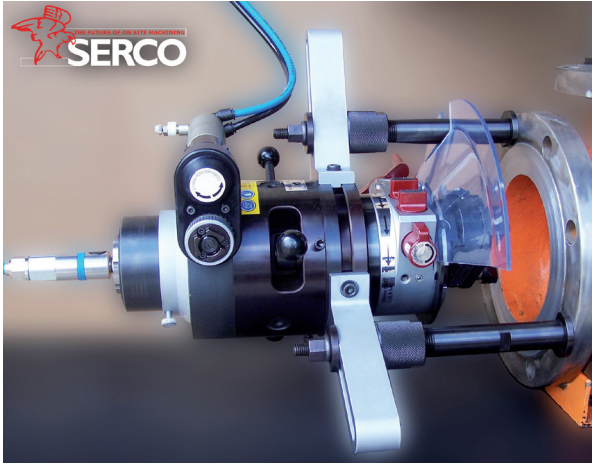


Flange facing machines applications



I) DEFINITION AND USE OF A FLANGE FACING MACHINE

A Flange Facing Machine also called Portable Lathe is made to mechanically polish a disk, collar or ring connected to a pipe in order to form a link with other piping elements (valves, other pipes, etc.) or to block off a part of the piping. This machining operation is done by successive strips to ensure face flatness and regularity.

A company needs a Flange Facing Machine when flanges are deformed or corroded due to flows inside a network (water, steam, oil & gas, etc.) and even damaged from outside due to vibrations or bad handlings.

Quality of a flange facing is fundamental because sealing and pressure resistance depend on it.

II) A FLANGE FACING MACHINE FOR WHICH INDUSTRIES?

Flange Facing Machines are needed wherever you can find a flange or a valve, including the following fields:

- Nuclear Industries
- Fossil Industries: Oil & Gas (drilling platforms, refineries, offshore, onshore, spool base, etc.)
- Petrochemical Industry (manufacturing plants of various chemicals)
- High Purity
- Diesel Engines
- Shipyards
- Tube Processing
- Defense
- And generally speaking all industries where mechanical device whose function is to control the flow of fluids in piping systems are present.



III) HOW OFTEN IS IT NECESSARY TO REPAIR A FLANGE?

There is not a common answer. Indeed, a flange is subject to many preexisting or evolving threats due to:

- Effect of corrosion
- Normal and, sometimes, abnormal stresses about bending, pressure, vibrations, etc.
- Low quality materials
- Defective fabrication and defective preparation before welding
- Unadvisable addition of welded attachments or details to stressed sections
- Weld of incorrect shape
- Welds containing internal defects or associated with residual stresses



Cracks of a flange

■ Unsatisfactory application of allied processes

In consequence, periodic examinations of their facilities by our customers, and also by building technical control offices, which can be legally required, enable to point out defective flanges and lead to a specific need of repair for each of them.

legally required, enable to point out defective flanges and lead to a specific need of repair for each of them.

IV) RISKS WHEN FLANGE OBSOLESCENCE IS TOO OLD

Waiting too long to repair pittings, scratches, cracks and other failures can cause serious accidents in case of flanges breaks.

Moreover, a business interruption means a lack of turnover and, finally, harm a company. That is why it is so important not to neglect a flange repair.

V) WHY PORTABLE MACHINES ARE SUITABLE FOR ALL TYPES OF FLANGE FACING?

Portable machines allow to repair flanges with numerous diameters without having to replace them.



Portable lathe – flange facing and boring machining units



Portable lathe – flange & valve facing and boring machining units

VI) CASE STUDIES: A LONG EXPERIENCE OF ON-SITE FLANGE FACING

1. Combined turbine inlet flange

Flange OD: DN250
No. of bolt hole: 12
Seal face type: flat
Machine: TU600

Procedure:

- Clean surface
- Re-welding the corrosion part
- Machining with cutting tool
- Fine machine with insert bits

Conditions:

- Seal face corrosion
- Upside
- Working above ground



Protem SAS

Z.I. les Bosses
26800 Etoile-sur-Rhone
France

Tel: +3347557 4141

Fax: +3347557 4602

contact@protem.fr

www.protem.fr



Before machining



2. Combined reactor pipe flange

Flange OD: DN400

No. of bolt hole: 20

Seal face type: flat

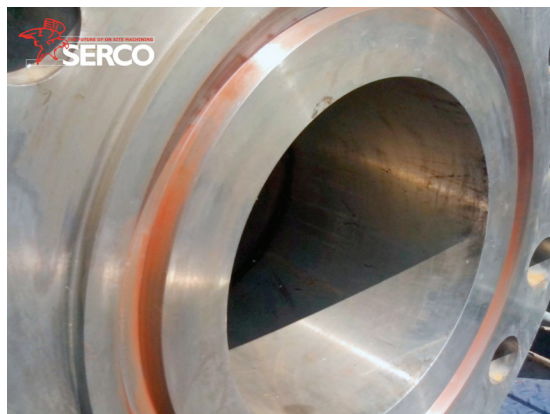
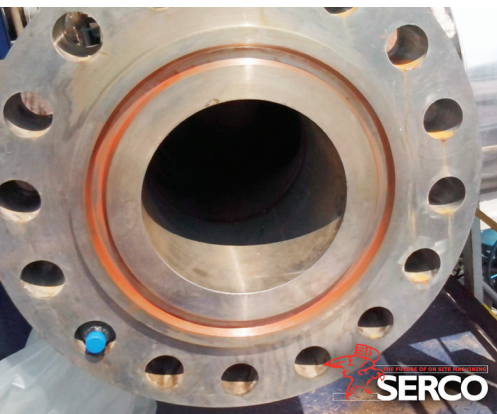
Machine: TU600

Procedure:

- Clean surface
- Machining with cutting tool
- Low rotation, low feeding
- Fine machine with insert bits

Conditions:

- Seal face corrosion
- Cutting Depth: 0.3mm the machining cutting depth determined depending on the corrosion situation
- Surface tolerance: Ra1.6



3. Heavy oil hydrogenation filter flange

Flange OD: DN400

Num. of bolt hole: 16

Seal face type: RTJ

Machine: TU1100RTJ

Conditions:

- As the width of the seal groove is too big, the ring gasket hardly has any effect.



4. Residuum oil hydrogenation reactor cover

Seal MD: 1090mm

Num. of bolt hole: 24

Working temp.: 340 °C

Working pressure: 170 MPa

Seal face type: RTJ

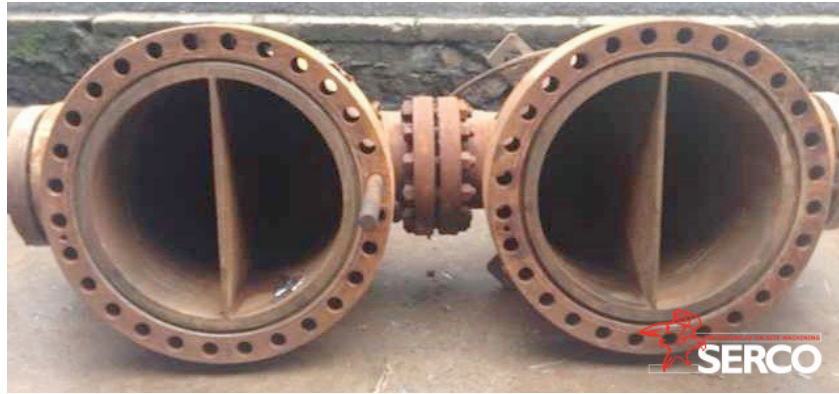
Machine: TU1100RTJ with extended support arm

Conditions:

- The seal surface deformed due to the hardness of the gasket and incorrect tighten method.
- The mounted dimension has beyond the max. clamping OD of the machine, we have to use extended arm. But we don't know what will follow once we use non-standard accessory.

5. Slur oil heat exchanger cover

Seal MD: 1100mm
 Num. of bolt hole: 44
 Working temp.: 390 °C
 Working pressure: 3.5 MPa
 Seal face type: RTJ
 Machine: TU1100RTJ with extended support arm



Part view



After machining

6. Reforming reactor cover

Seal MD: 1100mm
 Num. of bolt hole: 40
 Working temp.: 540 °C
 Working pressure: 1.8MPa
 Seal face type: RTJ
 Machine: TU1100RTJ with extended support arm





7. Heat exchanger outlet flange

Seal MD: 410mm
Num. of bolt hole: 18
Working temp.: 350 °C
Working pressure: 4.1MPa
Seal face type: RTJ
Machine: TU600RTJ



8. Reforming reactor body flange

Seal MD: 720mm
Num. of bolt hole: 28
Working temp.: 320 °C
Working pressure: 8MPa
Seal face type: RTJ
Machine: TU1100RTJ

Procedure:

- Re-welding the corrosive spot, and grind it.



After re-welding and grinding



After machining