SA Health - Legionella Seminar

16th & 17th August 2023

DRIFT ELIMINATORS

""What are Drift Eliminators; and why don't they eliminate"

Overview

- Definition & Standards
- Principle of Operation
- Types of Drift Eliminators
- Inspection, Cleaning and Maintenance

Definitions

Drift is the water lost from the cooling tower as liquid droplets entrained in the exhaust air, not to be confused with ‘plume’.

Aerosol is airborne water particles less than 10µm in diameter

Standards

AS3666.1:2011
Air-handling and water systems of buildings—Microbial control

4.1.5 Cooling Towers

Drift eliminators shall be provided and installed so as to facilitate ease of inspection, cleaning and maintenance. They shall be designed for in situ cleaning or capable of being withdrawn, without damage, for cleaning. The drift eliminators shall extend across the air stream and air bypass shall be prevented.

4.4 Drift Control

Maximum drift loss shall not exceed 0.002% of the maximum design water circulation rate through the tower, as determined under laboratory conditions and published in the tower manufacturer or as tested in field conditions.

Regulations & Guidelines

South Australian Public Health (Legionella) Regs 2013 & SA Guidelines for the Control of Legionella

Regulation 8

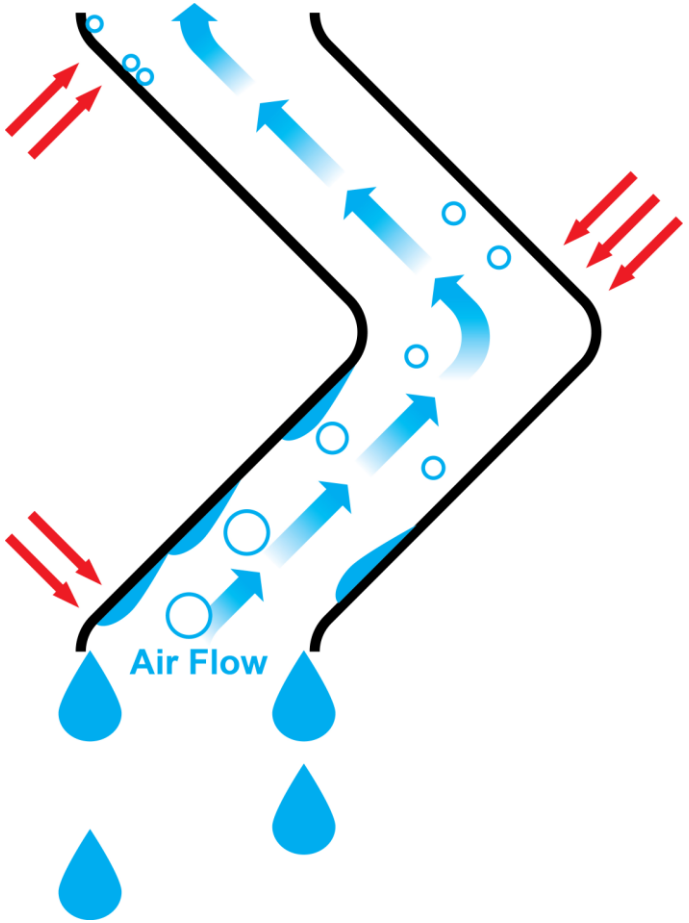
Drift eliminators must be fitted to every cooling tower in a cooling water system unless otherwise determined by the Minister

Why Eliminate Drift?

- ✓ Improved emission control
- ✓ Reduce water loss
- ✓ Reduce fan blade leading edge erosion on induced draught towers
- ✓ Reduce nuisance on surroundings
- ✓ Reduce bacterial dispersion
- ✓ Reduce particulate matter emissions that can be inhaled
  - <10 microns or less

Principle of Operation

Principle of Operation



Blade & cellular designs work by inertial impaction

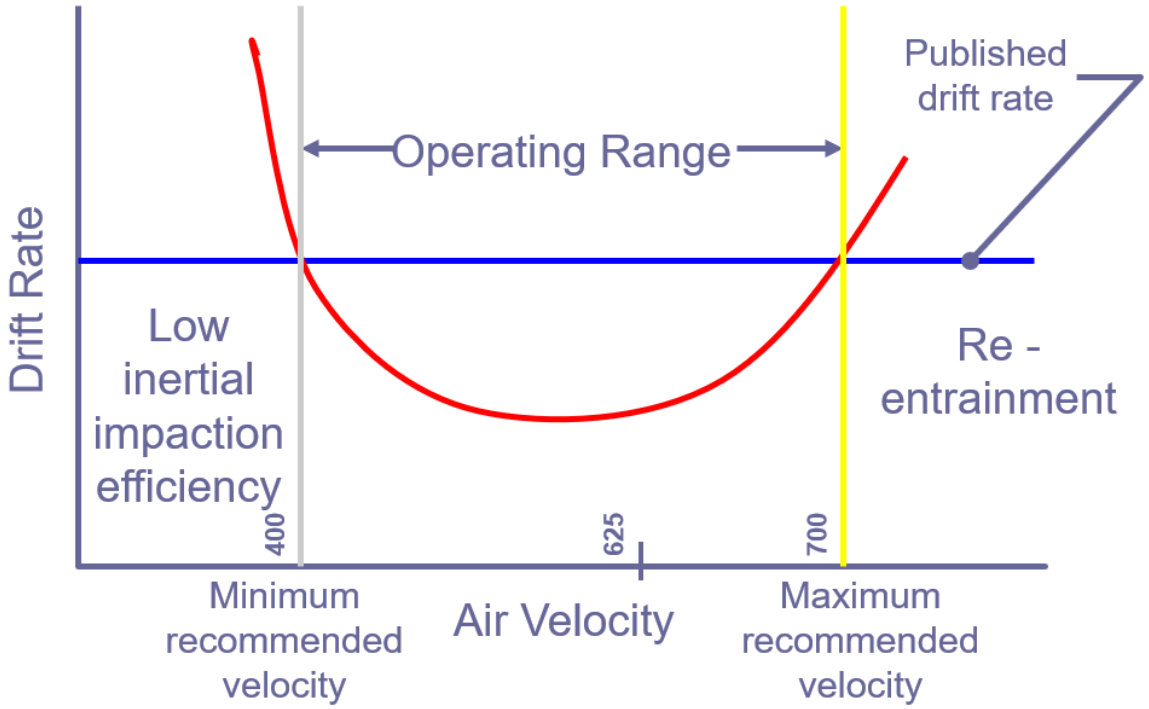
The inertia of the heavy droplets cause them to impact the walls of the drift eliminators

Collected droplets form a water film and drain back into the cooling tower

Certification & Operating Range

AS4180.1:2008 - Measurement of drift loss from cooling towers Lost chloride method

CTI-HBIK140 - Isokinetic Drift Measurement Test Code for Water Cooling Tower



So, what is 0.002% in reality?

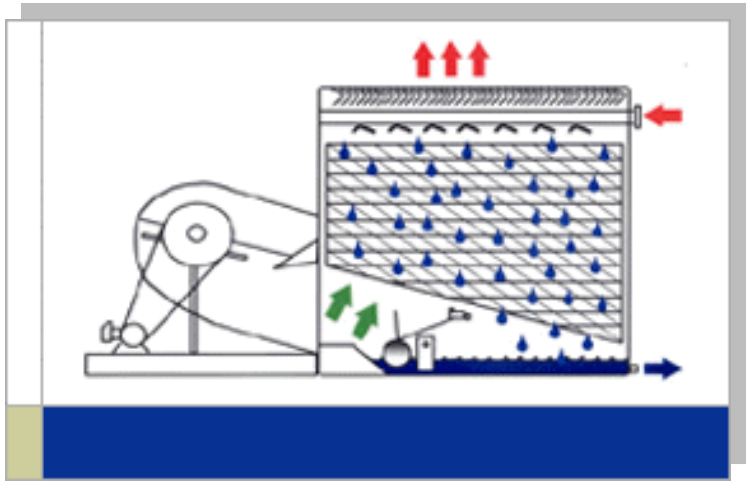
- For a typical 2,000kW cooling tower, a 600ml water bottle can ‘drift’ from the cooling tower every 6 mins.
- It’s difficult to accurately test in field conditions

Types of Drift Eliminators

Types of Drift Eliminators

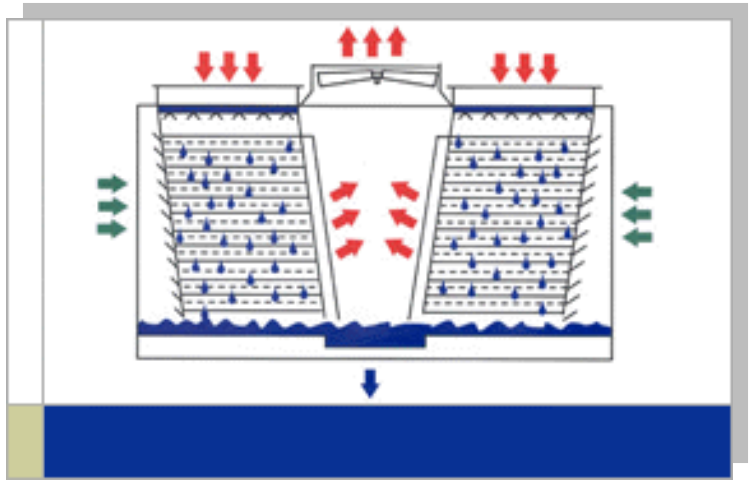
- Blade
- Cellular
- Integral

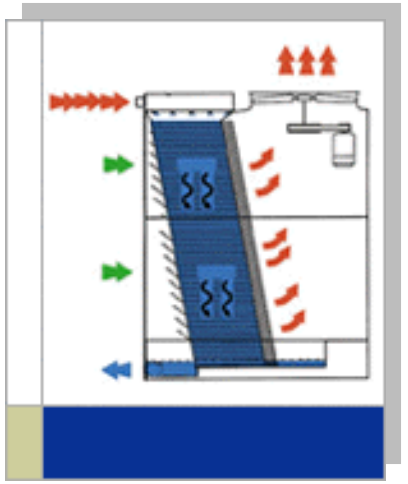
Cooling Tower Categories



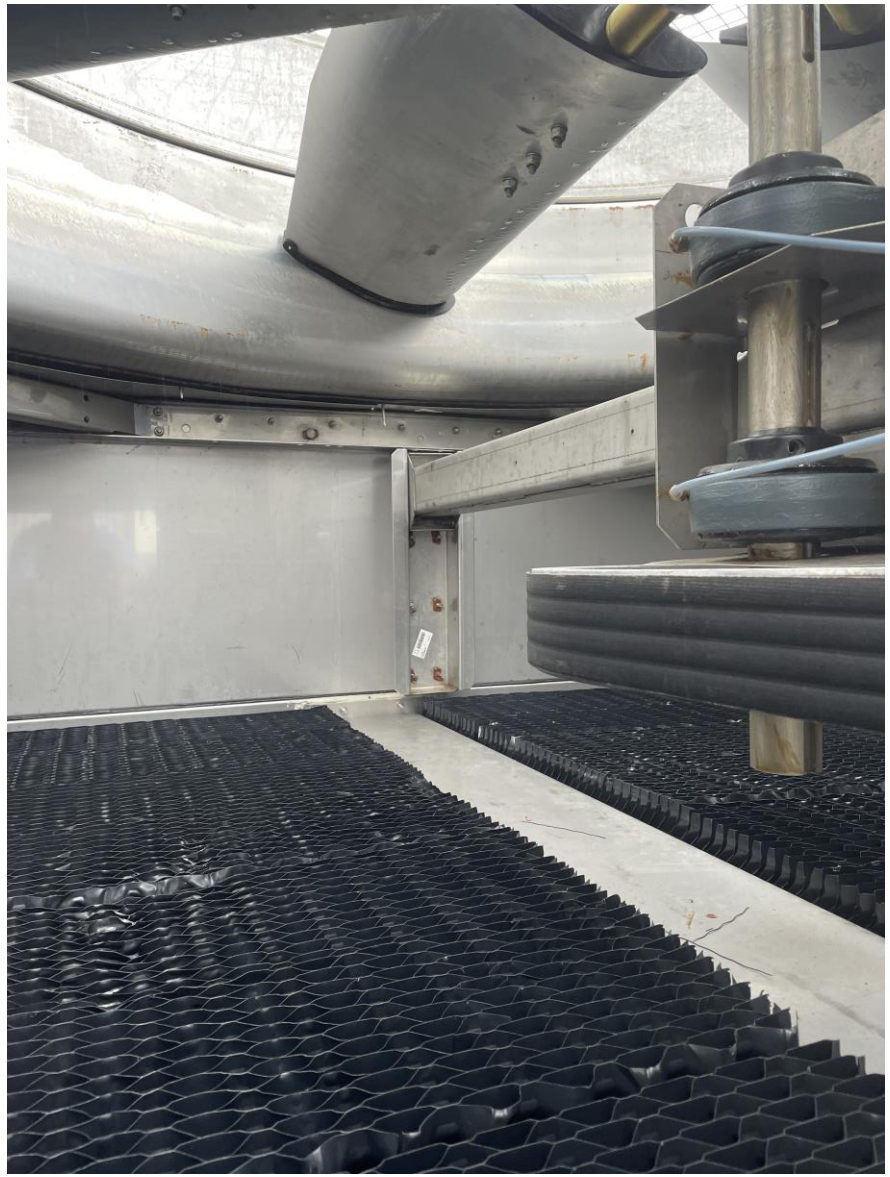
Induced Draft vs. Forced Draft

Crossflow vs. Counterflow





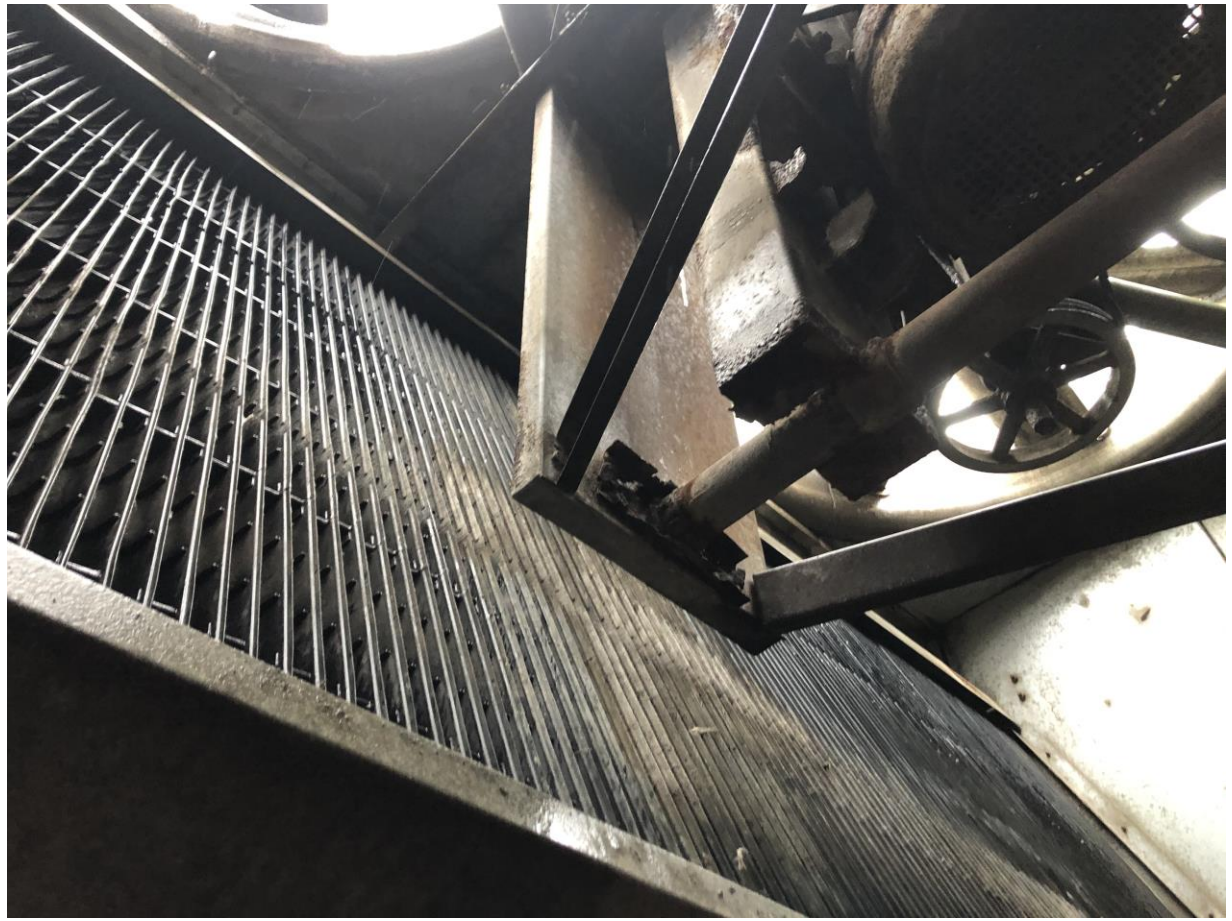
Counterflow, Induced Draft, Cellular



Counterflow, Forced Draft, Blade

Cross Flow, Induced Draft, Integral

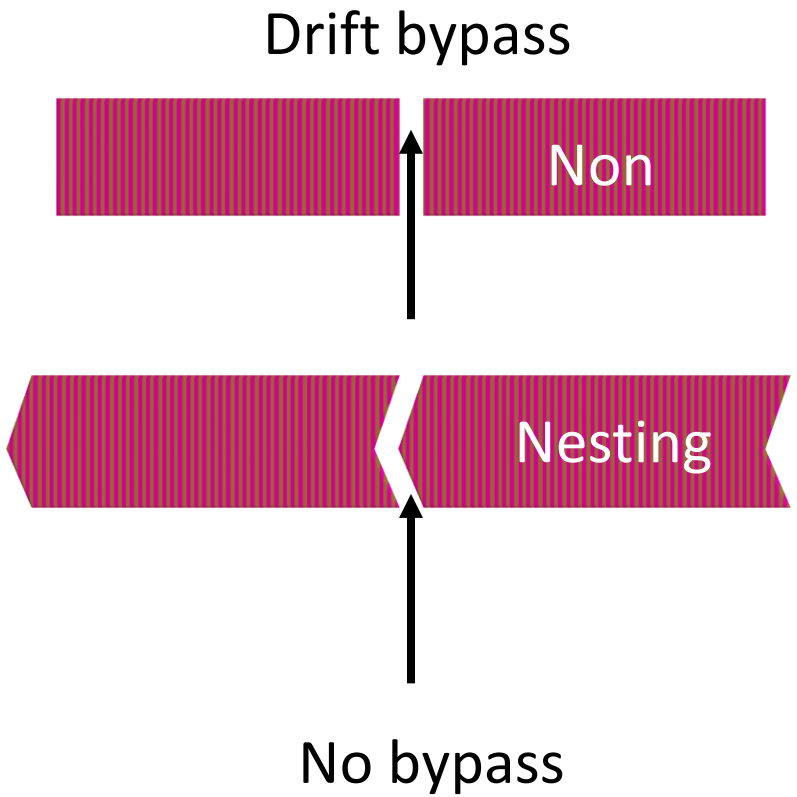
Combined Flow, Induced Draft, Blade

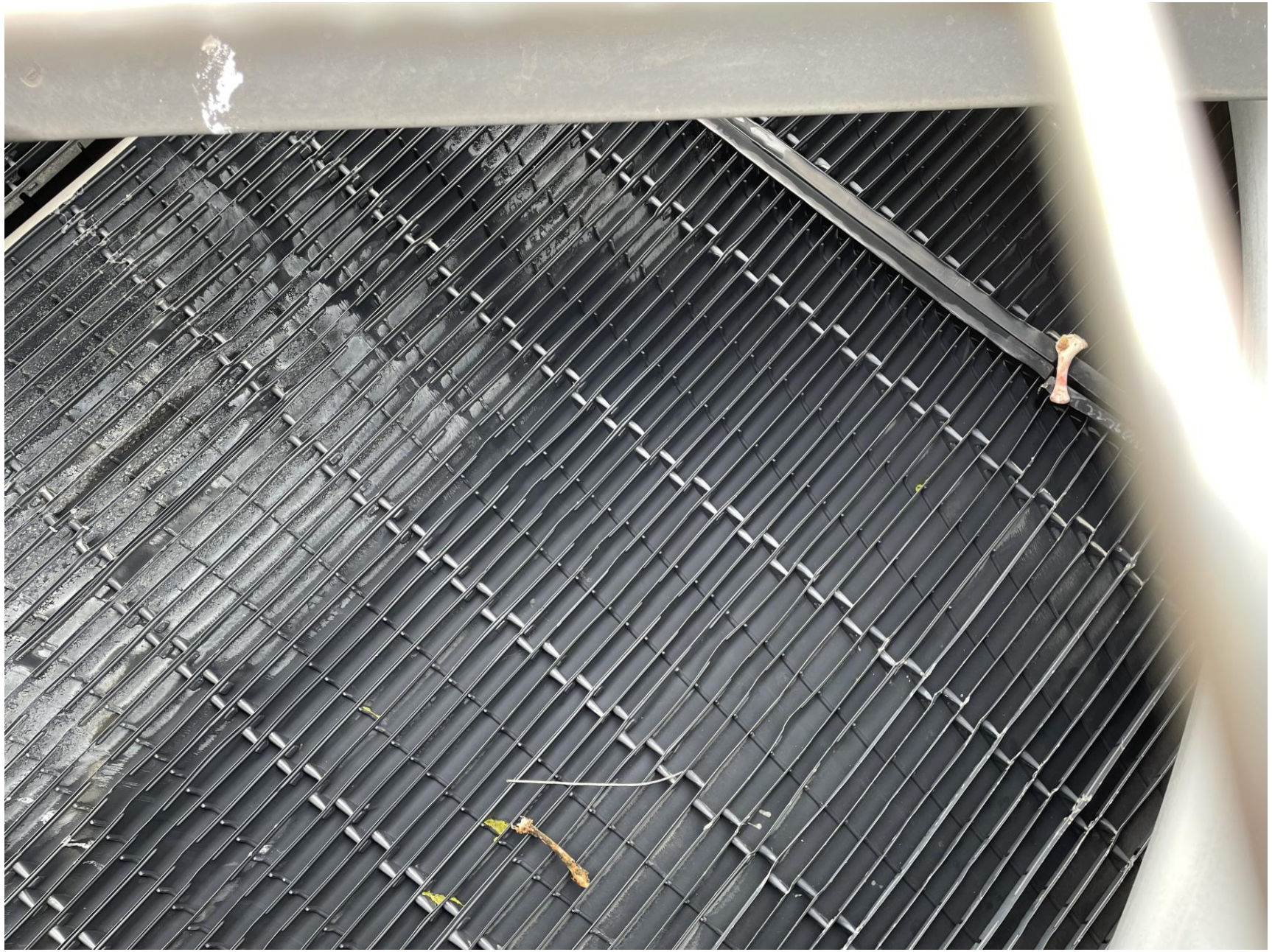


Inspection, Maintenance & Cleaning

Inspection, Cleaning and Maintenance

- ✓ No deflection & deforming
- ✓ Nesting panels
- ✓ Fit within ¼” (6mm) of any obstruction
- ✓ Extend across the full air stream
- ✓ Oriented in the direction of airflow
- ✓ 6 monthly clean
- ✓ Serviceable life ~7-10 years






CAUTION

"If you feel drift, then there probably is drift"

John Rule, Engineering Manager (Ret.)
Baltimore Aircoil Company

Questions?