

MEMORANDUM

State of Alaska

Department of Environmental Conservation
Division of Air & Water Quality
Air Quality Improvement Section

TO: John M. Stone, Chief
Air Quality Maintenance Section

DATE: August 26, 1998

FILE:

THRU:

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FROM: John F. Kuterbach, Env. Eng. Assoc.
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SUBJECT: Rated capacity for batch processes
and batch incinerators

This memorandum describes how to evaluate the rated capacity for batch processes.¹

Decision:

The rated capacity of a batch process equals the maximum mass of raw material in a batch divided by the batch cycle time. The batch cycle time begins when the raw material is charged to the process and ends when the process is ready to receive another batch of raw material.

Discussion:

Alaska's regulations define rated capacity as *the maximum sustained capacity of the equipment based on the fuel or raw material, or combination of fuels or raw materials that is actually used and gives the greatest capacity.*

This definition requires one to base the rated capacity of a batch process on the amount of raw material charged to the batch. Raw material can be charged to the process at the sustained rate of one batch per batch cycle. Therefore, the maximum sustained capacity of the batch process equals the maximum mass of raw material in a batch divided by the batch cycle time.

Examples:

1. A certain batch incinerator has a primary chamber that will accept up to 8 tons of waste. The waste is loaded at a rate of 1 ton per minute, until the chamber is full. The incinerator burns the waste for 22 hours. After incineration, the ash is removed and the unit is prepared to receive more waste. Total cycle time is 24 hours. The rated capacity of this unit is 667 pounds per hour. (8 tons/24 hours).

¹ A batch process is a process that operates on a given amount of material at a time, completing processing of the batch of material before operating on the next batch. Typically a batch process includes loading the batch of material into the process, processing the material, unloading the final product from the process and preparing for a new batch. The steps are distinct (that is, one cannot perform them simultaneously).

2. A batch chemical process consists of loading a reactor with 3 tons of material, allowing the reaction to progress for 30 minutes, unloading the reactor, and cleaning the reactor to prepare for the next batch. Loading and unloading takes 2-1/2 minutes each and the cleaning takes about 10 minutes. The rated capacity for this process is 4 tons per hour (3 tons / (2.5 + 30 + 2.5 + 10) minutes * 60 min/hr).

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