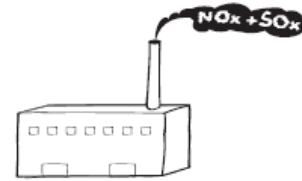


ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

A tool for understanding environmental decisions related to the pulp and paper industry



EMISSIONS TO AIR

EFFECTS OF DECREASED WATER USE ON EMISSIONS TO AIR

Inorganic Air Emissions

Elemental chlorine free (ECF) mills that seek to reduce water use by recycling a portion or all of their bleach plant effluent may find substantial increases in gaseous hydrochloric acid (HCl(g)) emissions. U.S. EPA has promulgated laws limiting HCl(g) emission. Adams examined the effect of increased chloride recycle to the kraft recovery cycle and determined that the loss of chloride due to HCl(g) leaving with the recovery boiler stack can be substantial (Adams 1994). A general chloride balance for kraft mills shows the importance of this HCl(g) export vector, which is anticipated to become more prominent over time with increased recycle of chloride-containing bleach plant filtrates to the recovery area.

Table W20. General Chloride Balance for Kraft Mills (Adams 1994)

Stream	Typical Cl (kg/odt)	Range Cl (kg/odt)
Inputs		
Wood	0.05	0-15
Process water	0.2	0.01-10
Chemical make-up		
purchased	0.1	0.05-0.4
ClO ₂ generator	0.25	0.1-0.8
Bleach plant filtrates	10	4-70
Losses		
Pulp	0.2	0.08-0.8
RB stack		
dust	0.01	0.005-0.05
HCl	0.5	0-2.5
Spills and misc.	0.15	0.05-0.5

References

Adams, T.N. 1994. *Overview of closed-cycle technology for kraft pulping and bleaching*. Report Number One. Project 3684/F017. Atlanta, GA: Institute of Paper Science and Technology.
https://smartech.gatech.edu/xmlui/bitstream/handle/1853/511/F017_001_02211994.pdf