Schmidt + Clemens Group

Centralloy® H 101

MATERIAL DATA SHEET

Designation: GX13NiCrNb37-25

Data Sheet for information only · September 2009, Rev. 02 · © Copyright Schmidt + Clemens GmbH + Co. KG
Schmidt + Clemens GmbH + Co. KG · Edelstahlwerk Kaiserau · P.O. Box 1140 · 51779 Lindlar, Germany

Contents:

Features

Centralloy® H 101 is an air melted iron-base alloy with low carbon content, consisting essentially of a Fe-Cr-Ni matrix. The composition has been optimised to combine adequate high temperature strength and structural stability.

Due to the balance of niobium and carbon, the cast austenitic iron-chromium-nickel matrix is stengthened by formation of interdendritic $M_{23}C_6$ type carbides with M being mainly chromium and interdendritic precipitation of NbC. With this optimum control of composition relaxation in heavy cross sections during weld fabrication and under thermal shock conditions in service results in superior crack resistance.

In comparison with cast high carbon heat resistant steels the stable austenitic structure of the alloy exhibits excellent tensile and creep ductility values after exposure in the temperature range of 700°C to 1000°C. Also, RT-ductility values are maintained after ageing at these service temperatures.

Product Forms

Centralloy® H 101 was designed as centrispun tube material to meet specific design criteria in terms of creep rupture strength, thermal fatigue resistance, ductility especially after thermal ageing and weldability. It is available as centrispun tubes, vertically spun and statically and investment cast product forms.

Other forms may be supplied upon request. Further information regarding these topics and maximum and minimum sizes may be obtained from the sales department.

Chemical Composition(*)

	mass percentage
Carbon	0.13
Silicon	1.30
Manganese	1.50
Chromium	25.00
Nickel	37.00
Niobium	0.60
Iron	Balance

(*) This is a typical composition which may be slightly modified according to the application.

Applications

Tubular systems requiring superior thermal shock resistance combined with sufficient stress rupture strength, creep resistance and ageing ductility.

Main high temperature applications for the material are:

Process:	max. operating temperature, °C
Steam cracking (transfer lines)	1000
Pyrolysis furnace outlet lines, collectors	1000
Steam reforming (outlet headers)	1000
Styrene, EDC	1000

Physical Properties

Density: 8.0 g/cm³
Thermal conductivity at 20°C: 14.6 W/mK

Mean coefficient of linear thermal expansion, 10^{-6}/K

400°C	16.0
800°C	17.0
1000°C	18.0

Mechanical Properties

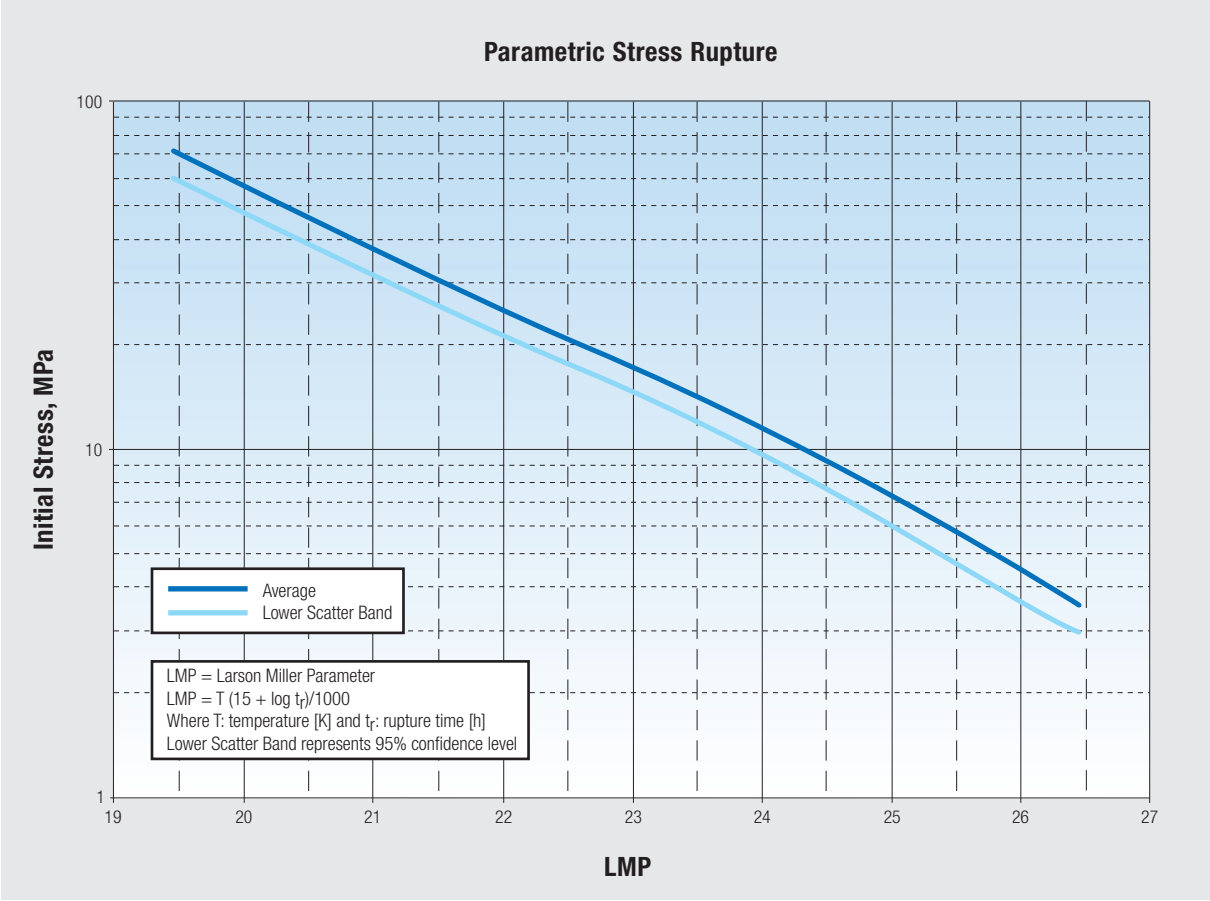
(only for wall thickness less than 25 mm in the as cast conditions)

Tensile properties

Minimum tensile properties at 20°C:

0.2% Yield strength:	210 MPa
Ultimate tensile strength:	490 MPa
Elongation (l = 5d):	20% for centricast tubes 15% for static castings

Parametric Stress Rupture Strength



Manufacturing Characteristics

Machining

In general terms the machinability of Centralloy® H 101 is similar to that of other heat resistant alloys with low carbon content.

Welding

Centralloy® H 101 is welded by SMAW, GTAW, GMAW and PAW processes using matching composition or filler materials. Approved filler materials are bare welding rods and electrodes. Preheating and postweld heat treatment is not required. Service exposed hardware from a temperature range of 750°C to 1000°C indicates that repair weldability remains fair and repairs can be made to high quality standards.

Health and Safety Information

The operation and maintenance of welding equipment should conform to the provisions of relevant national standards for the protection of personnel.

Mechanical ventilation is advisable, and under certain conditions in confined spaces, is necessary during welding operations in order to prevent possible exposure to hazardous fumes, gases, or dust that may occur.

Nickel- and iron-base materials may contain, in varying concentrations, elemental constitutions of chromium, iron, manganese, molybdenum, cobalt, nickel, tungsten and aluminium. Inhalation of metal dust from welding, grinding, melting and dross handling of these alloy systems may cause adverse health effects.

Schmidt + Clemens Group

Spun Casting – Petrochemical Industry

Industries
- Petrochemicals
- Iron-ore direct reduction

Services
- Business consulting
- Analysis of operational data
- Training of customer personnel
- Welding supervision

Germany
Schmidt + Clemens GmbH + Co. KG
Edelstahlwerk Kaiserau
Kaiserau 2, 51789 Lindlar
Phone: +49 2266 920
Fax: +49 2266 92370
E-Mail: info@schmidt-clemens.com

Spain
Schmidt - Clemens Spain S.A.U.
Ctra. Estella-Vitoria, Km. 12
31280 Murieta, Navarra
Phone: +34 948 53 46 00
Fax: +34 948 53 46 01
E-Mail: centracero@schmidt-clemens.com

Brazil
Schmidt + Clemens Brasil Ltda.
Avenida Beta, 351
13213-070, Jundiaí, Sao Paulo
Phone: +55 11 3378 3901
Fax: +55 11 4582 9888
E-Mail: scbrasil@schmidt-clemens.com.br

Malaysia
Schmidt + Clemens (Asia) Sdn. Bhd.
No. 15, Jalan Pemaju U1/15, Section U1
Hicom Glenmarie Industrial Park
40150 Shah Alam, Selangor Darul Ehsan
Phone: +60 3 5569 1945
Fax: +60 3 5569 1425
E-Mail: sc-asia@schmidt-clemens.com

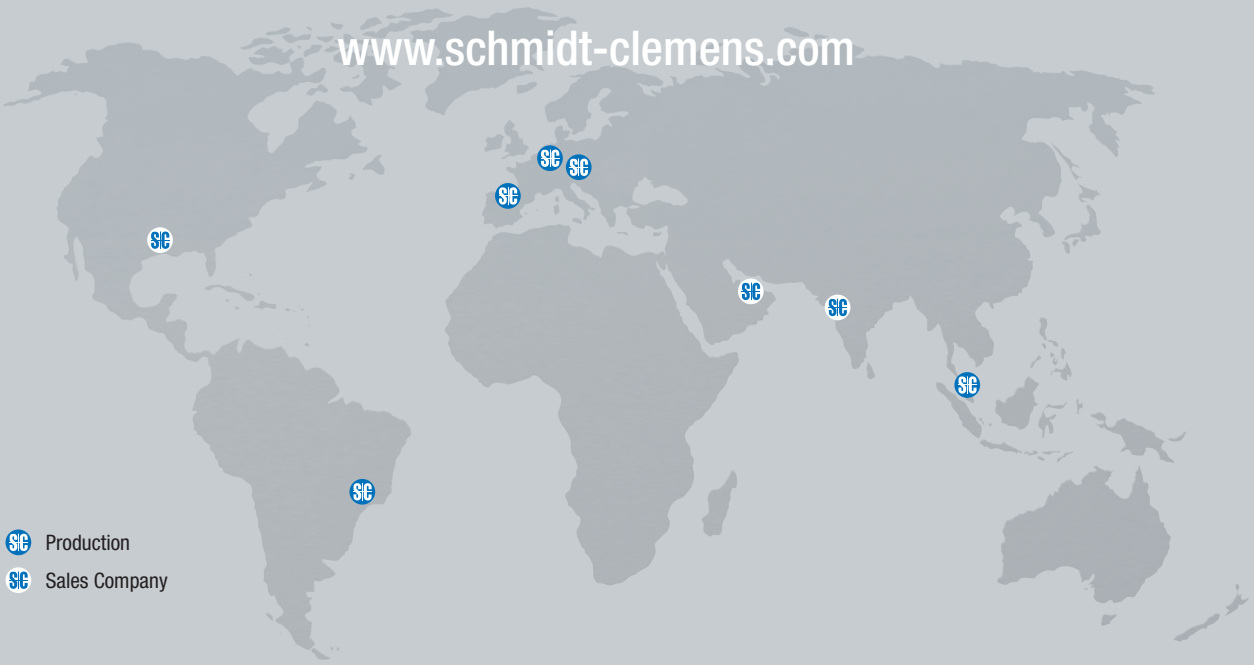
Czech Republic
S+C Alfanametal s.r.o koncern
783 57 Tršice c. 126
Phone: +420 58 59 57 428
Fax: +420 58 59 57 430
E-Mail: alfa@alfanametal.cz

USA
Schmidt & Clemens Inc.
24 Greenway Plaza Suite 1840
Houston, Texas 77046
Phone: +1 713 629 7770
Fax: +1 713 629 7373
E-Mail: sales-us@schmidt-clemens.com

United Arab Emirates
Schmidt + Clemens Middle East DMCC
10 E, 10th Floor, Silver (AG) Tower
Jumeirah Lake Tower, Dubai
Phone: +971 4 4328385
Fax: +971 4 4328384
E-Mail: dubai@schmidt-clemens.com

India
Schmidt + Clemens GmbH + Co. KG
India Liaison Office
A 214 Mahindra Gardens, S.V. Road
Goregaon (W), Mumbai 400 062
Phone: +91 22 8748 445
Fax: +91 22 8791 226
E-Mail: scindia@vsnl.net

www.schmidt-clemens.com



Production
Sales Company