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Socket Weld Fittings Types and Applications – Completely Specification

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Socket Weld Fittings Types and Applications – Completely Specification

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As we know there are four connecting types for the pipe fittings: Socket weld, butt weld, threaded, and flanged.

In terms of fittings that you would be able to use for your construction projects, you would find two of them to be quite popular. These would be socket weld fittings and butt weld fittings.

However, since both of them seem to have their own share of pros and cons, you might be confused about which one would be best for your particular purpose. It would be because of this reason that we have taken the responsibility of drawing up a comparison between them. In this way, you would be able to understand more about both of them and thus make a smart and rational decision at the end of the day.

To know more about these, continue reading below.

What is Socket Weld Pipe Fittings

A socket weld fittings would be a pipe attachment detail. In this case, the pipe would be inserted in to a recessed area of a pipe, fitting, valve, or flange. In order to join the pipes or valves to the other sections of the pipe, seal welds of fillet type would be used. And you would find socket weld fittings will be a good choice. This is because the benefits of great structural strength and high leakage integrity would be quite important factors that would need to be taken in to consideration when designing your construction project.

Usage about socket weld fittings

Since these fittings have been termed to be high pressure, these could easily be used in a diverse range of industrial processes.

- These fittings could be used for lines that would be conveying toxic, flammable, or expensive materials where there would be no scope for leakage to occur.
- They could be used in conjunction with ASME pipe and could also be found in the same range of sizes.
- Socket weld fittings could be used in areas where pipe work has been deemed to be permanent. In addition, they have also been designed in a manner which would provide characteristics of good flow.
- They have been produced in accordance with ASTM standards and could also be manufactured according to ASME B16.11. This is a standard which would cover dimensions, pressure-temperature ratings, marking, tolerances, and requirements for materials for carbon steel and forged carbon. In terms of material forms that would be acceptable, those would be bars, forging, seamless tubes, and seamless pipe which would conform to the requirements of fittings chemicals, mechanical property, and practices.
- Socket weld fittings could be found in three pressure ratings. Those would be Class 3000, 6000, and 9000.

Socket weld pipe fittings types

1. Full-coupling

This pipe would join two pipe or to a nipple.

2. Half-coupling

This could be directly welded to the run pipe in order to make a branch connection.

3. Reduced coupling

This would help to join two different outside diameters of a pipe.

4. Reducer insert

These have been manufactured according to MSS SP-79. This would help to enable economic and quick combinations of pipeline reductions. As such, these could be made by using standard socket weld fittings.

5. Union

This is a screwed joint design and would consist of three pieces which would be interconnected. This would include two internal threads and a centerpiece that would draw the ends together when it would be rotated. As such, the unions should be tightly screwed before the ends would be welded. This would help to minimize the warping of seats.

6. Tee Straight

This would help to make a ninety degree branch from the main run of the pipe.

7. Cross

The Cross would also help to make a ninety degree branch from the main run of the pipe.

8. Cap (End cap)

This cap would help to seal the end of the pipe.

Socket Weld Advantages and Disadvantages

Advantages

- The pipe would not need to be beveled for preparation of weld
- Temporary tack welding would not be required for alignment. This is because the principle in fitting would help to make sure that alignment would be proper
- The socket weld metal would not be able to penetrate the bore of the pipe
- Costs of construction have been found to be lower than butt-welded joints. This would be due to elimination of special machines and the lack of exact fit-up requirements.

Disadvantages

- The welder should make sure that the expansion gap between the shoulder of the socket and the pipe should be 1.6mm
- The internal crevices and expansion gap in socket weld systems would promote corrosion. It would be because of this reason that they have been deemed to be less suitable for radioactive or corrosive applications
- These kinds of fittings would also be unacceptable for UltraHigh Hydrostatic Pressure in food industries. This is because in addition to not allowing full penetration, it would also leave crevices and gaps that would then become very difficult to clean.

Differences between socket weld and butt weld fittings

In the case of socket weld fittings, these have already been defined in the ASME B16.11. Here, a pipe would be inserted in to a recessed area of the fitting. Both the fitting and the pipe would be square cut which would not require any preparation or beveled end other than cleaning the outside. This would then help for easy installation and welding.

As for butt weld fittings, these have also been already outlined in the ASME B16.9. with their ends being welded on to the pipe end, the thickness would be the same as those of pipes. In this case, the end of the fittings would be beveled.

Application differences between socket weld and butt weld

The socket weld would resist around half the strength of butt weld fittings. Hence, it would mainly be used for small pipelines with diameters NPS 2 or even smaller.

On the other hand, butt weld fittings would help to keep better strength. As such, it would be better for high temperature or high pressure pipelines. In addition, it would also be used when a welded joint with strength not greater than that of the base metal would be needed.

How to install – Socket weld vs Butt weld

In case of socket weld fittings, you would find them to be quite easy to install. Since it requires around 1/6 inches of gap at the bottom of the gap in order to allow the socket access, it would also allow thermal expansion. However, this gap could then lead to the problem of over stress which would then crack the fillet weld of the fitting. In addition, socket weld has also been found to be problematic in corrosive fluid service as a result of crevice corrosion. Also, it has been found to corrode quite easily due to the discontinuity of smooth pipe internals.

On the other hand, butt weld fittings have been found to be the best in terms of fatigue, strength, compliance with temperature, and resistance to corrosion. However, it would also be more difficult to weld and fit-up properly. This would then require more time and the expertise of skilled welders.

Socket weld and butt weld price differences

When thinking about using fittings for any construction project, price is a major factor which would need to be taken in to consideration.

Where socket weld fittings are concerned, the price has been found to be much higher than butt weld fittings of a similar size. However, the extra cost that would be associated with butt weld fittings would be higher for installation. This is because skilled welder and other labor costs would also need to be factored in.

Hence, this would be all where the discussion of socket weld and butt weld fittings are concerned. This would hopefully help you to attain a better understanding where both these fittings are concerned.

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Contact Info

Address : Unit 04, 7/F Bright Way Tower No.33 Mong Kok Road, Kowloon, HK Phone : +852 8191 1516 E-mail : info@octalsteel.com

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