CATHILD INDUSTRIE

The Energy Recovering System :

WRG

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CANADA

WHY ?

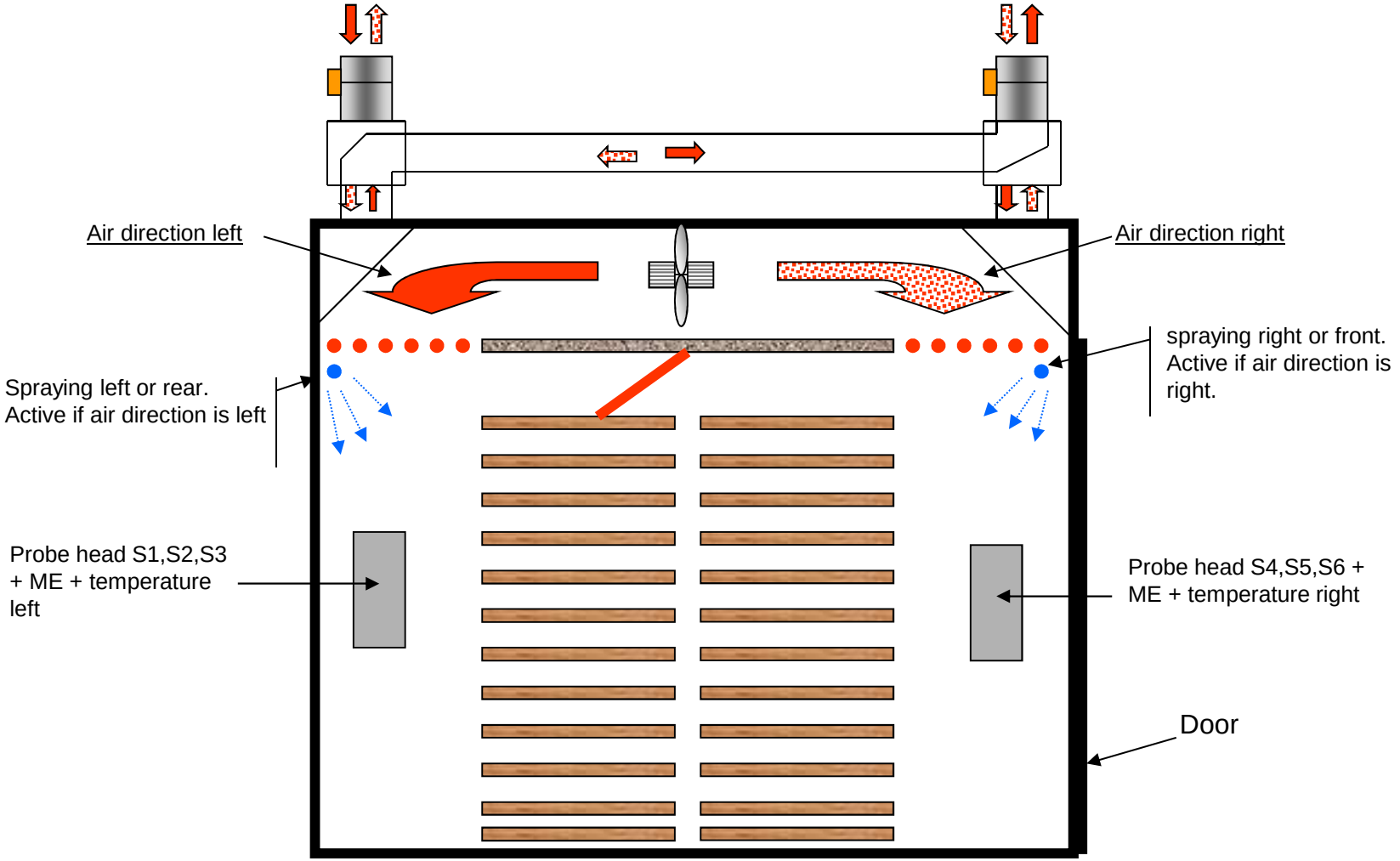
1) The timber drying requests lots of energy
2) The expensive cost of energy (whatever those energies are)
3) The protection of the planet :
   - Reduction of carbon dioxide emissions (greenhouse effect)
   - Atmospheric pollutions
   - Dusts, acid rains etc…

Where ?

- In a conventional drying (type ACC - warm conditioned air) : the warmth produced is used to evaporate the water contained in timber.

- It is completely rejected in air with moisture rejects through the dampers.

- The aim is to use this potential energy by transfering it to fresh air.



Side view

Information and positioning of the various elements in a front kiln dryer with WRG.

SOLUTION

- Transfering the warmth coming from water evaporation (latent), and even the sensitive warmth present in the mixture air-vapor rejected from the kiln dryer to the new fresh air introduced (renewal air).

LIMITS

- To the quantity of admissible warmth (weak) by the cold air, which is poor in water vapor, coming from the outside.

- The warm and moist air stores 5 times more warmth for a same volume at the beginning of the cycle.

MATERIAL

Heat exchangers Air-Air

(transmission by conduction).

The best performances are obtained around 70% (with large surfaces of transmissions).

The passages for rejected air and fresh air must guarantee in time a tight separation to avoid the risk of moisture short-cut.

They must have a good resistance to corrosion, because there is a lot of condensation, hence the presence of organic acids which are more concentrated than within the kiln dryer.

These passages must be large enough, so that condensations and dusts don’t create obstructions that would reduce the efficiency of the exchanger.

The large surfaces for the exchange, the length of passages entail an important loss of warmth.

The main ventilation is not sufficient by itself as for conventional dampers.

Forced and independant extraction and insufflation are compulsory. You have to foresee 2 motors of 3 kW (6 kW) for an exchange of approximately 10, 000 CFM.

Those motors will work during around 30% of a drying cycle, which is not negligible.

SAVINGS

With what has been said previously, we can by experience understand that the global warmth recovered depends on the drying programm chosen and the final moisture researched.

On the first half of the drying, the system will reject 5 times more warmth than the air introduced can store.

On the second half of the drying, the system will reject a quantity of warmth closer to the quantity that the air introduced can store.

The performance (70% in the best case), multiplied by the volume of warmth transferable (around 25%) will give **the savings level** :

→ **From 13 to 20%** according to the species, drying programmes and final moistures researched.

INVESTMENT RETURN

< 2 years for most of kiln dryers for softwoods (resinous species).

- **From 3 to 5 years for most of kiln dryers for hardwoods (deciduous species).**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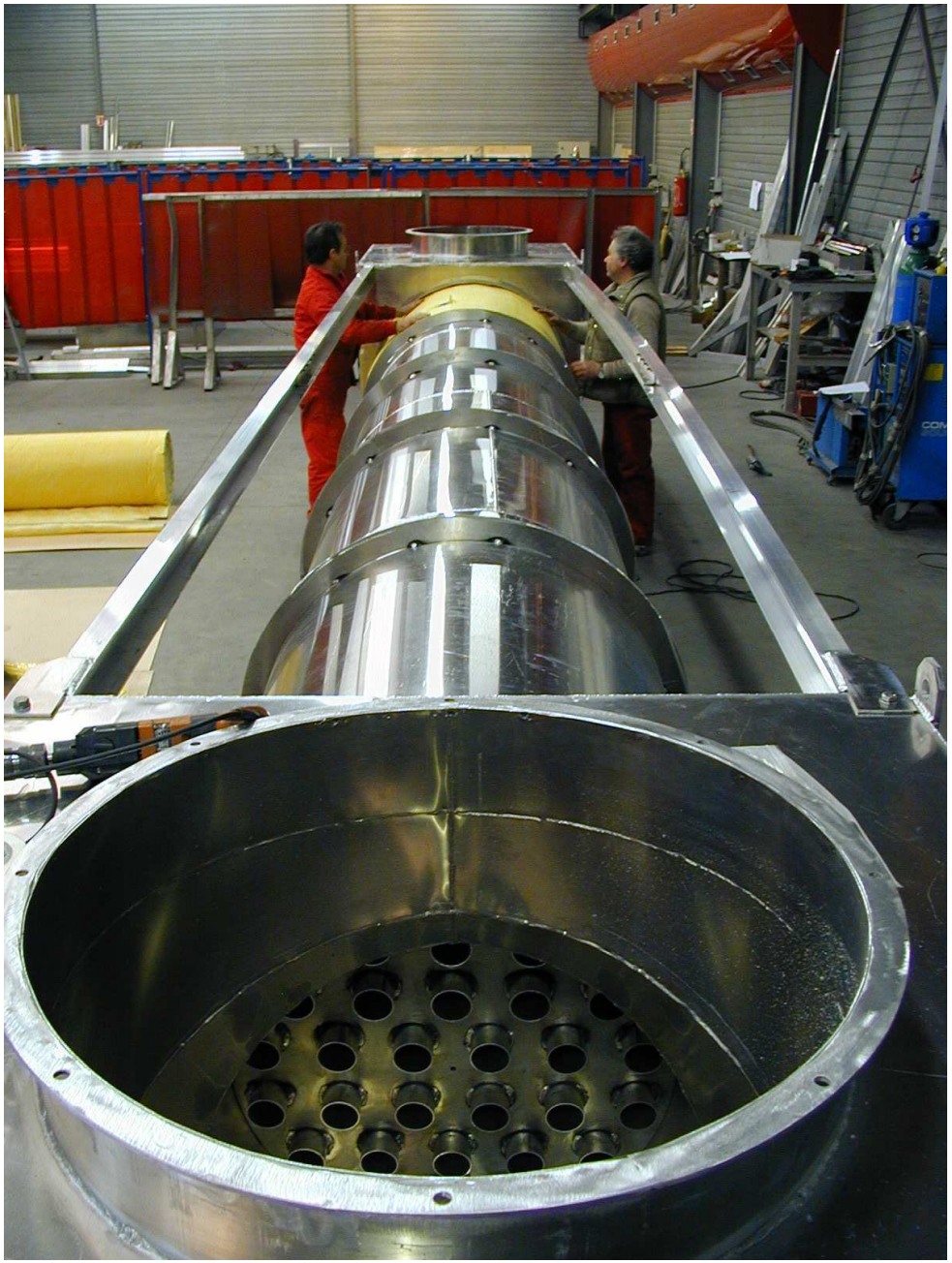

If you have any questions, do not hesitate to contact us.

We thank you for the attention you have granted us.