LINE & PROCESS PIPES

For a safe and reliable flow of energy
GLOBALIZING
to be close to our customers worldwide

DIVERSIFYING
our product portfolio to ensure economic stability and continuous development

SIMPLIFYING
our customers’ processes and enabling them to perform better

TEAMING UP
to bring together the strengths of more than 2,000 employees striving for better solutions
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AT HOME IN THE WORLD OF ENERGY
Integral solutions for the processing and pipeline industry

Progress originates from the willingness to think holistically and face challenges with vision and innovation: **unique projects need unique solutions.** Be it the intense temperatures in downstream process plants and power plants, the high pressures in the deep sea, the high level of corrosion in sour gas fields or the icy conditions of the Arctic and LNG/LPG facilities: being a leading specialist in the production of large diameter steel pipes, we offer integral solutions satisfying the needs of our customers along the entire energy supply chain.
In the past, when predominantly sweet oil and gas reserves were tapped, standard carbon steel pipes were the preferred choice. With growing energy demands, sour reserves, especially natural gas wells, are developed more and more. For these severe conditions, EEW offers LSAW pipes made from sour service steel grades with improved resistance to Sulphide Stress Corrosion (SSC) and Hydrogen Induced Cracking (HIC).

Another challenge in the transportation of oil and gas is “high pressure”. It can be induced from the inside by operating pressure or from the outside by water pressure in subsea environments. EEW responds to these requirements by supplying LSAW pipes made from high strength steels up to API 5L Grade X120. In other cases where pressure is not the challenge, high strength steels can be an economic incentive as wall thicknesses can be reduced.

>100,000 MT heavy wall conductor pipes were produced by EEW in the recent years (common dimensions: 36” O.D. with 1.5”/2” W.T., 22” O.D., with 1”/1.5” W.T.)
Tetney Sealine Replacement

Customer: ConocoPhillips
Destination: UK
Material: API 5L Grade X60MS
Dimensions: 914.4 mm O.D.
20.6 mm W.T.
Tonnage: 2,300
Coating: concrete weight coating

Carbon Steel inc. Sour Service

following various NACE standards (e.g. NACE TM0284, NACE TM0177 incl. HIC/SSC)
Clad pipe fabrication programme

EEW clad pipes are manufactured from metallurgically roll-bonded and explosion bonded plates. The metallurgical bonding assures the integrity of the clad material throughout the fabrication process up to welding and installation of pipes. In general, the fabrication of clad pipes follows the well-established EEW production routes. The standard dimensional production range with O.D. starting at 406.4 mm (16") and lengths up to 13,200 mm (43 ft) can be applied.

Material combinations

A wide range of carbon steel grades are available for the backing material e.g.:
- API 5L
- ASTM A 516

CRA layer
- 304L
- 316L
- 317L
- Alloy 904L
- Alloy 825
- Alloy 625
- C276

Other material combinations are available upon customer request.

CLAD PIPES

Long life span and excellent cost-efficiency

Environmental conditions, increased safety requirements and project cost pressure have changed the dynamics and demands of the pipeline industry. Clad materials combine the corrosive and/or wear resistance properties of corrosion resistant alloys respectively high-alloyed materials with the high strength and toughness of carbonmanganese steels. This results in potential reductions of the total wall thicknesses as well as in minimized need for CRA material both leading to significant cost savings.

Although the initial costs of clad pipes are significantly higher than carbon steel pipes, clad materials are becoming more and more economically interesting. As the lifetime of the fields is continuously enhanced by new technologies, the produced oil and gas will be increasingly sour. In order to avoid expensive replacements of existing carbon steel pipelines or in the light of latest risk assessments, the use of clad pipelines right from the initial development of a field might be the reasonable choice in future projects.
Bumi – D

Customer: PSI / Carigali
Destination: Malaysia / Thailand
Material: API 5L Gr. X65 + TP 316L
Dimensions: 508.0 mm O. D.
15.9 + 3 mm W. T.
Tonnage: 2,400

Upper Zakum

Customer: Petrofac / Zadco
Destination: Abu Dhabi
Material: API 5L Gr. X60 + Alloy 825
Dimensions: 457.0 – 1,067.0 mm O. D.
11.13 – 53.98 mm + 3 mm W. T.
Tonnage: 5,500
Superlatives describe the surroundings where stainless steel and high alloy pipes are used: highest corrosion as well as highest or lowest temperatures. For application in process plants, power plants or smaller pipelines, EEW manufactures LSAW pipes made from stainless and high alloy steels that provide reliable service in these conditions.

All stainless steels have one thing common – the corrosion resistance. Beside the classic stainless steel grades (e.g. TP 304/L, TP 316/L or TP 321) EEW produces LSAW pipes made of nickel alloys and nickel based alloys (e.g. 3 %, 9 % or 36 % Ni). Because of their excellent strength and toughness at low temperatures these pipes are used in cryogenic environments such as the LNG industry. An extremely low coefficient of thermal expansion (CTE) of 36 % Ni alloy makes it to a unique solution for cryogenic pipe-in-pipe systems. Compared to cryogenic Ni alloy pipes, high alloy stainless steel pipes have outstanding strength and toughness at high temperatures. Duplex and super duplex steels are distinguished by their increased surface hardness, strength and abrasive resistance.
Freeport LNG

Customer: CB&I/Texas Pipe
Destination: USA
Material: TP 304 / 304 L
Dimensions: 219.1 – 1,625.6 mm O. D.
3.76 – 33.33 mm W. T.
Tonnage: 2,400

Ni-based Alloys

ASTM A353 & ASTM A553 (9 % Ni),
ASTM A203 (3 % Ni),
36 % Ni (Invar® / Pernifer®)

CVN up to

−196 °C

combined with low CTE value

Standard Stainless Steel

e.g. TP304/L (S30400/30406),
TP316L (S31600/31603),
TP321 (S32100)
The power generation industry is facing two main challenges: how to increase plant efficiency while reducing emissions. Both these goals can be reached by considering technologies and materials, which are increasingly subjected to high operating stresses and temperatures.

We supply SAW pipes that fulfil the tough requirements of our customers from the energy generation industry with regard to creep resistance, high temperature oxidation resistance, high thermal fatigue resistance or optimum microstructural stability.

**Shell Pearl GTL**

Customer: QSGTL (MWK/JGC)/Shell  
Destination: Qatar  
Material: ASTM A 691 Gr. 91 Cl. 2  
ASTM A 691 Gr. 1¼ Cr  
ASTM A 671/API 5L Gr. B  
ASTM A 358 TP 321  
Dimensions: 460.0–1,528.0 mm O.D. up to 60.0 mm W.T.  
Tonnage: 33,100

**Rapid SCC Project**

Customer: Toyo Engineering Corp.  
Destination: Malaysia  
Material: ASTM A 691 Gr. 91 Cl. 2  
Dimensions: 457.2–711.2 mm O.D.  
29.36–42.0 mm W.T.  
Tonnage: 750

**Alloy Steels**

acc. to ASTM A691  
Gr. 1¼ Cr, 2¼ Cr, 5 Cr, 9 Cr, & P91/92

**ALLOY STEEL PIPES**

For ambient and high temperature applications
Buckle arrestors

Buckle arrestors are installed at intervals along the pipeline to stop the propagation of collapse failure and to limit the extent of damage to pipes. Additionally, buckle arrestors serve as pipe support collars for pipelines during the J-Lay installation process.

EEW manufactures full-length buckle arrestors using a heavy-wall mother pipe and perform machining on the pipe ends to match the flowline dimensions. If required, EEW also performs a pre-fabrication by connecting the mother pipes with the flowline pipes on both ends by circumferential welding as well as coating of the full joint.

Slug catcher

Slug catchers are used in downstream production facilities for separating the gas and condensate. EEW manufactures the complete set of pipe components for finger type slug catchers including e.g. headers, manifolds or spools.

EEW started to pre-fabricate slug catcher components in the early Nineties. While producing the large diameter SAW pipes in-house, EEW buys in seamless pipes, fittings, flanges and other accessories from specialist subcontractors. For the prefabrication, EEW has extensive circumferential welding capacities as well as the necessary know-how.
LSAW pipes have to be calibrated after forming and welding to bring them into the required roundness and straightness tolerances. For some applications, this normal calibration process is not sufficient to fulfill our client’s requirements. EEW COMPipes can demonstrate their quality in cases where:

- very tight tolerances are needed to ensure accurate circumferential welding during fabrication & installation
- residual stresses could lead to problems

EEW COMPipes are a result of a modification of the calibration system in order to plasticize the pipes over the entire length and whole circumference by compression. This is achieved by multi-cycle compression of the pipes using a 35 MN (3,500 tonnes) uniaxial calibration press with specially designed tools.

EEW COMPipe applications

- Risers
- Conductors
- Tendon pipes
- Deep water pipelines

EEW COMPipe

For tighter tolerances

with pipes bearing enormous pressure from outside
- requires closer tolerances require higher collapse/fatigue resistance
In order to increase installation efficiency and to ensure highest fatigue and collapse resistance, the offshore and pipeline industry demands tight dimensional tolerances. Using a laser measurement system, EEW is able to perform an automated dimensional measurement of pipes in terms of both: pipe ends or full pipe body. Beside the documentation of the perfect shape, we can also provide additional services such as Hi/Lo marking at the pipe ends or sorting of pipe bundles in order to improve the weldability and pipe handling on site.
In the manufacture of pipes for medium and high temperature applications, high-quality steel grades are used, where mechanical and technological properties are optimized by heat treatment. EEW operates different heat treatment systems like gas operated furnace and induction heat treatment to apply:

- Stress relieving
- Normalising
- Quenching & tempering
- Soft annealing
- Solution annealing

**Pickling**

EEW utilises of a pickling bath for the production of longitudinally welded stainless steel pipes as well as of an inside pickling line for the production of clad steel pipes.

**Coating**

Various techniques of corrosion protection can be carried out according to the industry standards. Having our own coating facilities in Malaysia and Saudi Arabia, which can apply FBE (single and dual coat systems), 3LPE/3LPP, epoxy coated external coating systems and TSA. Application of internal flow coatings, including those for sour gas, provides an added value service. Concrete Weight Coatings (CWC) can also be provided in partnership with our approved subcontractors.
Full logistical support inc. packing

It is our goal that every pipe reaches its destination on time and in the best quality. In order to ensure this, we can provide all kinds of packing including standard end protection, bundle packing, air packing or seaworthy packing according to our clients’ requirements. The packing is carried out in-house or by special subcontractors. Based on our extensive experience in handling large-scale projects, we are also able to develop full logistical concepts and supply chain management for storage and transportation.

Pre-fabrication

With today’s rapid changes in market demands and challenges in pricing, fast installation times and high flexibility are crucial factors. Due to this, EEW offers a pre-fabrication service to customers operating in the pipeline and process industry including the prefabrication of multiple pipe lengths, ready-to-assemble slug catcher components or the assembly of various accessories.
For more than 40 years, EEW has been the leading specialist of large diameter LSAW pipes for the energy industry. The EEW Group consists of a network of nine pipe mills around the globe. Bringing together the strength of these mills, we are able to deliver large-scale projects worldwide fast-track and in perfect quality.

Applications
- Terminal (Jetty) 11,000 MT
- Power Plant 28,000 MT
- Refinery 31,000 MT

CREATING WIN-WIN SITUATIONS
By teamwork

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Project Management
The efficiency and quality demonstrated in production as well as our ability to adapt to customers’ requirements are united in our technical and commercial project management. Standardised processes, complete traceability of products along the entire production process as well as continuous progress reporting makes us a reliable partner for your projects.

Technical Support
In order to deliver the best technical and commercial solutions, EEW can already contribute to our customers’ project success in its concept phase with our experience and special knowledge. In close collaboration with our clients, we develop individual products and services while taking cost optimisation and risk mitigation into account.
Extraordinary projects require extraordinary solutions. Our ability to develop these extraordinary solutions has been demonstrated on various projects. One of them was Saudi Aramco Jazan. In order to produce more than 70,000 MT of LSAW pipes both in terms of delivery dates as well as economic factors, EEW developed a multi-site production concept. Besides the parent plant in Erndtebrück, the plants EEW Bergrohr, EEW GPC and EEW Korea also contributed to the project. Being a perfect role model of teamwork and collaboration, the Saudi Aramco Jazan Project has shown our flexibility in developing customized technical and commercial solutions.
Because variety counts

Our traditional strength is the production of LSAW pipes. For our customers operating in the pipeline and process industry we offer a unique product portfolio encompassing pipes with outside diameters ranging from 304.8 mm (12") to 10,000 mm (394"), with wall thicknesses starting at 9.5 mm (0.375") up to 101.6 mm (4.0") and single pipe lengths up to 13.2 m in various material grades.

Exploring unique dimensions
Double Seam SAW Pipes

Due to the width and weight constraints imposed upon the transportation of plates, carbon steel pipes with one longitudinal weld seem can only be produced in double random lengths up to an outside diameter of approx. 60" (1,524 mm). As an alternative to a reduction of the single pipe length, EEW enhanced the production lines to manufacture of longitudinal double seam SAW pipes. This technique enables the production of pipes in double random length with outside diameters up to 100". All major pipe standards like API 2B or API 5L allow two longitudinal weld seams.
We apply the highest standards to ourselves and to our products. That is why high quality and reliability have the highest priority at EEW. We do not make compromises where materials, fabrication and quality control of our products are concerned.
Quality Management

As a family-owned business, the responsibility for quality and the ambition to continuously improve our products has been passed on by more than three generations. Because of EEW was one of the first companies in Germany certified according to ISO 9001 in the early nineties. Today, all EEW mills are certified according to this standard. In order to ensure the quality and reliability of our products and services, we established an integrated management system within the EEW Group and we work in accordance with defined procedures. At the same time our quality approach encompasses the entire supply chain including our suppliers and subcontractors: from engineering and manufacturing up to delivery.

In-house mechanical testing

In order to ensure and document the impeccable quality of our products, EEW is working together with accredited inspection companies and laboratories. If requested by our customers, we can also use our in-house material testing laboratory for the examination of the mechanical properties of welds. This includes tests to determine the yield strength, tensile yield strength, impact toughness and hardness. Bending tests and spectrographic analysis can also be carried out there.
We are aware of our responsibility for the community, the environment and the health and safety of our more than 2,200 employees worldwide. That is why we are convinced that HSE is an essential aspect of a successful project delivery as well as a necessary part of a strongly-integrated group management. Through regular self-evaluation, assessments of learning process and training programmes, we always improve our HSE performance.

As part of our HSE policy we are not only working together within the EEW Group in the field of HSE, but also with our customers, subcontractors and third parties. It is the combination of individual strengths and team spirit that brings us closer to our aim of ‘zero work-related injuries/illnesses’.

‘Accidents are not acceptable and all injuries are preventable.’

Christoph Schorge, Managing Director, EEW Group
CSR

Taking responsibility

It is our own approach to ensure that our international activities conform to the required laws and regulations as well as to the expectations of our customers and community.

We have established an integrated management system within the EEW Group encompassing the internationally recognised certifications in accordance with ISO 9001, OHSAS 18001, ISO 14001 and ISO 50001.

As an ‘ethical compass’, our code of conduct defines guidelines for behaviour in the daily business life of our employees worldwide.

‘Great to see EEW took part in our safety incentive scheme during the Beatrice project and encouraged excellent safety suggestions from employees for charity – improving safety and supporting the community.’

Douglas Blue, HSE Manager – BOWL EPCI Foundations and Inter-Array Cable Contract, Seaway Heavy Lifting

QHSE certifications

- ISO 9001 (Quality management)
- ISO 14001 (Environmental management)
- ISO 50001 (Energy management)
- OHSAS 18001 (Occupational health and safety management)
WE SEE OPPORTUNITIES.
WE CREATE SOLUTIONS.
WE ARE EEW.
EEW Line & Process Pipes are produced at the following locations: