been at the forefront of EvenWall™ power section development, alongside a full line of downhole motors, PBL bypass subs, drilling jars, shock absorbers, and non-mag collars.

EVEN RUBBER ADVANTAGES



Three-way cutaway comparison of power section types

PERFORMANCE

- Higher power output per unit length
- Less lobe deflection = tighter seal, greater transfer of force
- Consistent RPM across the pressure range

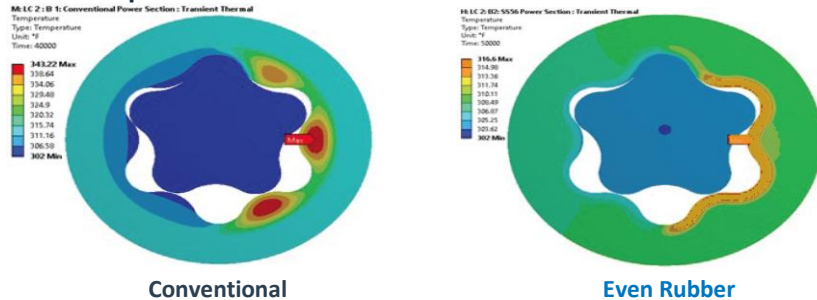
RELIABILITY

- Mechanical loads handled by the metal profile
- Better heat dissipation
- Reduced OBM and thermal swelling

RESILIENCE

- Smaller rubber chunks — less likely to clog bits
- Less likely to tear complete lobes, stay in the hole drilling

Heat Dissipation: Conventional vs. Even Rubber



Do you trust it enough to rerun it?.....



Hidden Damage...



Becomes a major problem

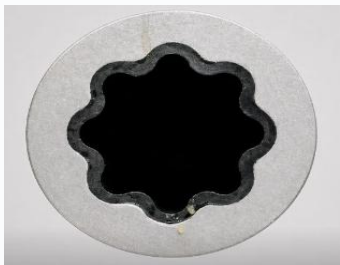
NOT ALL EVEN RUBBER IS CREATED EQUAL

Stator Tube Manufacturing Methods

Three different approaches — each with distinct trade-offs

Milling / Broaching / EDM

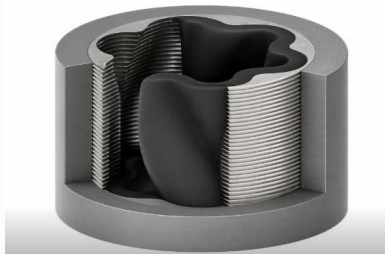
Monolithic construction



- ✗ Hard to verify internal dimensions
- ✗ Concentricity issues

Disc Stacking

Outer tube with a collection of discs defining the profile



- ✗ No structural advantage over conventional stators
- ✗ Uneven lobe profile
- ✓ Good concentricity

Precontoured Internal Tube

Profile formed directly into the tube



- ✓ Good centralization and concentricity
- ✓ Increased Strength AND Increased Flexibility
- ✓ QC verifiable from external measurements
- ✗ Complex to manufacture

FIT FOR PURPOSE

Multiple EvenWall® Platforms — matched to the wellbore conditions

BRUTE
RUGGED DEMANDS NO LESS




S2



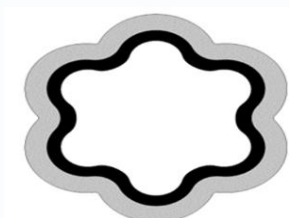
Equal to HNBR Pressure
Rubber thickness ~ 0.50"

Standard drilling
Reliable performance at value

BEAST
WHEN ONLY THE TOUGHEST WILL DO




S3




+25% pressure / stage
Rubber thickness ~ 0.30"

Harsh environments
Hot holes, OBM, tough intervals

ROCKET
DRILLING FASTER, GOING FARTHER



S4



+45% pressure / stage
Rubber thickness < 0.20"

Extreme laterals
Maximum power, longest runs

THINNER RUBBER = MORE PRESSURE

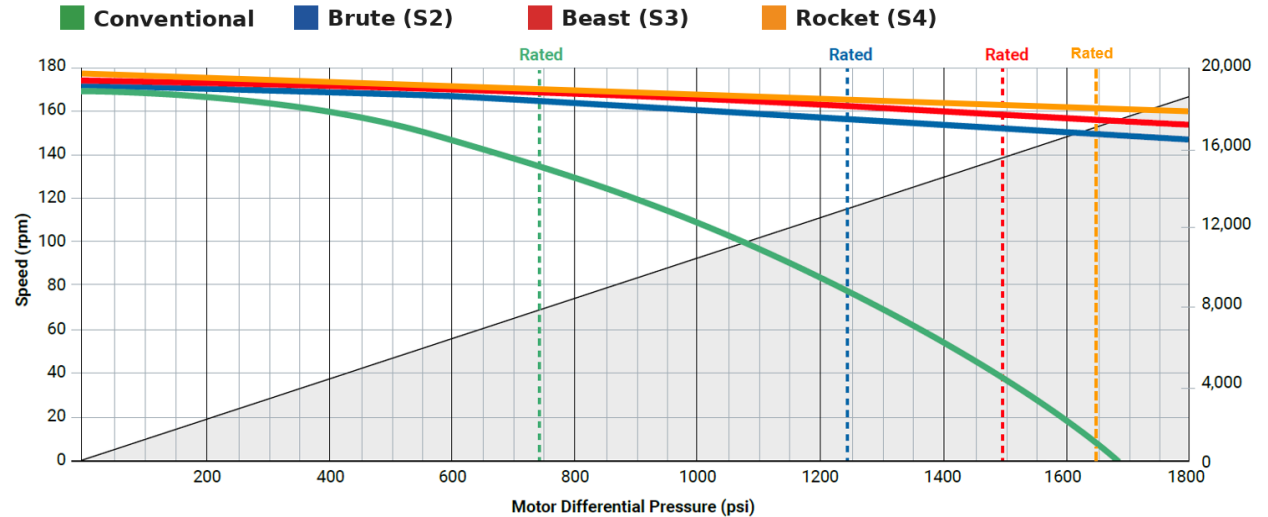
WHERE DID MY HORSES GO?

Power that doesn't run away — even under high differential pressure

$$\text{HP} = \text{Torque} \times \text{RPM}$$



Conventional motors: when pressure climbs, the horses bolt.



Speed vs. Motor Differential Pressure

CONVENTIONAL

Power falls off quickly as pressure rises

EVENWALL®

Keeps delivering power, even as RPM falls off

Conclusion

Ultra-thin EvenWall® power sections require the following:

- ✓ Precision Manufacturing
- ✓ Rigorous Quality Assurance Framework
- ✓ Advanced Elastomer Engineering
- ✓ Continuous Advancement Through R&D
- ✓ Proven Experience You Can Trust

ADJUST YOUR DRILLING PRACTICES — UNLOCK THE FULL BENEFIT

MORE ROP

Convert the extra pressure-per-stage into faster penetration — more feet per day.

FASTER WELLS

Higher sustained power means fewer stalls, fewer trips, and quicker TD.

LOWER COST / FT

Shorter drilling days and extended motor life drive down total well cost.

THANK YOU

Questions?

Raul Merino

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