



*High efficiency water  
heating technologies*

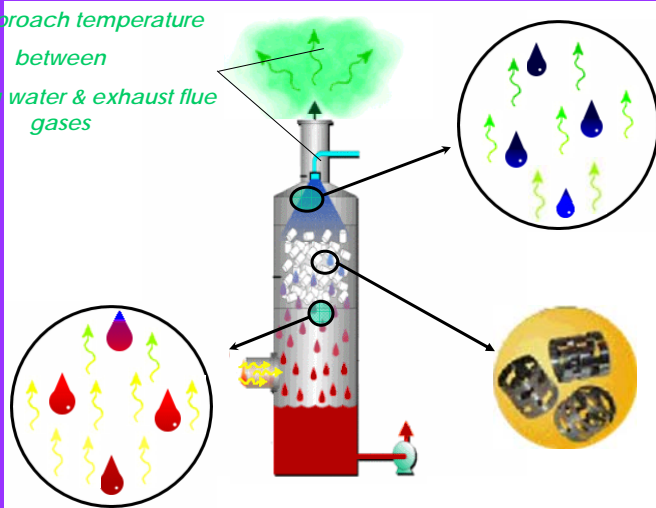


*Direct Contact Water Heating  
To  
Reduce Green House Gases  
(GHG)Emissions*

## Anatomy of a Direct Contact Device

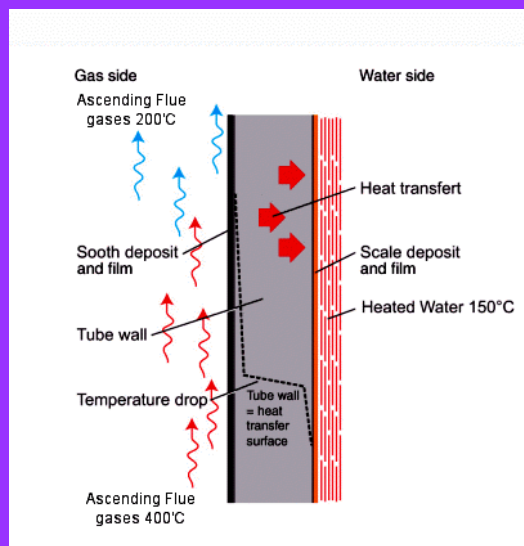
*Surprisingly Simple – Extremely Efficient*

*5°C approach temperature  
between  
incoming water & exhaust flue  
gases*



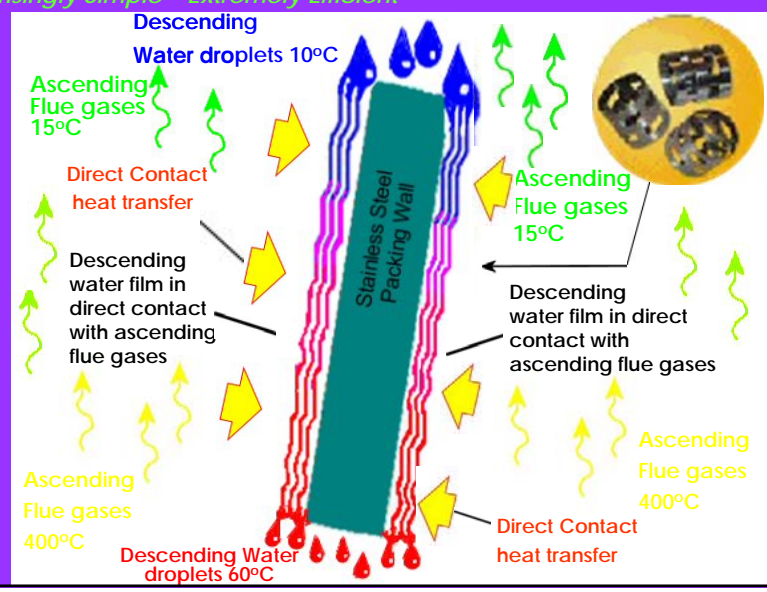
## Traditionnall Water Tubes Boilers

*Tube Wall Cut Temperature Profile*

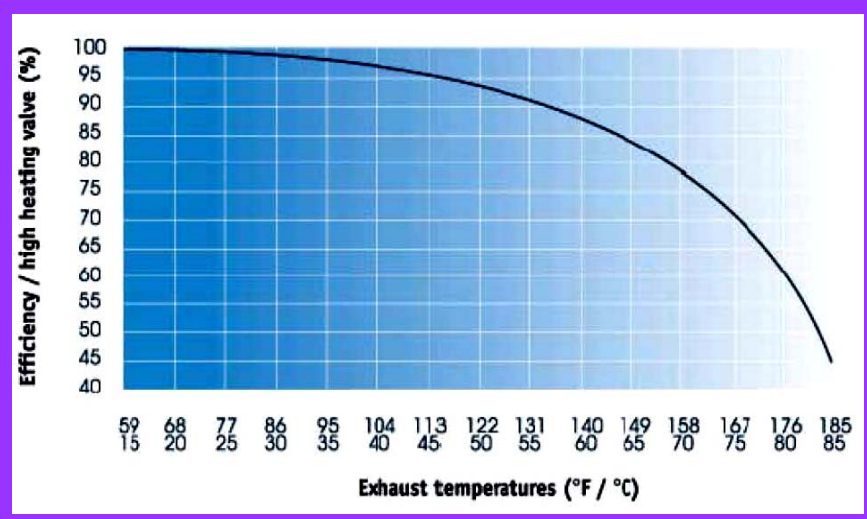


## Sofame Direct Contact Heat Transfer Principle

*Surprisingly Simple - Extremely Efficient*



## Combustion Efficiency vs Flue Gases Temperature



## Natural Gas Stoichiometric Combustion



	Natural gas	Air	Carbon Dioxide	Nitrogen	Water	Nitrogen Oxides	Carbon Monoxide
Gas	1 CU. FT.						
Air		10 CU. FT.					
Heat			1000 BTU				
Corrosion			Disolved CO <sub>2</sub> in water ⇒ HCO <sub>3</sub> (Carbonic Acid)				
water					0.1 #		
Water vapor condensation ~ 12% of the 1000 BTU							
NO <sub>x</sub>						<Possible (Smog)	
CO							< 400 PPM

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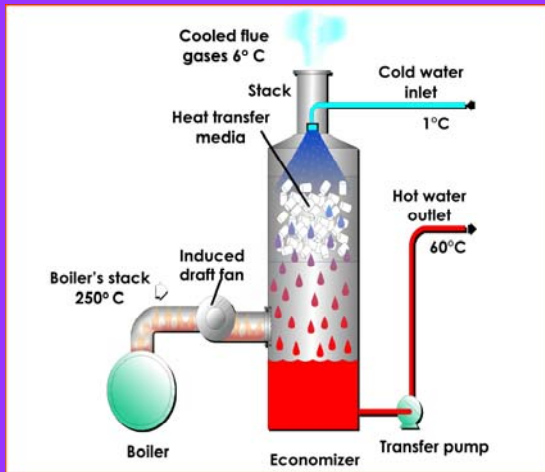
## Applications as

- ❖ Process hot water
- ❖ Sanitary water
- ❖ Boiler make-up water
- ❖ Fresh air heating
- ❖ Domestic hot water
- ❖ De-icing hot water
- ❖ Space heating

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## Percotherm

Thermal efficiency as high as 100%  
Final flue gas temperature as low as 6°C



### Features

- Heats water to a maximum temperature of 60°C (140°F)
- Recovers the sensible and latent heat contained in the flue gases of a boiler or other gas burning device

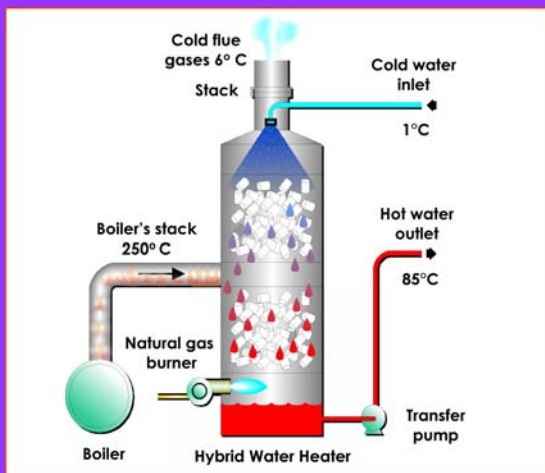
### Advantages

- Improves the efficiency of the connected boiler to as high as 100% (HHV)
- Minimum maintenance
- Reduced atmospheric emissions
- All stainless steel

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## Hybrid Percomtherm

Combustion/Thermal efficiency as high as 100%  
Final flue gas temperature as low as 6°C



### Features

- Heat is recovered from the thermal effluent of the connected device as well as produced by a fully modulating natural gas fired burner

### Advantages

- Efficiency as high as 100%
- Minimum maintenance
- Reduced atmospheric emissions
- No supervision required
- Rapid start-up
- All stainless steel
- Heats water to a maximum temperature of 85°C (185°F)

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