

Centralloy[®] G 4848

MATERIAL DATA SHEET

Designation: **GX40CrNiSi25-20**

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Features

Centralloy® G 4848 is a cast austenitic 25% chromium 20% nickel iron-base alloy. A balanced composition provides excellent structural stability, high stress rupture strength and good resistance to oxidation and carburisation.

The alloy is widely used in structural applications up to 1100°C, where long term creep properties are not a major design criteria.

The alloy offers good resistance to high temperature corrosion in both oxidising and reducing conditions.

Product Forms

Centralloy® G 4848 was designed as centrispun tube material to match specific design criteria in terms of creep rupture strength and weldability. It is available as centrispun tubes, vertically spun, statically cast and investment cast product forms. Other forms may be supplied upon request. Additional information regarding these topics and maximum and minimum sizes may be obtained from the sales department.

Chemical Composition*

	mass percentage
Carbon	0.40
Silicon	1.50
Manganese	1.50
Chromium	25.00
Nickel	20.00
Iron	Balance

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

Applications

Typical uses are for general heat resistant applications in industrial furnaces, petrochemical/chemical industries and for iron ore direct reduction processes, i. e. tubular products, castings, furnace rollers, rails, retorts etc. No heat treatment is required for most applications of this grade. Main high temperature applications for the material are:

Process	max. operating temperature, °C
Steam cracking	1000
Steam reforming	1000
Furnace support components	1100

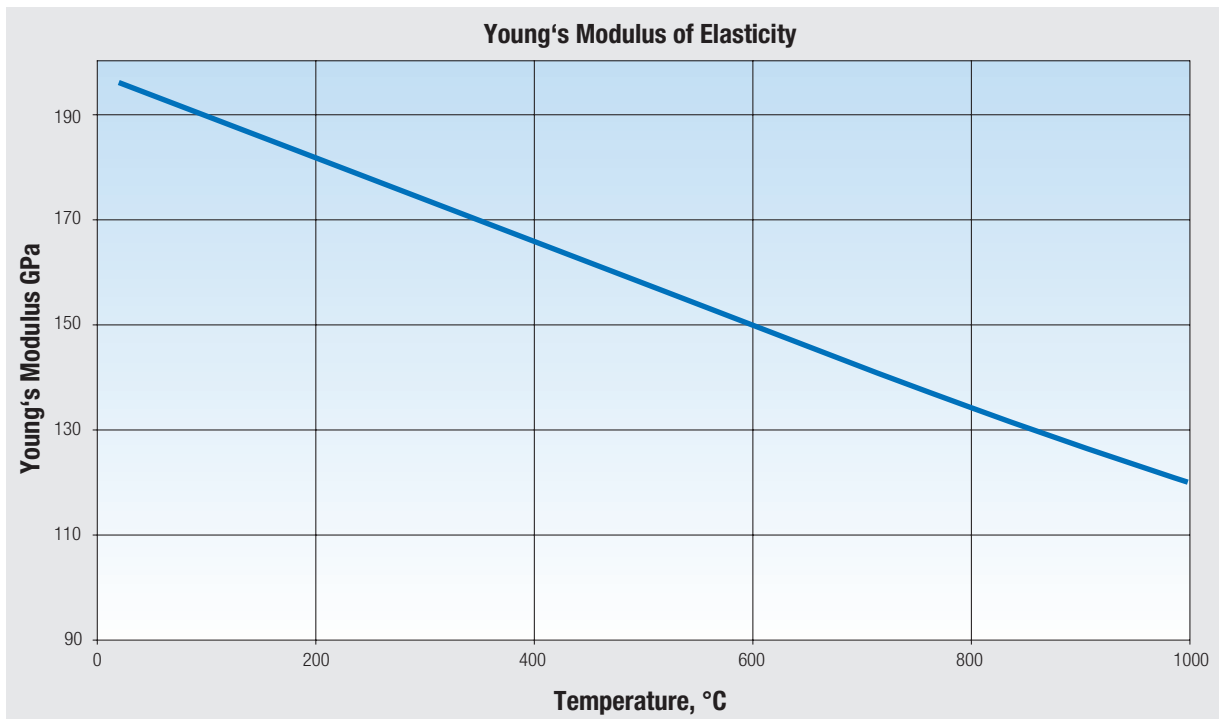
Physical Properties

Density at 20°C: 7.9 g/cm³

Typical physical properties

δ , °C	α , 10 ⁻⁶ /K	λ , W/mK	c_p , J/kg K	a , 10 ⁻⁶ m ² /s
20	16.1	11.9	472	3.3
100	16.7	13.3	487	3.4
200	17.2	15.1	503	3.7
300	17.7	16.7	512	4.1
400	18.1	18.3	520	4.3
500	18.4	19.8	530	4.5
600	18.8	21.3	541	4.7
700	19.1	22.8	551	5.0
800	19.4	24.3	559	5.4
900	19.7	25.7	565	5.7
1000	20.0	27.1	571	5.8

- δ : Temperature
- α : Mean coefficient of linear thermal expansion
- λ : Thermal conductivity
- c_p : Mean specific heat
- a : Thermal diffusivity

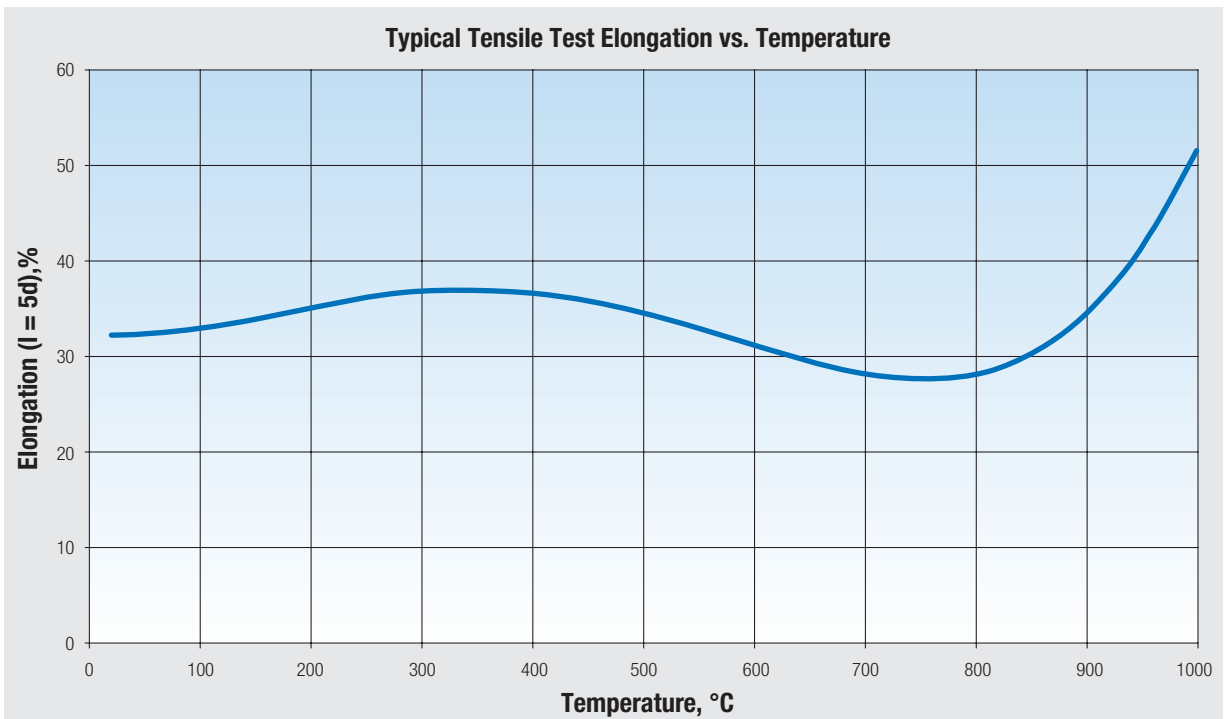
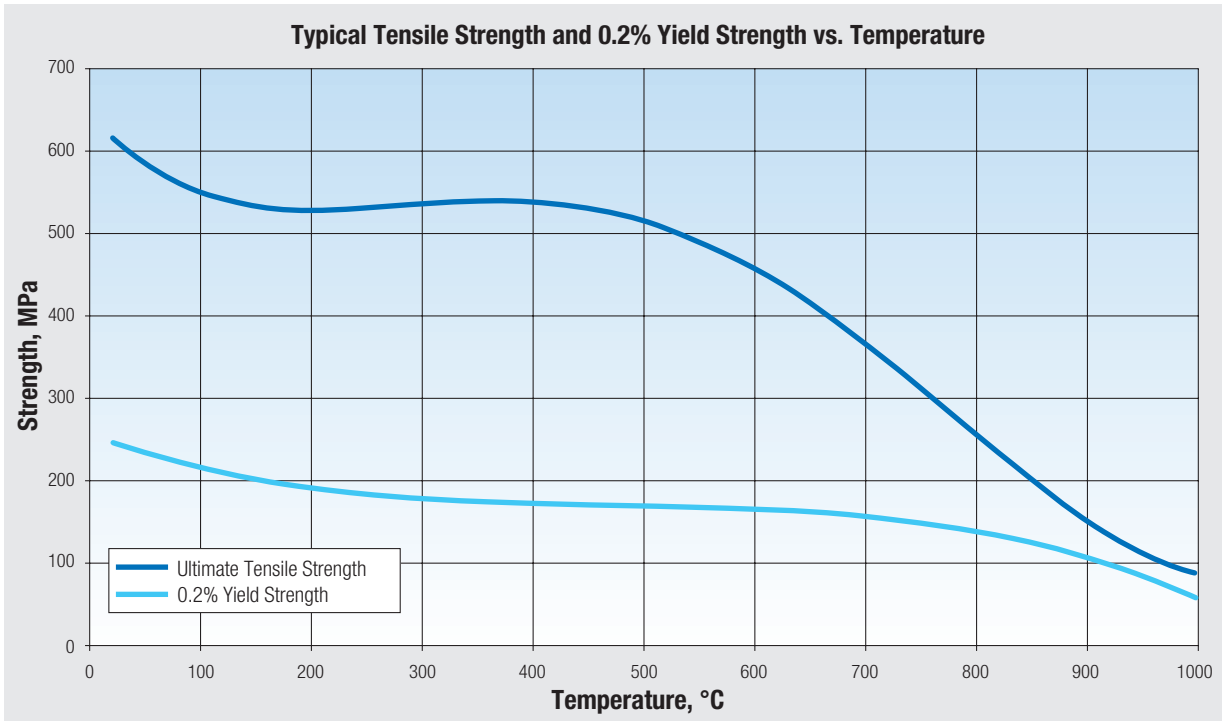


Mechanical Properties

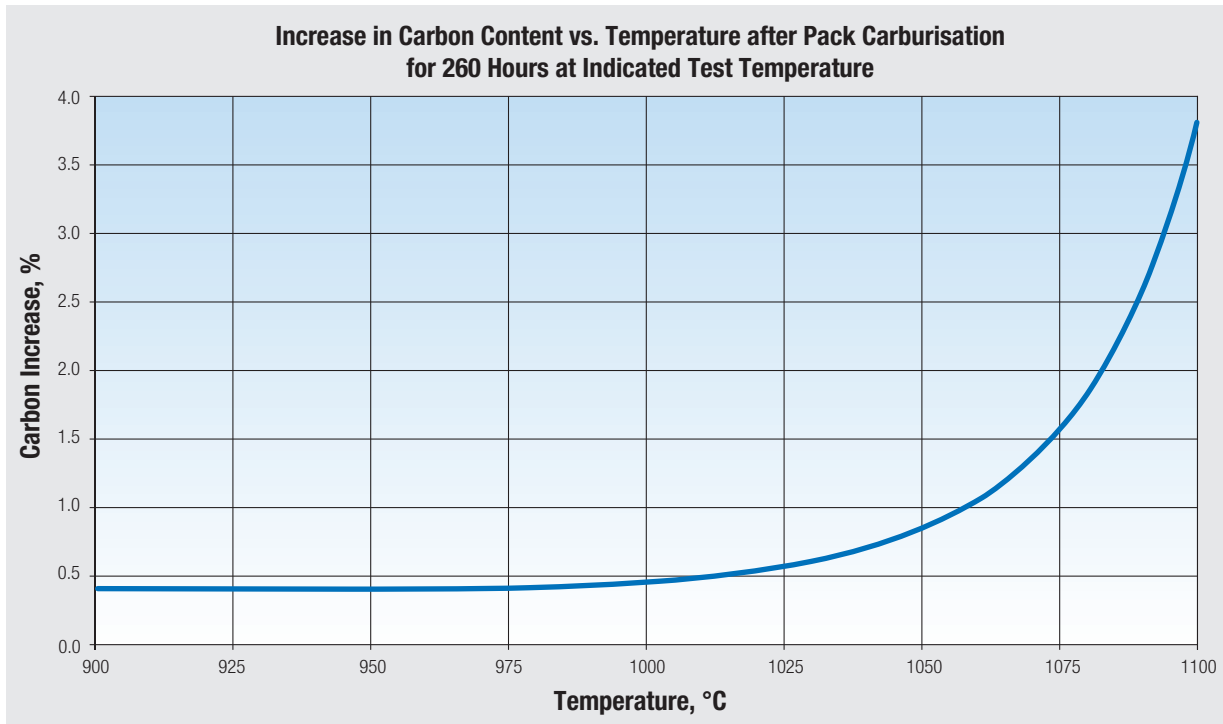
(only for wall thickness less than 25 mm, in the as cast condition)

Tensile properties

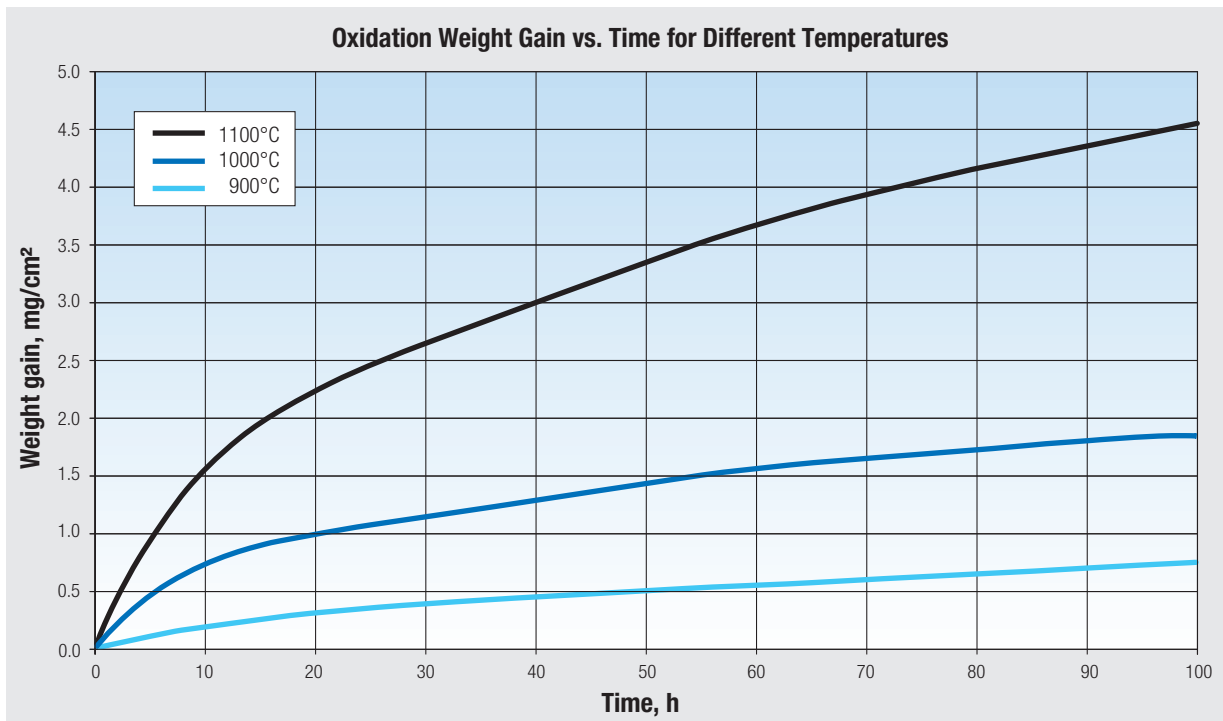
Minimum tensile properties at 20°C:	0.2% Yield strength:	240 MPa
	Ultimate tensile strength:	450 MPa
	Elongation, (l = 5d):	10.0% for centricast tubes 10.0% for static castings



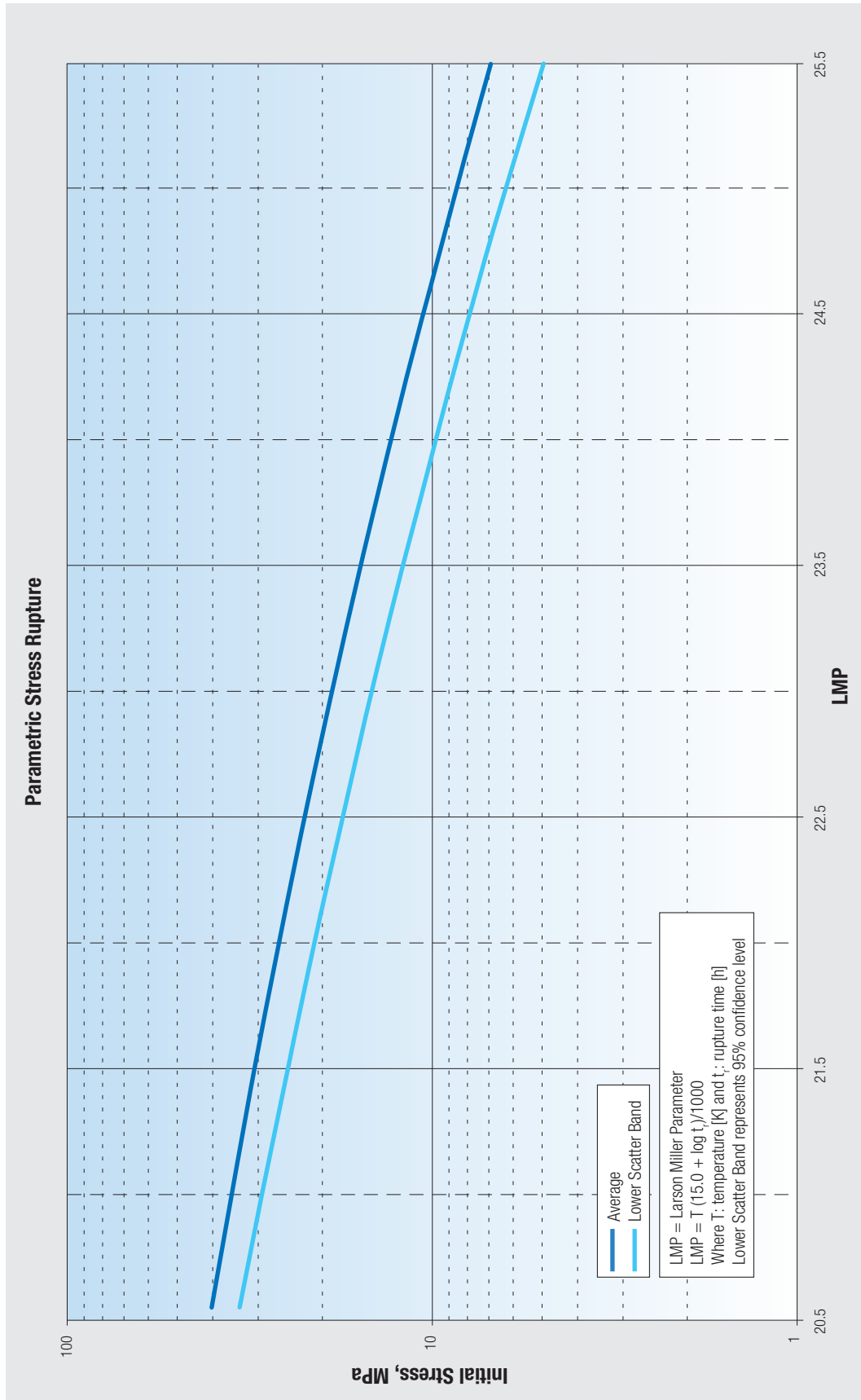
Carburisation Resistance



Oxidation Resistance



Parametric Stress Rupture Strength



Manufacturing Characteristics

Machining

In general terms the machinability of Centralloy® G 4848 is similar to that of other heat resistant alloys.

Welding

Centralloy® G 4848 can be welded by most conventional methods including gas tungsten arc (GTAW), plasma arc (PAW) and manual shielded metal arc welding (SMAW) processes.

Approved filler materials are bare welding rods and electrodes. Preheating and postweld heat treatment of the joint is not necessary. Further information will be supplied upon request.

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, it is necessary during welding operations to prevent possible exposure to hazardous fumes, gases or dust that may occur.

Nickel- and iron-base materials may contain, in varying concentrations, the elements 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.

The information in this publication is as complete and accurate as possible at the time of publication. Variations in properties can occur to production and process routes. However, no warranty or any legal liability for its accuracy, completeness and results to be obtained for any particular use of the information herein contained is given. Where possible the test conditions are fully described. Where reference, is made to the balance of the alloy's composition it is not guaranteed that this balance is composed exclusively of the element mentioned, but that it predominates and others are present only in minimal quantities. The creep rupture data are frequently insufficient to be directly translatable to specific design or performance applications without examination and verification of their applicability and suitability by professionally qualified personnel. The primary units for property data are based on those of the SI-system.

Spun Casting – Petrochemical Industry

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

Industries

- Petrochemicals
- Iron-ore direct reduction

Services

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

Czech Republic

S+C Alfanametal s.r.o concern

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

