

# Edgewood Chemical Biological Center

GB and HD test of the Concept NIOSH  
PAPR Standard

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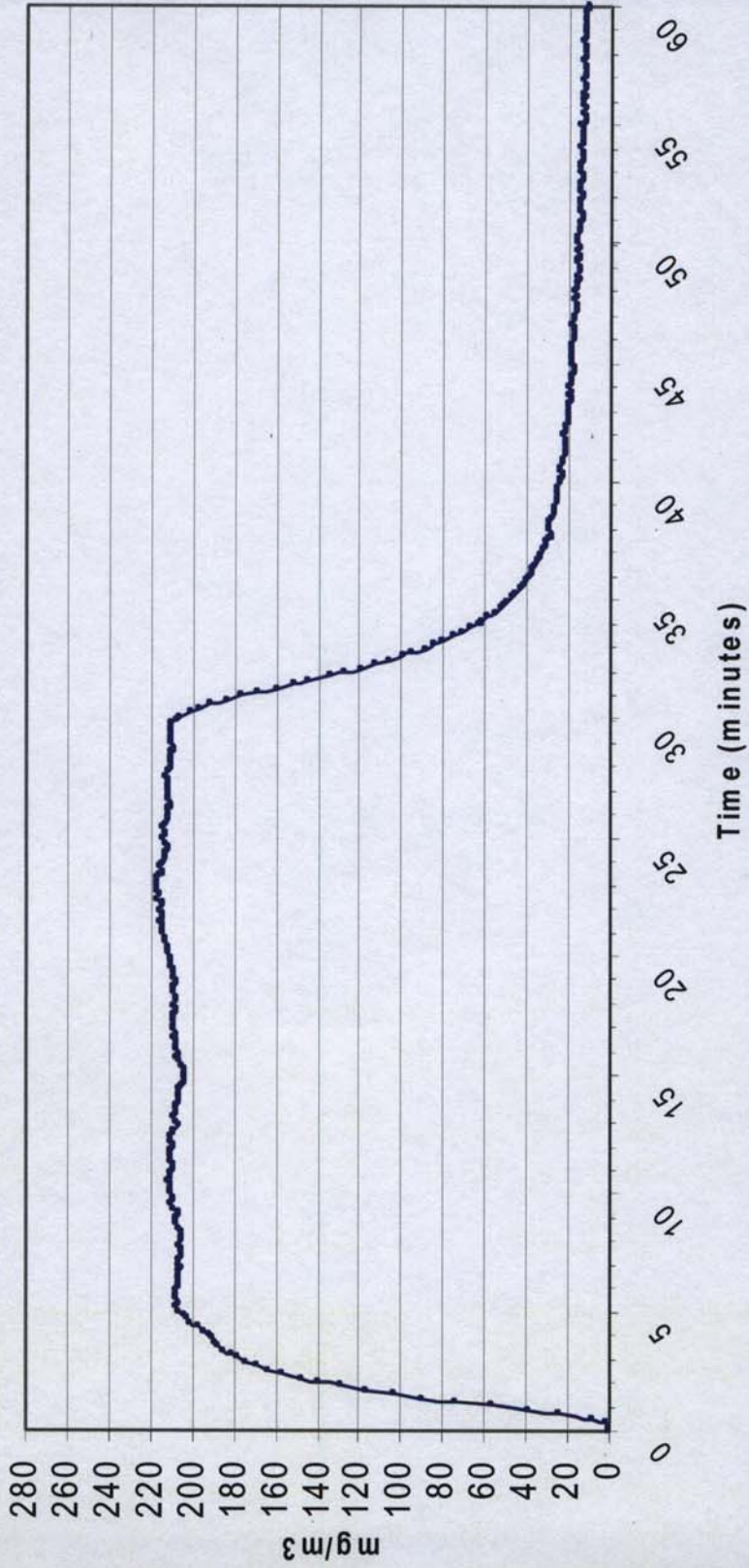
# **Determination of Powered Air-Purifying Respirator (PAPR) Performance During Dynamic Testing Against the Chemical Agent Vapor Sarin (GB) CBRN Standard Testing Procedure**

- **Number of Units: 3 (one as received, two durability conditioned)**
- **Test Requirements:**
  - Leak test (TDA-99M): 30 minutes with a response below 0.0010 percent penetration on the clean system and the agent system.
  - Breathing Rate: 40 L/min (constant flow and demand response)    Respirations:  $36 \pm 2$  strokes per minute  
Tidal volume: 1.1 liters



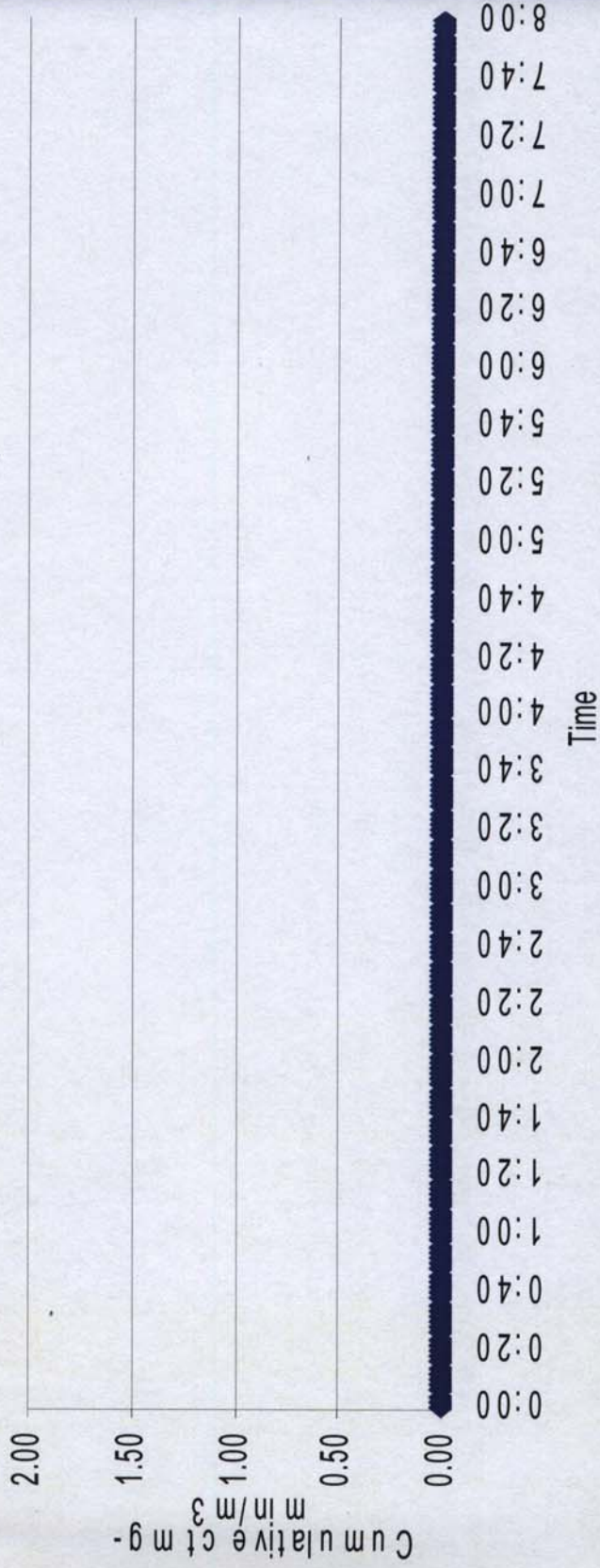
# GB Challenge

GB Vapor Challenge Profile



# GB Challenge Results

Manufacturer A PAPR  
GB Bench Mark Testing  
Cumulative CT: 0.00 mg-min/m<sup>3</sup>

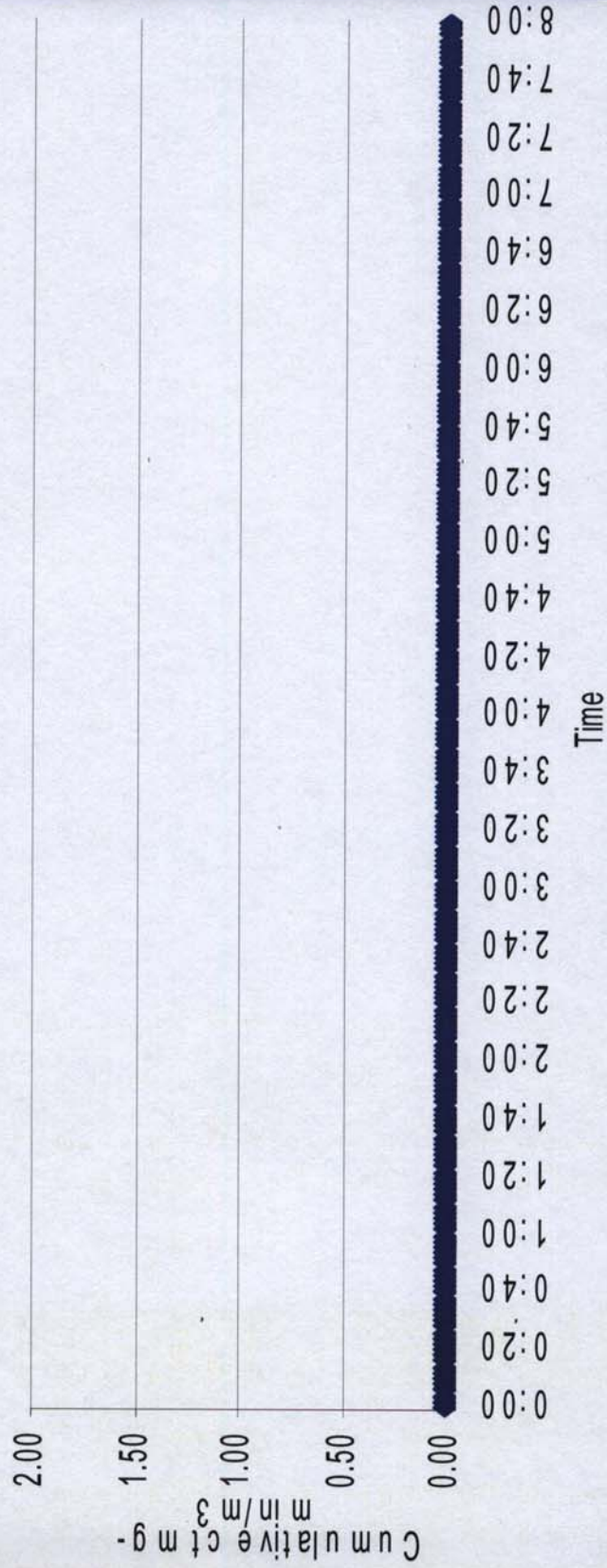


# GB Challenge Results

Manufacturer B PAPR

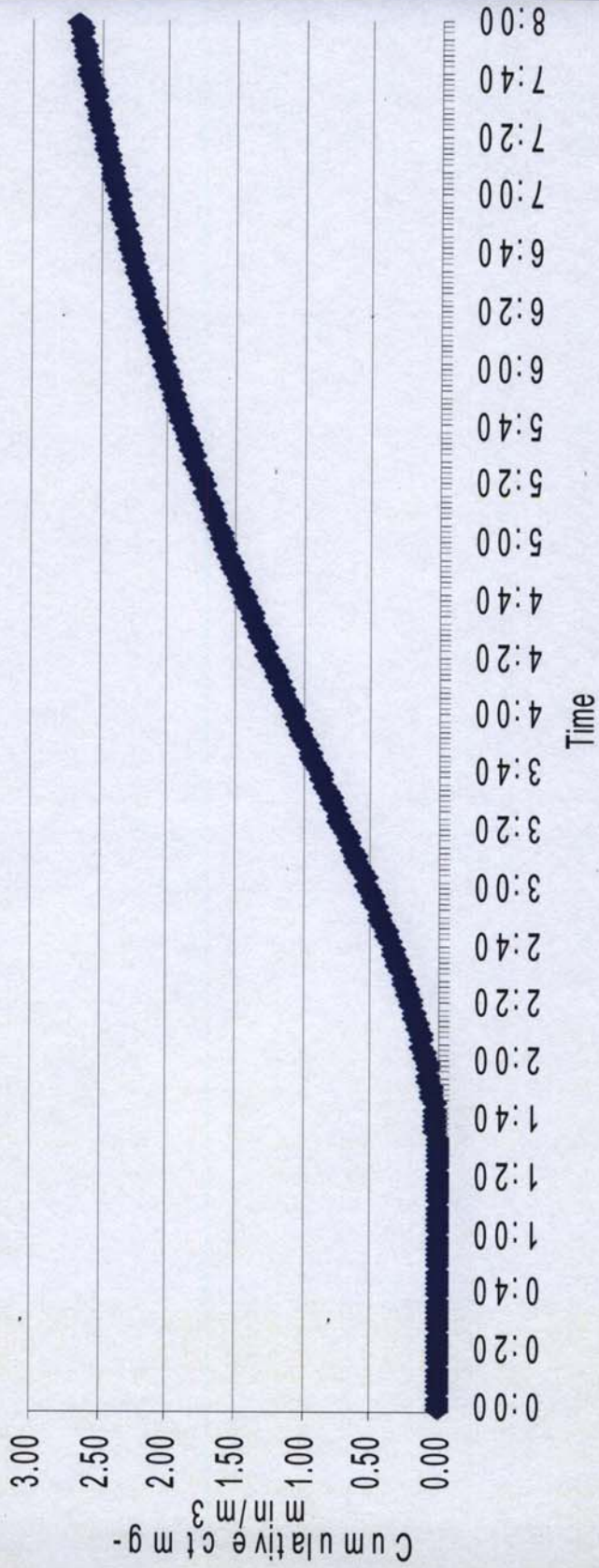
GB Bench Mark Testing

Cumulative Ct: 0.00 mg-min/m<sup>3</sup>



# GB Challenge Results

Manufacturer C PAPER  
GB Bench Mark Testing  
Cumulative CT: 2.65 mg-min/m<sup>3</sup>



## **Determination of Powered Air-Purifying Respirator (PAPR) Performance During Dynamic Testing Against the Chemical Agent Distilled Sulfur Mustard (HD) Vapor and Distilled Sulfur Mustard (HD) Liquid CBRN Standard Testing Procedure**

- **Number of Units: 3 (1 as received, 2 durability conditioned)**
- **Test Requirements:**
  - Leak test (TDA-99M): 30 minutes with a response below 0.0010 percent penetration on the clean system and the agent system.
  - Breathing Rate: 40 L/min (constant flow and demand response) Respirations:  $36 \pm 2$  strokes per minute Tidal Volume: 1.1 liters
  - Breathing Rate: 60 L/min (demand response mode only) Respirations:  $55 \pm 2$  strokes per minute Tidal volume: 1.1 liters

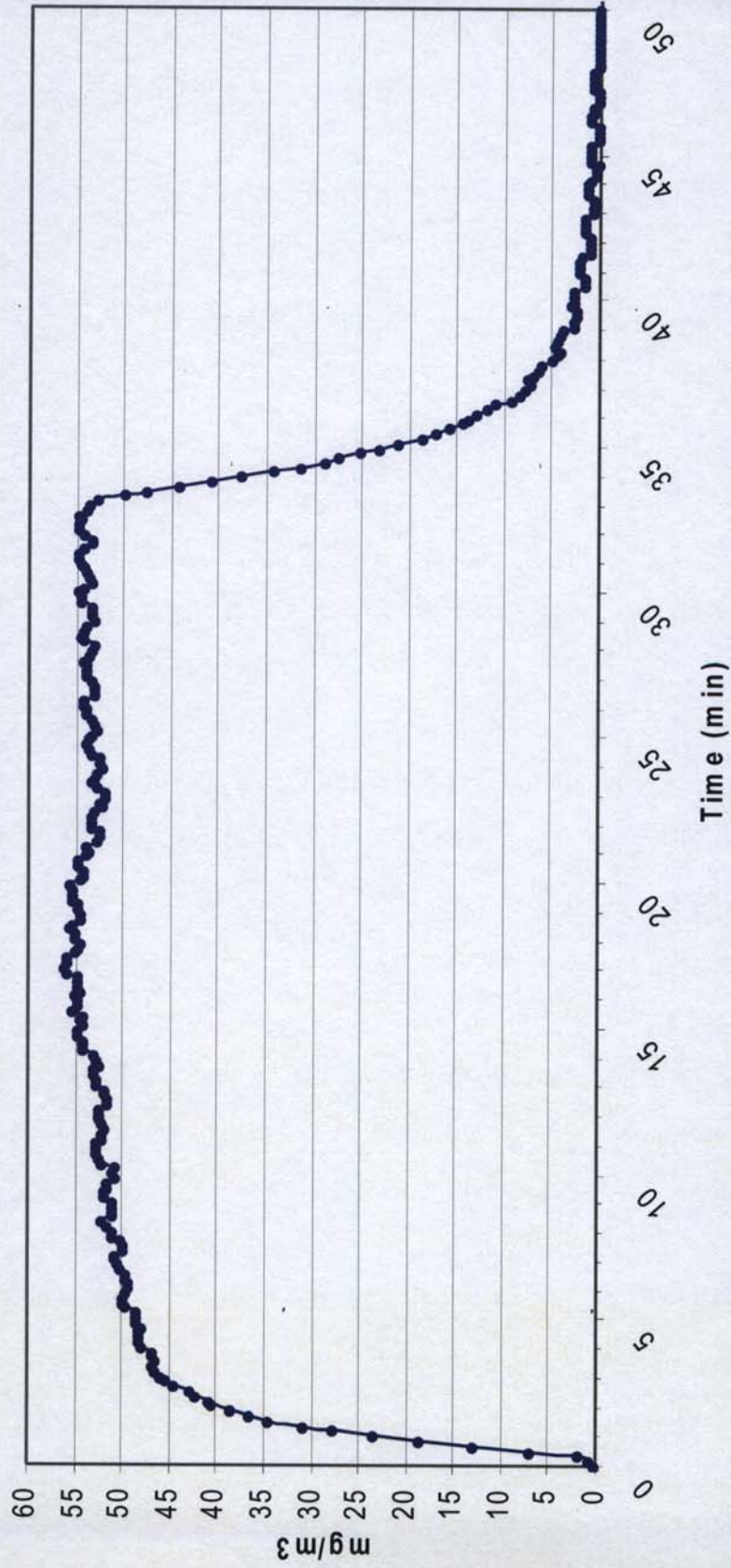


## **Determination of Powered Air-Purifying Respirator (PAPR) Performance During Dynamic Testing Against the Chemical Agent Distilled Sulfur Mustard (HD) Vapor and Distilled Sulfur Mustard (HD) Liquid CBRN Standard Testing Procedure (Continued)**

- **Test Requirements:**
  - Agent vapor concentration:  $50 \text{ mg/m}^3 \pm 10\%$   
Vapor challenge: 0 to 30 minutes, then monitor for an additional 7.5 hours.
  - Agent liquid application: Minimum of 0.43 ml (22, 20 $\mu$ l drops) Maximum of 0.86 ml (43, 20  $\mu$ l drops)
  - Liquid application time: 6 hours.
  - Total test time: 8 hours – Max peak 0.3 -- Break 3.0  $\text{mg}\cdot\text{min}/\text{m}^3$

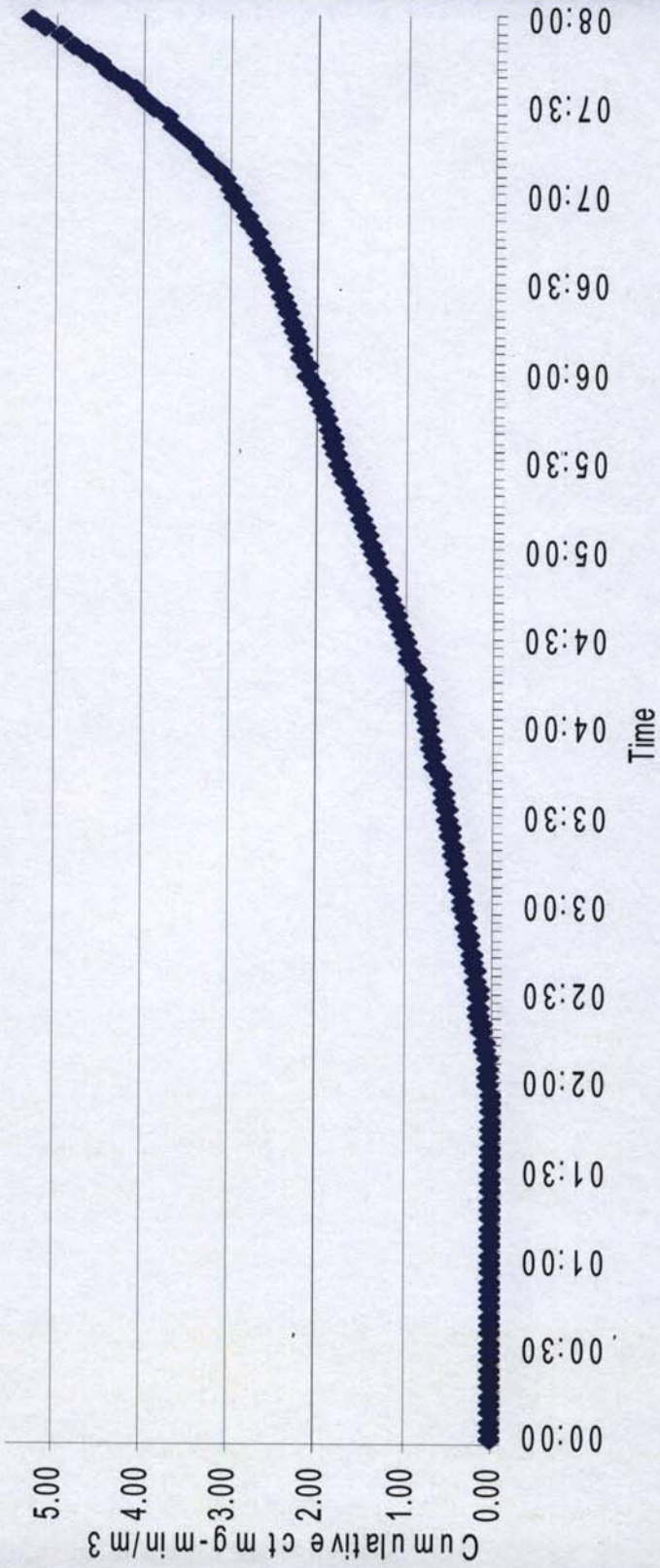
# HD Challenge

HD Vapor Challenge Profile



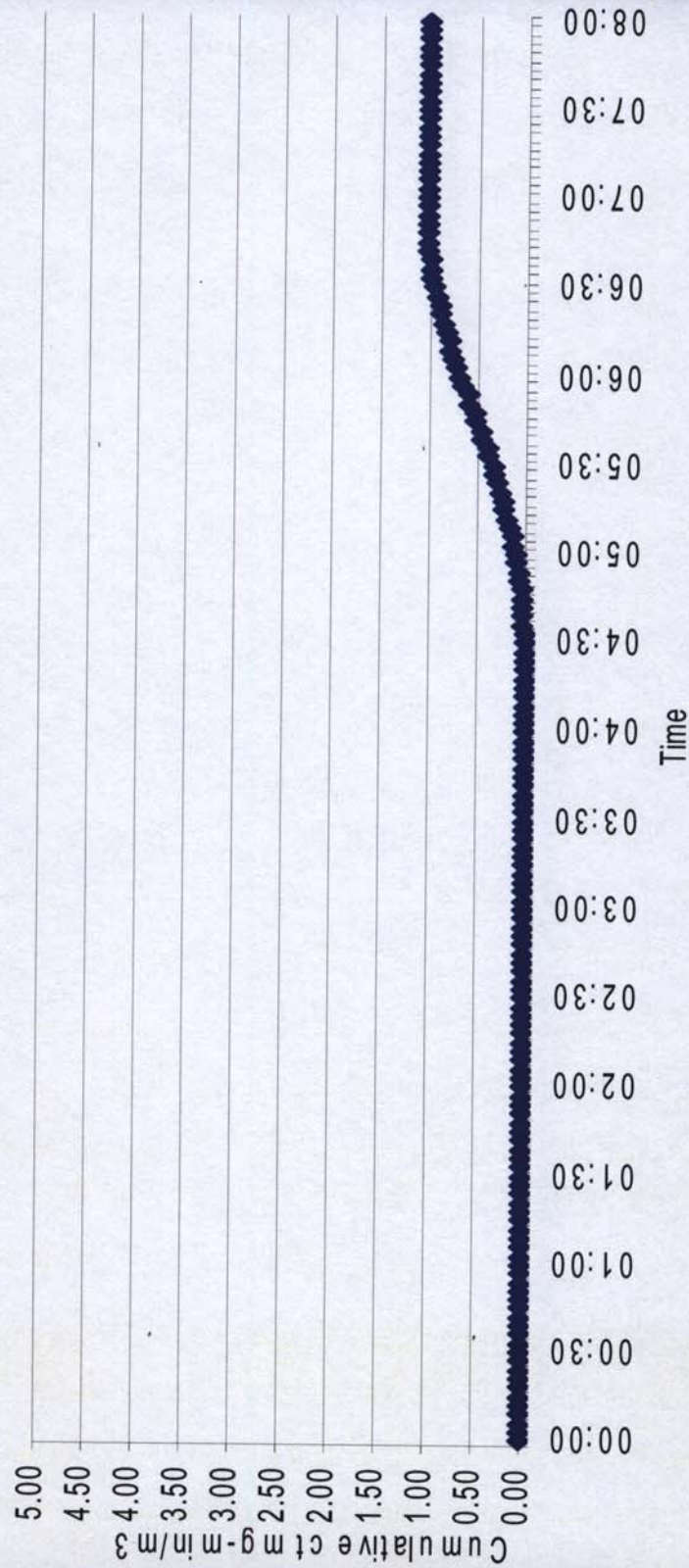
# HD Challenge Results

Manufacturer A PA PR  
HD Bench Mark Testing  
Cumulative CT: 5.27 mg-min/m<sup>3</sup>



# HD Challenge Results

Manufacturer B PAPR  
HD Bench Mark Testing  
Cumulative Ct: 1.02 mg-Min/m<sup>3</sup>



# HD Challenge Results

Manufacturer C PA PR  
HD Bench Mark Testing  
Cumulative CT: 22.92 mg-min/m<sup>3</sup>  
(Test Terminated Early due to Max Peak Excursion)

