

PQF[®] Roll Redressing Comparison

To carry out the roll redressing of PQF[®] cartridges two alternatives are available:

1. *Single roll profile redressing*, with standard CNC Lathe, after their dismounting from the proper PQF[®] cartridge.
2. Roll profile redressing leaving assembled on proper PQF[®] cartridge the three rolls, with dedicated *PQF[®] Roll Redressing Machine*.

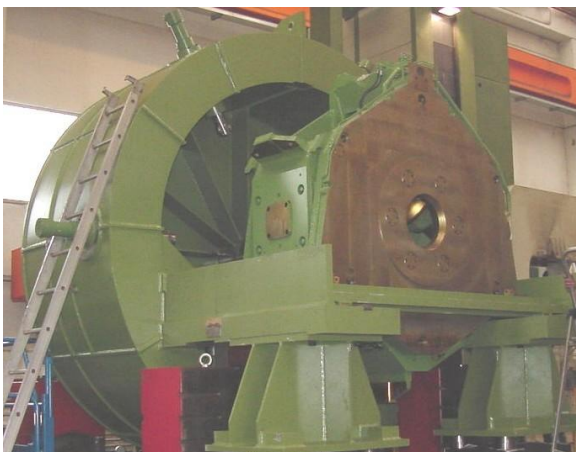
With this paper an overall comparison between the two methods will be presented, analysing all the involved aspects.

Necessary equipment for redressing operations

Basically the following equipment has to be foreseen in order to carry out the PQF[®] roll redressing for each alternative:

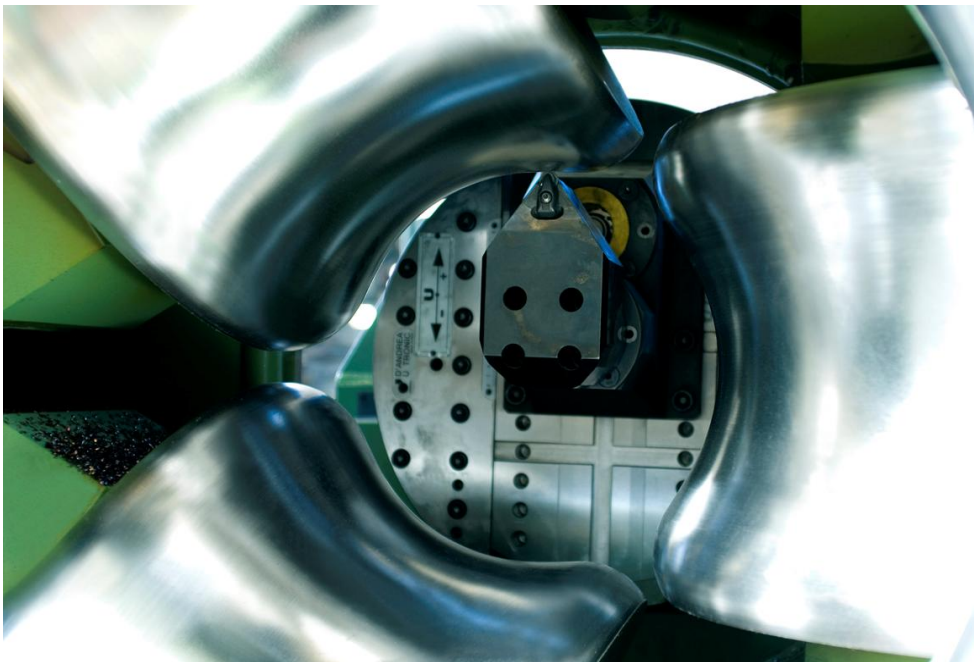
Alternative 1:

- PQF[®] cartridge Tilter device for dismounting and re-mounting the roll chocks assemblies from/into the cartridges (for every redressing).
- CNC Lathe for roll redressing mounted on chocks assembly.
- PQF[®] Roll Calibrating Stand in order to check and calibrate the roll assemblies after their re-mounting in the cartridge, before to send it to the mill.



Alternative 2:

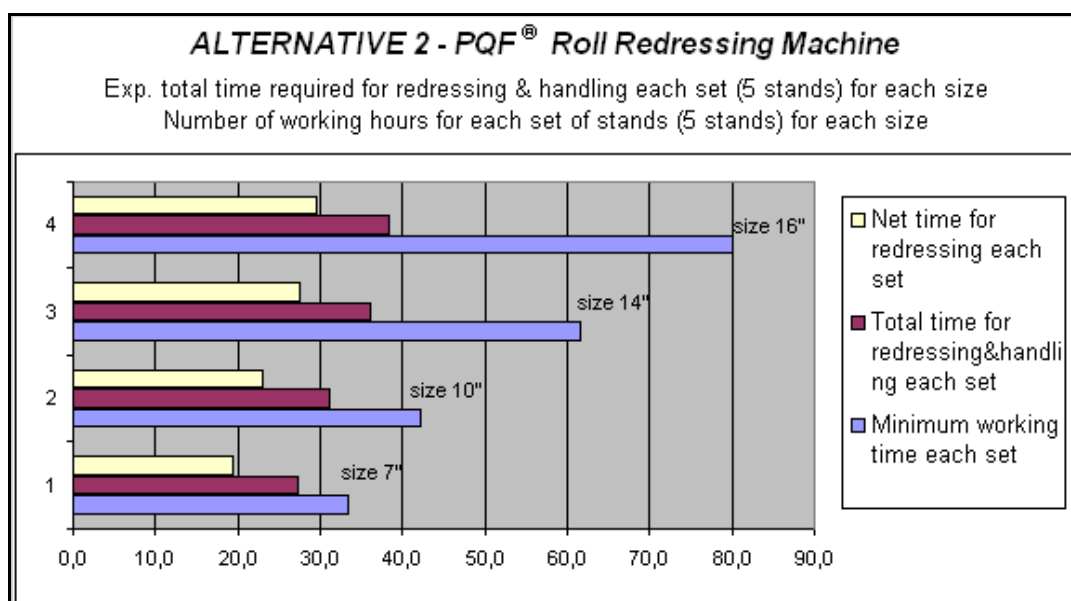
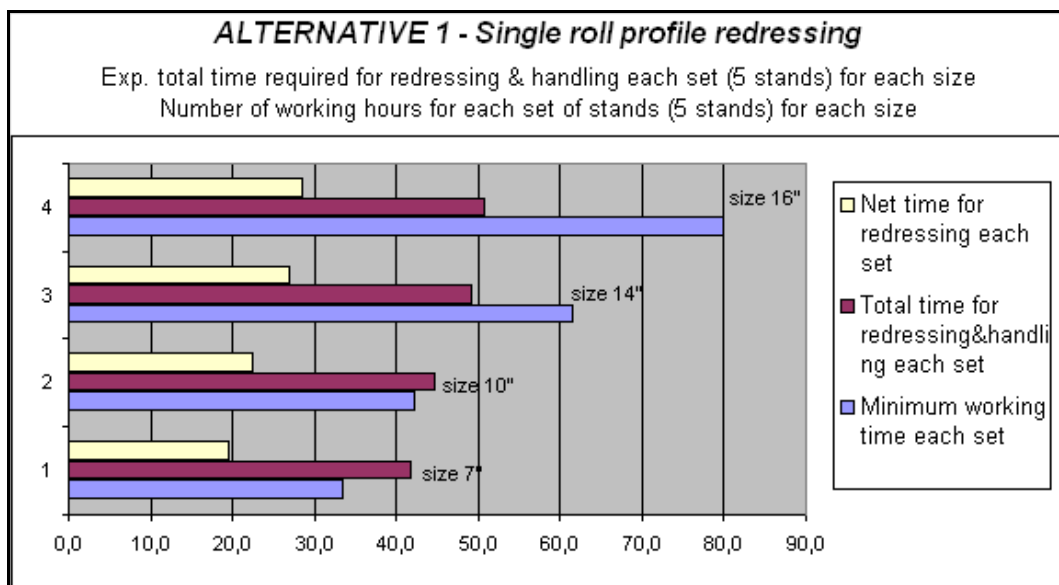
- PQF[®] cartridge Tilter device for dismantling the roll chocks assemblies from the cartridges (only at the rolls life end – average each 10 redressing).
- PQF[®] Roll Redressing Machine for roll redressing mounted in the cartridge, before to send it to the mill.



Time for redressing operations

The pure redressing time (cutting time) is comparable between the two alternatives.

The auxiliary time for the redressing operations, which include cartridges handling, machines preparation and roll assemblies mounting/dismounting when necessary, is completely different between the two alternatives. Auxiliary time for *Alternative 1* can be considered 4 times longer than *Alternative 2*, resulting a total time for redressing operations approx. 40% longer (see reference tables below).



Operating Spares

Due to the different cartridges management and the longer time needed for the redressing operations, for *Alternative 1* it is advisable to foreseen more additional cartridges sets in comparison of *Alternative 2*.

<u>SAVING</u>
20 % ÷ 33 % of PQF cartridges on initial investment

Overall space in the Roll workshop

The covered area for roll workshop for *Alternative 1* will be wider than the area for *Alternative 2* (approx. 50% more).

In fact for *Alternative 1* more main equipment has to be foreseen (3 instead of 2) and more area for roll assemblies and cartridges temporary storage has to be foreseen in comparison of *Alternative 2*.

<i>Alternative 1</i> <u>350 - 400 m²</u>
<i>Alternative 2</i> <u>230 - 270 m²</u>

Manpower for redressing operations

In case of *Alternative 1* a dedicated team (4 assemblers + 1 crane operator) for roll mounting/dismounting, has to be foreseen in addition to the machines operators. This team has to work continuously on two or three shifts basis according to Mill Plant productivity.

In case of *Alternative 2* in addition to the machine operator has to be foreseen a pair (2) of assemblers working on one daily shift basis, for roll mounting/dismounting at the roll life end.

The necessary manpower for *Alternative 1* can be considered 3 or 4 times higher than *Alternative 2*, according to Mill Plant productivity.

<u>SAVING</u>
approx 10 ÷ 12 people less

Cost Evaluation

The cost evaluation will consider two main aspects:

- Investment cost
- Operating costs

The Investment cost has to consider Equipment costs, Building costs, Operating Spare costs.

For what Equipment cost is concerned the *Alternative 1* will save approx. a 25% in comparison with *Alternative 2*. This gap will be reduced in consideration of the difference in Building cost. If we consider the additional cost of necessary Operating Spares (more sets of PQF[®] cartridges), for the Investment costs the balancing is in favour of *Alternative 2*.

The Operating costs have to consider mainly the redressing costs and the manpower cost.

For what redressing cost is concerned they are comparable between the two alternatives. The cost of manpower will be 3 or 4 times higher for *Alternative 1*.

Then also for the Operating costs the balancing is in favour of *Alternative 2*.

<u>COST EVALUATION</u>		
	<i>Alternative 1</i>	<i>Alternative 2</i>
<u>INVESTMENT COSTS:</u>		
Equipment:	-	+
Operating Spares:	+	-
Building:	+	-
<u>OPERATING COSTS:</u>		
Redressing:	=	=
Manpower:	+	-
<u>Balancing:</u>	+	-

Conclusions

After this analysis results that the *Alternative 2* (with dedicated PQF[®] Roll Redressing Machine) is the most suitable solution to carry out the PQF[®] roll redressing getting advantages both from operational and, in spite of an Equipment cost higher, economical viewpoints.

We can summarize the advantages of the adoption of this dedicated PQF[®] Roll Redressing Machine as follows:

1. Time saving to carried out the roll redressing operations.
2. Easier management of roll assemblies and cartridges.
3. Reduced manpower to carry out the roll redressing operations.
4. Reduced Operating Spare parts inventory.
5. Overall space saving in the roll workshop.