ERICSON
SAFETY IS OUR STANDARD

ericson.com

CONTROLLING DANGEROUS BACTERIA

in Food & Beverage Processing Operations

DELIVERING SAFE AND MICROBE-FREE PORTABLE PROCESS POWER

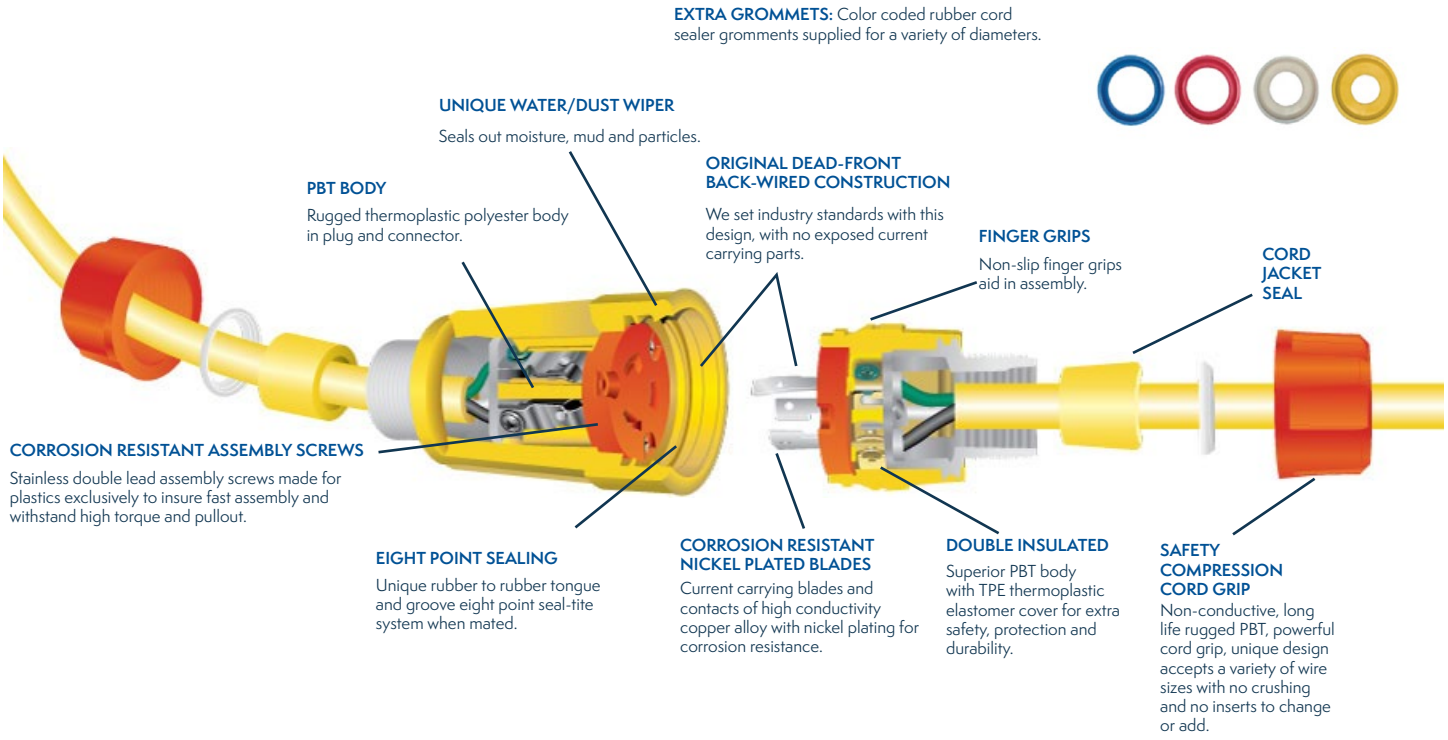
Portable food processing, packaging, and conveyance equipment, allow companies the flexibility to adjust food processing lines to maximize process efficiency and throughput.

They key to portability is the ability to delivery power to delivery flexible electrical power through portable electrical cord and NEMA locking plugs or Pin & Sleeve, connectors, and receptacles. All these connections are susceptible to air and water borne bacteria that collect on their surfaces, supporting dangerous bacterial growth.

Despite a ridged cleaning regimen, the risk of mold, mildew and bacteria is ever present. Given the opportunity to flourish, these microbes can develop into harmful bacteria affecting entire operations and affect the health and lives of employees and customers.

In response, Ericson developed, and patented, its line of Perma-Kleen Wiring Devices and Portable Cord. This suite of portable electrical power products is embedded with anti-microbial additives throughout polymer used in the construction of the device and insulation of the cord. These additives inhibit the microbe's ability to reproduce and grow. These additives remain in the construction of the cord and cannot be washed off. Even cord and devices subject to abrasion, nicks or cuts will continue to protect companies from these dangerous bacteria.

ANTI-MICROBIAL PROTECTION



UNDERSTANDING PERFORMANCE CHARACTERISTICS

Anti-microbial performance is usually discussed in terms of Log Kill, Percent Kill, and Log Reduction. Let's discuss the differences between these.

Log Kill is the measure of the starting population of organisms minus the number of surviving organisms. The results are reported as a logarithm of the killed organisms. For example, if the starting population is 1,000,000 organisms, and the number of surviving organisms is 750, the Log Kill rate is:

Log Kill= Log (1,000,000- 750) = Log (999,250) = 5.9997

Percent Kill involves the same formula from above, except that the result is represented as a percentage. Utilizing the same rate as above, the Percent Kill would be:

Percent Kill= (999,250/ 1,000,000) * 100= 99.925%

Log Reduction is the reduction factor calculated using the initial starting population of the organisms compared to the surviving number. The results in this case are reported as a base 10 Log. See page 5 for an illustration of the Log Reduction factor for several different kill examples and associated Percent Kill values.

Log	Reduction Factor	Remaining Organisms	Percent Kill
1	10	100000	90%
2	100	10000	99%
3	1000	1000	99.9%
4	10000	100	99.99%
5	100000	10	99.999%
6	1000000	1	99.9999%

E. coli at 24 hours-
Untreated

E. coli at 24 hours-
Treated with Perma-Kleen

REFERENCE

Graph 1: Escherichia coli/ Gram (-) Log Reduction

Sample	Number of Living Bacteria at Beginning (per cm²)	Number of Living Bacteria After 24 hrs (per cm²)	Activity Against Control	Reduction %
1	$1.4x10^4$	< 11	>5.2	> 99.999
2	$1.4x10^4$	< 25	> 4.8	> 99.998
3	$1.4x10^4$	< 11	> 5.2	> 99.999
4	$1.4x10^4$	< 17	> 5.0	> 99.999
5	$1.4x10^4$	< 11	> 5.2	> 99.999
6	$1.4x10^4$	< 11	> 5.2	> 99.999

Graph 2: Salmonella enterica subsp. Enterical/ Gram (-) Log Reduction

Sample	Number of Living Bacteria at Beginning (per cm²)	Number of Living Bacteria After 24 hrs (per cm²)	Activity Against Control	Reduction %
1	8.6×10^3	< 2.5	> 3.6	> 99.97
2	8.6×10^3	< 2.5	> 3.6	> 99.97
3	8.6×10^3	< 2.5	> 3.6	> 99.97
4	8.6×10^3	< 2.5	> 3.6	> 99.97
5	8.6×10^3	< 2.5	> 3.6	> 99.97
6	8.6×10^3	< 2.5	> 3.6	> 99.97

Graph 3: *Staphylococcus aureusl* Gram (-) Log Reduction

Sample	Number of Living Bacteria at Beginning (per cm²)	Number of Living Bacteria After 24 hrs (per cm²)	Activity Against Control	Reduction %
1	2.0×10^4	< 11	> 3.8	> 99.98
2	2.0×10^4	< 25	> 3.5	> 99.96
3	2.0×10^4	< 11	> 3.8	> 99.98
4	2.0×10^4	< 17	> 3.6	> 99.98
5	2.0×10^4	< 11	> 3.8	> 99.98
6	2.0×10^4	< 11	> 3.8	> 99.98

Graph 4: *Listeria monocytogenes/* Gram (-) Log Reduction

Sample	Number of Living Bacteria at Beginning (per cm²)	Number of Living Bacteria After 24 hrs (per cm²)	Activity Against Control	Reduction %
1	1.5×10^4	< 2.5	> 4.3	> 99.995
2	1.5×10^4	< 2.5	> 4.3	> 99.995
3	1.5×10^4	< 2.5	> 4.3	> 99.995
4	1.5×10^4	< 2.5	> 4.3	> 99.995
5	1.5×10^4	< 2.5	> 4.3	> 99.995
6	1.5×10^4	< 2.5	> 4.3	> 99.995

CONCLUSION

Perma-Kleen anti-microbial wiring devices, cables and cordsets provide a new and innovative approach to controlling microbial growth in the most difficult surfaces to clean. By incorporating anti-microbial additives stored within the polymer, continual, long-lasting protection is ensured. Confidence and peace of mind is achieved through the protection of employees and consumers against harmful and potentially deadly microbial contamination.

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