Over 30 years of proven field history

DUOLINE® 20

When corrosion starts in downhole tubing, the string soon fails. The result is downtime and increased operation costs for workovers and tubing pulls.

DUOLINE provides the following SAVINGS:

- Rig time & cost
- Manpower time & cost
- Workover time & cost
- Expensive chrome or alloy completions
- Costly Chemical Treatments

The DUOLINE system, developed by Duoline Technologies in 1965, has proven to be the most successful solution for the prevention of downhole tubular corrosion. The DUOLINE system ensures the isolation of corrosive oilfield fluids and gases from the steel, thereby preventing corrosion of steel tubing and line pipe. DUOLINE is the only fibreglass-epoxy lining system in the market place today with over 30 years of accumulated field history and over 80 million feet installed worldwide.

Design Features

- API & Premium Downhole Connections
- Wireline Resistant
- Holiday Free
- High Hoop Strength
- Special Epoxy Resin
- No Special Handling Necessary
- Can be installed in New & Used Pipe
- Lining can be carried out in any location
- Increases tubular life and performance
- Cost effective

Product Description

DUOLINE 20 is a GRE (glass reinforced epoxy) composite liner engineered with a special resin system developed exclusively for Duoline Technologies in 1971.

The DUOLINE 20 liner is manufactured using a filament winding and high temperature cure process.

DUOLINE 20 is then inserted inside carbon steel tubing, combining the high strength of steel with the inert properties of fibreglass to provide effective, long lasting corrosion protection.
Over 80 million feet installed worldwide

INCREASING TUBULAR LIFE & PERFORMANCE

MaxTube’s field service:
› Running/ Pulling DUOLINE products in the well
› Inspection of DUOLINE stock or used DUOLINE joints

DUOLINE 20 has an outstanding performance history, both onshore and offshore, in demanding environments containing produced fluids and gasses with CO₂ and H₂S.

Applications
DUOLINE 20 has an outstanding performance history, both onshore and offshore, in demanding environments containing produced fluids and gasses with CO₂ and H₂S.
› CO₂ Injection Fields (WAG)
› Waterflood Injection Fields
› Deep Gas Production Wells
› Gas Lifted Oil Production Wells
› Shallow Brine Water Disposal Wells
› Deep-Hot-Gas Production Wells
› Chemical Disposal Wells
› Sour Gas Services

Application Criteria
The criteria listed below are the minimum information required by MaxTube to select the correct DUOLINE product for any proposed applications.
› Tubing size
› Tubing connection
› Well fluid
› H₂S content
› CO₂ content
› BHT

Please visit www.maxtube.com or contact us for a DUOLINE Selection Form.

Performance Capabilities
Temperature: Up to 250°F / 121°C
Working Pressure: Full working pressure of the lined steel pipe
› Duoline has a better flow profile than steel pipe.
› The very smooth internal bore of Duoline causes much less overall friction loss than that of new bare steel;
› “Hazen & Williams” C-Factor: C=150

Portable Lining Units (PLUs)
MaxTube has transformed the DUOLINE installation process by making it completely portable with the MaxTube Portable Lining Units (PLUs). No purpose built facility is required. MaxTube can line pipe throughout the world in any location, including customer’s own yards and facilities or directly at the mill.

PLU’s Benefits include:
› Eliminates the need for pipe to be sent to specific locations
› Reduces transport time and costs
› Allows companies to utilise their existing pipe stock or used pipe

DUOLINE is available in several grades, including DUOLINE 20 and DUOLINE 35. All are designed to provide a solution for all oil and gas field corrosion problems. In addition, we also offer the revolutionary Weldshield® system, which allows the DUOLINE range of lining systems to be used in welded pipelines and flowlines.

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DUOLINE products offer an unsurpassed record for prevention of corrosion in very demanding conditions.

INCREASING TUBULAR LIFE & PERFORMANCE
Corrosion Barrier Ring - Duoline Technologies manufactures metal reinforced elastomer rings for API Connections.

DUOLINE is available in several grades.

The Duoline DL-Ring System is a revolutionary new system which allows lining of all Premium Connections without the need for modification of the connection.

Corrosion Barrier Ring - Duoline Technologies manufactures metal reinforced elastomer rings for API Connections.

Corrosion Barrier Rings - glass reinforced PTFE rings are available for all Modified Premium Connections.
### Common DUOLINE Tubing Sizes (other sizes also available)

<table>
<thead>
<tr>
<th>Pipe Size and Weight/foot</th>
<th>B</th>
<th>C</th>
<th>t</th>
<th>Normal Lining Weight lb/ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1/16” 3.2ppf</td>
<td>1.500”</td>
<td>1.430”</td>
<td>0.040”</td>
<td>0.40</td>
</tr>
<tr>
<td>2-3/8” 4.7ppf</td>
<td>1.810”</td>
<td>1.750”</td>
<td>0.040”</td>
<td>0.50</td>
</tr>
<tr>
<td>2-7/8” 6.5ppf</td>
<td>2.251”</td>
<td>2.195”</td>
<td>0.040”</td>
<td>0.50</td>
</tr>
<tr>
<td>3-1/2” 9.3ppf</td>
<td>2.750”</td>
<td>2.670”</td>
<td>0.045”</td>
<td>0.80</td>
</tr>
<tr>
<td>4-1/2” 11.6ppf</td>
<td>3.691”</td>
<td>3.600”</td>
<td>0.060”</td>
<td>1.50</td>
</tr>
<tr>
<td>5” 15 ppf</td>
<td>4.142”</td>
<td>4.032”</td>
<td>0.065”</td>
<td>1.65</td>
</tr>
<tr>
<td>5” 18 ppf</td>
<td>4.010”</td>
<td>3.900”</td>
<td>0.065”</td>
<td>1.65</td>
</tr>
<tr>
<td>5” 18.5 ppf</td>
<td>4.070”</td>
<td>3.950”</td>
<td>0.075”</td>
<td>1.80</td>
</tr>
<tr>
<td>5-1/2” 15.5ppf</td>
<td>4.675”</td>
<td>4.550”</td>
<td>0.075”</td>
<td>1.80</td>
</tr>
<tr>
<td>5-1/2” 17/20ppf</td>
<td>4.520”</td>
<td>4.400”</td>
<td>0.075”</td>
<td>1.80</td>
</tr>
<tr>
<td>5-1/2” 23ppf</td>
<td>4.395”</td>
<td>4.275”</td>
<td>0.075”</td>
<td>1.80</td>
</tr>
<tr>
<td>7” 23ppf</td>
<td>6.091”</td>
<td>5.976”</td>
<td>0.095”</td>
<td>2.50</td>
</tr>
<tr>
<td>7” 26ppf</td>
<td>5.900”</td>
<td>5.785”</td>
<td>0.095”</td>
<td>2.50</td>
</tr>
<tr>
<td>7” 29/32ppf</td>
<td>5.800”</td>
<td>5.685”</td>
<td>0.095”</td>
<td>2.50</td>
</tr>
<tr>
<td>10-3/4” 60.7ppf</td>
<td>9.170”</td>
<td>9.010”</td>
<td>0.155”</td>
<td>6.50</td>
</tr>
</tbody>
</table>

**Maximum Drift Diameter:**

- For API Connections with Duoline Technologies CBR: 1/4” less than Flare Diameter
- For Premium Connections with PTFE CBR: 1/8” less than Flare Diameter
Major **DUOLINE** users include:

- ANADARKO
- AMERADA HESS
- BHP
- BP
- BRITISH GAS
- CHEVRONTEXACO
- CANADIAN NATIONAL RESOURCES
- EXXONMOBIL
- KHALDA PETROLEUM
- KUWAIT OIL COMPANY
- NORSK HYDRO
- OCCIDENTAL
- PETROLEUM DEVELOPMENT OMAN
- QARUN PETROLEUM
- SAKHALIN ENERGY INVESTMENTS COMPANY
- SAUDI ARAMCO
- SHELL
- STATOIL