

STEEL



LIBERTY

# 9CrMo1 UNS K90941

A martensitic steel containing  
9%chromium and 1%Molybdenum

9CrMo1 UNS K90941 is most commonly used in the hardened and tempered condition.

It is often referred to as a stainless steel but the grade does not meet the criteria to be a stainless steel.

Typically used for completion equipment  
and pressure containing members.

MEMBER OF



## Scope

The specification defines the requirements for 9CrMo1 UNS K90941, hot rolled bars hardened and tempered to meet 80ksi minimum yield, 22HRC maximum, in line with NACE MR0175/ISO 15156.

## Steel manufacture

Steel is manufactured via Electric Arc Furnace, followed by Ladle Refining and Vacuum Degassing and is then Ingot Cast.

## Heat treatment

- Furnaces surveyed and calibrated per AMS 2750
- Austenitised and liquid quenched
- Tempered
- Second temper

## General delivery conditions

- Applicable bar diameters: 1-10".
- Surface conditions: As-Rolled/Peeled/Smooth Turned.
- Straightness: 1mm in 500mm, 1/8" in 5'.
- Enhanced straightness may be available on request.
- Tolerance ASTM A29.

## Structure

Grain size will be ASTM 5 or finer.

## Reduction ratio

Reduction ratio will meet 4:1 as a minimum.

## Chemical analysis

C	Si	Mn	P	S	Cr	Mo	Ni	Al
0.09	-	0.30	-	-	8.0	0.90	-	0.015
0.15	1.00	0.60	0.03	0.01	10.0	1.10	0.25	0.050

## Mechanical properties

	165ksi Variant 3-8" (mid radial)	
	Minimum	Maximum
0.2% Proof stress (ksi)	80	95
UTS (ksi)	100	120
% Elongation	20	
% reduction of area	45	
Hardness HRC	18	22
Hardness HBW	217	237
	Average	Min. Single
CVN @ -10°C (J)	50	45
CVN @ Room Temperature	90	

## Machining tolerances

For 'Machining Quality Bar' to ASTM A29 Tolerances the minimum machining allowance should be as follows:

Ordered Surface condition	Minimum stock removal
Peeled/Smooth Turned	1 % per side
Black	1.6 % per side

## API 6A

Each bar length will be 100 % ultrasonically tested per ASTM A388, with acceptance criteria in accordance with API 6A PSL 3&4.

## Technical Support

We have a comprehensive technical support team available to advise on grade selection and product range to achieve the maximum benefit. Customer Technical Support provide specialist advice and help with day-to-day problem solving.

Works based metallurgists and the full resources of our Steel Research and Development Laboratories are available to assist with longer-term developments.

For further information, enquiries or any technical guidance on our range of Oil & Gas products please contact the Commercial Department at the address below.

## LIBERTY SPECIALITY STEELS

7 Fox Valley Way, Stocksbridge,  
Sheffield, S36 2JA, United Kingdom

T: + 44 (0) 114 288 2361  
E: [contactus@specialityuk.com](mailto:contactus@specialityuk.com)

While care has been taken to ensure that the information contained in this publication is accurate, Liberty House Group does not accept responsibility or liability for information which is found to be misleading. ©Copyright 2018 Liberty House Group.  
V1 04/2018.