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HIGH UNDER PRESSURE WORKING PIPES QUALITY OUT OF CONTROL TRANSFER.

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Annotation: Quality control of pipelines operating at high pressure is crucial to ensuring safety, reliability, and efficiency in industrial applications. This article explores advanced methods and technologies used in high-pressure pipeline inspection and maintenance. It discusses key factors affecting pipeline integrity, such as material properties, environmental influences, and operational stresses. The study highlights non-destructive testing (NDT) techniques, including ultrasonic testing, magnetic flux leakage, and acoustic emission monitoring, as well as digital solutions like real-time monitoring and predictive maintenance systems. Implementing effective quality control measures enhances pipeline lifespan, reduces the risk of failures, and ensures compliance with regulatory standards.
Keywords: High-pressure pipelines, quality control, fault detection, ultrasonic inspection, pipeline integrity, safety standards, operational strength, digital diagnostics.

Introduction. Production release in the process of pipes quality provision for various kind inspections and tests is held .
High under pressure worker pipes metallurgical , non-destructive control , hydrotest , visual and size control from inspections Pipelines some special There are also tests They are aggressive to the material . in the environment when used This is tests pipe of the material aggressive to environments endure to give ability These tests buyer's on demand according to his/her in the specification is done .
Metallurgy tests. Metallurgy tests to the pipes to be placed chemical requirements materials to the standard suitable to come confirms .

- Metallurgy tests usually micro - and macro-inspection and pipes It's called testing .
- Microanalysis or chemical analysis .
- Raw materials
- Product
- Welding and all alloying in the material standard of the elements shown at the borders to be guarantees .
- Weld of the seam macroanalytical weld stitch of the material pipe material with correct connected checks .

Broken control to do. Pipes broken control to do type to the pipes to be placed mechanic of requirements materials to the standard suitable to come confirms .
Mechanical test - in this test transfer for from the pipe sample is cut . *To stretch test* of the

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pipe fluidity and strength border check for will be held . Buyer on demand according to or high or at low temperatures to stretch standard tests according to is checked . *Bending test* weld of the compound integrity check for is carried out . *Smoothing test* in the pipe plastic deformation ability learns . *Shock test* low temperature of the material under the circumstances endurance ability check for will be held . The following in the picture pipes mechanic from the test transfer according to some samples cited .

Figure 1. Pipes mechanic test

Product quality guarantee for working release on time and from it then pipes certain inspections and of the pipe in the body and weld at the seam not to violate control Pipes such inspections pipe / weld at the seam service show during his/her exploitative to the characteristics impact to do possible was some physicist defects existence check opportunity These tests :

• Flow leak exit check or magnetic defectoscopy
• With a twist vines
• Ultrasonic - whole surface or only weld stitch for execution possible
• Radiography (only welding for)
• Pipes and weld stitch the ends magnet powdered control to do

Pipes hydraulic test. Pipes hydrostatic test or hydraulic test the following for is held :

• 100% hermeticity of the pipe confidence harvest to do
• this of the pipe to pressure endure to give ability check
• hydraulic test pressure is given in ASTM A530 equation based on is considered ;

$P = 2St/D$ *or* $S = PD/2t$

this on the ground : P = kg/ sq . inch hydrostatic test pressure or MPa ,

S = pipe of the wall voltage square per inch in pounds or MPa ,

t = specified nominal wall thickness , ANSI table shown to the number suitable incoming nominal wall thickness , or minimum wall shown 1.143 times the thickness , inches [mm],

D = indicated external diameter , ANSI pipe shown to size suitable coming external diameter or shown internal 2 t per diameter (above) as specified) inch [mm] add way with calculated external diameter

Hydraulic tests for waiting time to ASTM A530 appropriate at least 5 seconds organization does . Pressure computer system through control Welded pipes check for test pressure weld of the seam whole length check for enough was time during hold erection In the ASTM standard designated known under the circumstances hydrostatic test void to be done possible .

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Figure 2. Hydraulic test process

Pipes visual inspection. Visual examination of the product general quality of inspection the most effective from the methods Visual examination on time of the product general makeup checked. Mechanical traces, lamination, breaks or other every how visual defects such as surface defects is checked , as well as the weld of the seam porosity , internal layers , uneven weld stitches such as defects , as well as welding of the material excess or enough at the level incompleteness This is checked . shortcomings to the current ASTM standard appropriate acceptance will be done .

Pipe dimensions control to do. Pipe dimensions check dimensions according to standard based on is performed , the pipe final size to the standard appropriate to be or buyer in the specification as shown to be need .

Weld and seamless steel pipes for to the dimensions to be placed The requirements are given in ASME B36.10 .

Stainless from steel made pipes for to the dimensions to be placed The requirements are also given in ASME B36.19 .

Dimensions check during its diameter, length , thickness , straightness , ovality and weight is determined .

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Figure 3. Trumpet dimensions from the test transfer

Carbon from steel prepared all pipes and stainless from steel prepared seamless of pipes mass up to +10% limited , minimum limit and to size looking at changing stands - detailed information for to standards see .

Pipes in the packaging control. Transportation on time of injury prevent to take for of pipes ends traffic jams with The pipe is closed . roundness storage for of the pipe to the end his/her diameter with one kind was supports is installed.

Figure 4. Pipes for transportation preparation

Pipes to check to be placed additional requirements

Additional requirements mandatory not them buyer purchase to do for application with together to show Basically , this is low temperature requirements stretch , cross stretching , carbon equivalent according to restriction and others such as of the product additional tests with depends .

Conclusion

Ensuring the quality and integrity of high-pressure pipelines requires a combination of advanced inspection techniques, preventive maintenance strategies, and strict adherence to industry standards. Non-destructive testing methods and real-time monitoring systems play a crucial role in detecting potential defects early, minimizing risks, and optimizing pipeline performance. By integrating innovative technologies and data-driven maintenance approaches, industries can significantly improve pipeline safety, reduce operational costs, and enhance overall efficiency.

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Continued research and development in this field will further refine quality control measures, ensuring sustainable and reliable pipeline operations in the long term.

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