TUTHILL ASSOCIATES, INC.

CORROSION BEHAVIOR OF STAINLESS STEELS IN MUNICIPAL WASTE WATERS

REPORT

Prepared For

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CORROSION BEHAVIOR OF STAINLESS STEEL IN CHEMICAL SPECIES FOUND IN MUCINICAPL WASTE WATERS

CHEMICAL SPECIES

	304			316			6%Mo	STL	STL
	GEN	CC	PIT	GEN	CC	PIT	GEN	CC	PIT
LOCAL WATER (1.2)									
<200 PPM CHLORIDES	R	R	R	R	R	R	R	R	R
>200 PPM & <1000 PPM									
CHLORIDES	R	S	R	R	R	R	R	R	R
>1000 PPM CHLORIDES	R	S	R	R	S	R	R	R	R
UNDER-THE-SINK (3)									
DETERGENTS	R	R	R	R	R	R	R	R	R
HOUSEHOLD BLEACH	R	S	R	R	R	R	R	R	R
CAUSTIC SODIUM									
HYDROXIDE TO 10%									
SOAP	R	R	R	R	R	R	R	R	R
DISHWASHING SOAPS	R	R	R	R	R	R	R	R	R
AMMONIA	R	R	R	R	R	R	R	R	R
FOODS (4)									
FRUIT JUICES	R	R	R	R	R	R	R	R	R
SUGAR (CANE JUICE)	R	R	R	R	R	R	R	R	R
VEGETABLE OILS	R	R	R	R	R	R	R	R	R
CANNED TOMATOES	R	R	R	R	R	R	R	R	R
ACIDS (4)									
ACETIC (VINEGAR) TO 10%	R	R	R	R	R	R	R	R	R
NITRIC TO 10%	R	R	R	R	R	R	R	R	R
PHOSPHORIC TO 10%	R	R	R	R	R	R	R	R	R
HYDROCHLORIC									
(MURIATIC) TO 3%	S	S	S	S	S	S	R	R	R
SULFURIC TO 5%	S	S	S	R	R	R	R	R	R
SULFURIC TO 10%	S	S	S	S	S	S	R	R	R
OTHER									
GASOLINE (5)	R	R	R	R	R	R	R	R	R
$FeCl_3$ TO 0.03%	R	R	R	R	R	R	R	R	R
GASES									
OXYGEN	R	R	R	R	R	R	R	R	R
CARBON DIOXIDE (1)	R	R	R	R	R	R	R	R	R
HYDROGEN SULFIDE (6)	R	R	R	R	R	R	R	R	R
RESIDUAL CHLORINE TO 2mg/L (7)	R	R	R	R	R	R	R	R	R
FLOWING DOMESTIC SEWAGE (8)	R	R	R	R	R	R	R	R	R
STAGNANT DOMESTIC SEWAGE*	S	S	S	S	S	S	R	R	R

*When stagnant domestic sewage tends to decompose and putrify creating conditions that favor microbiological influenced corrosion, (MIC)

FOOTNOTES

1. The general corrosion rates are based on continuous exposure for one year. For shorter periods, the extent of corrosion may be assumed to be directly proportional to the actual length - days, hours, minutes - of exposure.

2. No ratings are given for chemicals in industrial wastes other than the acids and gases listed due to the great variety of chemical species in industrial wastes. Most industrial wastes must be neutralized before being sewered. When neutralized, 316L is generally resistant.

R AND S RATINGS BASED ON PUBLISHED LITERATURE

R < O.1 MPY GENERAL CORROSION
< 1 MIL DEPTH OF CREVICE CORROSION
< 1 MIL DEPTH OF PITTING ON CLEAN SURFACES

S > 0.1 MPY GENERAL CORROSION
> 1 MIL DEPTH OF CREVICE CORROSION
> 1 MIL DEPTH OF PITTING ON CLEAN SURFACES

TYPE 304 and 304L	UNS	S 30400 AND S 30403
TYPE 316 and 316L	UNS	S 30400 AND S 30403
6% Mo STL STL	UNS	S 31254, N08367, N08026

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