

CHAPTER 1

INTRODUCTION

The unit described in this manual is designed to concentrate a feed liquor solution containing 11% solids to a product of 57% solids concentration. The unit accomplishes this by evaporation in 5 steps (one body on wash) as shown on the following drawings:

Flow Diagram	627-B-9808	
Piping & Instrument Diagram	627-D-9809	(3 Sheets)
General Arrangement	641-D-8483	(12 Sheets)

The unit is designed to maintain the input and output flows with fouled heat transfer surface as shown on Flow Diagram 627-B-9808 summarized below:

<u>Clean</u>	
1) Feed Flow	205,910 lb/hr
Temperature	197°F
Feed Concentration	11%
2) Evaporation Rate	166,170 lb/hr
3) Product Flow	39,740 lb/hr
Temperature	136°F
Concentration	57%
4) Vent Flow	
SO ₂	926 lb/hr
Air	200 lb/hr
5) Steam Flow	37,123 lb/hr
Pressure	120-140 psig
Temperature	400-450°F
6) Cooling Water Flow	3,550 gpm
Temperature In	80°F
Temperature Out	102°F

PROCESS PRINCIPLES

The paragraphs that follow describe the various process principles incorporated in the design of this unit.

EVAPORATION (BOILING)

To concentrate a solution by evaporating a portion of the water normally requires a two step process. First the solution must be