

Solutions for Sour Service



Mitigating Risk While Lowering Completion Costs

Over the past decade, technological advancements have allowed the oil & gas industry to economically produce from deeper reservoirs with higher pressure and higher temperature conditions. From new wells in the Eagle Ford shale and in the oil sands of Alberta, to workover rigs in the Permian Basin, these reservoirs are often associated with high levels of hydrogen sulfide (H₂S). Depending on H₂S levels—as well as length of exposure, temperature and mechanical stress—steels in these environments can become susceptible to Sulfide Stress Cracking (SSC).

TMK IPSCO has developed a family of oil country tubular goods that are SSC-resistant, designed to mitigate risk to operators and help reduce completion costs. These premium products combine high-strength characteristics and targeted SSC-resistance for deep and demanding well conditions. Our family of sour service tubular products includes, L80, TMK I80 MS-1, TMK P110 MS-1, TMK P110 MS-2 and API 5CT T95 (see chart). Our sour service casing and tubing adhere to the requirements of NACE Standard MR0175/ ISO 15156-2.

TMK IPSCO supplies proprietary seamless, controlled-yield grades with a minimum yield strength of 110 ksi, ideal for mild and intermediate sour conditions. Our newest addition is a proprietary ERW offering with a minimum yield strength of 80 ksi. Our casing & tubing can be packaged with any of our patented TMK ULTRA™ Premium Connections, available exclusively from TMK IPSCO. Technological advances in clean steel practices and heat treatment processes allow TMK IPSCO to provide the advanced SSC-resistant grades within our OCTG product line, making TMK IPSCO your one-stop source for products that meet or exceed the needs of demanding sour service environments.



Grade Name	Specification	Mechanical Properties				Region	Solution	Applied Stress	SSC Certificates
		Yield Strength, ksi		Ultimate Tensile Strength, ksi	Hardness, HRC				
P110 MS-1	Proprietary	min 110	max 125	min 125	30.0 average	1	B	90% AYS	w/o
P110 MS-2	Proprietary	min 110	max 125	min 125	30.0 average	2	B	85% SMYS	Method A
T95	API 5CT	min 95	max 110	min 105	max 25.4	3	A	80% SMYS	Method A

Quality Tested

To meet sour service performance expectations, TMK IPSCO carefully controls production characteristics for our seamless offerings; from steelmaking to heat treatment, including careful attention to the chemical composition, steel cleanliness, quenching and tempering, tensile property, hardness and microstructure in our grades. Additionally, the steel for our ERW grades is ordered to meet specific chemical, metallurgical and mechanical properties. Our precise quality corrosion testing programs cover the full range of material properties, pH levels and H₂S partial pressure for each region. All TMK IPSCO products receive a mill test certificate in accordance with our documented Quality Management Systems (API Q1 and ISO 9001).

Regions of Environmental Severity

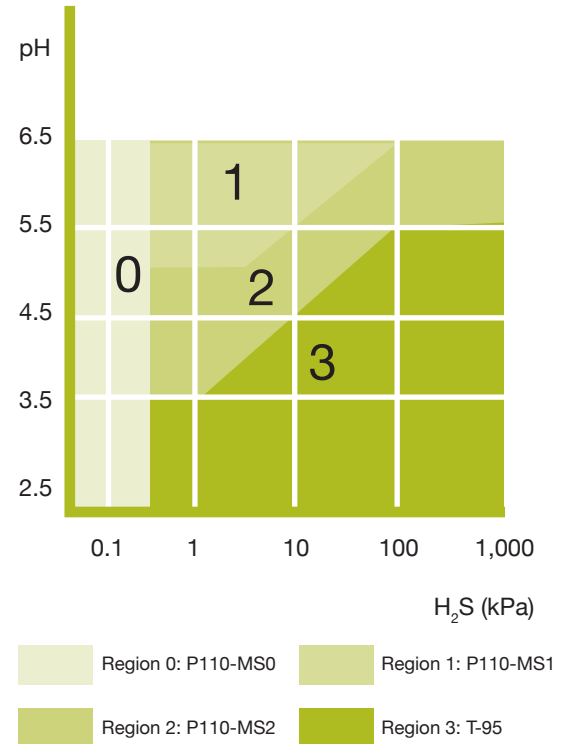
Wells and produced fluids are considered sour if the partial pressure of H₂S exceeds 0.3 kPa (0.05 psi). The severity of the service condition depends not only on the partial pressure of H₂S, but on the pH of the fluid as well. NACE uses these combined conditions to define the regions of environmental severity. The American Petroleum Institute (API) specification 5CT for Casing and Tubing provides guidance for grades of steel suitable for Region 3 conditions, often referred to as NACE grades.

Disclaimer / Note: The SSC test is for quality control purposes only and does not qualify the material for any specific sour service application. It is the product user's responsibility to ensure that the product is suitable for the intended application. (API 5CT Section 5.1)

Global Strength

TMK IPSCO is an industry leader in welded and seamless pipe, premium connections and accessories with a legacy of quality, exceptional customer service and innovation. We offer unparalleled value for our customers through the strength of more than twenty manufacturing facilities strategically located in the key energy-producing areas of the world. Our strength—in product and presence—gives customers a competitive edge, making us the ideal supplier for the oil and gas industry as well as many other industrial markets worldwide.

NACE MR0175 - ISO 15156 Chart with TMK IPSCO Sour Service Chart



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