World Leader in Premium Tubular Solution

Vallourec proprietary High Collapse grades

- Integrated pipe manufacturer
  - Design, process and control of proprietary steel chemistries.
  - A steel mill in France, Germany, USA, Brazil and several pipe mills throughout the world dedicated to the production of OCTG.
  - Connection threading integrated into the pipe mills or strategically located to serve a market.
- Reliable Products and Services
  - Vallourec collapse model built over the years and correlated with more than 1800 physical test results.
  - High Collapse performance guaranty.
  - Sour Service resistance guaranty for proprietary High Collapse & Sour Service grades.
  - Best-in-class quality control plan, including technology with improved sensitivity to defects and enhanced control frequency.

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For further information on our connections, please visit our website www.vallourec.com/OCTG.
Vallourec offers a complete range of OCTG High Collapse grades, to meet the most challenging collapse conditions of well environment and load cases scenarios. With Vallourec's expertise and process know-how, customers can rely on safe high collapse ratings, for best-in-class performances.

Vallourec proprietary High Collapse grades cover the full range of sizes and weights from 4 1/2” to 26”, grades from 80 KSI to 150 KSI, and offer special drifts on a standard basis without collapse derating. While strictly compliant with API standards, Vallourec High Collapse grades are delivered with the guarantee of their minimum High Collapse rating. High Collapse performances are also available on 13 Cr and Super 13 Cr pipes.

**Benefits**
- API compliance.
- 30% over API Collapse in average.
- Collapse performance guaranteed
- High Collapse & Sour Service and arctic grades.
- Tailor-made products & characterization.
- Special/alternate drift on a standard basis.

**Combining High Collapse and Sour Service**

**HCS series “Time Saving”**
- Same chemistry and process as HCSS series.
- 85% SMYS threshold stress guarantee, higher than 80% in API.
- Reduced delivery time (no NACE method A test, SSC resistance proven by mill quality records).

**HCSS series “Enhanced API”**
- Available in grades 80 to 125 ksi.
- Fully compliant with API.
- 85% / 90% SMYS threshold stress guarantee, higher than 80% in API.
- Delivered with NACE method A test, performed on actual order (additional NACE method D performed on HCSS-D products).

**Vallourec Collapse calculation model**

Vallourec started long ago to accumulate collapse testing data in order to understand the collapse phenomenon and its influencing factors.

This extensive knowledge is consolidated within the Vallourec proprietary collapse model as a function of the influencing parameters. It has demonstrated its prediction accuracy through extensive correlation and state-of-the-art statistical analysis.

This robust formula enables to provide customers with a safe guaranteed high collapse value for a large catalogue of products.
Vallourec proprietary High Collapse grades

→ Integrated pipe manufacturer

- Design, process and control of proprietary steel chemistries.
- 4 steel mills in France, Germany, USA, Brazil and several pipe mills throughout the world dedicated to the production of OCTG.
- Connection threading integrated into the pipe mills or strategically located to serve a market.
- In-house metallurgical and Collapse testing, corrosion characterization and Non-Destructive Examination (NDE).
- Expertise and Know-how (large collapse testing experience).

→ Reliable Products and Services

- Vallourec collapse model built over the years and correlated with more than 1800 physical test results.
- High Collapse performance guaranty.
- Sour Service resistance guaranty for proprietary High Collapse & Sour Service grades.
- Best-in-class quality control plan, including technologies with improved sensitivity to defects and enhanced control frequency.
<table>
<thead>
<tr>
<th>SIZE (OD)</th>
<th>NOM. WEIGHT</th>
<th>NOM. WALL THICKNESS</th>
<th>MAX. DRIFT APPLIABLE SPECIAL DRAFT*</th>
<th>VM 80 HC</th>
<th>VM 90 HC</th>
<th>VM 110 HC</th>
<th>VM 125 HC</th>
<th>VM 140 HC</th>
<th>VM 80 HCSS</th>
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<th>VM 110 HCSS &amp; HCSS-D</th>
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* Alternate or special drift
** OD Oversize

Other sizes and weights, larger diameters (above 10", up to 26"), special drifts, grades and ratings available upon request.
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