# BALL & SEAT BLANKS

ATI Firth Sterling is ISO 9001:2000 certified, ensuring consistency and reliability in all our products. ATI Firth Sterling has been serving our customers with tungsten carbide products for over 75 years. We have implemented continuous improvement and cost reduction programs designed to provide customers with the highest quality products possible at competitive prices.

## Features and Benefits

- ATI Firth Sterling offers a complete line of tungsten based ball and seat blanks for use in oilfield sub-surface pumps.
- Ball blank sizes are available from 5/8” OD through 3-3/4” OD.
- Seat blanks are available in a wide range of sizes to finish to industry standards.
- ATI Firth Sterling also offers “Texas” pattern and “O-ring” style ball seat blanks.
- Our heat treating process has been perfected to maintain carbon control and to eliminate porosity giving our customers the maximum performance possible.
- ATI Firth Sterling offers ball and seat blanks in 4 industry recognized grades. These grades include cobalt, nickel, and titanium based carbides. Nickel based tungsten carbide compositions provide improved corrosion resistance while our titanium carbide grade is a light weight alternative to heavier materials. Our cobalt based carbide materials are the recognized industry standard.

ATI Firth Sterling
Allegheny Technologies

www.atifirthsterling.com

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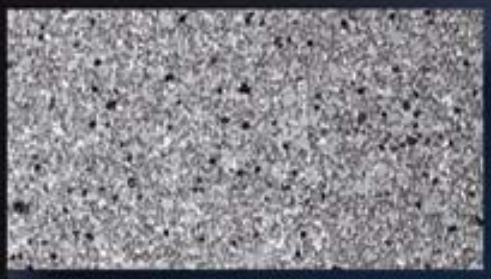
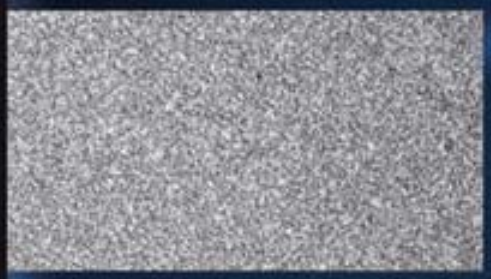


## H-81 (Cobalt Based Alloy)

H-81 is recognized as the industry standard for balls or seats in downhole submersible pumps and possesses a unique combination of high abrasion resistance and strength.

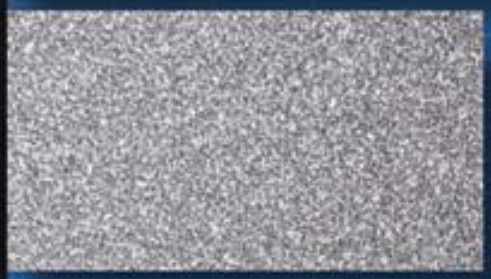
| | |
|---|---|
| HARDNESS ( $HR_A$) | 88.6 |
| % BINDER CONTENT | 13% |
| DENSITY (g/cm3) | 14.15 |
| TRANSVERSE RUPTURE STRENGTH (Kpsi) | 450 |



## HAN-6 (Nickel Based Alloy)

HAN-6 provides improved corrosion resistance for downhole balls and offers resistance to abrasive wear.

| | |
|---|---|
| HARDNESS ( $HR_A$) | 90.5 |
| % BINDER CONTENT | 6% |
| DENSITY (g/cm3) | 15.00 |
| TRANSVERSE RUPTURE STRENGTH (Kpsi) | 250 |



## HAN-10 (Nickel Based Alloy)

HAN-10 provides improved corrosion resistance for downhole seats and offers a tougher alternative to HAN-6.

| | |
|---|---|
| HARDNESS ( $HR_A$) | 90.0 |
| % BINDER CONTENT | 10% |
| DENSITY (g/cm3) | 14.50 |
| TRANSVERSE RUPTURE STRENGTH (Kpsi) | 300 |

## NM-15 (Titanium Based Alloy)

NM-15 can be used in either balls or seats where the reduction of component weight is critical.

| | |
|---|---|
| HARDNESS ( $HR_A$) | 90.5 |
| % BINDER CONTENT | Proprietary |
| DENSITY (g/cm3) | 9.10 |
| TRANSVERSE RUPTURE STRENGTH (Kpsi) | 200 |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