



Healthier Way to Life

RELYON

A BROAD-SPECTRUM BIOCIDES FOR
FRUIT & VEGETABLE WASH

Prepared by :-

PROPHYLAXIS

Website: www.clo2india.com

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RELYON:A BROAD-SPECTRUM BIOCIDES FOR FRUIT & VEGETABLE WASH

1.WHAT IS RELYON :

RELYON IS A TWO-COMPONENT LIQUID KIT THAT DELIVERS A 0.76 % CHLORINE DIOXIDE SOLUTION. **RELYON** DOES **NOT** GENERATE BY-PRODUCTS KNOWN FROM CHLORINE DIOXIDE (e.g.CHLORITE,CHLORATE,CHLORIDE OR FREE CHLORINE). **RELYON** CAN BE CONSIDERED FAR MORE ADVANCED THAN CHLORINE DIOXIDE GENERATED IN CLASSICAL WAYS.FUTHER **RELYON** IS **NOT** **EXPLOSIVE** AND HAS A KINETIC HALF TIME OF 30-60 DAYS(DEPENDING ON STORAGE CONDITIONS).LIKE OZONE,CHLORINE DIOXIDE IS SOLUABLE AS A TRUE GAS.THE ClO₂ MOLECULE REMAINS A TRUE GAS IN SOLUTION-MAKING IT MORE ENERGETIC AND ABLE TO REACH ALL POINTS IN A SYSTEM.BECAUSE IT IS A TRUE GAS AND SOLUBLE IN VIRTUALLY ANYTHING,IT CAN PENETRATE THE BACTERIAL SLIME LAYERS(BIOFILM).FINALLY,CHLORINE DIOXIDE BREAKS DOWN TO SODIUM CHLORIDE.THIS ALONG WITH THE FAILURE TO FORM TOXIC AND CARCINOGENIC CHLORINATION BY-PRODUCTS AND PRODUCE A BUILD-UP OF TOXIC ORGANIC OR INORGANIC BY-PRODUCTS LIKE BROMATES MAKES CHLORINE DIOXIDE THE MOST ECO-FRIENDLY BIOCIDES THAT CAN BE USED.

2. FRUIT & VEGETABLE WASH:

SOURCES OF CONTAMINATION ARE MANY. DIRECT OR INDIRECT CONTAMINATION FROM ANIMAL AND HUMAN FAECES CAN OCCUR AT MANY POINTS IN THE FRESH-PRODUCE CHAIN. PRE-HARVEST CONTAMINATION CAN COME FROM IRRIGATION WATER, IMPROPERLY COMPOSTED MANURE USED AS FERTILIZER,FAECAL CONTAMINATION FROM FERAL AND DOMESTIC ANIMALS AND FROM WORKERS.ON HARVESTING,CONTAMINATION MAY BE CAUSED BY IMPROPERLY CLEANED HARVESTING EQUIPMENT AND TRANSPORT. AFTER HARVESTING, CONTAMINATION MAY OCCUR FROM WASH WATER AND CROSS-CONTAMINATION FROM OTHER VEGETABLES.

DURING PROCESSING,PROPER STORAGE,CONTROL OF TEMPERATURE AND HYGIENE ARE IMPORTANT IN LIMITING CONTAMINATION AND GROWTH OF PATHOGENS. THE QUALITY OF WATER USED IN PRODUCTION AND PROCESSING IS OF PRIME IMPORTANCE SINCE WATER CAN CONTAMINATES,OR SPREAD CONTAMINATION THROUGH,A LARGE AMOUNT OF PRODUCT.PATHOGENS CAN BE TRANSMITTED TO PRODUCT HANDLED BY INFECTED WORKERS. CUTTING AND SHREDDING CAN BE MAJOR SOURCE OF IN-PLANT CONTAMINATION SINCE THE EQUIPMENT USED CAN BE DIFFICULT TO CLEAN AND HAS BEEN IDENTIFIED AS AN IMPORTANT SITE FOR THE ACCUMULATION OF PATHOGENS,PARTICULARY OF L. monocytogens.

WHILE GREAT CARE AND ATTENTION IS OFTEN TAKEN TO MINIMIZE THE RISK OF INFECTION FROM PROCESSING STAFF AND OTHER FOOD HANDLERS,RELATIVELY INEFFECTUAL BIOCIDES AND DISINFECTANTS ARE USED TO TREAT PROCESS WATER AND EQUIPMENT.

BEWARE,THAT EVEN SINGLE CONTAMINATED BATCH OF FOOD,ONE POOR OR ERRATIC OUTPUT CAN DESTROY YOUR COMPANY'S REPUTATION.

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MANUFACTURERS OFFER A LARGE NUMBER OF DISINFECTANTS, EACH CLAIMED TO BE BEST ON THE MARKET. COMMONLY AVAILABLE CONTAIN CHEMICALS OF THE FOLLOWING GROUPS:

1. CHLORINE AND CHLORINE RELEASING COMPOUNDS.
2. QUATERNARY AMMONIUM COMPOUNDS.
3. AMPHOTERIC (AMPHOLYTIC) COMPOUNDS.
4. PHENOLIC COMPOUNDS.
5. PERACETIC ACID.

THE DISADVANTAGES OF THE ABOVE CHEMICALS ARE MANY AND THEIR DISINFECTANT PROPERTIES ARE LIMITED BY MANY FACTORS; SOME OF WHICH ARE LISTED BELOW:

1. THE CONCENTRATION OF AVAILABLE CHLORINE SHOULD BE AS HIGH AS 200-300mg/liter.
2. PERACETIC ACID AND QUATS ARE ONLY EFFECTIVE ONLY IN HIGH DOSES. PERACETIC ACID PRODUCES ACETIC ACID, WHICH IS VERY USEFUL NOURISHMENT FOR MICRO ORGANISMS-THEREFORE BACTERIA GROW/ENLARGE MORE AFTER USING PERACETIC ACID.
3. TO REDUCE THE BREAKDOWN DURING STORAGE, THE HYPOCHLORITE SOLUTION SHOULD BE MAINTAINED AT pH 9-11 i.e. HAS pH LIMITATION.
4. THE DISINFECTANT CAPABILITIES ARE DIMINISHED IN THE PRESENCE OF FATS, OILS, PROTEINS, BODY FLUIDS etc.
5. NOT EFFECTIVE AGAINST WIDE RANGE OF BACTERIA, SPORES, FUNGI AND VIRUSES.
6. THE HYPOCHLORITE IS MORE EFFICIENT IF THE CONCENTRATION AND TEMPERATURE ARE RAISED AND/OR THE PH IS LOWERED.
7. THESE ARE TEMPERATURE AND CONTACT TIME DEPENDENT (LONG EXPOSURE IS REQUIRED).
8. THESE ARE VERY CORROSIVE AND STAINING TO COMMON METALS.
9. ORGANIC MATERIAL CONSUMES CHLORINE AND REDUCES THE DISINFECTING CAPACITY.
9. MANY DEVELOP TOXIC GASES AND IRRITATE THE SKIN OF PERSONNEL.

CHLORINE IS OFTEN USED AS A TREATMENT FOR WASH WATER, ALTHOUGH THERE ARE FREQUENT PROBLEMS WITH TASTE TINTING AND UNPLEASANT WORKING ENVIRONMENTS AT HIGH LEVELS.

RELYON A VERY POWERFUL BIOCIDES, HAS A NUMBER OF ADVANTAGES OVER OTHER PRODUCTS COMMONLY USED IN THE INDUSTRY.

RELYON IS PROVEN AGAINST BOTULISM ORGANISMS AND OTHER FOOD CONTAMINANTS SUCH AS SALMONELLA, STAPHYLOCOCCUS, STREPTOCOCCUS etc. EVEN MOST RESISTANT STRAINS OF FUNGI ARE COMPLETELY DESTROYED IN 60 SECONDS. TRICOPHYTON MENTAGROPHYTES ARE KILLED IN 5 MINUTES. THE MOST DIFFICULT ORGANISMS OF ALL-THE SPORE FORMERS ARE DESTROYED IN 5 MINUTES-MANY MANY TIMES FASTER THAN MOST CHEMICALS; YET **RELYON** IS SAFE ENOUGH AND REQUIRES NO RESTRICTIONS ON USE IN DIRECT CONTACT WITH FOOD.

3. THE ANSWER TO TRADITIONAL PROBLEM-THE ALTERNATIVE FOR CHLORINE

RELYON IS A DISINFECTION SOLUTION THAT UNITES THE POSITIVE CHARACTERISTICS OF CHLORINE (LOW CHLORINE ACID) WITHOUT THE NEGATIVE EFFECTS OF CHLORINE AND IN ADDITION TO THAT

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PROVIDES A SUBSTANTIAL STRONGER RESULTANT DISINFECTANTS WITH A VERY BROAD PH-VALUE RANGE (4-10).

RELYON –CHLORINE DIOXIDE IS APPLICABLE IN WATER AND AVOIDS THE HAZARDOUS EFFECTS ON THE HUMAN BODY (NO IRRITATION OF MUCOUS GLANDS OR MEMBRANES AND IS ENVIRONMENT FRIENDLY) AND COMPARED TO OZONE IS MUCH MORE STABLE AND ECONOMICAL.THE **RELYON** TWO-COMPONENT CONCEPT ENABLES, FOR THE FIRST TIME, AVAILABILITY IN SOLUBLE FORM WITHOUT THE NEED OF VERY EXPENSIVE EQUIPMENT TO USE IT.DUE TO THIS INNOVATIVE CHARACTERISTICS THE **RELYON** TWO-COMPONENT CONCEPT HAS BEEN ADDED TO THE LIST OF STORABLE DISINFECTANTS ACCORDING TO THE GERMAN REGULATION DVGW- ARBEITSBLATTES-W291.

4.THE COMPARISON

CRITERIA	CHLORINE	RELYON CHLORINE DIOXIDE
BIOFILM ERADICATION IN THE WATER CIRCUIT	IN DRINKING WATER CONCETRATION IS LIMITED,HENCE NO ERADICATION DUE TO LACK OF PENETRATION OF THE BIO-FILM.	RELYON PENETRATES THE BIO-FILM COMPLETELY AND ERADICATES VERY WELL.
DEODORIZATION	PRODUCTION OF SMELL AND TASTE INFLUENCERS BY REACTION WITH PHENOLS,AMINES AND ALGAE.	EXCELLENT DEODORIZATION CHARACTERISTICS AND THEREFORE SMELL AND TASTE CAUSERS IN WATER LIKE PHENOLS,AMINES AND ALGAE ARE AVOIDED OR NOT PRODUCED.
PH-VALUE DEPEND-ABILITY DURING DISINFECTION	DISINFECTION ONLY AT PH VALUES < 7.5.LIMITED DISINFECTION OF CONCRETE BASED PIPELINE CIRCUITS.	DISINFECTION IS PH-VALUE INDEPENDENT WITHIN A BANDWITH OF 4< PH < 10.EFFECTIVE DISINFECTION OF CONCRETE BASED PIPELINE CIRCUITS ALSO.
BUILDING OF CANCER CAUSING THM`S	STRONG BUILDING DUE TO REACTION WITH ORGANIC MATERIAL IN WATER	NO THM`S BUILDING IN DRINKING WATER.
BUILDING OF MUC- OUS GLANDS OR MUCOUS MEMBR- ANCES IRRITATING CHLORAMINES.	ALL AMINES ARE TRANSFORMED TO CHLORAMINES WHEN IT REACTS WITH CHLORINE.	NO REACTION WITH PRIMARY OR SECONDARY AMINES AND THERE- FORE NO CHLORAMINES ARE BUILT.

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5. WHAT OTHERS SAY:

THE **WHO** GUIDELINES FOR DRINKING WATER QUALITY RECOMMEND CHLORINE DIOXIDE AS A PERSISTENT RESIDUAL FOR CONTINUED MICROBIAL CONTROL.

MANY TESTS OF APPLICATIONS OF CLORINE DIOXIDE HAVE BEEN EXECUTED.IN ORDER TO QUOTE ONE OF THEM THE FOLLOWING:"THERE`S PRACTICALLY NOTHING IT CAN`T DESTORY.IT HAS KILLED EVER VIRUS AND BACTERIA THAT IT HAS EVER BEEN TESTED ON.INCLUDING FUNGI AND EVEN PARASITES," SAID Dr.MICHAEL BARZA,DIRECTOR OF MEDICINE AT BOSTON`S CARITAS CARNEY HOSPITAL .

(http://www.cantas_carney.org/home/default.asp)

THIS BECOMES INDISPENSABLE IN BOTH HOSPITALS AND THE FOOD INDUSTRY,WHERE TRANSMISSION OF PATHOGENIC MICRO ORGANISMS CAN BE MAJOR PROBLEM.

STAPHYLOCOCCUS AUREUS IN ONE OF THE COMMON PATHOGENS FOUND AT HOSPITALS,WHILE LISTERIA MONOCYTOGENES,ESCHERIACHIA COLI AND SALMONELLA TYPHIMURIUM LIKE TO HANG OUT NEAR FOOD.SOME OF THE PROBLEMS THESE NASTIES CAUSE INCLUDE VOMITING,MENINGITIS, MISCARRIAGE AND ABSCESES.

"IT (CHLORINE DIOXIDE)WORKS IN DIFFERENT WAYS ON DIFFERENT MICRO ORGANISMS.IN BACTERIA IT DAMAGES THE CELL MEMBRANE;IN VIRUSES IT DENATURES THE VIRUSES,"BARZA SAID. "IT BURSTS THEM -IT WORK LIKE A LITTLE NUCLEAR BOMB."

DESPITE ITS DEVASTATING EFFECT ON HARMFUL MICROBES,BARZA SAID,CHLORINE DIOXIDE,WHEN USED IN SMALL DOSES,POSES NO RISKS FOR HUMANS.

6. RELYON GERMICIDAL SPECTRUM:

BACTERIA:

E.COLI	COXIELLA BURNETTI
PSEUDOMONAS AERUGINOSA	CAMPYLOBACTER JEJUNI
PSEUDOMONAS SPECIE	FLAVOBACTERIUM SPECIES
ENTEROBARCTER CLOACEAE	YERSINIA ENTEROLITICA
ENTEROBARCTER HAFNIA	CLOSTRIDIUM SPOROGENUS
PROTEUS VULGARIS	CLOSTRIDIUM DIFICILE
KLEBSIELLA PNEUMONIAE	CLOSTRIDIUM PERFINGENS
SALMONELLA TYPHI	FUSOBACTERIUM NUCLEATUM
SALMONELLA ENTERIDITIS	BACILLUS SUBTILIS
SALMONELLA GALLINARUM	BACILLUS CIRCULANS
SALMONELLA TYPHIMURIUM	BACILLUS MEGATARIUM
SALMONELLA CHOLERAESUIS	BACILLUS CEREUS
SALMONELLA TYPHOSA	BIFEDIBACTER LIBERIUM
CORYNEBACTERIUM NUCLEATUM	STAPHYLOCOCCUS AUREUS
SARCINAE LUTAE	STAPHYLOCOCCUS EPIDERMIA
STREPTOCOCCUS PYROGENES	STREPTOCOCCUS FAECALIS
STEP 1,2,3	MYCOBACTERIUM BOVIS
MYCOBACTERIUM SMEGMATIS	MYCOBACTERIUM KANSAAIL

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FUNGI:

CANDIDA ALBICANS
SCOPULARIOSIS SPECIES
TRICHOPHYTON MENTAGROPHYTES
MUCOR SPECIES
SACHROMYCES CEREVISIAE

TRICOPHYTON RUBRUM
ASPERGILLUS NIGER
ASPERGILLUS FLAVUS
FUSARIUM SPECIES
FONSECAEA PEDROSOI

VIRUS:

HERPES VIRUS 1
HERPES VIRUS 1
ADENOVIRUS ECHOVIRUS
COXSAKIEVIRUS
INFLUENZA
FELINE PAROVIRUS
MOUSE FLU
MINUTE VIRUS OF MICE (MVM)
NEW CATTLE DISEASE VIRUS
IRIDOVIRUS

POLIOVIRUS
ENCEPHALOMYOCERDITIS (EMS)
VACCINA VIRUS
VESICULAR STOMATITIS VIRUS (VSV)
PARA INFLUENZA
BLUETONGUE VIRUS
MOUSE HEPATITIS VIRUS (MHV)
MOUSE ENCEPHALOMYELITIS VIRUS
MOUSE POLIO VIRUS (MEV)
PERTIVIRIES – TOGAVIRIDAE

OTHER:

VIBRIO CHOLERAЕ
MYCOPLASM

CULEX QUINQUIFASIATUS

7. COST COMPARISON:

AN ABSOLUTE COMPARISON PER VOLUME OF OTHER DISINFECTANTS DOES NOT PROVIDE THE REAL COST COMPARISON WITH [RELYON](#). OTHER COST FACTORS RANGE FROM:

- (CHLORINE) REACTOR COST OF OWNERSHIP, INCLUDING MAINTENANCE, CERTIFICATION & RE-CERTIFICATION.
- SECURITY MEASURES & RISK AND LIABILITY INSURANCE POLICY.
- TRAINING, CERTIFICATION AND RE-CERTIFICATION OF QUALIFIED PERSONNEL.
- ENVIRONMENTAL, HEALTH & SAFETY FACTORS.
- HAZARD TRANSPORT COST.
- USE OF ADDITIONAL CHEMICALS (e.g. PH LEVEL STABILIZERS).
- THE COST OF **NOT** DELIVERING THE REQUIRED BIOCIDAL RESULTS.

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8.APPLICATION & DOSAGE:

RELYON CHLORINE DIOXIDE CAN BE USED AT MUCH LOWER DOSES THAN TYPICAL HALOGEN ANTIMICROBIALS WITH FAR SUPERIOR MICROBIAL CONTROL. ITS AGGRESSIVE ATTACK ON BIOFILMS ENSURES LESS FOWLING OF PIPING AND PRACTICALLY ELIMINATES BACTERIAL “SEEDING” OF PROCESS WATERS. CHLORINE DIOXIDE DOESN`T PRODUCE HALOGENATED ORGANIC BYPRODUCTS,WHICH ARE SERIOUS PROBLEMS ASSOCIATED WITH CHLORINE AND BROMINE COMPOUNDS.

LETTUCE:

WASHING OF LETTUCE FOR SUPPLY TO SUPERMARKETS,FAST FOOD CHAINS,RESTAURANTS etc.

QUALITY REQUIREMENTS	SALMONELLA ZERO,LISTERIA ZERO,E COLI ZERO. MUST PASS SENSORY EVALUATION TEST CRITERIA (NO CHLORINE TASTE). APPEARANCE OF LETTUCE MUST BE GOOD. TPC MUST BE WITHIN GUIDELINES AT DAY 10.(TPC = TOTAL PASTE COUNT) (MICROBIOLOGICAL SURFACE CONTAMINATION).
OLD PROCESS DESCRIPTION	CHLORINE AT 100-200 PPM DOSED FROM SODIUM HYPOCHLORITE 12.5% TERRIBLE CHLORINE SMELL IN FACTORY WITH EMPLOYEES COMPLAINING OF EYE AND SKIN IRRITATIONS. IMPOSSIBLE TO CONTROL CHLORINE RESIDUAL AND REQUIRED MANUAL CHEMICAL ADDITION EVERY 15 MINUTES. PH CONTROL NOT POSSIBLE AS ALWAYS-CREEPING HIGH. REQUIRED TO DUMPA LOT OF WATER TO MAINTAIN CHLORINE RESIDUAL, WHICH WAS HIGH,COST FOR CHILLING AND EXTRA ICE. E.COLI WAS NOT ALWAYS ZERO. ALWAYS CONCERNED ABOUT LISTERIA IS NOT AFFECTED BY CHLORINE AT LOW TEMPERATURES. TPC AT DAY ZERO WAS INCONSISTENT.
DESCRIPTION OF RELYON BASED SYSTEM	RELYON SOLUTION AT 1.0 PPM IN 2-STAGE WASH.FIRST WASH STAGE IS 8 DEG.C AND SECOND WASH STAGE IS 2 DEG.C. DOSING IS DONE AUTOMATICALLY USING RELYON SOLUTION STORAGE TANK,AUTOMATIC RESIDUAL CONTROL AND A DOSAGE PUMP (ACID RESISTANT, EQUAL TO PROMINENT B-LINE). OPERATORS DO CHECK ON THE DOSING EQUIPMENT EVERY HOUR OR SO BUT DON`T ADD ANY CHEMICAL MANUALLY. PH IS AUTOMATICALLY CONTROLLED TO 7.5. VERY LITTLE DUMPING OF WATER AND ONLY CHILLED WATER IS USED.E.COLI

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SOLUTION EASILY KILLS	<p>IS ALWAYS ZERO.</p> <p>NO CONCERN ABOUT LISTERIA AS RELYON</p> <p>LISTERIA AT LOW TEMPERATURES.</p> <p>TPC AT DAY ZERO IS CONSISTENT AND ALWAYS LESS THAN 7×10^4</p>
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POTATOES:

POTATOES ARE TRANSPORTED BY TRUCK AND PLACED INTO HEAPS. THEY ARE THEN WASHED AND CUT INTO FRENCH FRY SHAPES PRIOR TO FREEZING. WATER USED FOR PROCESSING IS FROM MUNICIPAL SUPPLY.

PROCESS DESCRIPTION SOLUTION	<p>POTATOES ARE CUT AND WASHED WITH RELYON</p> <p>TREATED WATER.</p> <p>RELYON SOLUTION IS FLOW PACE DOSED INTO THE TREATED WATER AT A DOSE OF 0.7 -1.0 PPM TO MAINTAIN CONCENTRATION OF 0.5 PPM OF ClO2 RESIDUAL.</p>
ADVANTAGES/ BENEFITS	<p>IMPROVED CONTROL ON RESIDUAL CONTROL OF RELYON SOLUTION.</p> <p>UNUSUAL TAINTS ON PROCESSED PRODUCT ARE REMOVED.</p> <p>CHLORINE DIOXIDE DELIVERS BETTER MICROBIOLOGICAL CONTROL (THAN CHLORINE AT 5-10 PPM).</p> <p>AUTOMATIC OPERATION SIMPLE AND EFFECTIVE.</p> <p>NO CHLORINATED ORGANIC BY PRODUCTS.</p>
REQUIRED EQUIPMENT	<p>RELYON SOLUTION STORAGE TANK.</p> <p>CHLORINE DIOXIDE RESIDUAL CONTROLLER/SENSOR (REDOX), FLOW METER.</p> <p>DOSAGE PUMP (ACID RESISTANT, EQUAL TO PROMINENT B-LINE).</p> <p>USE A BY-PASS OF 2,500 L/Hr TAP OF THE MAIN FLOW AND DOSE THE REQUIRED RELYON SOLUTION AND FEEDBACK TO THE MAIN FLOW.</p>

CORN PEAS AND BEANS:

PROCESS DESCRIPTION	<p>GENERAL PROCESS CONTAINS 0.5 PPM CHLORINE (MUNCIPAL SUPPLY).</p> <p>WASH WATER IS PROCESS WITH UP TO 2 PPM RELYON SOLUTION ADDED.</p>
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	<p>CORN IS BLANCHED AND THEN COOLED DOWN.AS THE CORN IS COOLING MICROBIOLOGICAL GROWTH CAN OCCUR.</p> <p>THE CORN IS COOLED BY WATER SPRAYING WITH UP TO 2 PPM RELYON SOLUTION (CRITICAL STAGE).</p>
ADVANTAGES/ BENEFITS	<p>NO TASTE AND ODOR INFLUENCE ON THE CORN.</p> <p>RELYON SOLUTION WORKS WELL IN AN ENVIRONMENT OF HIGH ORGANIC LOAD.</p> <p>NO CHLORINE SMELL IN THE FACTORY HALL.</p> <p>EASY GENERATION,DOSING AND CONTROL OF DISINFECTION.</p>
REQUIRED EQUIPMENT	<p>RELYON CHLORINE DIOXIDE STORAGE TANK</p> <p>CHLORINE DIOXIDE RESIDUAL CONTROLLER/SENSOR.</p> <p>DOSAGE PUMP (ACID RESISTANT,EQUAL TO PROMINENT B-LINE).</p>

TOMATOES:

RELYON SOLUTION IS USED TO DESTROY MOULDS ON THE TOMATOES AND THE FLUME TANK.

PROCESS DESCRIPTION	<p>TOMATOES ARE DUMPED FROM THE TRUCK ONTO A CONVEYOR.</p> <p>COARSE RINSE WITH MUNICIPAL WATER SPRAYS TO REMOVE DIRT,STEMS AND LEAVES etc.</p> <p>TOMATOES FALL INTO FLUME TANK (20,000 ltr).THE FLUME WATER IS PUMPED TO THE SORTING CONVEYOR AND BACK INTO CLOSED CIRCUIT WITH THE TOMATOES.</p> <p>OPERATERS REMOVE UNACCEPTABLE PRODUCT.</p> <p>MAKE-UP CONDENSATE WATER IS CONTINUALLY ADDED (5,000 ltr./hr.)FROM THE TOMATO PASTE PROCESS.</p> <p>RELYON SOLUTION IS DOSED INTO THE FLUME WATER TO MAINTAIN CONCENTRATION OF 0.2 -0.4 PPM.(IN THIS STAGE A PH OF 4.0 IS ACCEPTABLE)</p>
REQUIRED EQUIPMENT	<p>RELYON SOLUTION DOSING DIRECTLY INTO FLUME.BY PASS WATER IS CONDENSATE FLOW CONTROL TO 650m V BY REDOX CONTROLLER AND PROPORTIONAL CONTROL WITH INDUSTRIAL REDOX PROBE.</p> <p>THIS SYSTEM IS ONLY USED IN WET WEATHER AND OCCASIONALLY DURING DRY WEATHER.MOULD IS BAD PROBLEM WHEN THERE IS LOT OF RAN DURING HARVEST.</p>

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PREVIOUS TREATMENT	RELYON SOLUTION PROVIDES EASY RESIDUAL CONTROL OF CHLORINE - DIOXIDE.WITH PREVIOUS CHLORINE TYPE OF DISINFECTANTS(e.g.SODIUM HYPOCHLORITE) THERE IS GREAT DIFFICULTY IN MAINTAINING ANY FREE CHLORINE DUE TO THE CONCENTRATION OF ORGANIC MATERIAL.THIS MEANS THAT MOLDS ARE NOT CONTROLLED AND SURFACES ARE FOULED.FUTHER THE PRODUCTION PROCESS DOES NO LONGER NEED TO BE STOPPED DUE TO CHLORINE SMELL IN THE SORTING AREA.
ADVANTAGES/ BENEFITS	LOW CONCENTRATION OF RELYON SOLUTION IS VERY EFFECTIVE IN DESTRUCTION OF MOULDS ON TOMATOES.MOULDS AFFECT THE TOTAL PRODUCTION PROCESS NEGATIVELY AND SHOULD BE AVOIDED. LOW CONCENTRATION OF RELYON SOLUTION IS VERY EFFECTIVE IN DESTRUCTION OF MOULDS IN THE FLUME WATER.IF UNTREATED,THE MOULD ATTACH TO SURFACES OF TANKS AND FLUMES AND LOOK LIKE “MEAT”. EVENTUALLY,THEY FOUL SCREENS AND SMELL. RELYON SOLUTION IS EFFECTIVE AT PH 4-10. NO SMELL FOR OPERATERS.CONTROL ON THE PROCESS.NO CHLORINATED ORGANIC BY-PRODUCTS.
POINT OF ATTENTION	TWO PARALLEL REDOX-MEASURING SYSTEMS ARE ADVISED. OPERATORS PREFERABLY WEAR SUITABLE GLOVES WHEN TOUCHING THE FUME WATER (IN MANY COUNTRIES MANDATORY ACCORDING TO HACCP REGULATION).

CITRUS:

CITRUS FRUITS ARE IMMERSED WITH WATER CONTAINING **RELYON** 0.76 % SOLUTION DURING THE WASHING STAGE.

AIM OF REDUCTION	GEOTRICHUM CANDIDUM SOUR ROT SPORES PENICILLIUM DIGITATIUM BLUE MOLD GREEN MOLD
PROCESS DESCRIPTION	DOSAGE RATE OF 1-2 PPM RELYON SOLUTION TO THE RECIRCULATED WASH WATER (THAT ALSO GOES TO THE SHOWER BIN)TO ENSURE A RESIDUAL OF 0.4 PPM RELYON SOLUTION. DOSAGE CONTROLLED VIA REDOX AS WASH WATER IS VERY DIRTY WASH WATER TEMPERATURE 20 DEG.C, PH 8
REQUIRED EQUIPMENT	RELYON SOLUTION STORAGE TANK CONTACT WATER METER OR BY DPD MEASUREMENT

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	DOSAGE PUMP (ACID RESISTANT,EQUAL TO PROMINENT B-LINE)
ADVANTAGES/ BENEFITS	INCREASED PRODUCTION YIELD WITH RELYON SOLUTION (SIGNIFFICANTLY)LESS OUTTURN COMPARED TO NYLATE(BROMINE) OR CHLORINE TYPE TREATMENT NO TASTE OR ORDOR PROBLEMS WITH THE CITRUS FRUITS SHELF LIFE OF CITRUS FRUIT MAY INCREASE THREEFOLD RELYON SOLUTION REMOVES FUNGI THUS NO LONGER NEED FOR A SEPARATE FUNGICIDE
POINT ATTENTION	THE IMMERSE TANK BE CAUSE AIRBORNE SPORES THAT MIGHT REQUIRE THE USE OF AN EXHAUST SYSTEM.

SPINACH:

PROCESS DESCRIPTION	SPINACH IS MOVED DRY (REMOVING OF BEETLES AND CATERPILLARS). WASHING WITH COLD TAPE WATER. BLANCHING AT 80-90 DEG.C. COOLING. THE WATER FROM THE LAST BLANCHING SEGMENT IS TAKEN TO A COOLER.
PRODUCTION	TWO PROCESSING LINES,EACH 12 T/hr. MAKE-UP WATER PER LINE 12,000 ltr./hr.
REQUIRED EQUIPMENT	RELYON SOLUTION STORAGE TANK CHLORINE DIOXIDE RESIDUAL CONTROLLER/SENSOR DOSAGE PUMP (ACID RESISTANT,EQUAL TO PROMINENT B-LINE)
DOSING FOR CIO2	IN THE COOLER RELYON SOLUTION IS DOSED,TIME PROPORTIONAL, INTERLOCKED WITH THE LAST ZONE OF THE WASHING MACHINE.

RELYON IS AVAILABLE AS 7600 PPM CONCENTRATE. DOSAGE IS SUBJECT TO VARIOUS FACTOR SUCH AS FRUIT AND VEGETABLES TYPE CONTAMINATION LEVEL,QUALITY OF PROCESS WATER AND OTHER ENVIRONMENTAL CONDITIONS.

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9.SUMMARY:

RELYON –ClO₂, WHICH HAS BEEN DEVELOPED BY EXPERIENCED SCIENTISTS, IS A VERY POTENT BIOCIDES WHILE AT THE SAME TIME BEING STABLE, RELIABLE & ENVIRONMENT FRIENDLY. FREQUENTLY, SYSTEMS THAT REQUIRE MULTIPLE BIOCIDES FIND EQUAL OR BETTER MICROBIOLOGICAL CONTROL WITH JUST **RELYON**. **RELYON** IS A SPECIFIC OXIDIZER AND HAS LITTLE TO NO REACTIVITY WITH MANY PRODUCTS THAT MAY BE FOUND IN WATER. IT DOES, HOWEVER, REACT WITH SOME PRODUCTS READILY. THESE PRODUCTS INCLUDE MANY AMINO ACIDS (SULFUR CONTAINING AMINO ACIDS), CYANIDE, HYDROGEN SULFIDE, FORMALDEHYDE, IRON, MANGANESE AND PHENOLIC COMPOUNDS. THIS QUICK REACTIVITY WITH AMINO ACID, THE BUILDING BLOCKS OF LIFE, IS ONE OF THE REASONS THAT **RELYON** IS SUCH A STRONG BIOCIDES. MANY APPLICATIONS FOR CHLORINE DIOXIDE CAN BE FOUND. THERE IS A BIG LIST OF CONSIDERATIONS AND APPLICATIONS THAT MAKE CHLORINE DIOXIDE INTERESTING TO USE ABOVE THE KNOWN TRADITIONAL DISINFECTANTS. THE LIST IS LONG AND INCLUDES TREATMENT FOR POTABLE WATER, FOOD, MEMBRANES, LEGIONELLA, ALGAE, BIOFILM, AND PROCESS APPLICATIONS, CLEANING IN PLACE, AIR TREATMENT etc. ALSO ON THE LIST ARE ISSUES INCLUDING SYNERGY WITH WATER TREATMENT CHEMICALS, USE COST, SYSTEM PERFORMANCE, ENVIRONMENTAL IMPACT, SELECTIVE OXIDIZER, AND WIDE PH RANGE. ONE FACT MANY PEOPLE SEEM TO AGREE UPON IS THAT THERE ARE A LOT OF GOOD REASONS TO USE **RELYON**.

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