

# Do you really need so much refrigerant?

**NEW**

**Armónia**

Low-charge ammonia industrial coolers

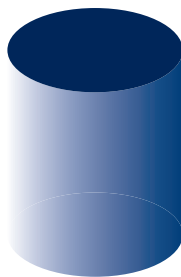
## AMMONIA REFRIGERANT CHARGE

Traditional market solution\*



**-67%**

**Armónia**



\*(5/8" tube diameter, wavy fins, cross-flow design)



- > Greater safety
- > Cost saving
- > Less restrictive regulation limits
- > Higher efficiency
- > Environmental benefits

## Down to 0.07 kg/kW



## Low-charge ammonia industrial coolers



**ARMÓNIA**, the new range of pumped NH<sub>3</sub> unit coolers, brings the low-refrigerant charge concept to a brand new meaning.

- > very low ammonia charge in the cooler - down to 0.07 kg/kW
- > minimized number of circulation rate\* at equal performance - down to 1.8

\*defined as the ratio between the actual inlet flow rate and the flow rate of generated vapor

Conventional ammonia unit coolers are designed for circulation rate around 4-5. The reason for such high values is the need to ensure nearly uniform flow distribution among the circuits and to reach high internal heat transfer coefficients.

The **ARMÓNIA** family, by proper selection of circuits and orifices, allows high unit cooler performance to be maintained even at low circulation rates (1.8). This means lower ammonia mass inside the unit cooler and in the entire plant.

### Comparison between a conventional and a LU-VE low-charge unit cooler in terms of charge/capacity ratio

	CONVENTIONAL COOLER* (Tube Ø 5/8")	LU-VE LSA (Tube Ø 1/2")	LU-VE ARMÓNIA (Tube Ø 1/2")
Pump circulation rate	4	4	1.8
Ratio between liquid hold-up and capacity [kg/kW]	0.23	0.10	0.07

\*(5/8" tube diameter, wavy fins, cross-flow design)

**-57%**

**-67%**

Greater safety

Cost saving

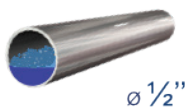
Less restrictive regulation limits

Higher efficiency

Environmental benefits

### TECHNOLOGY

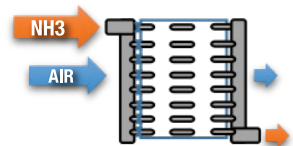
> Compact tube



> Specialized large surface



> Co-flow optimized design



### WIDE RANGE AND CUSTOMIZED SOLUTIONS

