Wash-X preparations

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Wash-X service

1. Water is sprayed to the floor as soon as the remaining bed has cooled down to 800ºF and floor tube temperatures are below 300ºF. Water can be sprayed to furnace floor through liquor guns or nozzles installed in various openings. Several water sources can be used
    - feedwater
    - condensate
    - warm water
    - fire water
2. Mixing devices are installed on the furnace floor and operated continuously throughout the whole boiler washing period.
3. Once superheaters are clean, the mixing devices are removed and floor is emptied from wash water using smelt ejectors.

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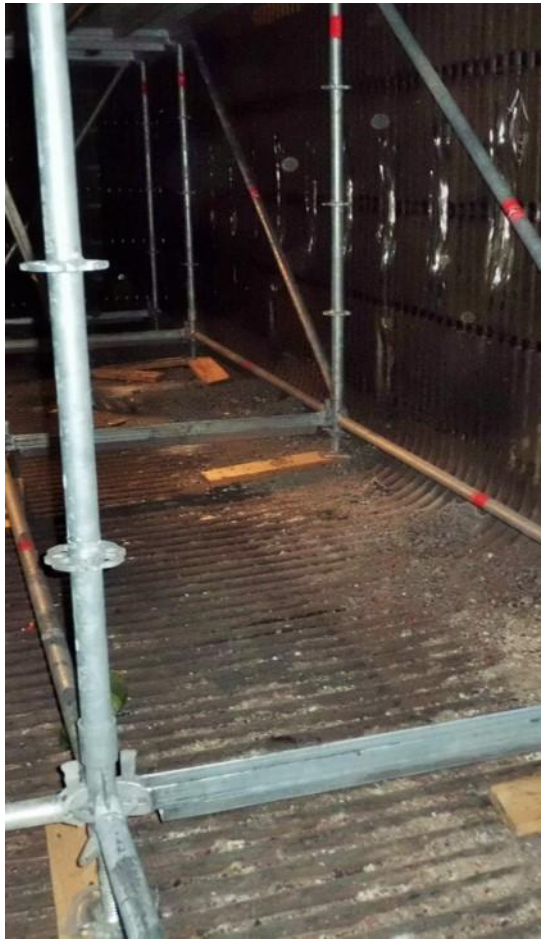
Wash-X prerequisites

1. Pressurized air (as with Smelt-X)
2. Warm water that can be pumped into furnace floor while other parts of the boiler are being washed
   - temperature 120 - 160ºF (50 - 70ºC)
   - flow water 250 gpm for 1000 ft^2 floor

Total water consumption and washing time will depend on the amount of soot to be dissolved.

Total water consumption can be minimized, if needed, so that wash water is removed from floor only when the density is high (salt content 20 %). This may require heating the water pool with steam or hot water as extended circulation may be required and mixing with pressurized air may cool the pool too much otherwise.

However, some water needs to be sprayed so that soot pile is dissolved as quickly as possible



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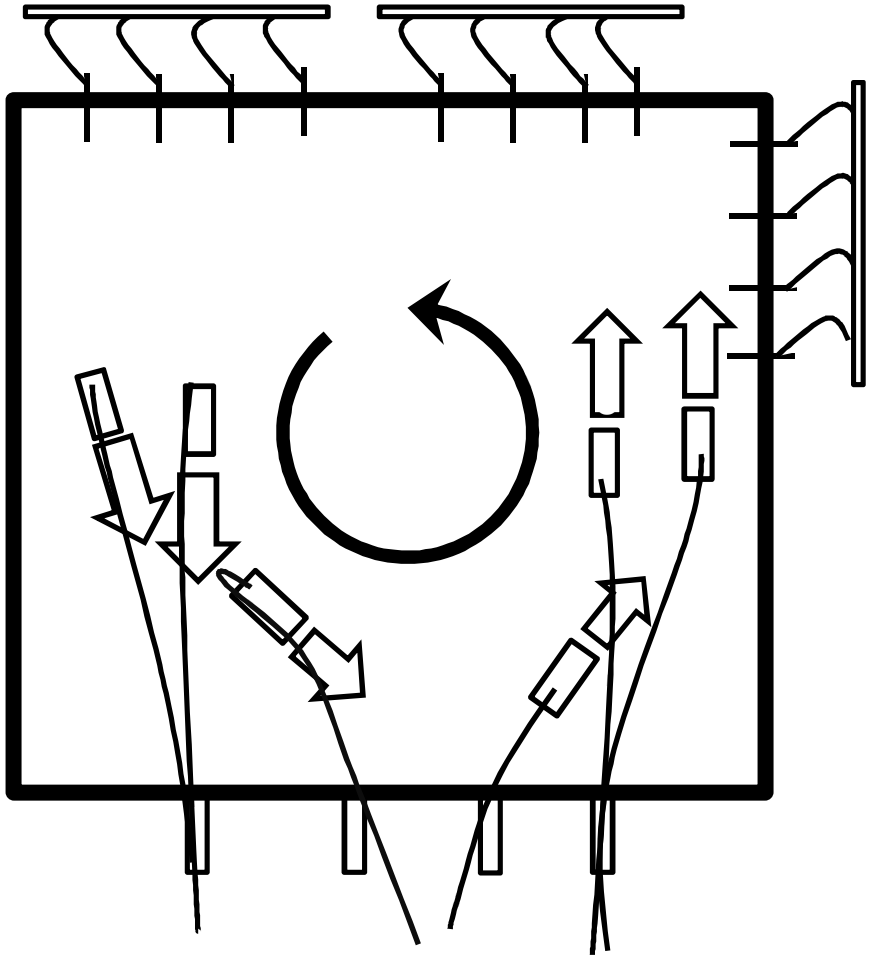
Typical Wash-X arrangement for mixing devices and wash water sprays

- 1 or 2 mixing devices in each spout (operated with pressurized air)
- 8 - 18 primary air port sprays connected to feedwater or warm water system (depending on floor size)
- black liquor sprays (at least) in front wall (not shown here) spraying warm wash water



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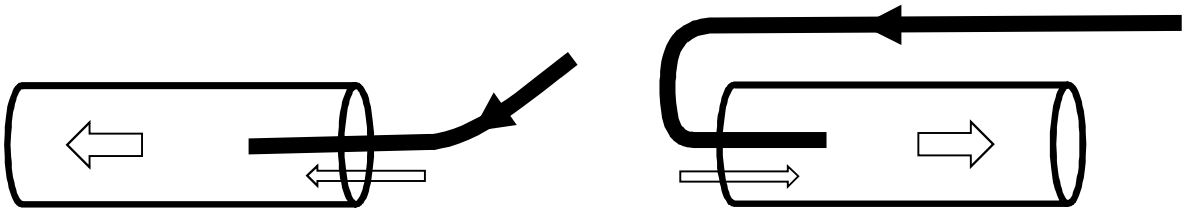
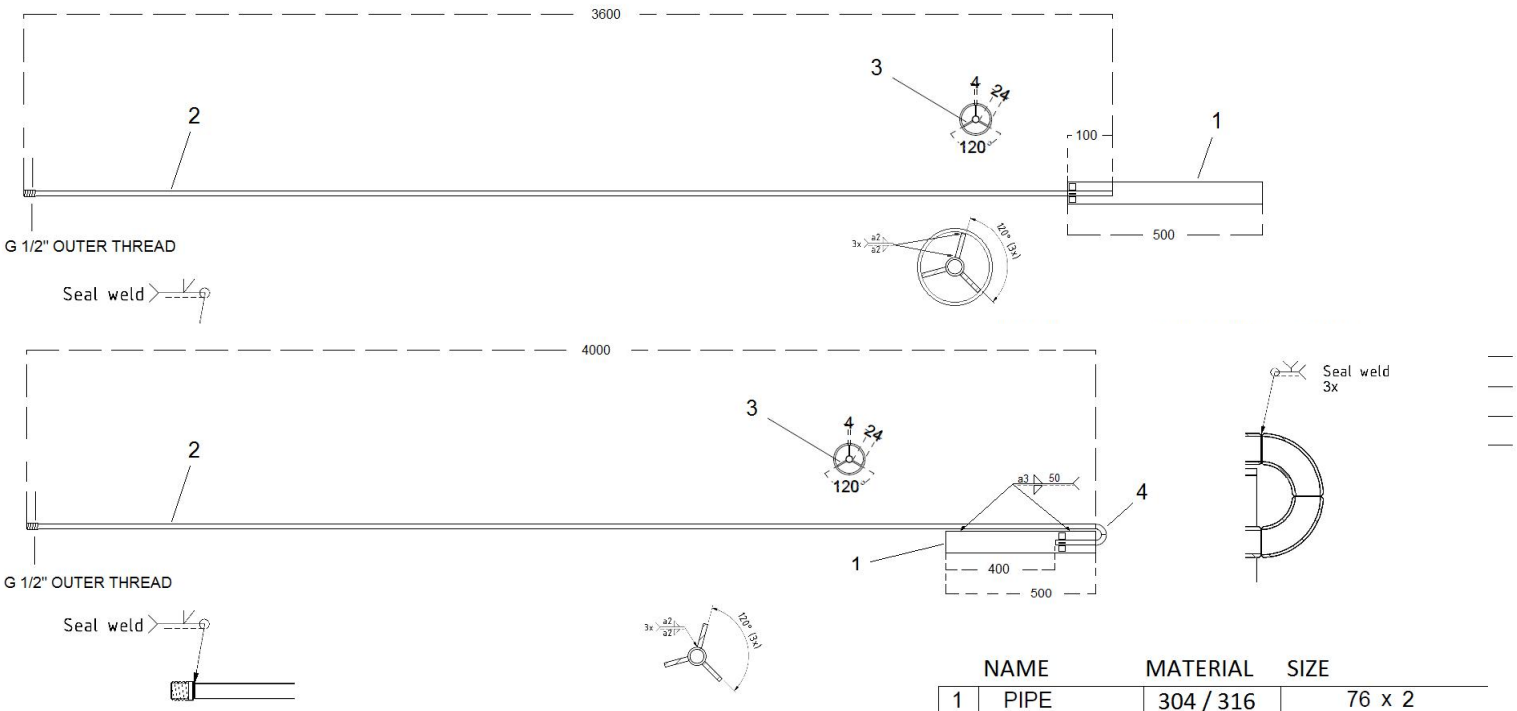
Mixing ejectors





	NAME	MATERIAL	SIZE
1	PIPE	304 / 316	76 x 2
2	PIPE	304 / 316	18 x 2
3	PLATE	304 / 316	PI4 25 x 24
4	CURVE r=1.5xd	304 / 316	18 x 2

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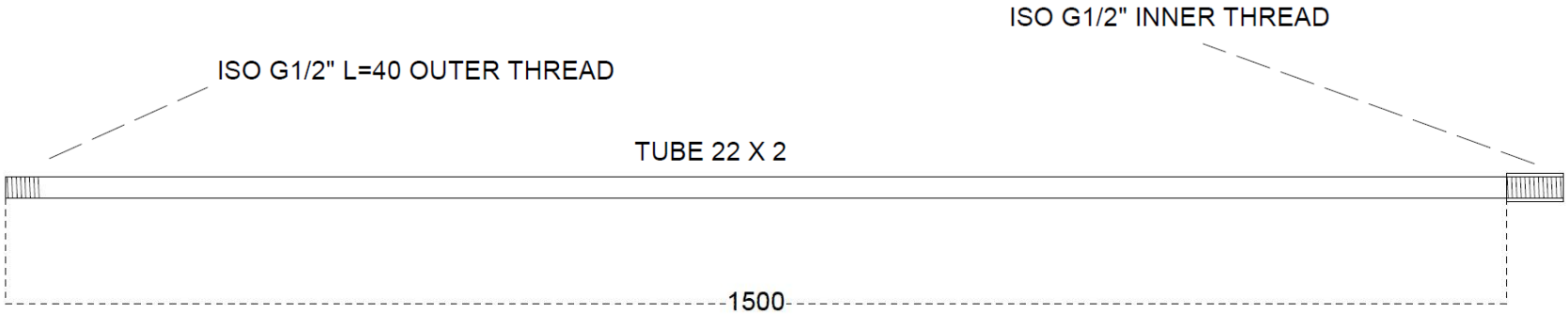
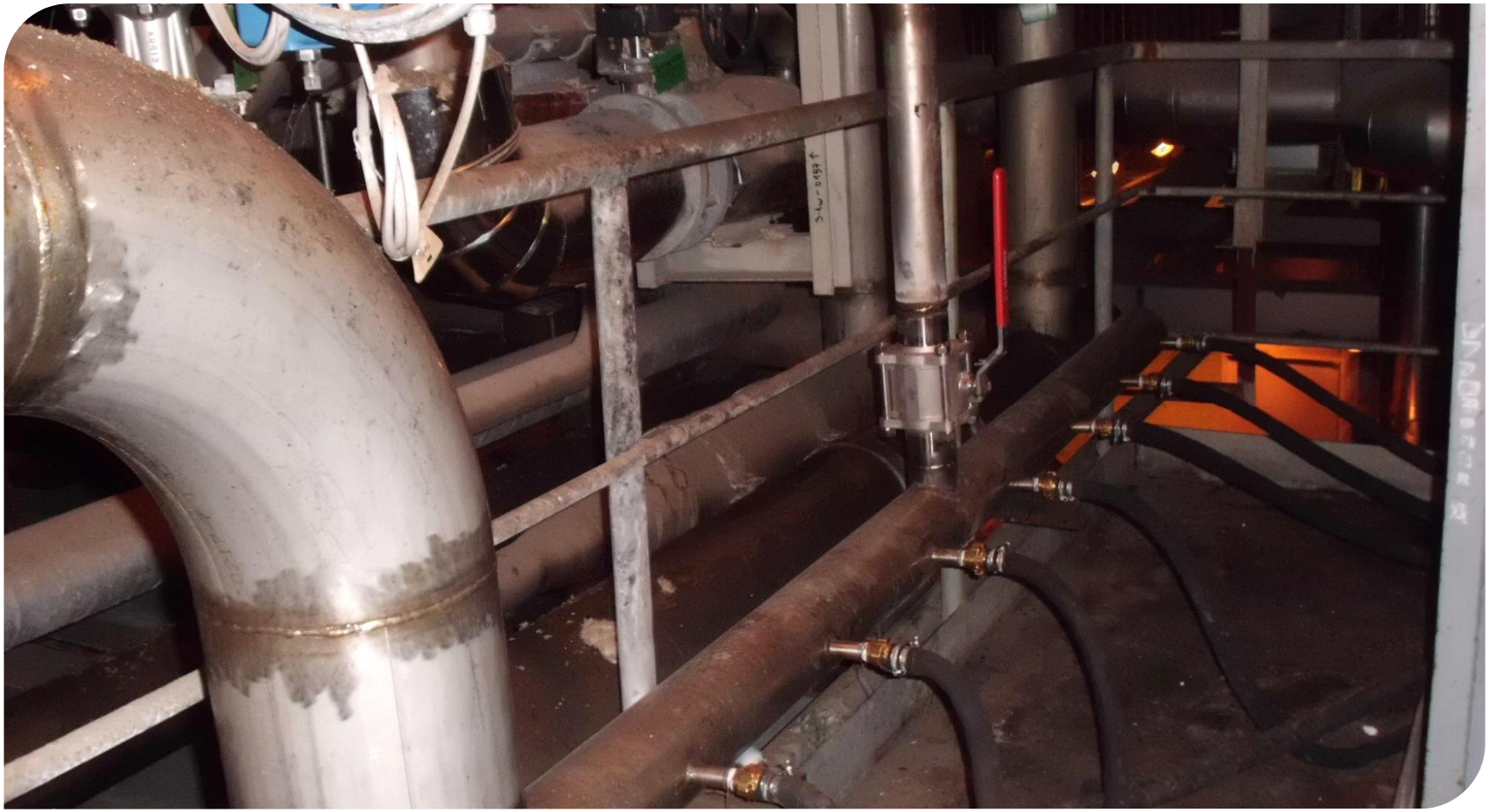
Mixing ejectors



Water sprays installed into primary air ports in Ilim Group Bratsk mill

Wash water header welded into warm water system in Ilim Group Bratsk mill



Connection of the wash water hose to the warm water system in Stora Enso Heinola mill

Feedwater header near the primary air ports in the front wall for wash water sprays in UPM Kymi mill

Planning

- A detailed plan for wash water spraying has to be made in co-operation with the customer so that the equipment needed will be available in time.
- Black liquor system wash water may be the easies source to use, but other sources (feedwater, warm water) may be needed, too. If everything else fails, fire water is used, but then the result is not guaranteed.
- Usually Valmet delivers spray nozzles, headers and hoses needed, and the customer provides the connections (flanges, fittings or welding) to the water system(s).
- Some customers have wash water systems already in place. In this case Valmet operates the wash water system, including sprays, and the mixing ejectors during washing.
- Information needed from the customer:
  - availability of warm or hot water (flow rate, total amount, temperature)
  - the amount of soot (expected soot pile height and area)
  - schedule for boiler washing
  - equipment available from the customer (if any)

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Typical time schedule for Smelt-X & Wash-X

	h		Friday												Saturday											
Bed reduction	8	00 - 08																								
Oil firing	7	02 - 09																								
Smelt-X	3	06 - 09																								
Depressurization	5	09 - 14																								
Economiser washing	4	14 - 18																								
Boiler bank washing	4	18 - 22																								
Superheater washing	8	22 - 06																								
Floor washing	16	14 - 06																								
Wash water removal	2	06 - 08																								
Drying	3	08 - 11																								
Safety roof installation	4	11 - 15																								
Scaffolding		15 - ...																								
Total time spent on cooling and washing	23	09 - 08																								


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