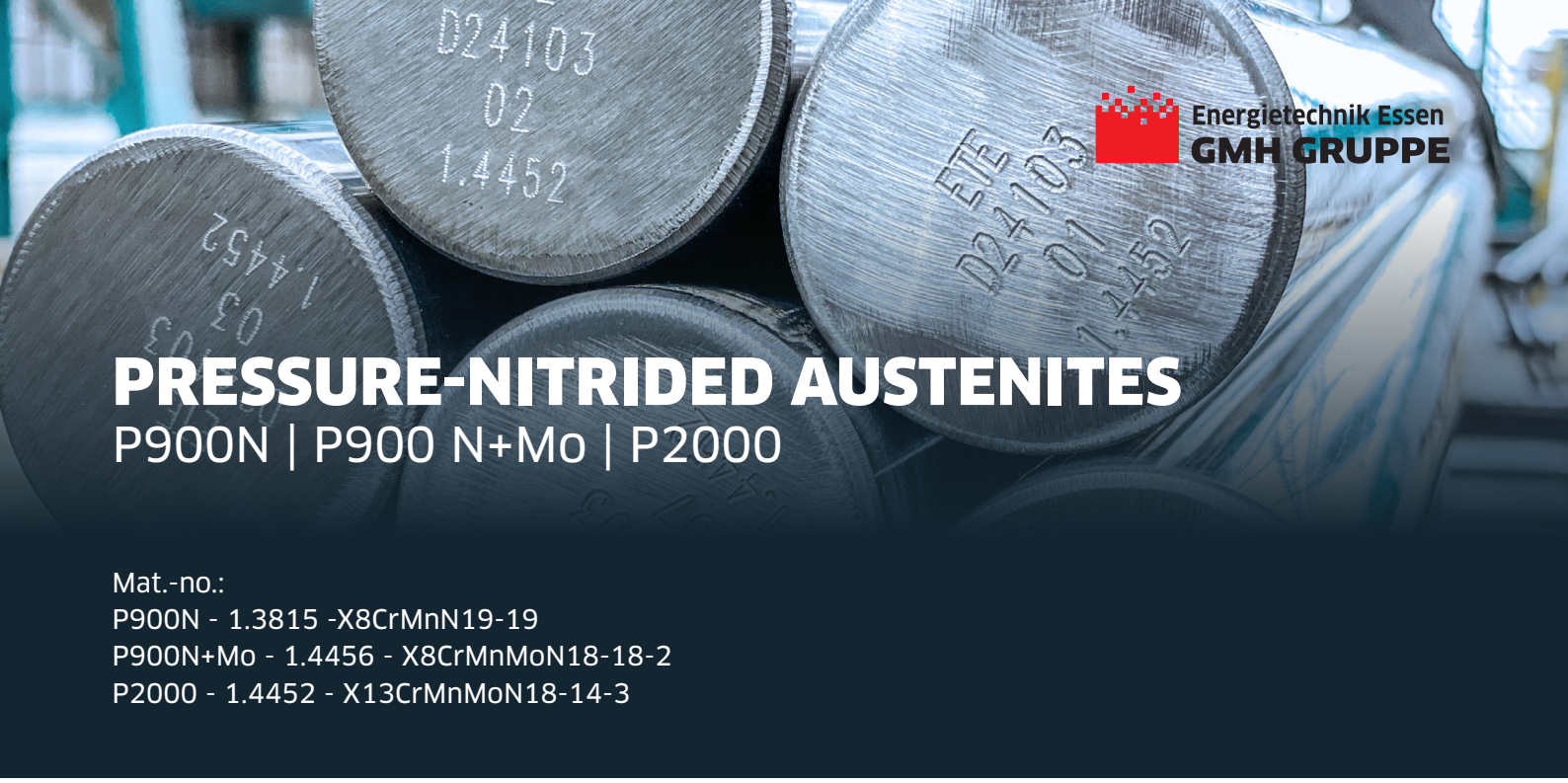


PRESSURE-NITRIDED AUSTENITES

P900N | P900 N+Mo | P2000

Mat.-no.:
P900N - 1.3815 -X8CrMnN19-19
P900N+Mo - 1.4456 - X8CrMnMoN18-18-2
P2000 - 1.4452 - X13CrMnMoN18-14-3

Pressure-nitrogen-alloyed austenites exhibit outstanding corrosion resistance and exceptional toughness while achieving tensile strengths (Rm) exceeding 2000 MPa. The addition of nitrogen beyond its solubility limit using the PESR process (Pressure Electro-Slag Remelting) is what makes these steels unique. Nitrogen stabilizes the austenitic structure, increases strength—particularly in austenitic steels—without reducing toughness, and improves corrosion resistance. In combination with advanced forging and cold-forming techniques, a high degree of purity with a fine and homogeneous microstructure is achieved.

Upon request, delivery in a cold-worked condition is possible, enabling direct final machining. The high final strength, combined with the purity level achieved through the DESU process, results in excellent polishing characteristics with high resistance to mechanical damage such as scratches or concentrated point loads. High-nitrogen austenites therefore represent the ideal solution for highly corrosion-exposed components in chemical, food and pharmaceutical plant engineering, where conventional austenites often cannot be used due to their typically lower strength levels.

Key Advantages:
- Exceptional corrosion resistance
- High yield strength and high tensile strength
- High elongation
- Low magnetic permeability
- Biocompatibility

MAIN APPLICATION AREAS

Energy and power engineering, pump impellers, spindles, conveying and dosing units in chemical and pharmaceutical processing, fastening technology (e.g., bolts, screws), offshore and marine applications, engine technology, instruments used in medical engineering, jewellery and watch components.

Properties: (1 = low – 10 = excellent)

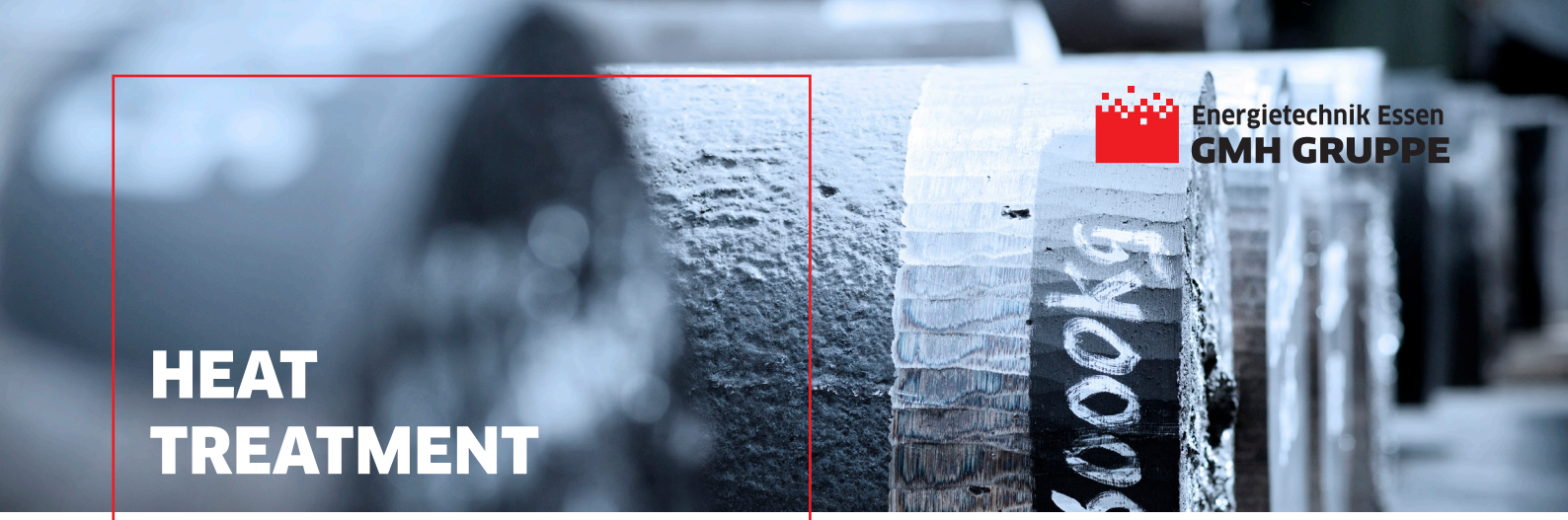
▪ Weldability	2
▪ Machinability	7
▪ Wear resistance	8
▪ Corrosion resistance	9
▪ Toughness	9
▪ Polishability	10

Chemical Analysis (in wt.%):

1.3815 X8CrMnN19-19	C	Si	Mn	Cr	Mo	N
min.	-		17.0	17.0	-	0.70
max.	0.10		20.0	20.0	-	1.00

1.4456 X8CrMnMoN18-18-2	C	Si	Mn	Cr	Mo	N
min.	-		17.0	16.0	1.80	0.80
max.	0.10	1.00	20.0	19.0	2.50	1.00

1.4452 X13CrMnMoN18-14-3	C	Si	Mn	Cr	Mo	Ni	N
min.	-	-	12.0	16.0	2.50	-	0.75
max.	0.15	1.00	16.0	20.0	4.20	0.30	1.00



HEAT TREATMENT

Solution Annealing
Nitrogen-alloyed austenites must be heated uniformly (according to the table). The holding time after complete through-heating is approx. 30 minutes. Subsequent cooling must be performed by water quenching. The base strength achieved after quenching is > 900 MPa.

Stress Relief Annealing
These austenites are supplied in the required final strength. If necessary, stress relief annealing can be carried out at temperatures up to approx. 400 °C.

Work Hardening
Austenites are brought to their required final strength through cold working. Depending on the degree of deformation, tensile strengths (Rm) of over 2000 MPa can be achieved. Due to the substantial work-hardening potential, the forming parameters must be evaluated in advance regarding technical feasibility.

Temperature Resistance
Since austenites obtain their final strength through cold forming, prolonged exposure to elevated temperatures has a negative effect on strength. At temperatures below 100 °C, no loss of strength is expected.

Low-Temperature Performance
Due to the exceptional alloy design with a high nitrogen content, these materials exhibit superior toughness even at very low temperatures. The transition temperatures (FATT) for this material group are approx. –100 °C.

Mechanical Properties (solution-annealed):

	P900N	P900N+Mo	P2000
Yield Strength [MPa]	>550	>600	>600
Tensile Strength [MPa]	>900	>900	>900
Elongation at Break [%]	>48	>50	>50
Impact Energy [J]	>350	>350	>350

Solution Annealing Temperatures:

P900 N	1050 – 1100°C
P900N+Mo	1100 – 1140°C
P2000	1120 – 1150°C

Product Portfolio:

	Bars	Sheets	Blank Thickness	Wire Rod
min (mm)	10	on request	30	5,5
max. (mm)	80		100	20

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