NUTS & SEEDS

APEX 85

Microbial Disinfection

APEX 85 was developed in response to a severe Salmonella outbreak in the California almond market as a non-ionizing, chemical- and steam-free alternative for microbial disinfection system suitable for nuts and seeds. Developed in partnership with STALAM, the global leader in Radio Frequency technology, the APEX 85 effectively reduces *Salmonella* by a 3 to 5 log kill without impacting product sensory qualities.

Designed and manufactured in partnership with the global leader in radio frequency technology, STALAM, the Apex 85 combines the precision of radio frequency technology with Ziel's proprietary process solutions to effectively eliminate *Salmonella*, *E. coli*, and other microbial pathogens in nuts and seeds. APEX 85 easily integrates into automated processes and effectively reduces microbial pathogens without the use of chemicals, ionizing radiation, or steam, making a superior application for food products.

Salmonella

Salmonella, a pathogenic microorganism that is the source of many food recalls, is frequently found on nuts and seeds. To prevent *salmonella* outbreaks, nut and seed cultivators must meet regulatory safety requirements through the treatment of all products before they enter the retail market.

Radio Frequency (RF)

RF works by creating an oscillating electromagnetic field between two electrodes in the APEX 85's processing chamber. Operating at a 27.12 MHz frequency level, polar water molecules contained in the natural moisture of the product rotate 27 million times per second, generating friction and thus the heat necessary to kill microbial pathogens The long radio wave profile penetrates uniformly throughout the product, creating 'volumetric heat,' as opposed to traditional thermal heating. Ziel's proprietary process settings, administered by a Siemens PLC/HMI system, precisely control heat in real time, reducing microbials to safe levels, without compromising the product's sensory qualities.

Benefits:

- Non-ionizing radiation, chemical- and steam-free
- Retains product's sensory attributes
- Proven 3 to 5 log kill for *salmonella*
- Load consistency
- Food-grade conveyor belt
- No impact on seed germination
- Moisture loss <1%
- 725-1200 kg/hr (1600 -2700 lbs/hr) throughput
- Treatment time of 20 to 30 minutes
- Process solutions customized to each customer's product profile
- Suitable for: Almonds, Cashews, Brazil Nuts, Hazelnut, Sunflower Seeds, Sesame Seeds, Chia Seeds, and Peanuts

Easy to Operate

APEX 85's HMI user interface consists of easy-to-use menus of preprogrammed processing recipes, developed by Ziel on-site with your team. The system monitors the progress and temperature of each treatment to provide real-time user feedback. Data logs are generated automatically to assist in quality control monitoring and reporting. Optional remote monitoring and software upgrades are available via a standard internet connection.

Installation & Commissioning

Ziel provides a turnkey solution for your operation. Our professional installation and process settings teams coordinate directly with your facilities and QA teams to design customized treatment recipes and train your operators.

Throughput depends on product density, moisture & desired log kill

TECHNICAL SPECIFICATIONS	
Product Applications	Nuts and Seeds
Processing Capacity	Treats up to 725-1200 kg/hr (1600-2700 lbs/hr)*
Wash Water	Up to 60 gallons per minute
Chilled Water	23° C (75° F) water, ~20 Tons (40,000 LBS) of Refrigeration.
RF Processing Time	Treatment time per batch: 20-30 minutes
RF Power	85 kW
Electrical Requirements	400/480 VAC +/- 5% | 50/60 Hz | 3-Phase + Ground | ~500/430 A Connected Load
Codes & Standards	CE mark; UL and CSA compliant FCC compliant
System Dimensions	21.9 m (L) x 2.4 m (W) x 3.3 m (H) 72' (L) x 8' (W) x 11' (H)d
Compressed Air	Requires clean, dry, oil free compressed air at 7 bar (min)
Regulatory Compliance	Food-grade components in all commodity contact areas
Standard Baseline System	Infeed hopper, metal detector, RF generator(s), product holding and cooling section, chiller for cooling RF generator, remote monitoring system (EWON) and SCADA
Material Construction	Food grade stainless steel product contact surfaces, with painted steel support structure
Operating Environment	Indoor location, well ventilated room 15° C to 40° C (59° F to 104° F) Relative humidity 10% to 90% non-condensing environment
Other Equipment	Pre-wet section- dependent on the product to be treated
Warranty	1 year limited parts & labor
Manufactured	Italy

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