

EndoSan™

RECOMMENDED SAFE INGESTION LEVELS



The purpose of this document is to display and allow easy comparison between the recommended dose levels of EndoSan and the safe levels of ingestion of hydrogen peroxide for humans. There are two recommended methods of EndoSan application, Shock Dose and Constant Dose, data has been presented for both.

SHOCK DOSE - WATER TREATMENT

Applicable for removal of biofilm from water systems. Required before implementing constant dose.

EndoSan50 ppm	H ₂ O ₂ ppm	Safe ingestion ppm (NOAEL)	EndoSan50 volume	Minimum Residence Time
200	100	728	200ml / m ³	24 Hours
400	200	728	400ml / m ³	12 Hours
800	400	728	800ml / m ³	6 hours
1600 <small>INGESTION RISK *</small>	800	728	1600ml / m ³	3 hours
4800 <small>INGESTION RISK *</small>	2400	728	4800ml / m ³	1 hour

* INGESTION RISK - SYSTEM MUST BE OFF LINE DURING THIS TREATMENT

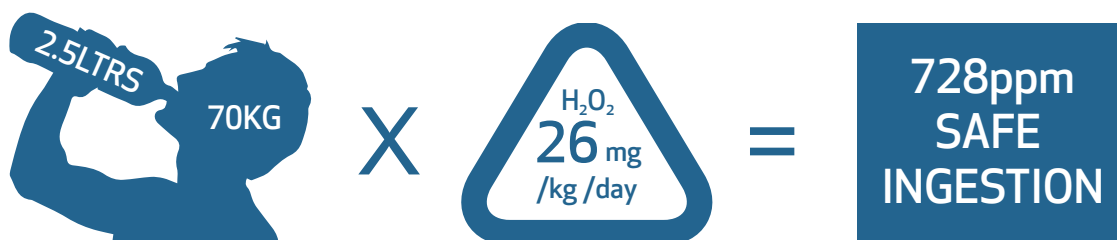
CONSTANT DOSE

Applicable for legionella control, livestock drinking water, swimming pool disinfection, etc.

EndoSan50 ppm	H ₂ O ₂ ppm	Safe ingestion ppm (NOAEL)	EndoSan50 volume	Time
20-40	10-20	728	20-40ml / m ³	Constant

HOW SAFE INGESTION PPM (NOAEL) IS CALCULATED

NOAEL stands for No Observed Adverse Effect Level and was calculated by NSF¹ (see overleaf for more detail). The safe ingestion level of hydrogen peroxide is calculated as follows:



Typical Adult Mass:
70kg
Typical Daily Water Intake:
2.5 litres²

NOAEL:
26 mg of H₂O₂ per kg, per day
NOAEL multiplied by typical mass:
26 x 70kg = 1820mg H₂O₂ per day.

Per litre NOAEL calculation:
1820mg / 2.5ltr = 728mg per litre
As mg to ppm is 1:1
728mg = 728ppm

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LEVELS



SWIMMING POOL INGESTION

EndoSan is a highly effective disinfectant when used to treat the water in swimming pools. During a 45 minute swim the US EPA estimate that water ingestion by adults would be 16ml and non-adults 37ml³. As the conversion of ml to ppm is 1:1 these represent 16ppm and 37ppm respectively. When compared with the NOAEL value of 728ppm it is clear that these values are significantly less and therefore represent no risk to human ingestion.

Values can change with higher daily water ingestion or adult mass values.

DATA SOURCES

NSF - National Sanitation Foundation

NSF International is an accredited, independent third-party certification body that tests and certifies products to verify they meet these public health and safety standards. Products that meet these standards bear the NSF mark. NSF International has been collaborating with the World Health Organization since 1997 in water quality and safety, food safety and indoor environments.

NOAEL - No-Observed-Adverse-Effect Level

The no observed adverse effect level (NOAEL) denotes the level of exposure of an organism, found by experiment or observation, at which there is no biologically or statistically significant (e.g. alteration of morphology, functional capacity, growth, development or life span) increase in the frequency or severity of any adverse effects in the exposed population when compared to its appropriate control.

US EPA - US Environmental Protection Agency

The United States Environmental Protection Agency (EPA or sometimes USEPA) is an agency of the U.S. federal government which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress.

REFERENCES

¹ NSF Toxicology Services CAS 7722-84-1 Oral Risk Assessment -NSF Toxicology Services Copyrighted and Peer Reviewed 2010

² Water as an essential nutrient – the Physiological basis of hydration European Journal of Clinical Nutrition (2010) 64 115 -123 J. Equier, F. Constant

³ An Observational Study: Determination of the volume of water ingested during Recreational Swimming Activities US EPA Evans O.M. et al 13/10/2006

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