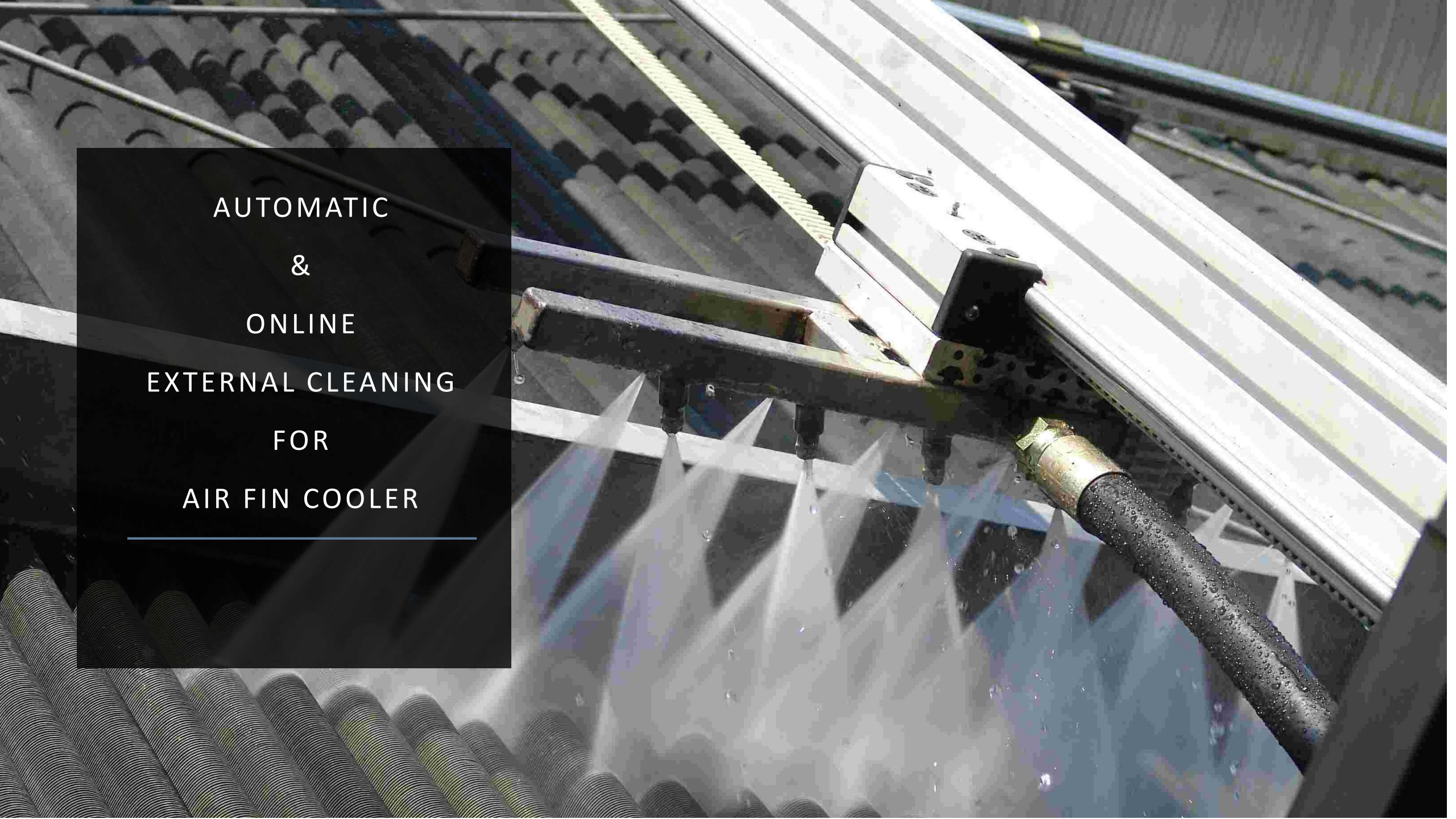
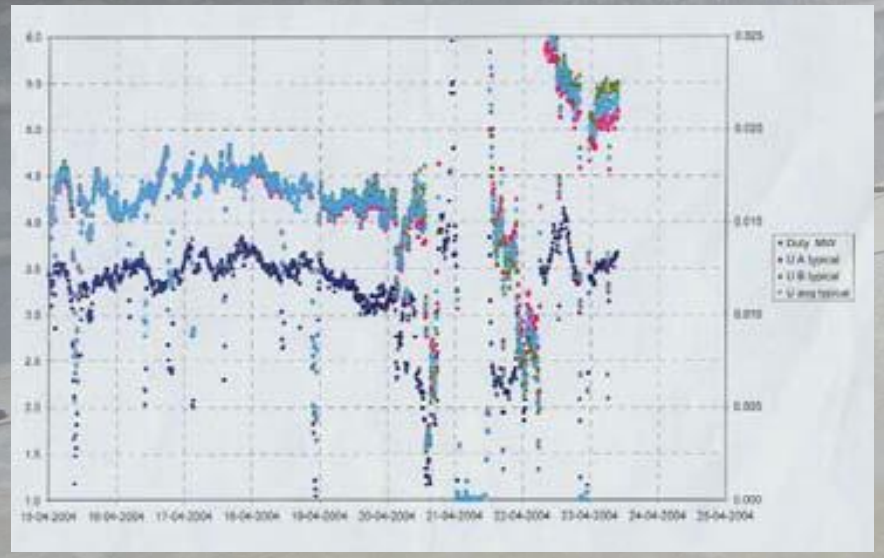


AUTOMATIC & ONLINE EXTERNAL CLEANING FOR AIR FIN COOLER

AIRFLOW IMPROVEMENT

Automatic & Online Cleaning System would increase the Cooling Performance up to **30 – 55%** which results in achieving the heat transfer factor as per design and improved product flow within the process equipment.



The cleaning process remove the debris and obstruction for the air and the airflow increased with the factor 2 – 3. As the cooling performance increased, the product flow increased which results to the increased in production.

AUTOMATIC CLEANING SYSTEM - ADVANTAGES

Manually	Chemical	Automatic System
Manpower using standard hydro-jet system – difficult to maintain pitch spraying angle with the pressure of min 80 bar. This would damage the finned surface.	Manpower using chemical spraying system – Chemical foaming would not reach the middle part of the finned tube as it blocked by the existing fouling.	Fully automatic – fixed spraying angle to penetrates through the whole finned tube and would not damage the finned surface.
Manpower safety concern as working in a hazardous area environment with a process temp of approx. 70 - 110 degC	Manpower safety concern as working in a hazardous area environment with a process temp of approx. 70 - 110 degC	No manpower involves during cleaning system operating even during plant operation
Only managed to clean during shutdown	Only managed to clean during shutdown	Cleaning can be done at anytime during online

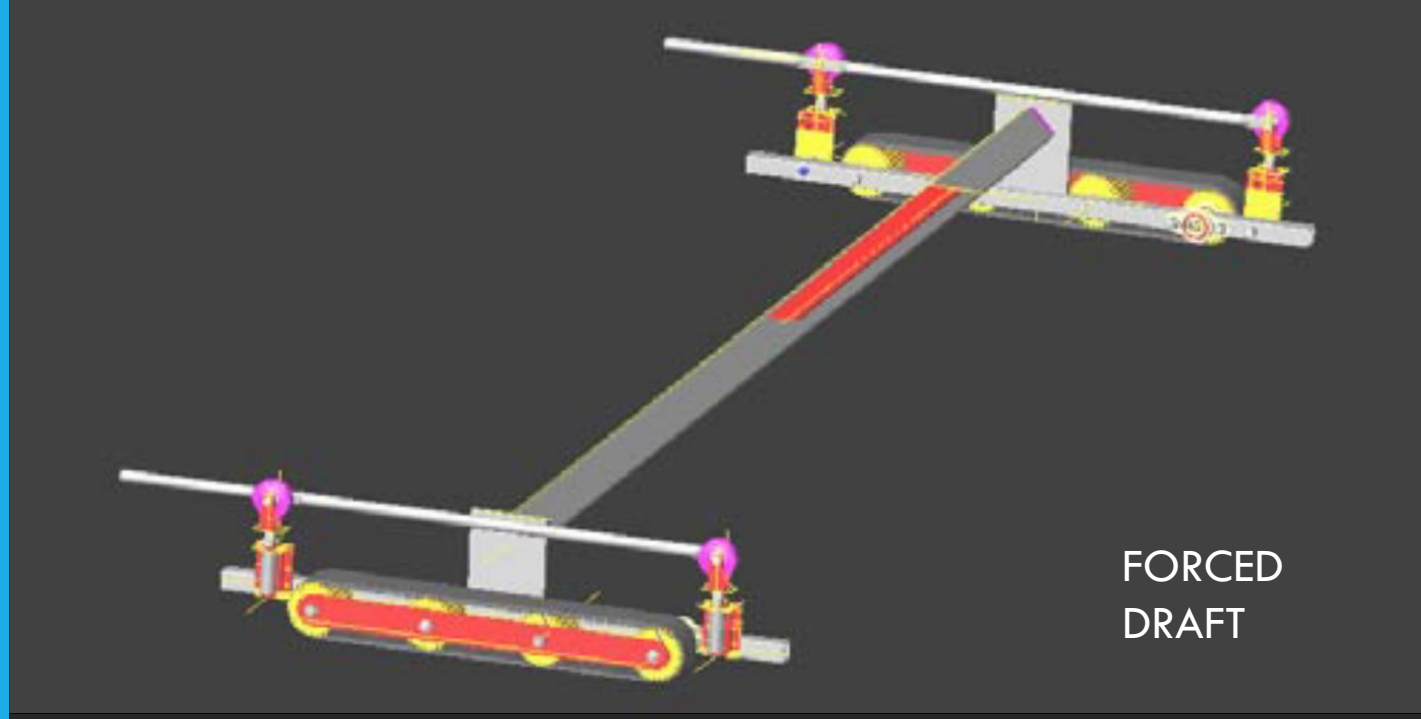
THE DESIGN

Specifically designed for Forced & Induced Draft Air Cooler

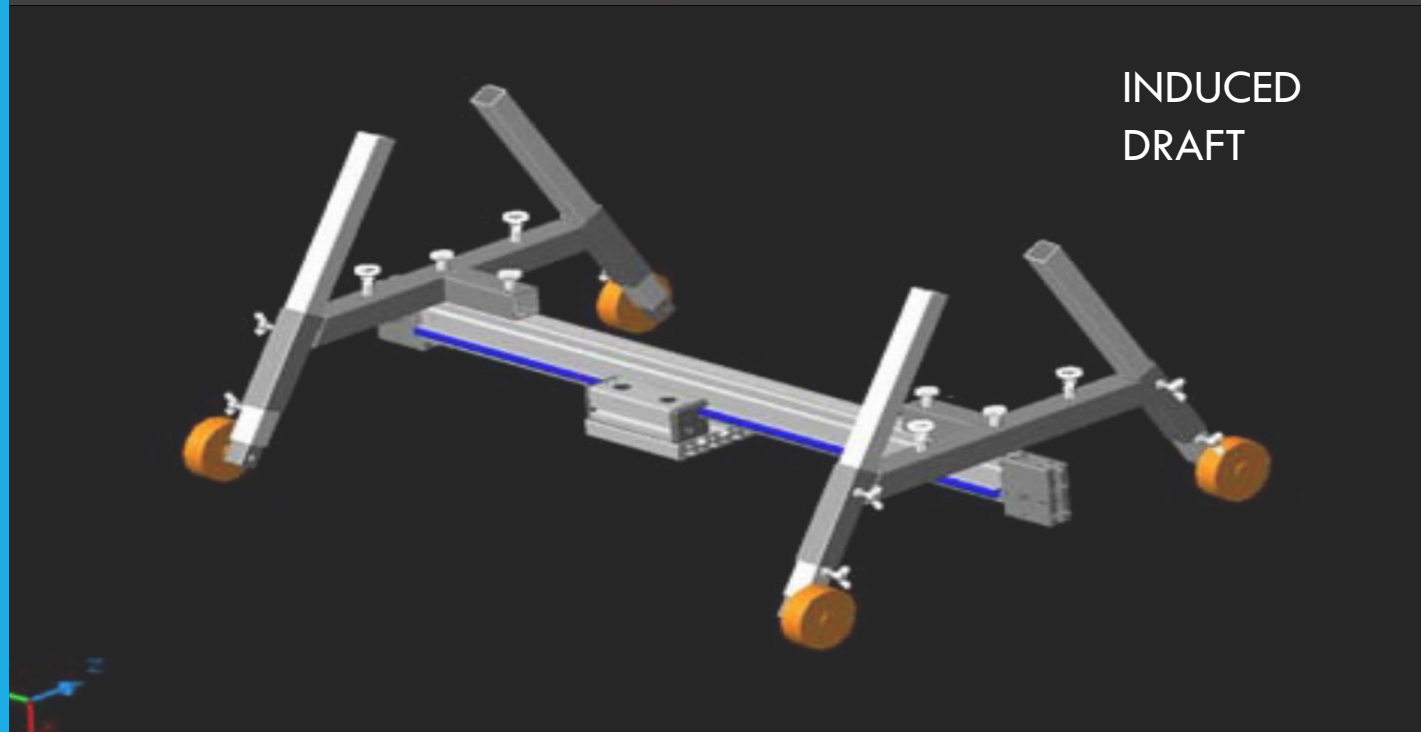
Fully Automatic with approx. total weight of 40kg

Telescopic & Horizontal Beams for all type bundle width

Height approx. 170mm (adjustable)



FORCED DRAFT



INDUCED DRAFT


AUTOMATIC CLEANING – FORCED DRAFT
(VIDEO)
FLOTEK


AUTOMATIC CLEANING – INDUCED DRAFT
(VIDEO)
FLOTEK

WATER SPRAY ANGLE

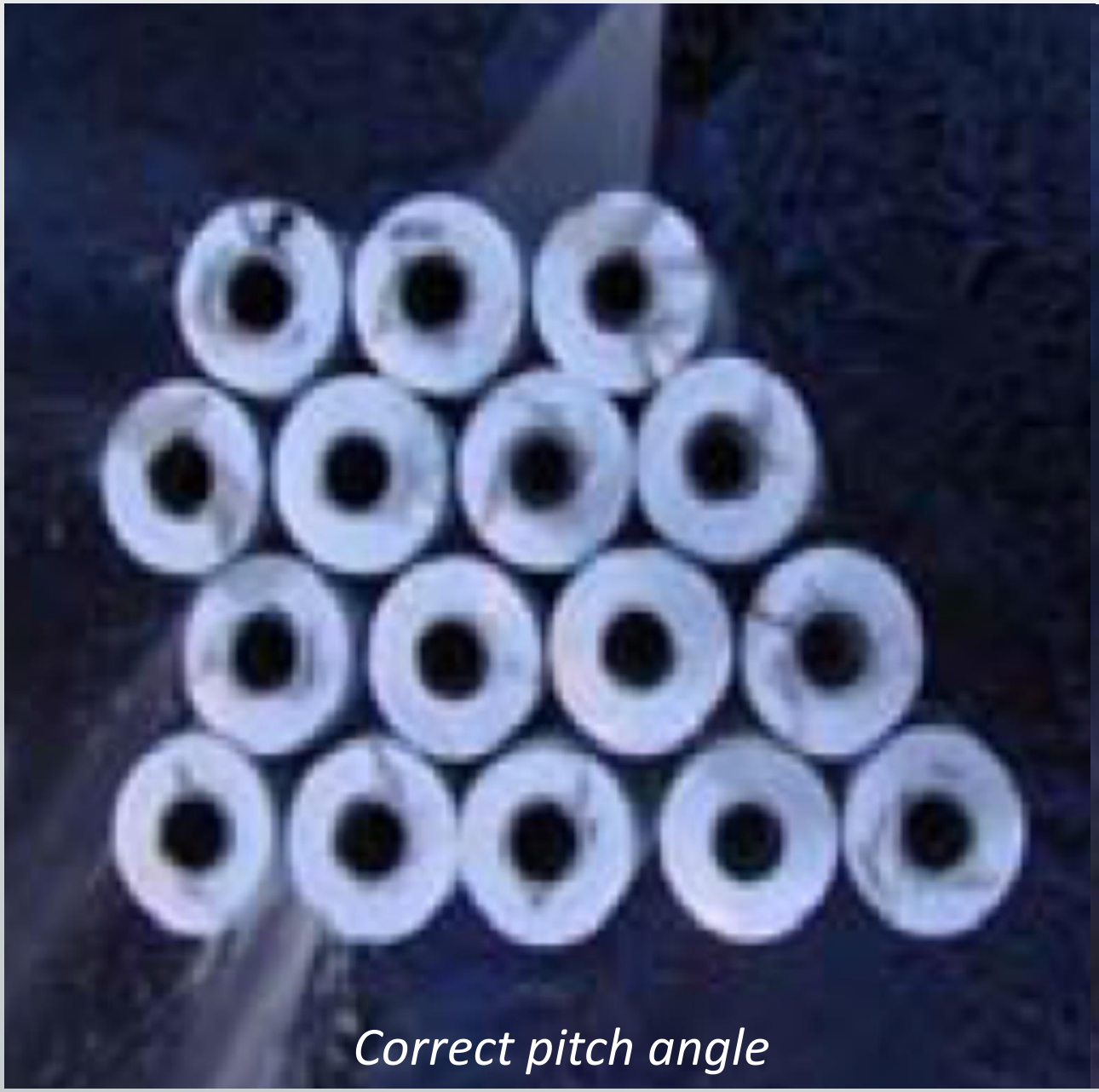
The Cleaning system consists of hydro-jet system which uses **only water and no chemical** with the water pressure of 80-100 bar and flow of 150-300 l/min.

The Cleaning Head and the nozzle pitch specifically designed to suit the bundle and the fin tube arrangement.

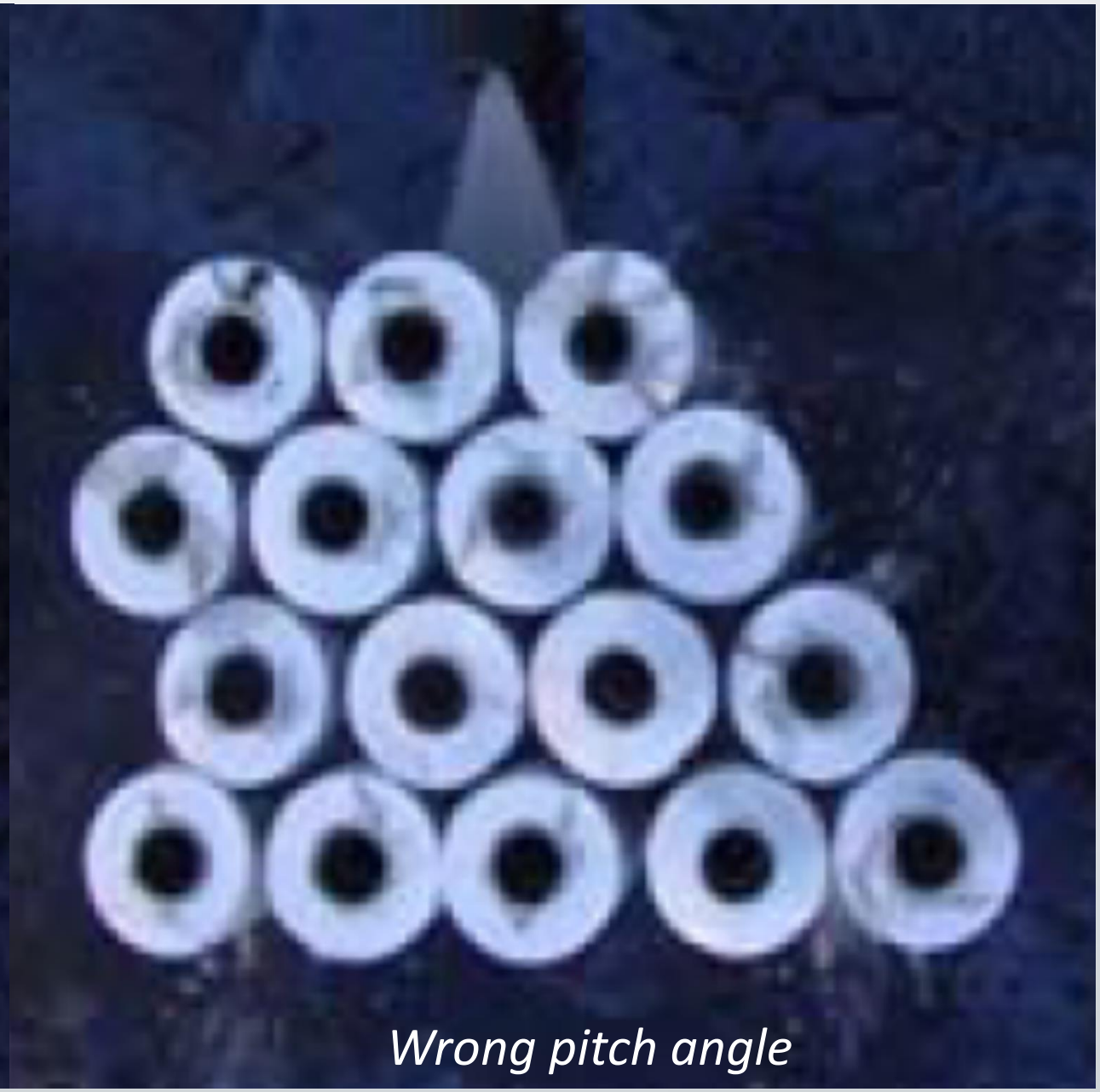
The tube row arrangement from the data sheet of the Air Cooled Condenser will determine the correct spraying angle for the flat razor blade water beam to cut through any external fouling and penetrates through the bundle.

The spraying angle is fixed throughout the cleaning process in order to prevent any damage to the finned tube by the water force.

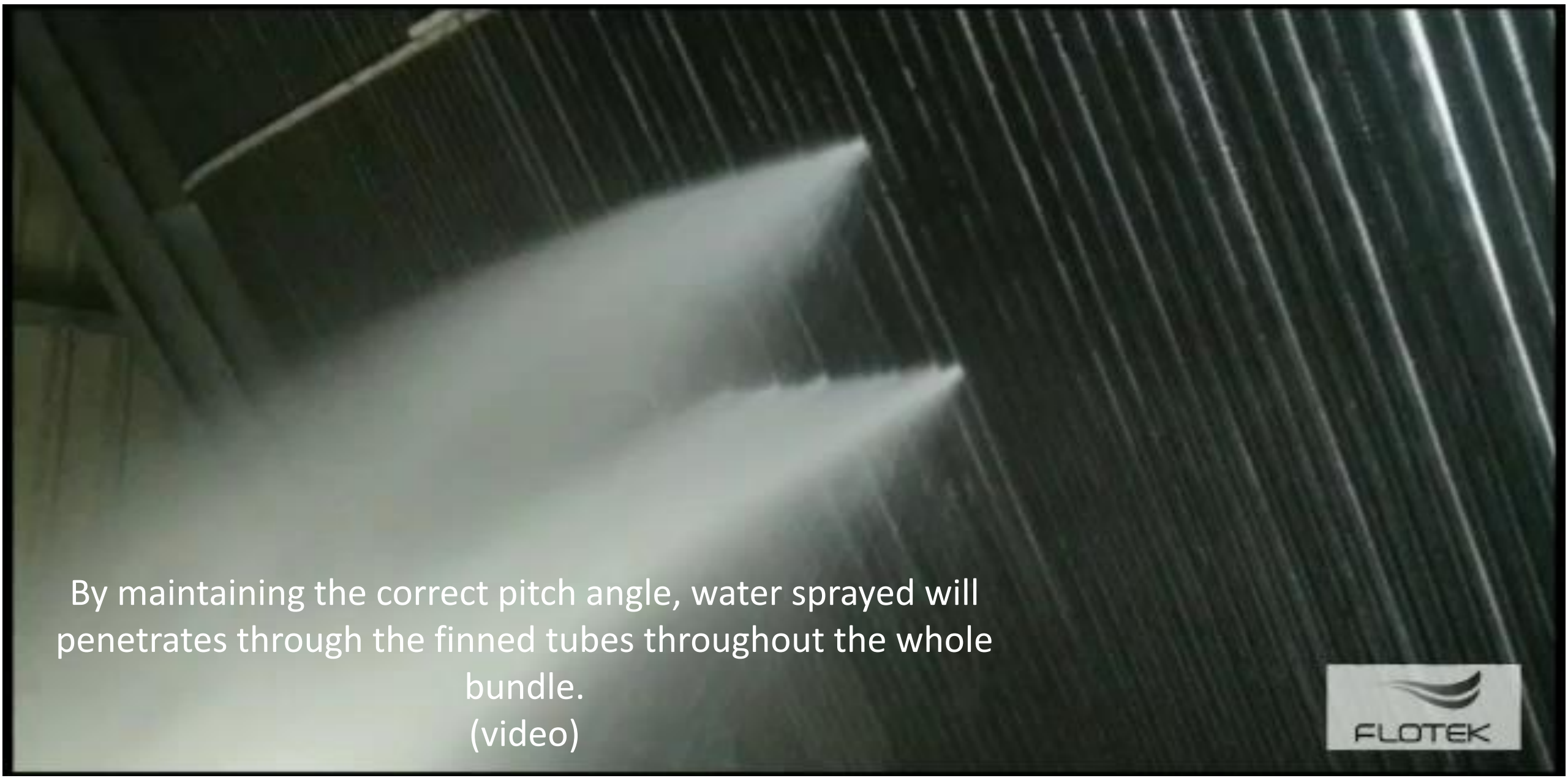
AUTOMATIC CLEANING – PITCH ANGLE (VIDEO)



Correct pitch angle



Wrong pitch angle


By maintaining the correct pitch angle, water sprayed will penetrates through the finned tubes throughout the whole bundle.
(video)
FLOTEK

HIGHLIGHTS

The Automatic Cleaning System is currently widely used all over Europe.
Below are some of the success story which was implemented by our product Principal:

Client	Description	Results
Shell, Moerdijk (NL) Petrochemical Plant	100 nos of Air Cooled Condenser	25% airflow increased & current contract
Shell, Pernis ROM (NL) Refinery Plant	150 nos of forced draft Air Cooled Condenser	20% airflow increased & current contract
Hexion I & II (NL) Petrochemical Plant	30 nos of Air Cooled Condenser	23% airflow increased
Damhead Creek (UK) Powerstation	36 nos of Air Cooled Condenser	20% airflow increased
Kings Lynn (UK) Powerstation	8 nos of Air Cooled Condenser	25% airflow increased
AKZO Nobel (NL) Petrochemical Plant	All Air Cooled Condenser for the methanol production	20% airflow increased
DOW Chemical (NL) Petrochemical Plant	260 nos of Air Cooled Condenser	40% airflow increased

Client	Description	Results
SAREF (Saudi Arabia) Oil Refinery Plant	All Air Cooled Condenser was cleaned during plant operation	50% airflow increased
WAG Phillip Conoco (D) Oil Refinery Plant	110 nos of Air Cooled Condenser	20% airflow increased
SABIC (UK) Petrochemical Plant	18 nos of Air Cooled Condenser	20% airflow increased
EBERHARDZELL (D) Biomass Powerstation	All 30 nos of Air Cooled Condenser	20% airflow increased
Q8 Refinery (NL) Oil Refinery Plant	All 80 nos of Air Cooled Condenser	20% airflow increased
INEOS (B) Petrochemical Plant	All Air Cooled Condenser for the Sulphuric Acid Plant on permanent basis	22% airflow increased
YARA, Norsk (NL) Fertilizer Plant	60 nos of Air Cooled Condenser	25% airflow increased

20% - 25% airflow improvement
'the product flow increased as the product temperature decreased"

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