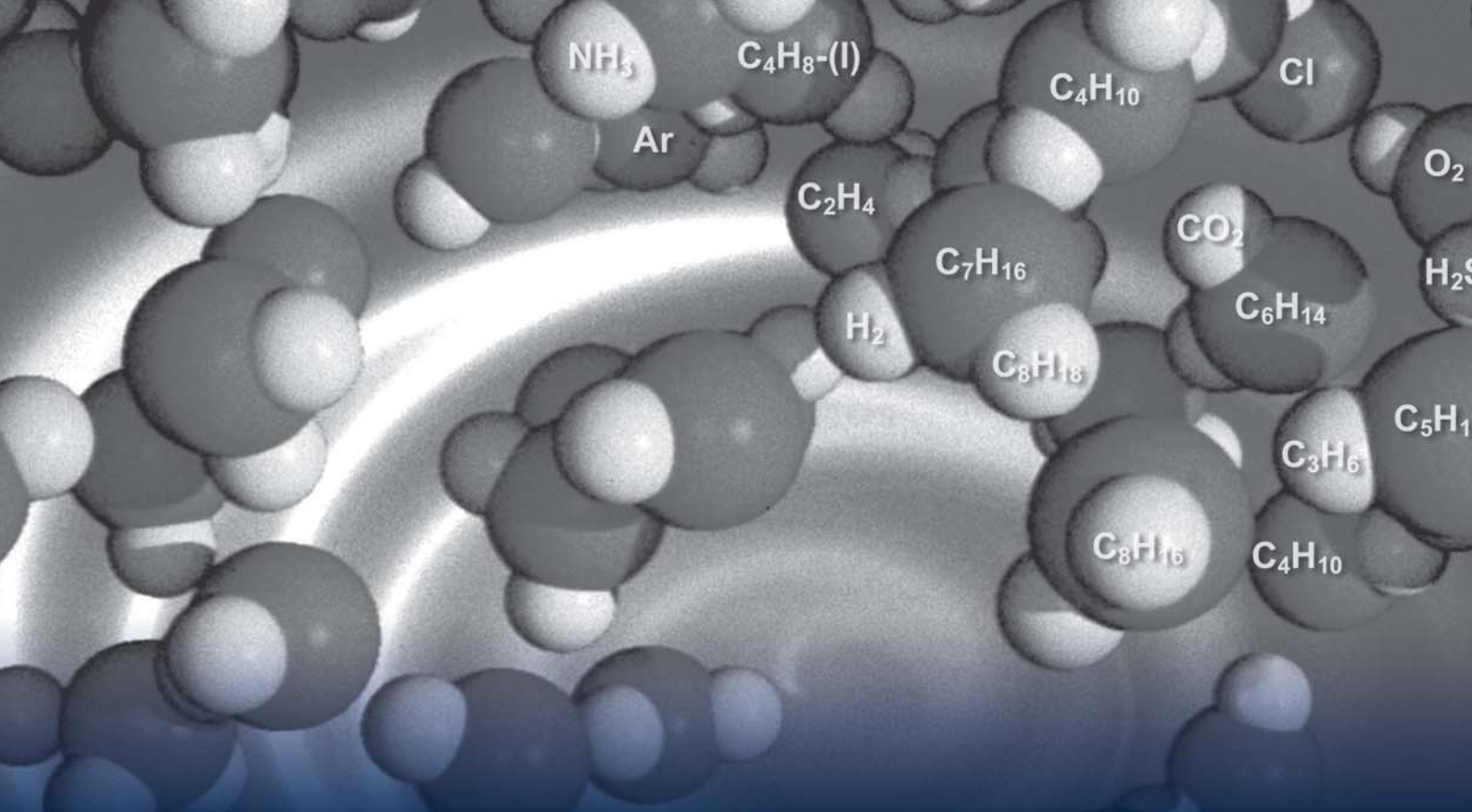




**NEUMAN & ESSER**  
**PROCESS GAS COMPRESSORS**



## WELL-FOUNDED AND GLOBAL

The experience of NEUMAN & ESSER in designing and constructing reciprocating compressors is just as profound, far-reaching and extensive as the years of operation of the enterprise itself since its foundation in the year 1830.

The whole "life cycle" of a process gas compressor is supervised by NEUMAN & ESSER GROUP, from the first "stroke of the pen" to the start-up commissioning and through its whole operating period. A typical life time of a NEA compressor comprises the following stages: analysis ■ solution proposal ■ design and engineering ■ manufacturing ■ testing ■ installation ■ commissioning and start-up ■ maintenance, and upon request, adjustment to modified process parameters.

The individual steps of the process are supported by digital simulations and are put into effect by means of adjusted IT solutions. Diagnostic and monitoring systems record and analyze the technical data during the operating period. Notwithstanding the number of techniques used, great importance is attached to the personal experience of the NEA engineers, which often is based on decades of practice and is decisive for the longevity of a compressor.

Clients of the chemical and petrochemical industry confirm that longevity is the key feature of a NEA compressor, built to API 618 or ISO 8012 standards. This not only applies to the lubricated design, but also to the dry-running one. For over 70 years, the NEA compressor has had a leading role as a highly developed dry-running unit. The technology and strategy of the enterprise were adjusted to market demands requiring absolutely oil-free compression.

When leaving the workshop, the uniquely constructed NEA compressor is provided with a quality certificate. If requested by the client, the bare compressor can be completed as a packaged unit by one of the international NEA sales and engineering companies. This global engineering net, having special knowledge and experience in flexible order handling, guarantees the operating admission of the compressor plant, taking into consideration the legal and regulatory standards of each country. The world-wide presence of service centers warrants a high reliability and economic efficiency of each unit with its tailor-made service packages.



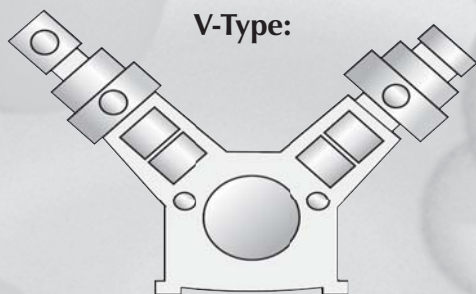
# Experience



# THE NEA PORTFOLIO

frame size	-	25	40	V1	30	63	130	190	300	320	500	320 hs	<b>Key to type designation:</b> <b>4 SVL 190</b> 4-stage, lube 4-crank horiz. reciprocating compressor size 190  4 — number of stages 1-8 S — S = lube T — T = non lube  V — number of cranks 1-8 (E-Z-D-V-S-A)  L — S = vertical L = horizontal V = V-type  190 — frame size
cylinder lubrication	-	S,T	S,T	S,T	S,T	S,T	S,T	S,T	S,T	S,T	S,T	S,T	
max. stroke	mm inches	150 5.9	100 3.9	120 4.7	110 4.3	150 5.9	200 7.8	230 9.0	270 10.6	400 15.7	500 19.6	175 6.8	
construction type	-	S	S	V	SL	SLV	SLV	SL	SL	SL	L	L	
max. power*	kW hp	80 100	300 400	550 750	570 800	1600 2200	3100 4200	4400 6000	6600 9000	8600 11700	30000 40000	10500 14300	

\* average values



V-Type:

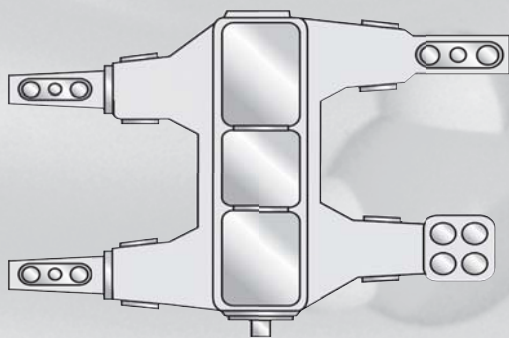
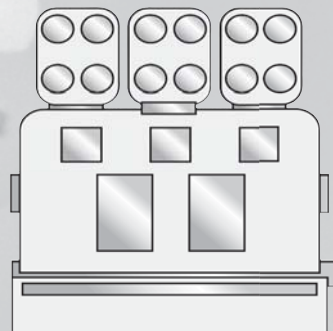
- balanced mass forces 1<sup>st</sup> order
- horizontal mass forces only 2<sup>nd</sup> order
- less space required
- low foundation loads
- oil-free or lubricated design

number of cranks: 1, 2  
 number of stages: 1 to 4  
 discharge pressures: max. 6,000 psi  
 power range: max. 2,000 hp  
 flow rates: max. 400 scfm

## Vertical Type:

- most suitable for dry-running operation because of minor wear of the guide elements only
- appropriate for labyrinth compression for more precise guidance of piston and piston rod
- oil-free or lubricated design

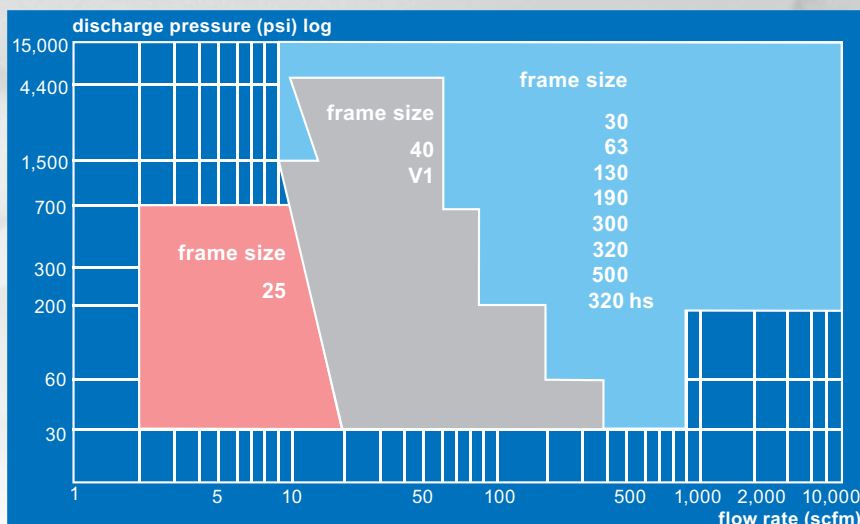
number of cranks: 1 to 4  
 number of stages: 1 to 8  
 discharge pressures: max. 15,000 psi  
 power range: max. 11,700 hp  
 flow rates: max. 5,000 scfm



## Horizontal Type:

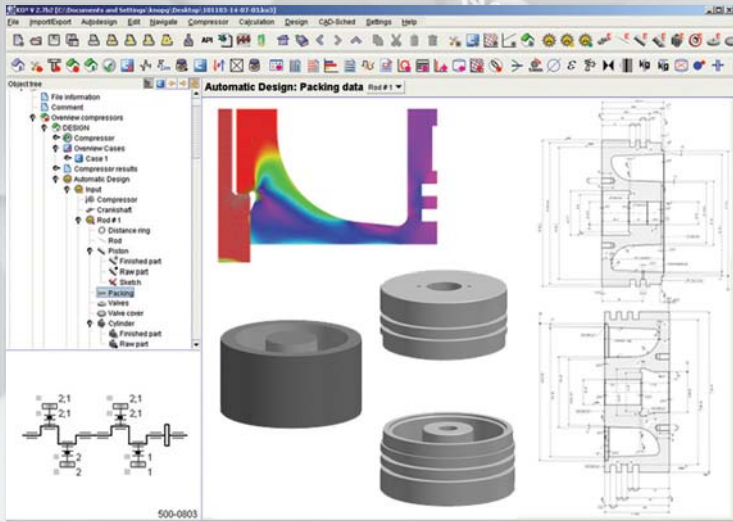
- balanced mass forces
- excellent quietness in running
- low foundation loads
- short maintenance time due to very good accessibility
- oil-free or lubricated design

number of cranks: 2, 4, 6, 8  
 number of stages: 1 to 8  
 discharge pressures: max. 15,000 psi  
 power range: max. 40,000 hp  
 flow rates: max. 10,000 scfm  
 max. 100,000 Nm<sup>3</sup>/h



Models

# SIMULATIONS FOR LONG-LIFE OPERATION



## KO<sup>3</sup> - Compressor Software

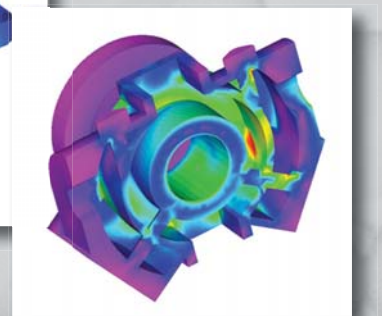
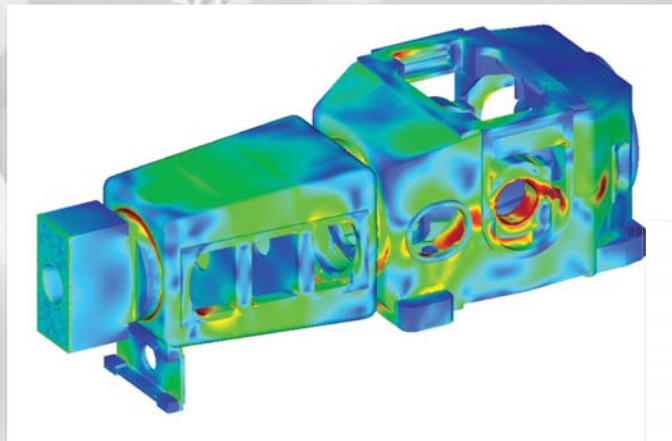
**Task:** General compressor calculation and design platform

- Benefits:**
- thermodynamics
  - load calculation
  - Panhandle Diagram
  - part strength utilization
  - sophisticated crankshaft and X-head bearing simulation
  - arrangement editor
  - control selection
  - automatic design of compressor parts
  - pulsation study
  - drive train simulation

## Finite Element Analysis of Standard Compressor Parts

**Task:** Determining stress and deformation of driving mechanism parts

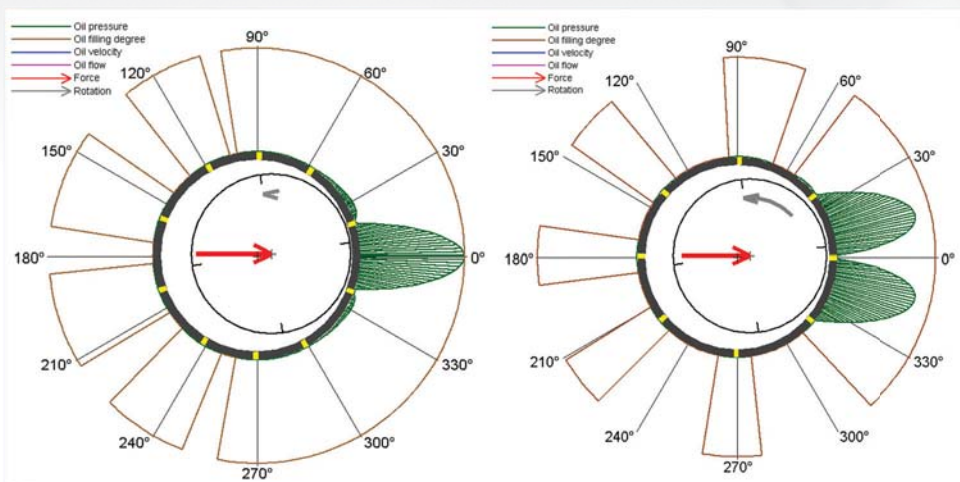
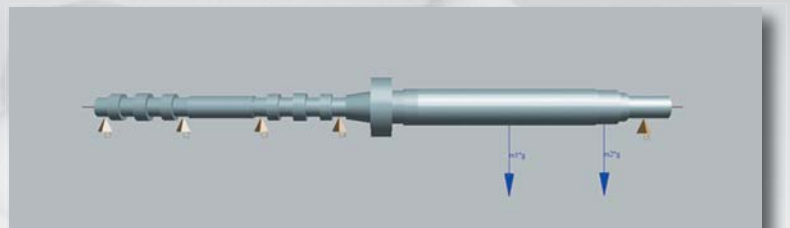
- Benefits:**
- Highest utilization of strength
  - Minimum residual risk of component failure
  - Minimum oscillating masses
  - Higher speeds possible
  - Higher load rating of the driving mechanism



## Analysis of the Drive Train's Torsional and Bending Vibrations

**Task:** Optimizing coupling and flywheel size

- Benefits:**
- Small fluctuations of the motor current
  - Longest possible lifetime of motor windings
  - Higher lifetimes for couplings
  - Minimized risk of resonant vibrations



## Journal Orbit of Plain Bearings

**Task:** Determining the smallest lubrication film thickness, maximum oil pressure and friction power

**Benefit:** Minimizing the danger of plain bearing damage

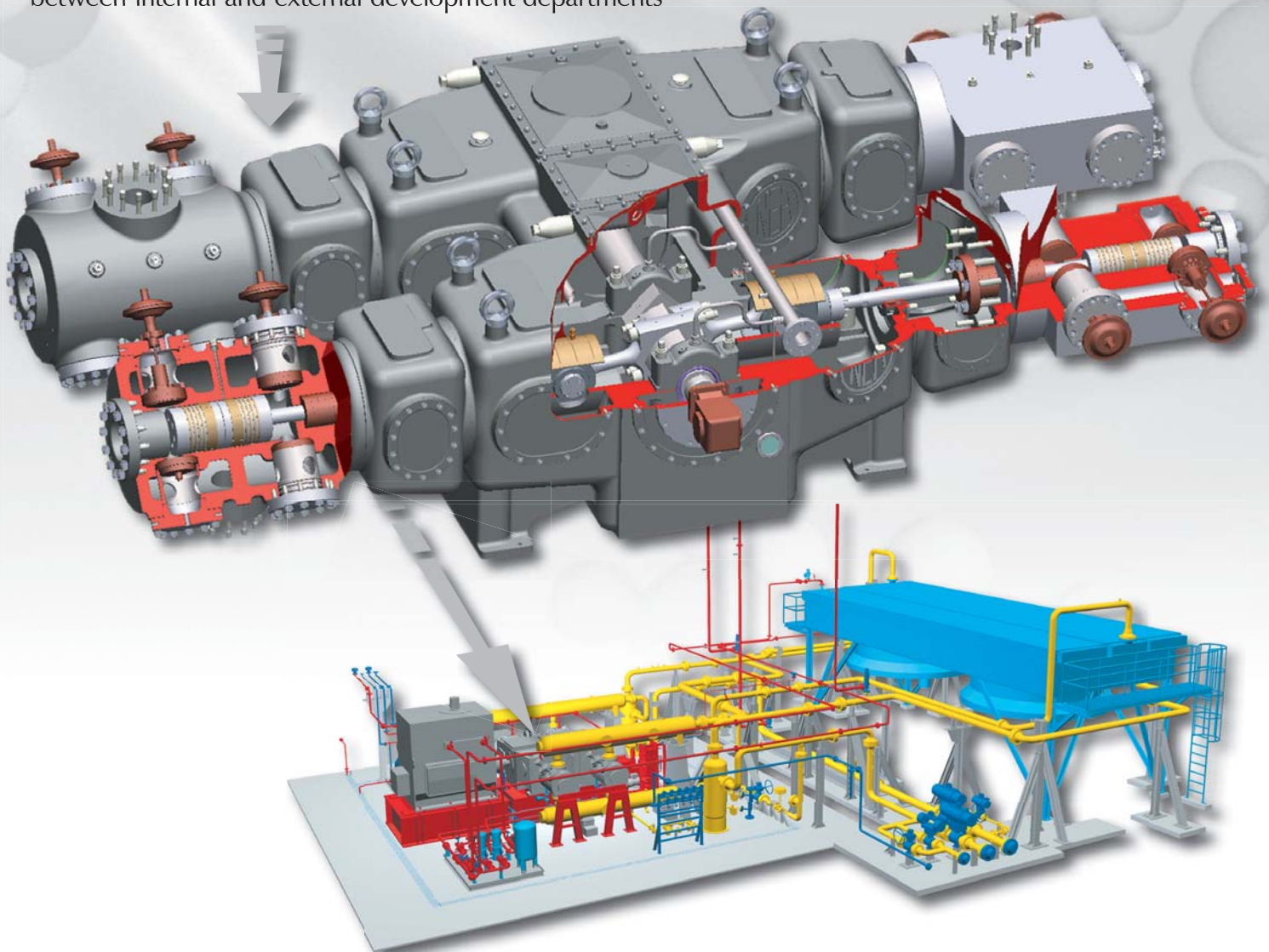
# TOTAL PROJECT ENGINEERING

## Compressor Design and Optimization

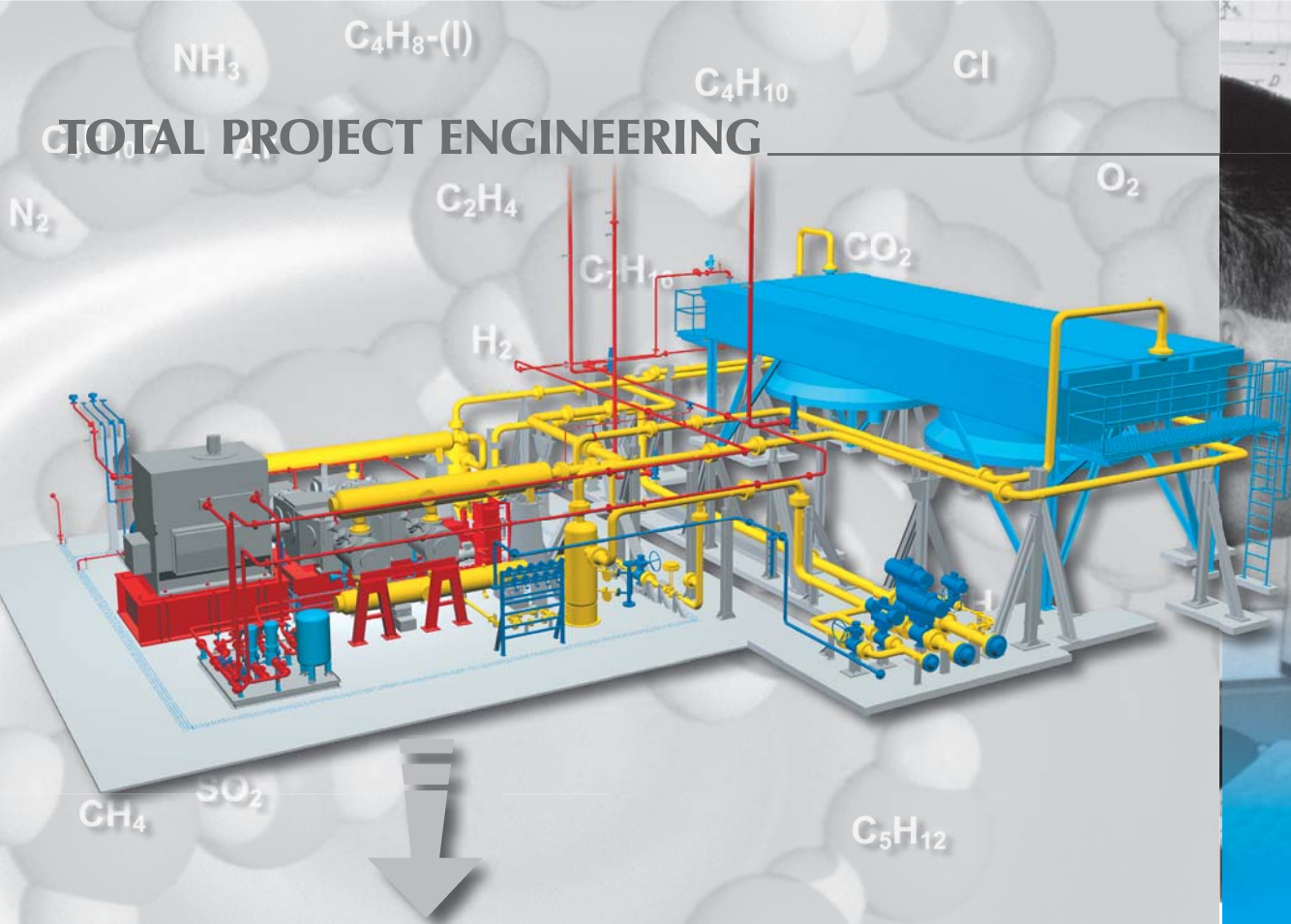
- Determining the process parameters under various operating conditions for reciprocating compressors up to 8 stages and 8 cranks of any configuration and gas analysis
- Automatic examination as to the adherence to international standards (API 618, Pneurop, ISO 8012) and NEA's parameters
- Transferring interface data to the customer's engineering (among others utilities consumption, performance data, foundation loads, nominal width of piping, and flange ratings)
- Load tests of all driving mechanisms
- Delivering flow rate and performance diagrams (Panhandle)
- Designing pulsation dampers and defining residual pulsations in advance

## 3D Volume Modelling of Reciprocating Compressors

- Transparent management of parts and construction groups
- Comprehensive and flexible modelling functions for customer specific constructions of variants
- Rapid and faultless configuration of new orders by adhering to the relationships between parts and construction groups
- Deducing 2D drawings according to DIN and ISO standards with guaranteed correct reproduction of model changes in the drawings
- Optimized flow of information and transparent cooperation between internal and external development departments



# TOTAL PROJECT ENGINEERING



## Multi-dimensional System Planning and Visualization

- Dimensioning catalogues for piping parts in accordance with DIN and ANSI in a relational database
- Simple generating of customer specifications
- Any views and sectional presentations of piping plans and general arrangement plans
- Simple and quick preparation of flow sheets
- Preparing the 3D plant model on the basis of the R&I diagram
- Collision check with regard to the correct installation of pipes and other components
- Fully automatic extraction of isometrics and part lists
- Automatic dimensioning by indicating the item numbers
- Marking and summarizing weld seams of the piping system
- Studies to ensure optimal maintenance and operation of the plant
- Simultaneous access of several work stations to a central plant model

## Plant System Load Simulations

- Defining torsional and bending stresses as well as stiffness of pipes and fittings by taking into account load cases occurring during operation such as thermal stresses or stresses due to dead weight and pressure
- Dynamic calculation of piping and vessel systems
- Comparison of superimposed stresses with admissible values in accordance with ANSI B 31.3
- Presenting thermal piping displacements

## Vendor Data Book

- Assembly, operation and maintenance manuals for reciprocating compressors and plant periphery incl. detail drawings and instructions
- Inspection certificates of all components that require official approval
- 3D piping and general arrangement plans, foundation design data, R&I diagrams
- Protocol of release procedure for the start-up commissioning, incl. experts' inspections



Engineering



## Holdings

NEUMAN & ESSER Verwaltungs- und Beteiligungsgesellschaft mbH  
Übach-Palenberg, Germany

NEUMAN & ESSER Investments, Inc.  
Wilmington, Delaware, USA

NEUMAN & ESSER Investments Asia Ltd.  
Hong Kong, China

## Sales and Engineering

NEUMAN & ESSER América do Sul Ltda.  
Belo Horizonte, Brazil

NEUMAN & ESSER (Beijing) Co., Ltd.  
Beijing, China

NEUMAN & ESSER Compressor Application Centre Pvt. Ltd.  
Pune, India

NEUMAN & ESSER Deutschland GmbH & Co. KG  
Übach-Palenberg, Germany

NEUMAN & ESSER Egypt Ltd.  
Cairo, Egypt

NEUMAN & ESSER Eng. (India) Pvt. Ltd.  
Pune, India

NEUMAN & ESSER GmbH Mahl- und Sichtsysteme  
Übach-Palenberg, Germany

NEUMAN & ESSER Gulf FZE  
Dubai, UAE

NEUMAN & ESSER Italia S.r.l.  
Milan, Italy

NEUMAN & ESSER Rus Ltd.  
Moscow, Russia

NEUMAN & ESSER South East Asia Ltd.  
Rayong, Thailand

NEUMAN & ESSER USA, Inc.  
Katy, Texas, USA

## Machine Factories

NEUMAN & ESSER GmbH & Co. KG Maschinenfabrik  
Übach-Palenberg, Germany

NEUMAN & ESSER Maschinenfabrik Wurzen GmbH  
Wurzen, Germany

STASSKOL Kolbenstangendichtungen GmbH  
Stassfurt, Germany

## Service Centers

NEAC Compressor Service GmbH & Co. KG  
Übach-Palenberg, Germany

NEAC Compressor Service Ltda  
Belo Horizonte, Brazil

NEAC Compressor Service USA, Inc.  
Katy, Texas, USA

NEAC Italia S.r.l.  
Milan, Italy

## Website

[www.neuman-esser.com](http://www.neuman-esser.com)  
[www.neacusa.com](http://www.neacusa.com)  
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