

List of Core values

Professional, Reliable, Efficient



Tubes Erosion Shields are used to reduce excess wear of boiler tubes within the extreme conditions prevalent inside a fossil fuel fired boiler, Sunny Steel is able to manufacture and supply erosion shield solutions to protect and reduce

wear in all applicable boiler related situations.

Tube Shields are custom made to fit perfectly into straight sections, curved sections and even finned and specialized tubing.



Advantages



Wall thickness inspection by third party

A u t o m a t i c
g e n e r a t i o n
o f
d i g i t a l
c o n t r o l
s m a l l
s i z e
e r r o r



Size inspection

Boiler Tubes Erosion Shields, also known as anti-corrosion Shields, anti-wear plate, anti-wear protection Shields, anti-wear cover plate, anti-corrosion cover plate, boiler climbing pipes, anti-wear pressure plate, etc. which are used in combination with snap rings.

Boiler Tubes Erosion Shields are produced using a high-pressure press and professional mold pressing. The production time is short, the welding performance is good, the welding should not fall off, the surface is smooth, and the appearance is beautiful. Boiler Tubes Erosion Shields with bends are formed by pressing on a press or bending with a special abrasive on a tube bender.



Service life

Boiler Tube Shields are designed to eliminate major maintenance and downtime costs from boiler and condenser tube failure.

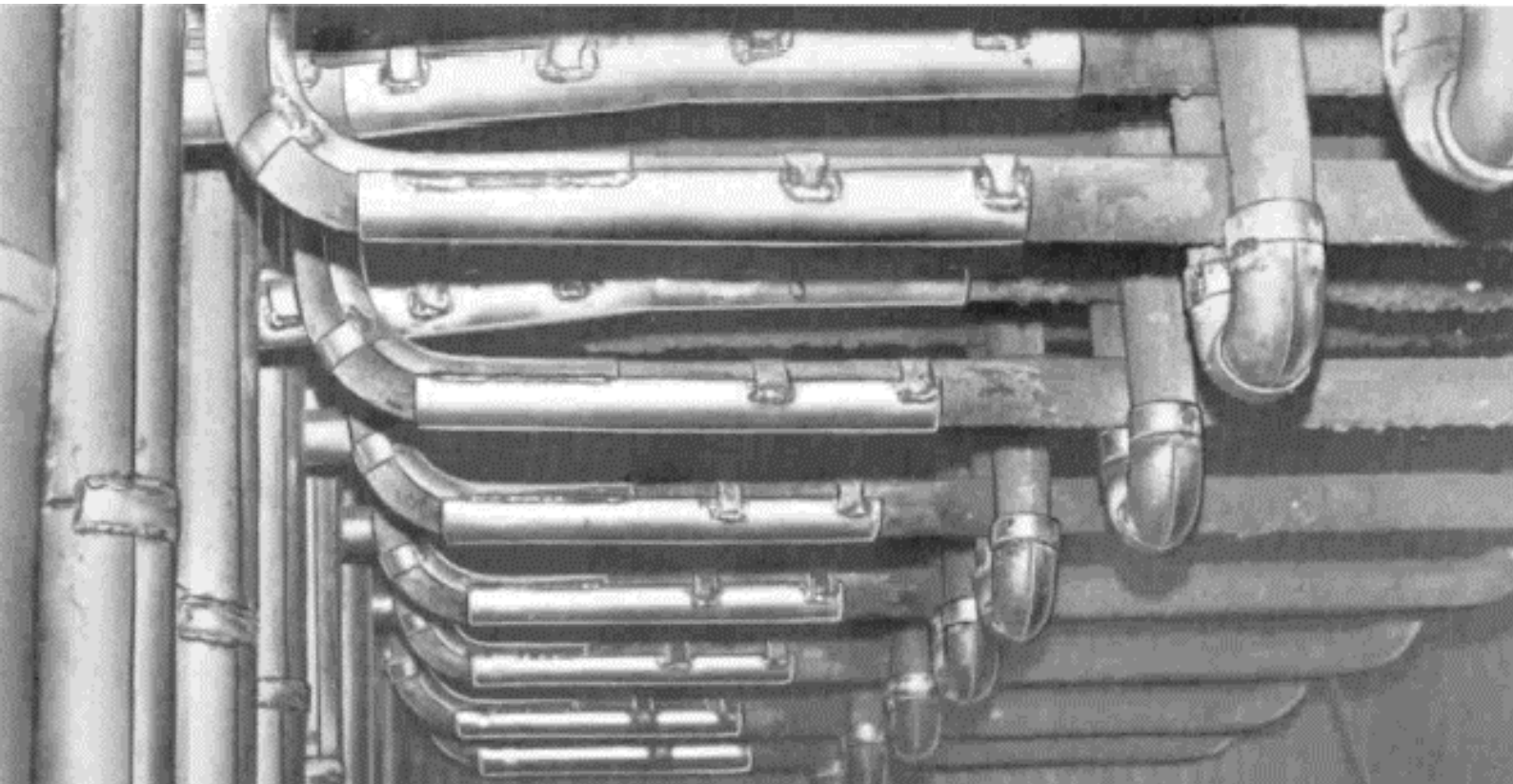
The service life of Boiler Tubes Erosion Shields is different in different types of boilers and different use parts. The normal service life is a period of overhaul (3-5 years) for the boiler.

Generally, some boilers will be replaced or retrofitted every time

the boiler is overhauled. The main replacements are those of the Boiler Tubes Erosion Shields that are severely thinned and exceeded the standard; those that were not firmly detached during the boiler operation during the previous installation. According to the wear of the Boiler Tubes Erosion Shields during replacement, if the thickness is severely reduced, it needs to be replaced, the deformation is severe, and those that cannot protect the tube also need to be replaced. In addition, some boiler tubes are not equipped with Boiler Tubes Erosion Shields, but during the boiler inspection, it is found that the tubes have



a tendency of wear and thinning. Generally, Boiler Tubes Erosion Shields are also installed to prevent further wear of the tubes and cause serious consequences such as boiler explosion.



On the heating surface of superheater and economizer tube bundle of the boiler, in order to prevent the pipe from being worn by high temperature flue gas washing, boiler tubes erosion shields are mostly arranged on the outer side of the pipe in the direction of flue gas flow. The elbow erosion shields solves the abrasion problems of water wall tubes, superheater tubes, economizer tubes and reheater tubes in the furnace, and provides guarantee for the long-term and reliable operation of CFB boiler. With the increase of CFB boiler products, the type and quantity of the elbow erosion shields will increase.



Main material of tubes erosion shields

Different types of steel are selected according to the specific conditions of different working conditions.

Common materials are: TP321 (Cr18Ni9Ti), TP309S (Cr23Ni13), 1Cr20Ni14Si2, TP310S (Cr25Ni20), 1Cr25Ni20Si2, and some low

temperature areas (such as low temperature superheater, low temperature reheater) are made of 1Cr13, 1Cr6Si2Mo and other materials.

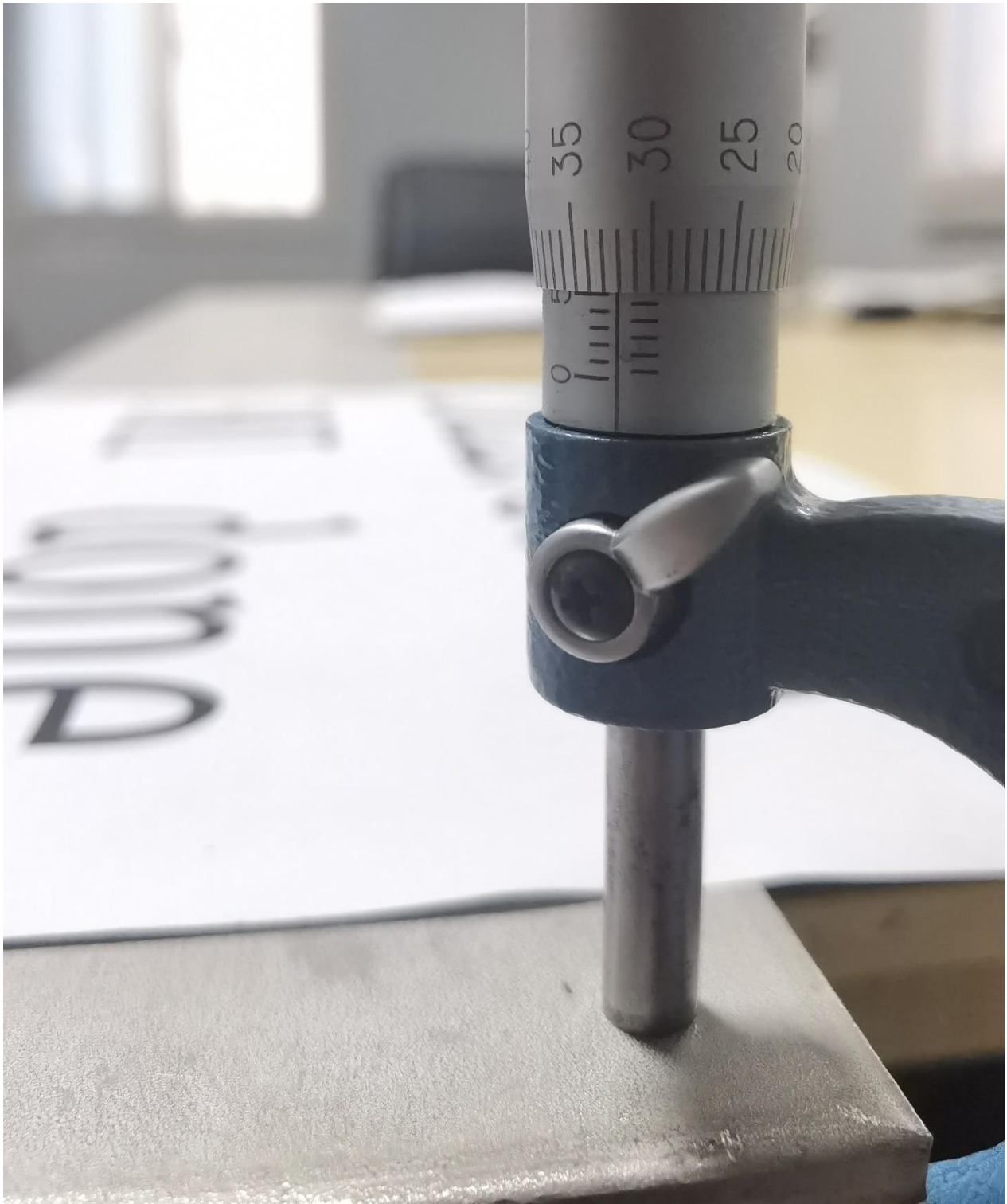
The boiler was originally designed to be accurate. Different materials have different temperature resistance and mechanical strength. 1Cr13, 1Cr6Si2Mo generally has a temperature resistance of 600 °C or less.



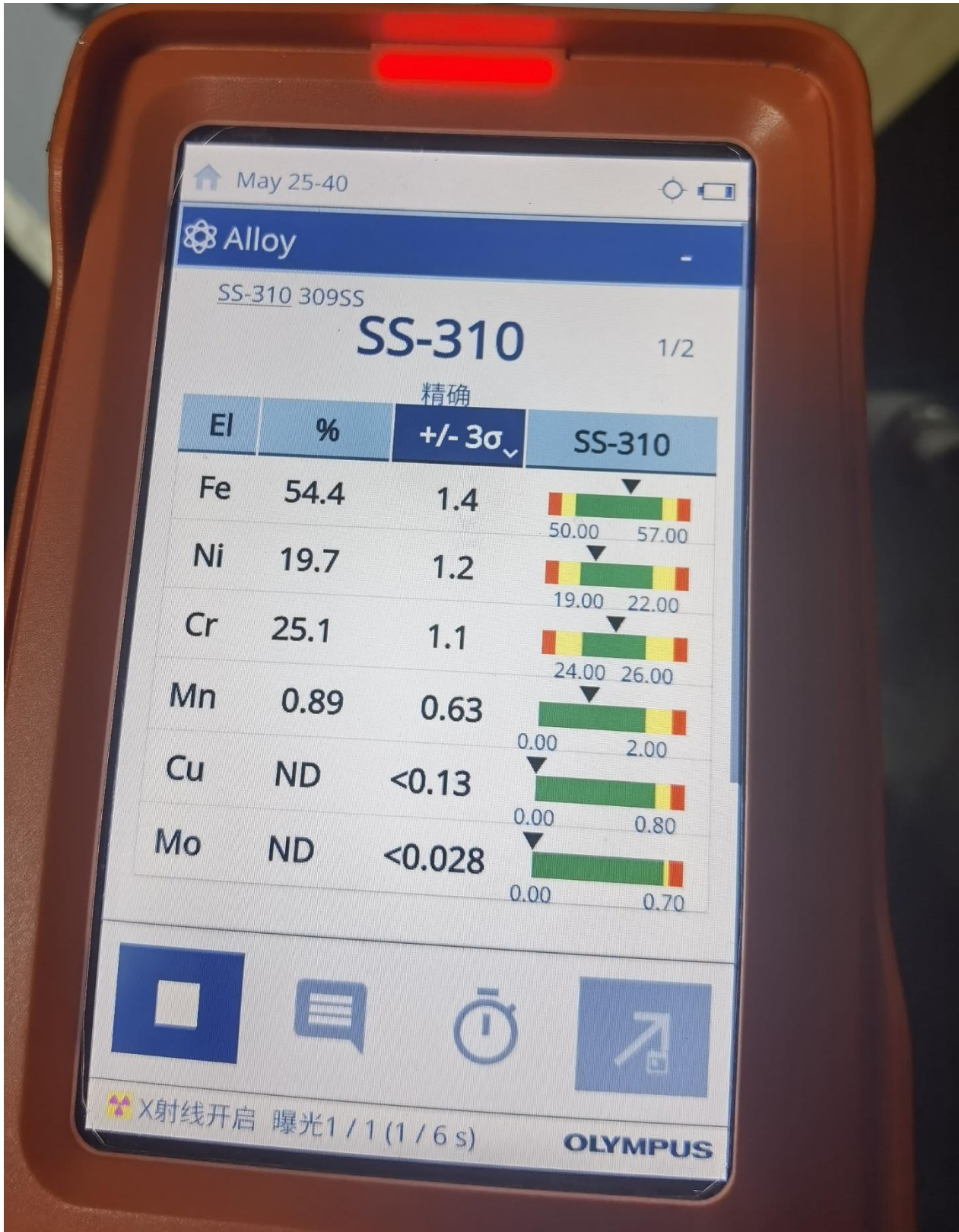
Material (Grade)	Temperature resistance	Yield strength	Tensile strength	Elongat ion	HB	HRB	HV
1Cr18Ni9Ti	925 °C	≥205MPa	≥520MPa	≥40%	≤187	≤90	≤200
Cr23Ni13	1095 °C	≥205MPa	≥520MPa	≥40%	≤187	≤90	≤200
1Cr20Ni14Si2	1095 °C	---	≥590MPa	≥40%	---	---	---
Cr25Ni20	1150 °C	≥205MPa	≥520MPa	≥40%	≤187	≤90	≤200
1Cr25Ni20Si2	1150 °C	---	≥540MPa	≥35%	---	---	---

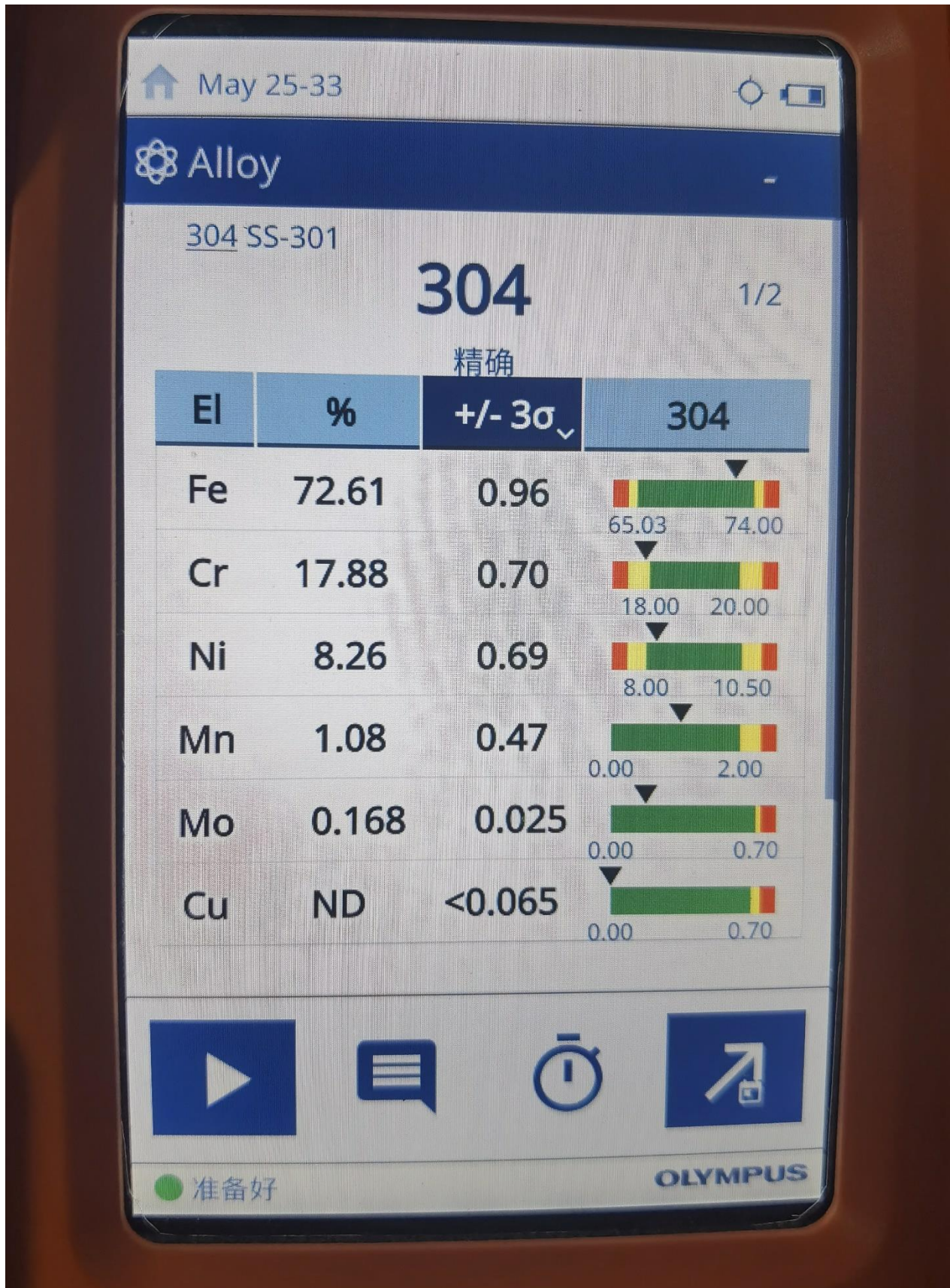


Raw material

















304 stainless steel Erosion Shields

Grade 304 stainless steel is the most versatile and the most widely used of all stainless steels.



309 stainless steel Erosion Shields

CS 309 is a highly alloyed austenitic stainless steel used for its excellent oxidation resistance, high temperature strength and creep resistance.



310S stainless steel Erosion Shields

Grade 310S is a lower carbon version, less prone to embrittlement and sensitization in service.



316L anti corrosion and anti wear steel erosion shields

Grade 316 is the standard molybdenum-bearing grade, second in importance to 304 amongst the austenitic stainless steels.



Custom tube shields

Custom tube shields are designed to minimize tube failure in highly abrasive or corrosive areas. Our many styles ensure that you'll be able to choose the most appropriate design for your application, providing an inexpensive way to prolong tube life.

Advanced manufacturing facilities mean fast response

Tube shields from us are manufactured to exacting standards. Advanced equipment and material handling capabilities permit us to offer the fastest turnaround times anywhere.

Stainless Straight and Bend Type

Boiler tube Protection Erosion

Shield Eco tube shield



Custom curved shields

Curved Shields can be manufactured to cover both outside and inside curves of tubing.



Shapes and specifications of Tubes Erosion Shields

The cross-sectional shape of Boiler Tubes Erosion Shields is mostly semi-circular (180 degrees), and there are also 120-160 degrees. It is mainly used on finned tubes (water-cooled walls); Boiler Tubes Erosion Shields are divided into direct wear-resistant shields, In-curve anti-wear shields, outer-curve anti-wear shields, side-curve anti-wear shields, S-curve anti-wear shields, etc.

Outside of bend



Inside of bend



S-shape Outside of bend



Straight tubes erosion shields

The length of the straight anti-wear shields ranges from 20mm to 3000mm, and the general length of 1000-2000mm is commonly used.

The anti-wear shields with bends generally requires a processing drawing and the following parameters should be on the drawing: outer diameter of the pipe used, bending of the pipe Radius R (to the center of the pipe), the degree of bending angle, and the length of the straight sections on both sides of the arc segment of the wear-resistant shields.

The most basic parameter of Boiler Tubes Erosion Shields is the outer diameter of the tube used (that is, the inner diameter of Boiler Tubes Erosion Shields).





Processing thickness of boiler tube erosion shields

Boiler Tubes Erosion Shields are processed in thicknesses of 2mm, 3mm, 4mm, and 5mm. Different thickness is adopted according to the wear severity and the need of heat conduction.



Finned tube shields

Boiler Tubes Erosion Shields are produced using a high-pressure press and professional mold pressing. The production time is short, the welding performance is good, the welding should not fall off, the surface is smooth, and the appearance is beautiful. Boiler Tubes Erosion Shields with bends are formed by pressing on a press or bending with a special abrasive on a tube bender.



Boiler Erosion Shields

Ash content, high furnace temperature, increased soot blower pressure and longer time between cleans – all these things result in the likelihood of greater erosion to boiler tubes.



In such cases, the most effective course of action is to shield the erosion prone tubes with boiler erosion shields. This alternative is far cheaper than actual replacement of damaged sections of boiler tube, to say nothing of the associated downtime and loss of generation capacity and revenue that occurs with a tube leak.

In addition to straight tube shields, which go over straight sections of boiler tube, we also make shields to cover bends and special shields for finned tubes.

The erosion shields can be made out of mild steel, chrome moly steel, stainless steel and exotic alloys such as Inconel. The most popular materials and sizes are 3mm stainless steel grade 304 and 2mm stainless steel grade UNS S30815 (Sandvik grade 253MA). Our Bending uses certified material to A387 P11, P22 chrome moly and Australian Standard A240TP304, 316 and 309 stainless steel. Our shields can also be coated with a hard-wearing chromium carbide coating for additional wear resistance.



Boiler house accessories, boiler tube erosion shield

Boiler House Accessories Boiler Tube Erosion Shield, also known as anti-corrosion Shields, anti-wear plate, anti-wear protection Shields, anti-wear cover plate, anti-corrosion cover plate, boiler climbing pipe, anti-wear pressure plate, etc., which are used in combination with snap rings.

Main Technical Parameter:

The production time is short, the welding performance is good, the welding should not fall off, the surface is smooth, and the appearance is beautiful.

Material:

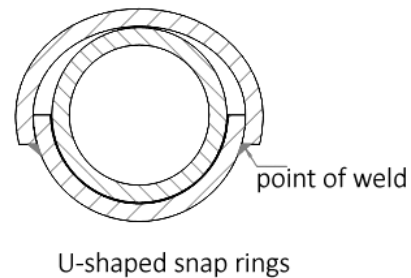
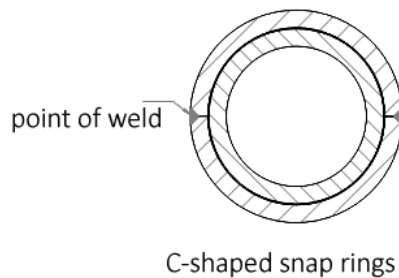
1Cr18Ni9Ti(321), Cr23Ni13(309s), 1Cr20Ni14Si2, Cr25Ni20(310s),
06Cr19Ni10(304/304L), 1Cr25Ni20Si2, 06Cr17Ni12Mo2/
0Cr17Ni12Mo2(316), 022Cr17Ni12Mo2(316L), 1Cr6Si2Mo, 1Cr13

Types: Straights, inside bends, outside bends, and side bend shields



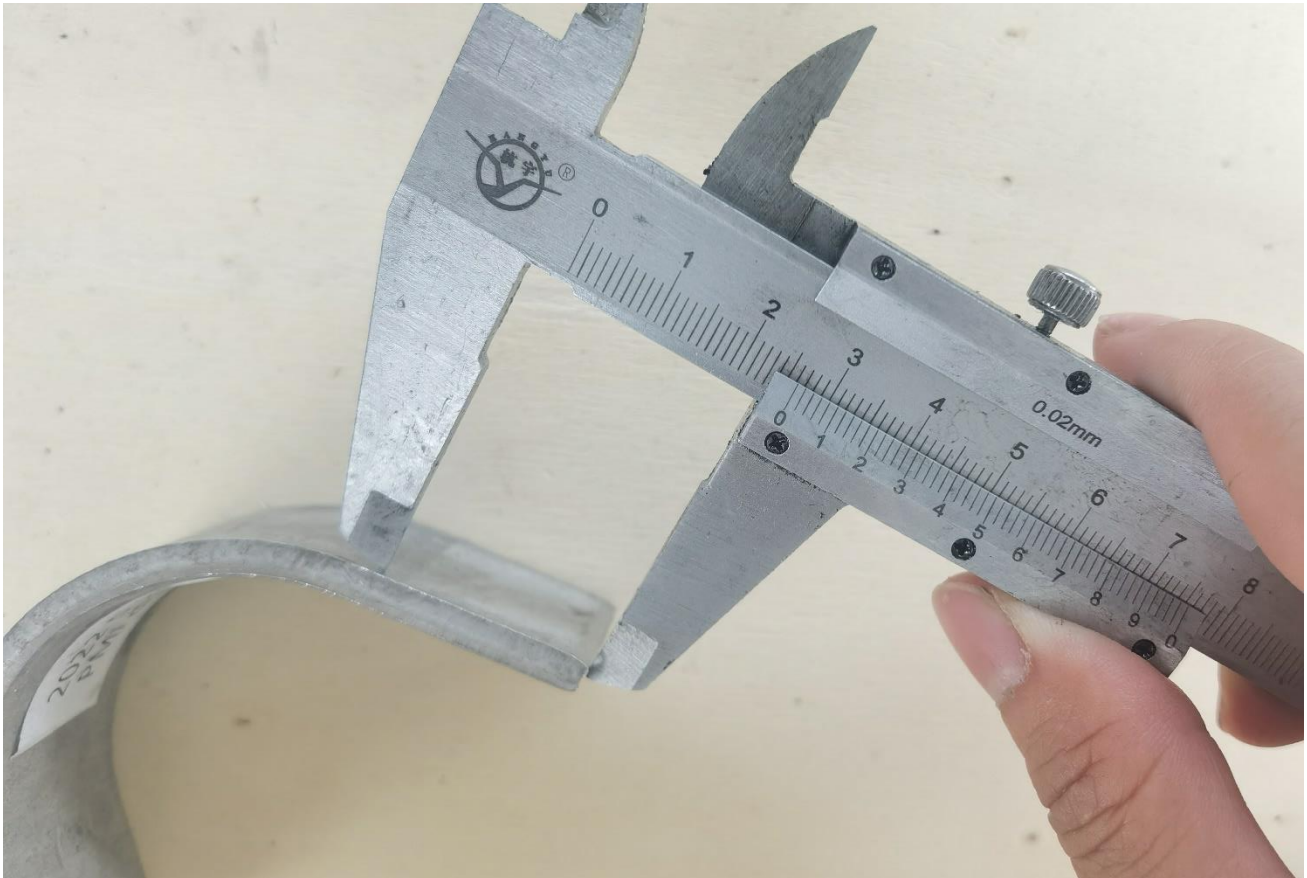
Snap rings for Tubes Erosion Shields

Snap rings are used in conjunction with Boiler Tubes Erosion Shields, which is a clip that easily installs Boiler Tubes Erosion Shields to the tube.



The snap ring and Boiler Tubes Erosion Shields are overlapped and welded, generally about 190-200 degrees (Erosion Shields is a 180-degree semicircle), but also leave a welding position for easy welding and fixing. Generally, each piece of Boiler Tubes Erosion Shields needs to be equipped with 2-4 snap rings with a pitch of 200-500mm.









The anti-wear snap ring is also called clamp, buckle, tube clamp, etc.



The main role of the anti-wear tile snap ring: the role of fixing the anti-wear tile to avoid problems such as the anti-wear tile falling off during installation.

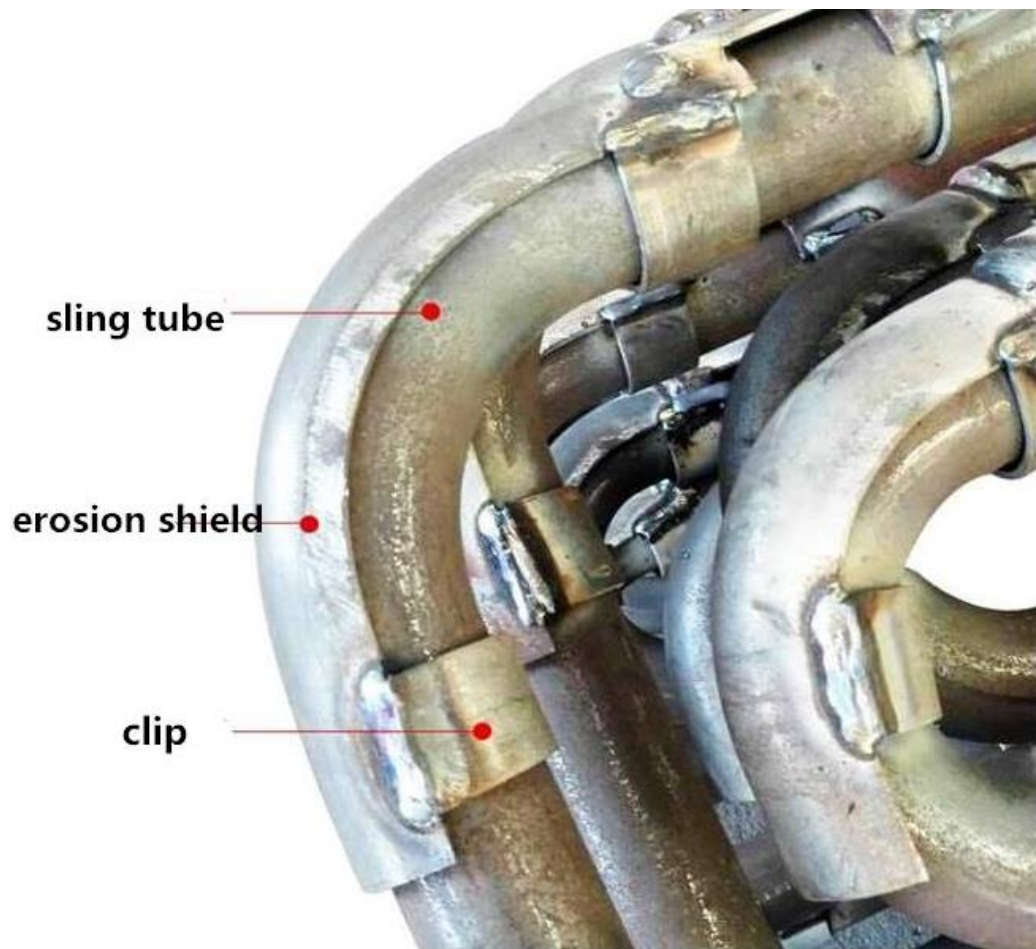
The types of common anti-wear tile rings can be divided into: U-shaped lap type snap ring, butt-type semicircular snap ring.

Install erosion shields with snap ring

The snap ring is a short section that is installed on the pipe in conjunction with the wear-resistant tile.

Generally, it is welded to the wear-resistant tile by lap welding, that is, to cover the wear-

resistant tile slightly, so it is larger than the wear-resistant tile. The opening arc is Around 190-200 degrees, the welding position needs to be set aside to facilitate welding and fixing. The width of the snap ring must not be less than 20mm.

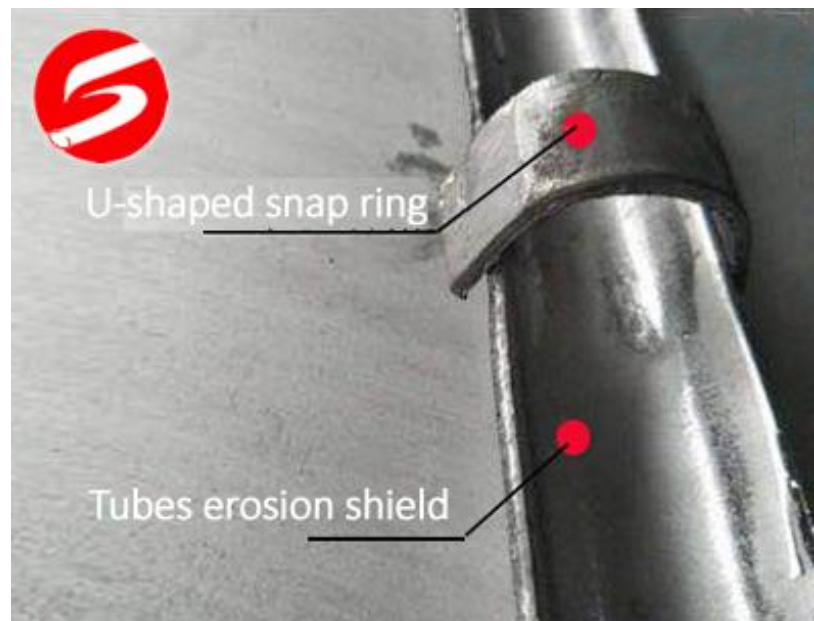


The installation requirements of anti-friction tiles of different shapes are slightly different. Basically, each anti-friction tile is installed with not less than 2-4 snap rings. The snap ring and the anti-friction tile are welded together to prevent expansion due to heat. The tiles fall off, and the joints are required to be fully welded.

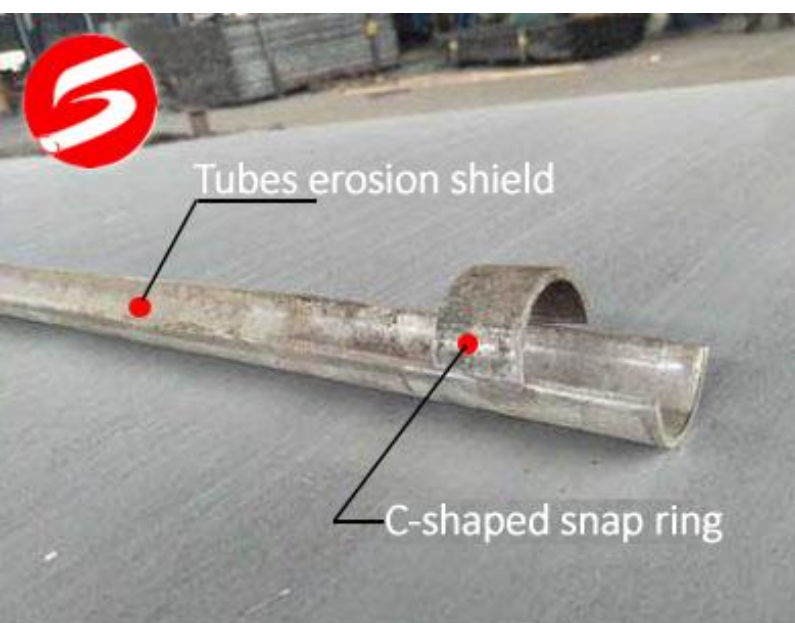
U-shaped snap ring

The inner diameter of the U-shaped snap ring is the outer diameter of the wear-resistant tile plus the thickness of the wear-resistant tile, and the length varies from 20mm to 70mm. It will

be 5mm more in semicircle. The extra part during installation will hold the wear-resistant tile and then spot weld. Compared with the butt-type semicircular snap ring, it is stronger after holding the wear-resistant tile and



welding.



C-shaped snap ring

C-shaped snap ring is the most common snap ring. Mainly based on the size of anti-friction tile, the diameter and thickness are similar to the matching anti-friction tile, and the length varies from 20mm to 70mm. It is mainly connected to

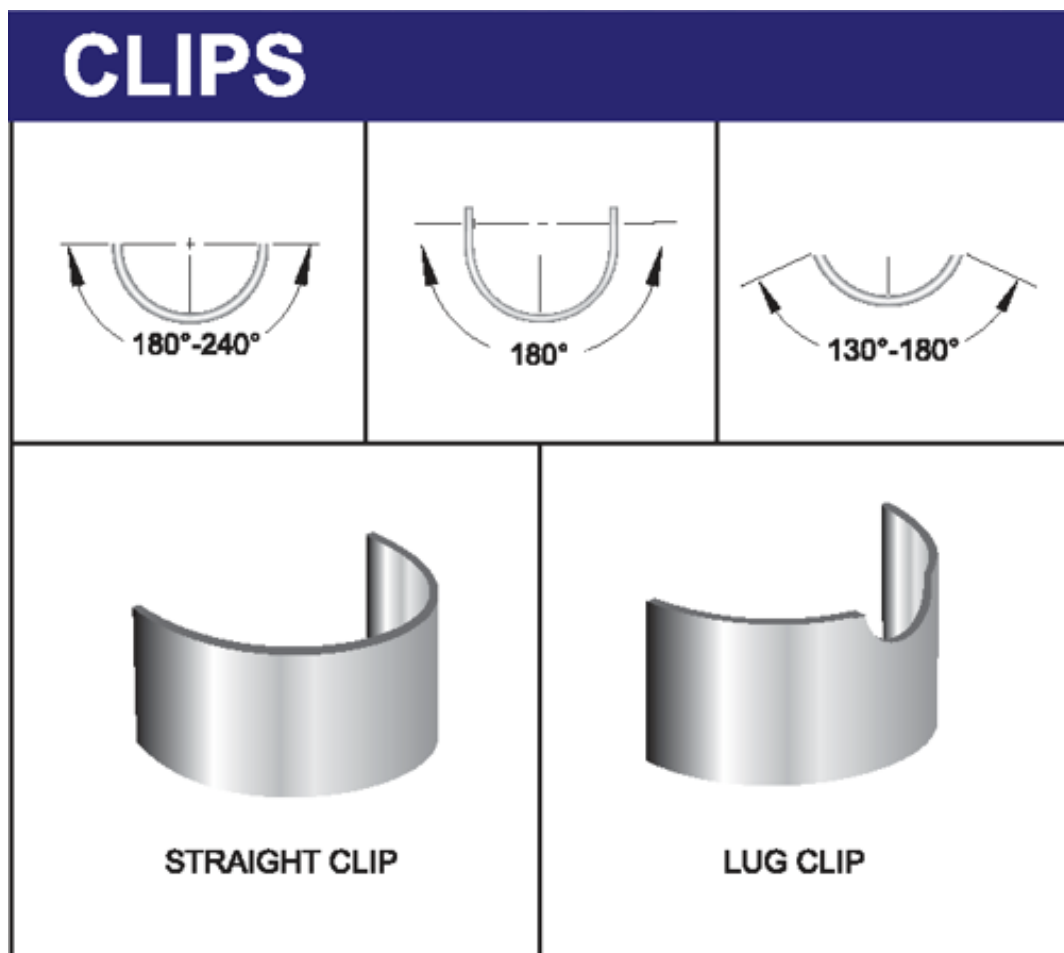


the wear-resistant tile by spot welding when installing the wear-resistant tile, so as to fix and prevent the wear-resistant tile from falling off.





Custom snap ring





Custom snap rings are the recommended method for tube shield attachment.

- Style: Bull, Overlap, Wrap
- Tube Diameter: 0.500" to 5.000" (Tube OD is shield ID), XML
- Angle of Wrap: Maximum 240° XML
- Gauge: 7 to 24 XML
- Material: 304 SS, 316 SS, 309 SS, 310 SS, 430 SS, Inconel

All products are purchased to proprietary customized specifications as well as normal industry standards with supporting documentation.





Application of Tubes Erosion Shields

Tubes Erosion Shields are mainly used on the windward side of the heating surface of the boiler, such as superheaters, reheaters, economizers, and water-cooled wall pipes.

The main role is to protect the heating surface of the boiler pipes, reduce pipeline wear, and increase the heating surface of the pipes.

Erosion shields are used to protect boiler tubing from the highly erosive effects of high temperatures and pressures thereby greatly extending tube life.



We offer shielding for tubing, covering straight, bent and finned sections, as well as the clips that hold these in place.



In the long term, these shields more than pay for themselves, preventing the



costly replacement of tubing and avoiding the downtime that results from tube breakdown and leaks.

Service life. In general, most of them are called "wear-resistant tile" and "wear-resistant cover plate". Erosion Shields are special boiler accessories.

Generally, most of them are used in power station boilers, small boilers are used less, and some coal chemical industries will also use them.



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Collect steel pipes and fittings

