INNOVATION IN
SPIRAL WELDED PIPE TECHNOLOGY

High-Productivity Spiral Pipe Plants and Finishing Lines
Complete solutions for HF and spiral pipe welding plants

1 Spiral Pipe Plants
2 Finishing Lines for Spiral Pipes
3 HF Pipe Welding Plants
4 Finishing Lines for Automotive Tubes

TUBING THE WORLD WITH DANIELI W+K

DANIELI W+K is located in Dortmund, Germany, and has been successful in the international pipe plant business since 1968. The company forms part of the global operating group DANIELI & C.Officine Meccaniche SpA, Italy.

DANIELI workshops worldwide offer an extensive range of individual manufacturing solutions.

Wide Range of Programs from a Single Source

We deliver both complete plants and single machines for the production of longitudinally-welded (HF) and spiral-welded pipes (SAW), and we focus in particular on offering innovative and customized solutions.

Our core business covers development, planning, design and also includes manufacturing, assembly and commissioning. Complete finishing lines, turnkey supplies and comprehensive after-sales service as well as upgrading solutions complete our extensive portfolio for the tube and pipe industry.
HIGHLIGHTS

> Innovative and economical solutions offering the highest plant productivity and energy efficiency
> High plant availability and security through process-reliable systems and integrated state-of-the-art automation components
> Two-step production process for high output: the strip is formed and tack-welded at high speed. SAW final welding by multiple final welding stands
> Simultaneous final multi-wire SAW welding for inner and outer welding seam

Automation System & Safety

> Automated quick-setting solutions with reproducible process parameters in all plant areas, such as strip preparation, pipe forming, cutting, finishing, high user-friendly operating and monitoring systems
> Production data management for efficient manufacturing processes, supported by e.g. material tracking, cross seam tracking, continuous quality control, performance by higher-level automation systems Level 2 and Level 3

Technical Data

<table>
<thead>
<tr>
<th>Final product</th>
<th>Spiral pipes (HSAW)</th>
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</thead>
<tbody>
<tr>
<td>Steel grades</td>
<td>Max. X100</td>
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<tr>
<td>Final application</td>
<td>Line pipes for gas, oil water</td>
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<tr>
<td>International Standards (e.g)</td>
<td>API 5L, AWWA, Aramco, EN 10208</td>
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<tr>
<td>Outside pipe diameter range</td>
<td>406.9 to 3,048.0 mm (16&quot;-120&quot;)</td>
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<tr>
<td>Wall thickness range</td>
<td>6.4 to 28.0 mm</td>
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<tr>
<td>Pipe length</td>
<td>8.0 to 25.0 m</td>
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</tbody>
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> Comprehensive production quality control systems: automatic welding gap control, laser-controlled strip edge tracking, pipe OD measuring
> Quick dimensional changing times for high plant flexibility using motorized, automatically parameterized settings according to the individual pipe diameters
> Single machinery, such as coil preparation stands, edge millers, plasma cutters, pipe inside cleaning stations, bevelling machines, etc.
> Turnkey supply in cooperation with the DANIELI Group

Innovative drive systems to fulfill the continuously increasing demands for energy-efficiency

Integrated safety solutions according to international regulations by implementing customized automation to provide for safe operation functions and plant monitoring

OCTG Applications:
1. Offshore
2. Onshore
3. Underground pipelines
Automatic Coil Opening and Strip Preparation

DANIELI W+K delivers complete logistics to handle the entry coil and prepare the strip for insertion into the following strip preparation section. DANIELI W+K’s automated strip preparation section enables a very fast coil change-over minimizing downtimes to < 15 min. When changing coil or strip dimensions, easy and quick settings are achieved by using comprehensive automation systems. Strip centering and control process is also automatized. The high-quality and saleable cross seam is produced by a preliminary SAW tack welding process and subsequent final welding by using three SAW welding heads.

Spiral Pipe Forming and Welding

DANIELI W+K’s unique pipe forming system ensures high quality of spiral-welded pipes. The forming unit consists of an infinitively adjustable 3-roll bending system with an outside guiding cage, enabling a very precise and automatic welding gap control. A laser-controlled strip edge tracking system serves for exact positioning of the SAW welding heads ensuring a high accuracy during the entire final welding process. Thus excess weld beads are minimized. DANIELI W+K’s spiral forming and welding technology guarantees for process reliability even at high wall thicknesses of 25.4 mm (1”) and extremely high material strengths.

2-Step Production Process

In addition to the conventional one-step spiral pipe production process, DANIELI W+K offers their high-efficiency two-step production solution. The complete process is automated: from tack-welding up to the final SAW spiral welded pipe.

In the 1st step high speed continuous forming and tack-welding takes place. Final pipe welding is effected in the 2nd step by installing a set of SAW final welding stands, thus high final pipe output is achieved. Smooth and slip-free pipe transportation is ensured by DANIELI W+K’s unique orthogonal roller system.
Plant solutions from a single source: Production of spiral – welded API pipes

Spiral pipe welding and finishing line, 2-step production process
1 Coil transport carriage/decoiler
2 Strip straightening machine
3 Forming unit
4 Flying pipe cutting carriage
5 Pipe transport system
6 SAW final welding stands
7 Outside welding
8 Single pipe ultrasonic testing stand
9 Pipe end bevelling machine
10 Rewelding Section
11 Visual inspection
Wide Range of Equipment & Services from a Single Source

**Coil Preparation**
- Automated coil opening and preparation stand
- Plasma cutting unit to cut the coil tongue
- Sturdy design for heavy coils
- Safe coil handling
- Offline or online solution

**Strip Preparation**
- Providing an automated and safe strip preparation, e.g. decoiler, strip levelling machine, strip-edge milling machine
- Automated strip center stabilizing unit
- SAW strip cross seam welding station

**Forming & Tack-Welding**
- Innovative 3-roll bending system
- Welding gap control system
- Inside SAW tack welding system, fitted to sturdy beam
- Pipe OD measuring system
- Laser seam tracking system

**Pipe Cutting Machine**
- High-efficiency plasma cutting unit with carriage

**Final SAW Welding Stands**
- State-of-the-art final welding stands
- Inside and outside helical SAW welding system
- Pipe transport by orthogonal roller conveyors

**Submerged Arc Welding (SAW) & NDT Testing Systems**
- Integration of the latest technologies for continuous quality control as well as for inside and outside welding processes

**Finishing Line**
- Complete finishing line for line pipes according to international standards such as API, GOST, ARAMCO, SHELL

**Electrics & Automation**
- Automated setting system with reproducible roll positioning for all process parameters
- Pipe tracking and product management system
- Automation systems Level 2 or Level 3
- Fault analysis and troubleshooting via teleservice

**Additional DANIELI W+K single machines**
- Edge milling machines
- Pipe end bevelling machines
- Pipe inside cleaning stations
- Test ring cutting stations

**Upgrading Solutions and After-Sales Service**
- Modernisation and process optimization of existing lines
- Comprehensive after-sales support

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1. Strip edge miller
2. Pipe forming & SAW welding section
3. Plasma cutting carriage
4. Control desk
5. SAW Final welding stands