

# Solid Gauge Mandrel

Protective recess for WellWatcher permanent monitoring system gauges

## APPLICATIONS

- Permanent wellbore monitoring in
  - vertical to horizontal wells
  - production and injection wells
  - mild to sour wells

## BENEFITS

- Minimizes interventions and saves costs by
  - protecting the permanent gauge during deployment and long-term production
  - ensuring long-term tubing integrity via metal-to-metal sealing technology

## FEATURES

- Mechanical ratings equal to or exceeding the tubing characteristics
- Compact design that enables instrumentation in tight clearances
- Wide range of metals to suit various downhole conditions
- Construction from a single piece of metal with no welding
- Highly reliable metal-to-metal connection to the gauge
- Optional protective bypass groove for hydraulic lines
- Field-proven design

The solid gauge mandrel provides a protective recess for WellWatcher\* permanent monitoring system gauges. It is available in various grades of metal to ensure characteristics equivalent or superior to the tubing. It can be installed in sweet to severely corrosive environments.

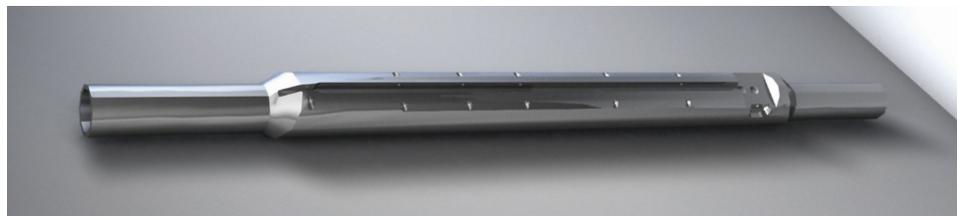
## Robust construction

Solid gauge mandrels are rated for various working pressures according to tubing weight and material grade. They have no inherent weak points or highly stressed areas because they are machined from a single block (billet) with no weld seams. All solid gauge mandrels are designed and manufactured to API 5CT specifications for collapse pressures, burst pressures, tensile strengths, and drift. The mandrels are custom cut with premium connections. Tong space and thread recut lengths are provided as requested.

The mandrel design features an internal bore with no sudden upsets that could cause flow to become turbulent or scale deposits to build up. Optionally, the design can include grooves to allow control-line passage and protection.

## Field-proven seal design

The gauge is fitted to the mandrel with a lower radial connector that provides a metal-to-metal seal between the gauge and the mandrel. This seal can be pressure tested on the rig floor before the completion is run. The field-proven seal design, which relies on a metal gland, has a perfect track record, providing long-term integrity of the tubing-annulus interface.



*Solid gauge mandrel, used with WellWatcher permanent monitoring system gauges.*