



# SPRAY NOZZLES FOR INDUSTRIAL APPLICATIONS



**UPB SERIES**  
MIXING EDUCTORS NOZZLES

# UPB SERIES MIXING EDUCTORS NOZZLES

PNR NOZZLES UPB SERIES ARE AN OPTIMAL SOLUTION FOR FLUIDS MIXING IN TANKS AND VESSELS, BECAUSE:

- they have no moving parts;
- they are highly clog-resistant;
- they require minimal maintenance;
- they are available in a wide variety of materials;
- the volume of fluid they can handle is 3 to 5 times greater than the volume of the operating fluid.

## WORKING PRINCIPLE

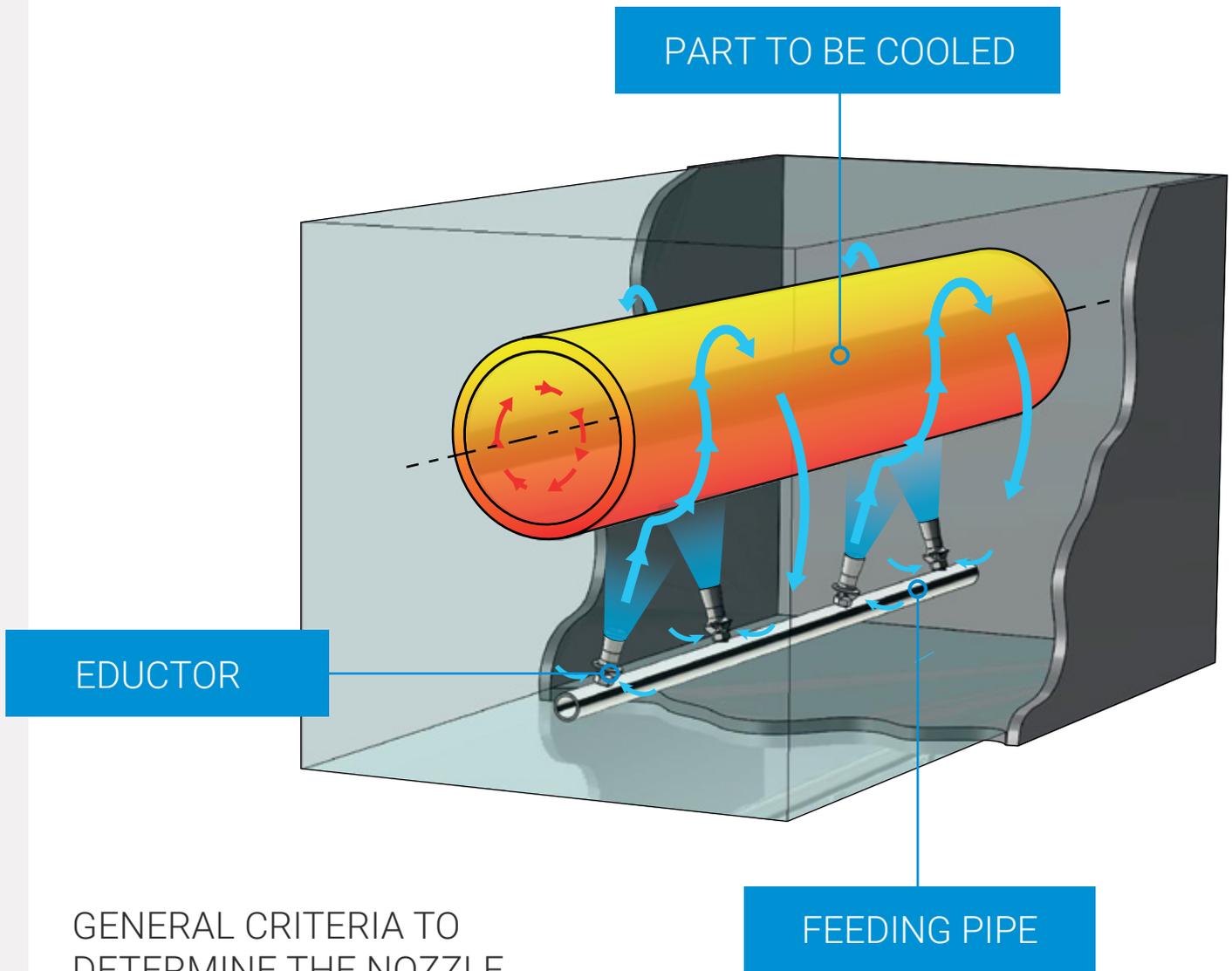
The liquid pumped from the supply line into a UPB nozzle, while passing through the Venturi-diffuser, sucks up from the side openings an additional amount of liquid 3 to 5 times greater than the total pumped in volume.

Therefore, the total available flow circulation inside the tank is average four times greater than the pumped in liquid.

## APPLICATIONS IN THE STEEL INDUSTRY

The quenching process of steel parts after reheating requires their dipping in vessels that must have an adequate water recirculation for an optimal and uniform cooling of the steel parts.





## GENERAL CRITERIA TO DETERMINE THE NOZZLE FLOWRATE

Depending on the type of application, a good tank mixing requires 10 to 30 complete turns of liquid per hour. Considering an average value of 20 turns, by multiplying this value by the tank volume, you find the total quantity of liquid to agitate and mix per hour.

As the educator nozzle generates a circulation of liquid that is four times the amount of liquid pumped in, you can calculate the required nozzle flowrate by dividing by four the total value of the liquid to mix.

Therefore, the total flow-rate must be divided by the number of nozzles required to optimize the mixing action.

The number and positioning of the nozzles will be determined taking into account both the tank size and the required type of mixing.

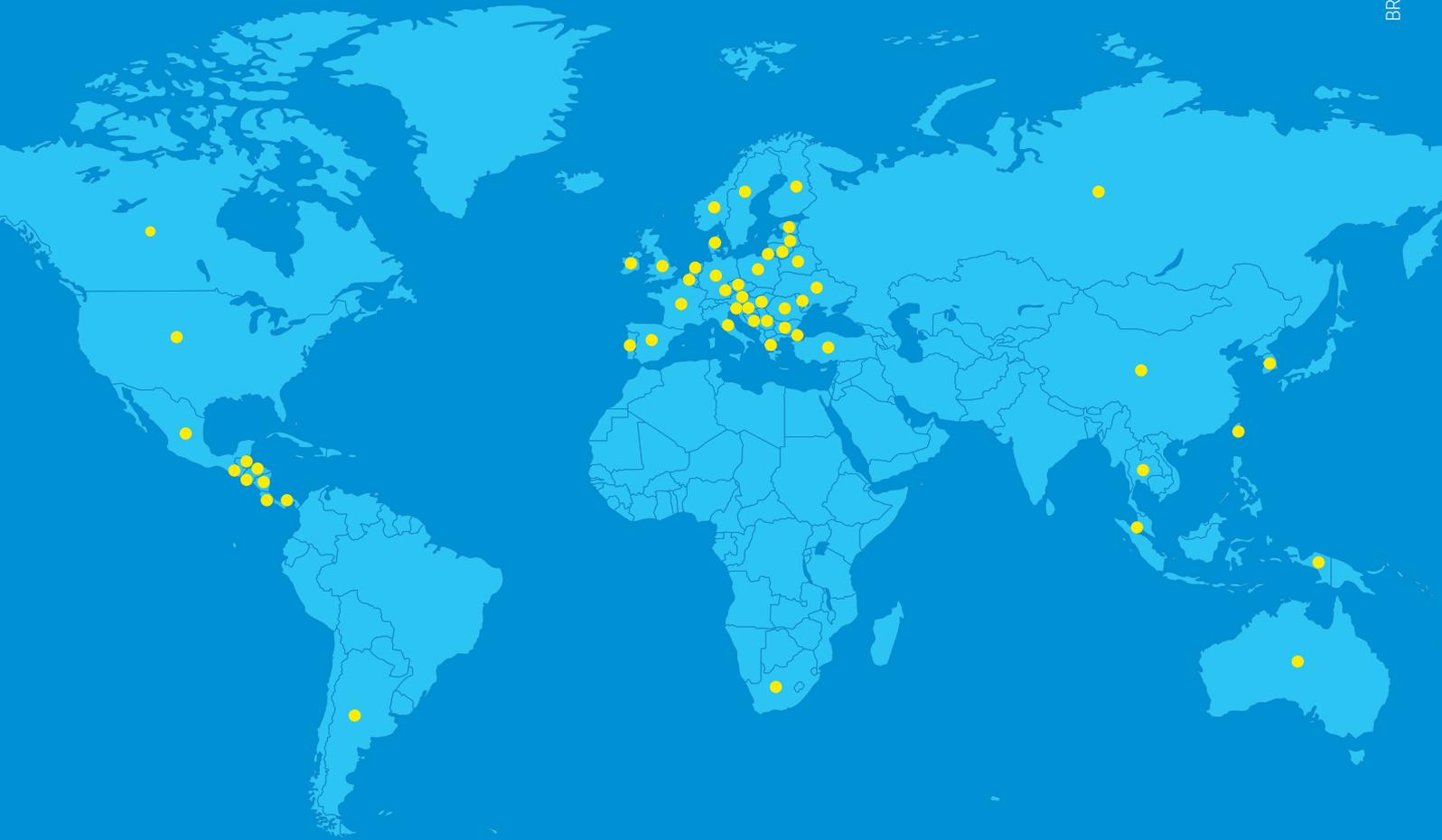
## GENERAL CRITERIA FOR POSITIONING EDUCTOR NOZZLES

The liquid jet sprayed has angle values comprised between 10° and 15° and a spray radius range between 2 m and 5 m, both depending upon its pressure and flowrate.

The lateral sucking action extends for some tens of centimeters, whereas the liquid sucking effect is minimal in the rear part of the nozzle.

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