

# Results of Worldwide Heat Release (OSU) Round Robin

**Richard Johnson**

**Retired, Fire Safety Team**

FAA Wm. J. Hughes Technical Center  
Atlantic City International Airport, NJ 08405

**The Fifth Triennial Fire & Cabin Safety Research  
Conference**

Tropicana Casino Resort

Atlantic City, NJ

October 29 – November 1, 2007



**Federal Aviation  
Administration**

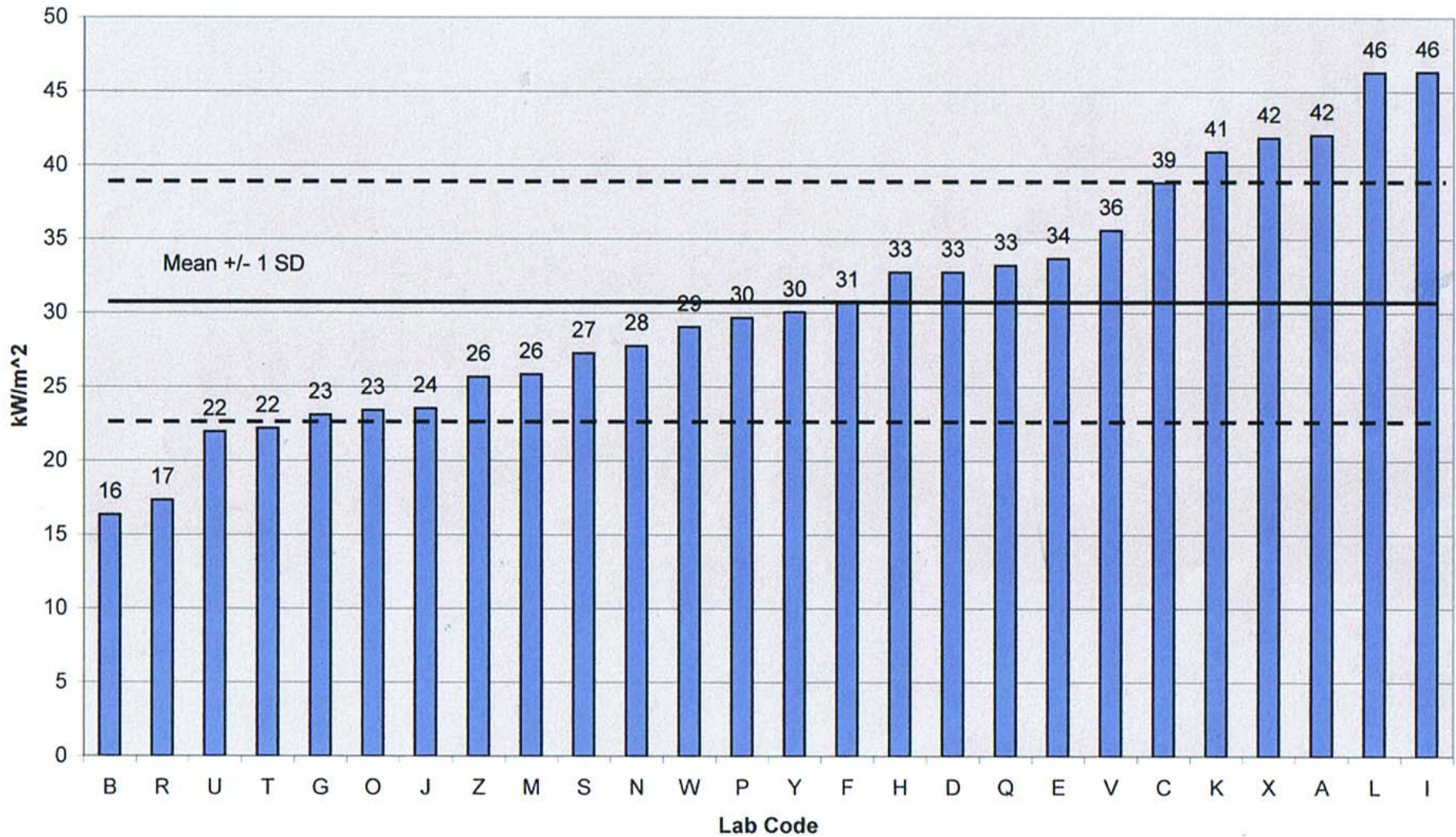


# Background

- **Three samples of three materials were sent to 26 labs worldwide.**
- **Results were tabulated according to Peak HRR and Two Minute HRR.**

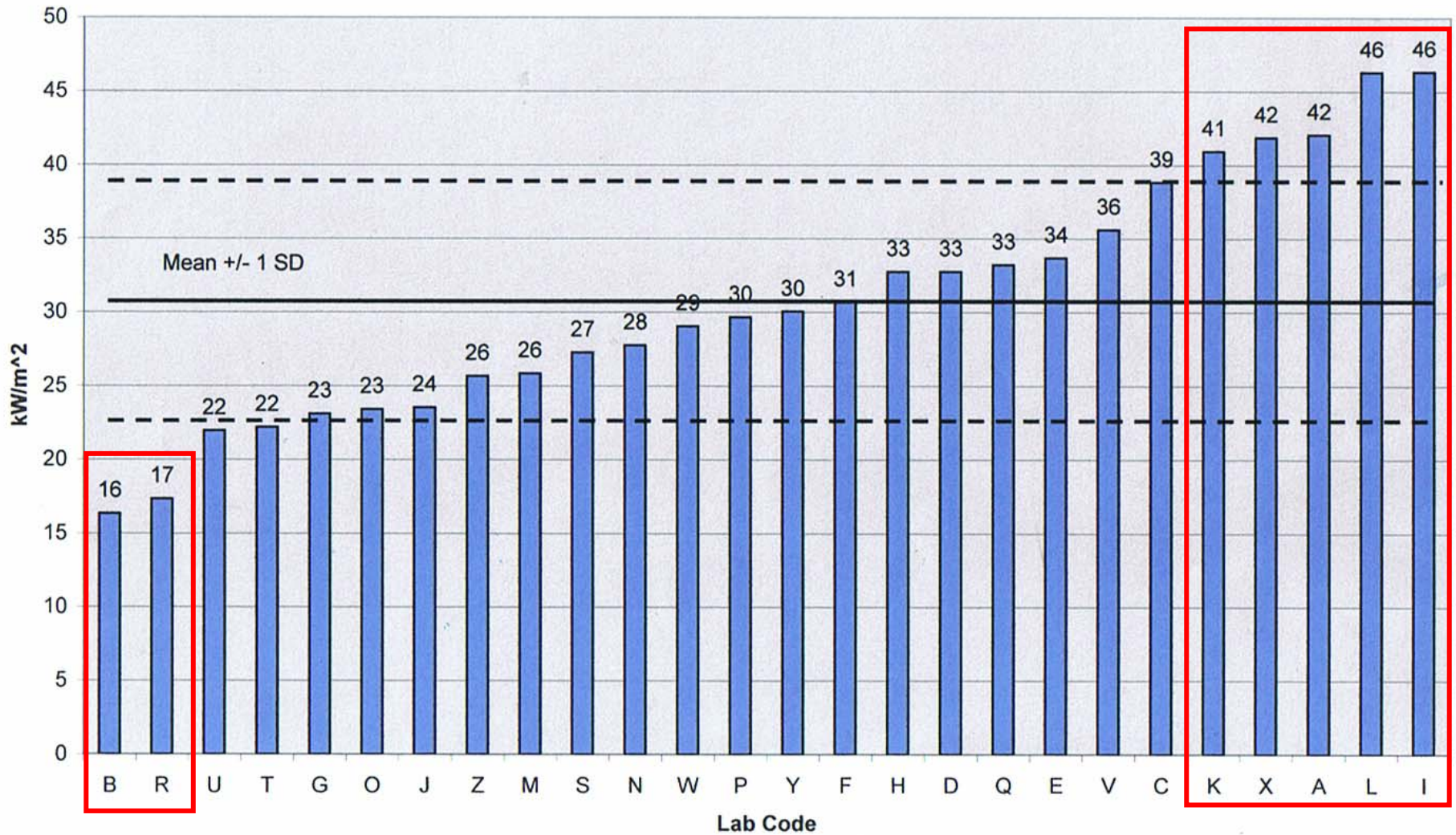
# 5300 - PEAK HRR

Mean = 30.7 SD = 8.3



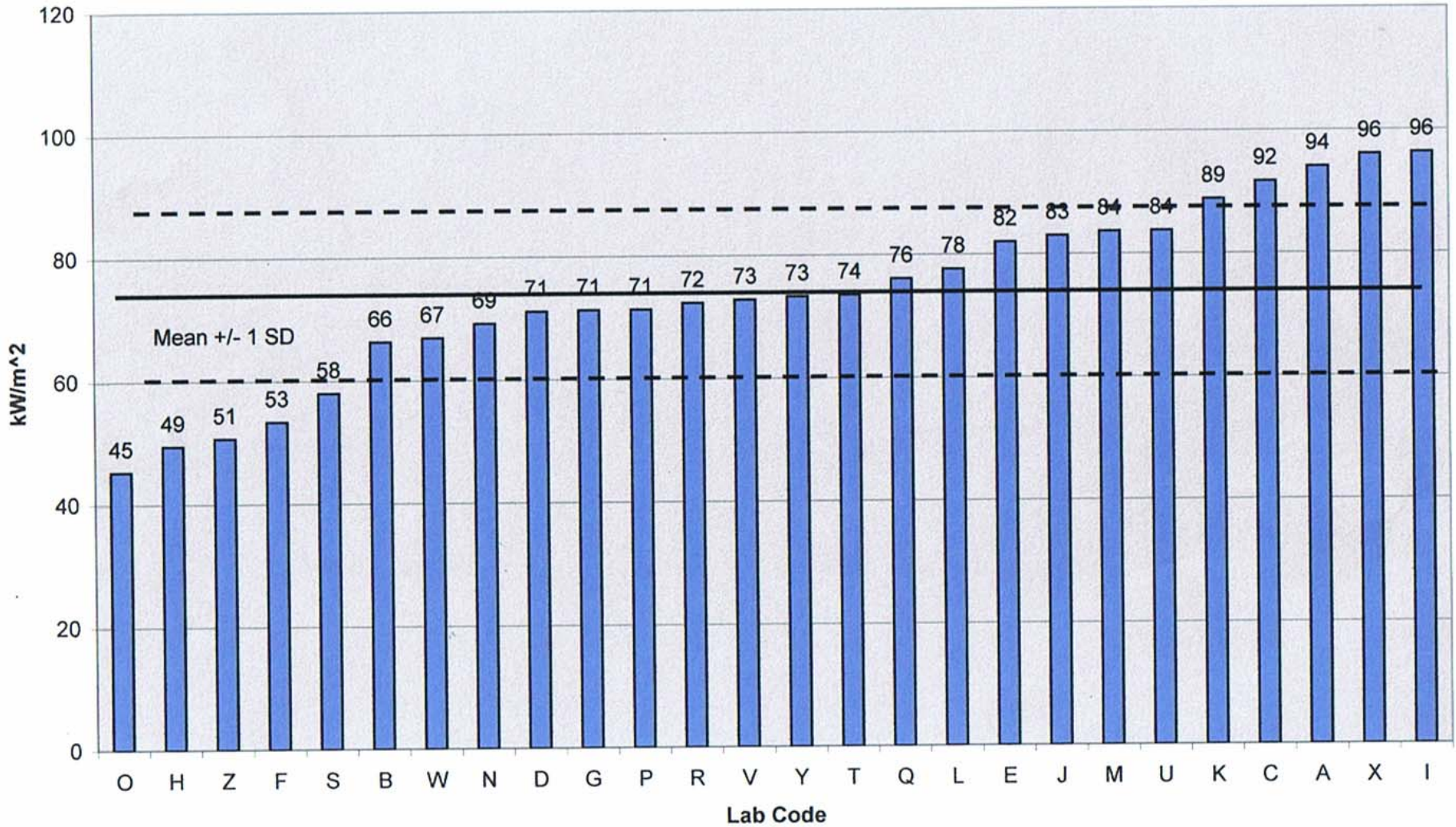
# 5300 - PEAK HRR

Mean = 30.7 SD = 8.3



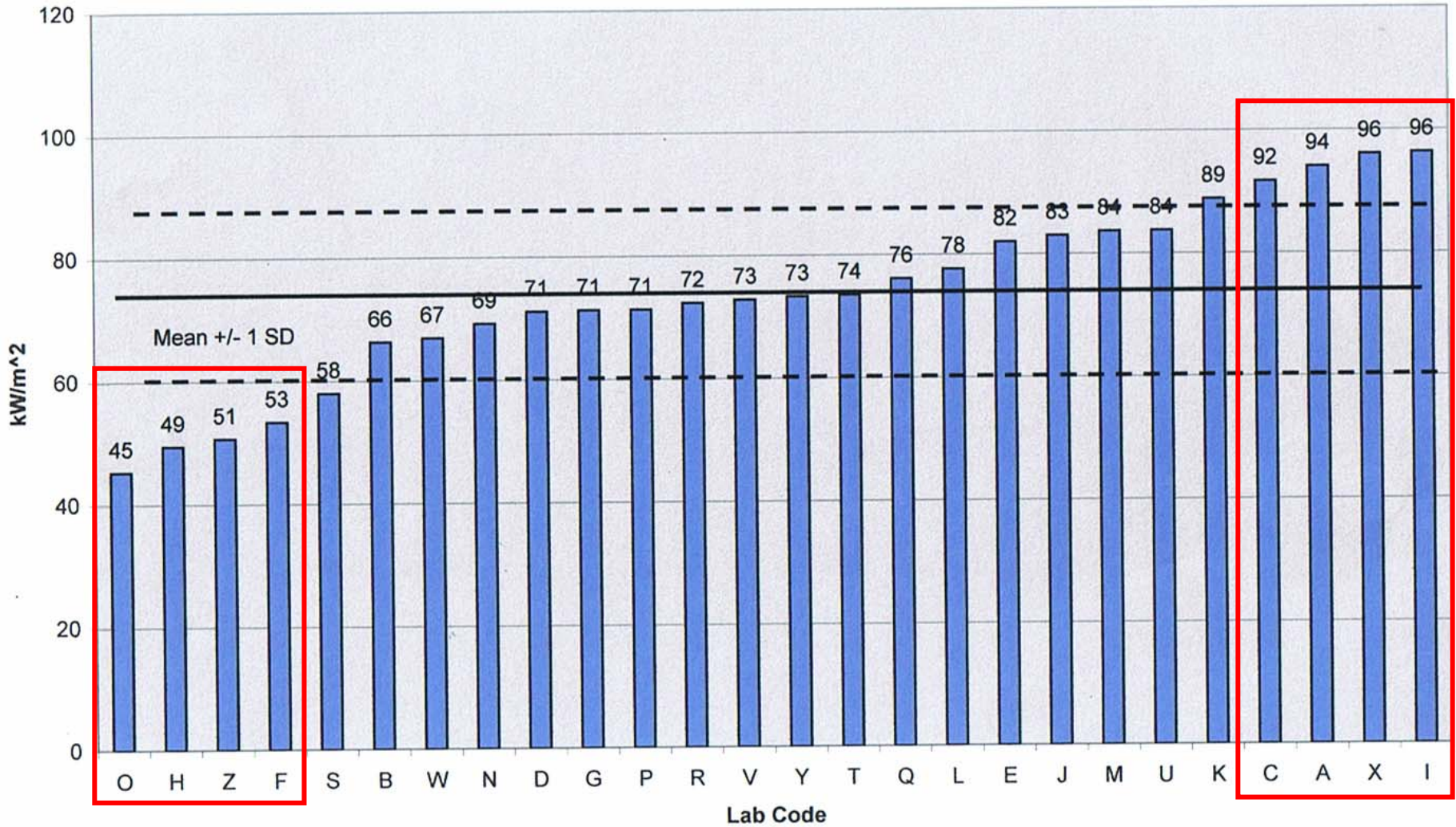
# 5400 - PEAK HRR

Mean = 73.4 SD = 14.3



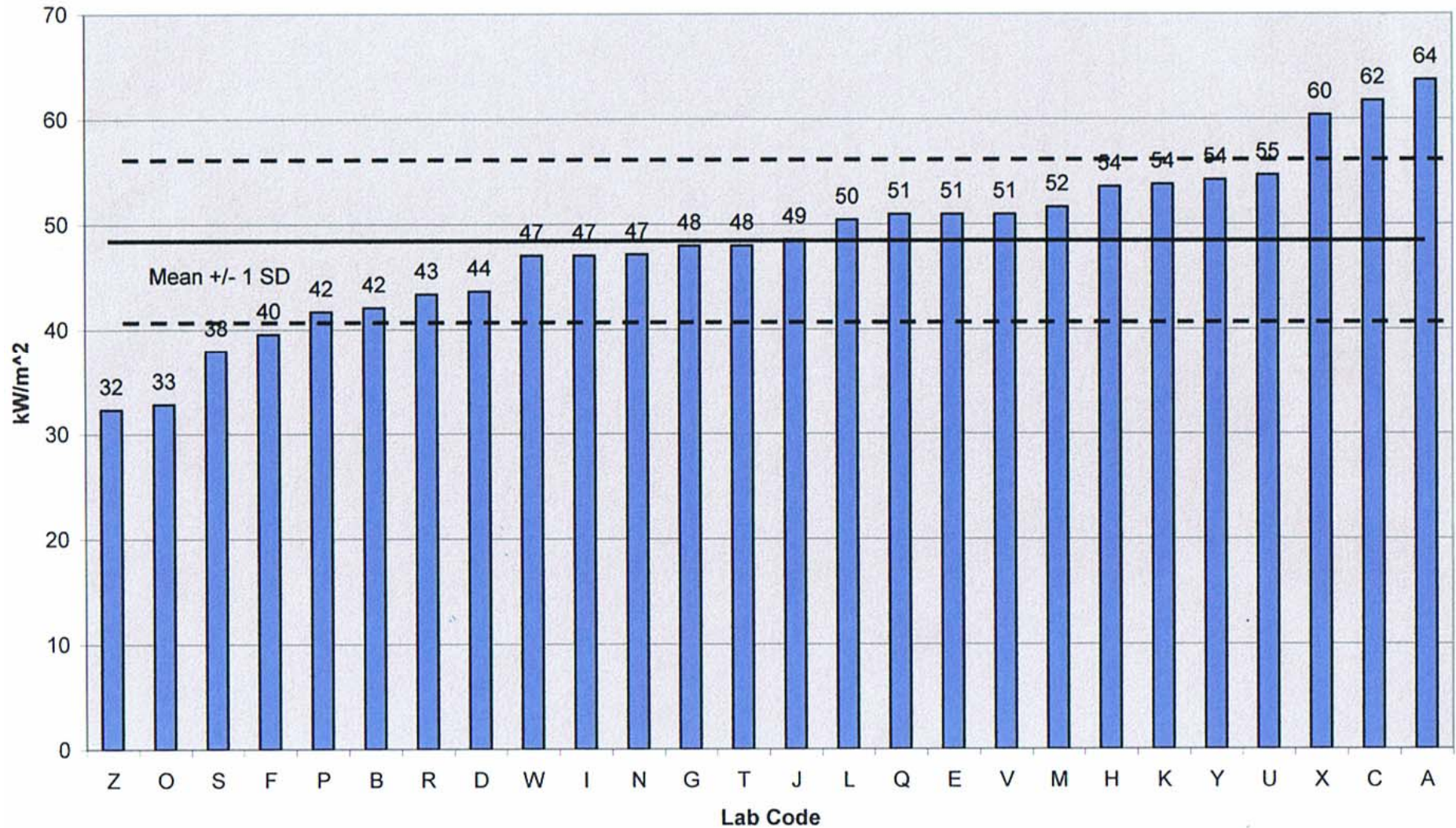
# 5400 - PEAK HRR

Mean = 73.4 SD = 14.3



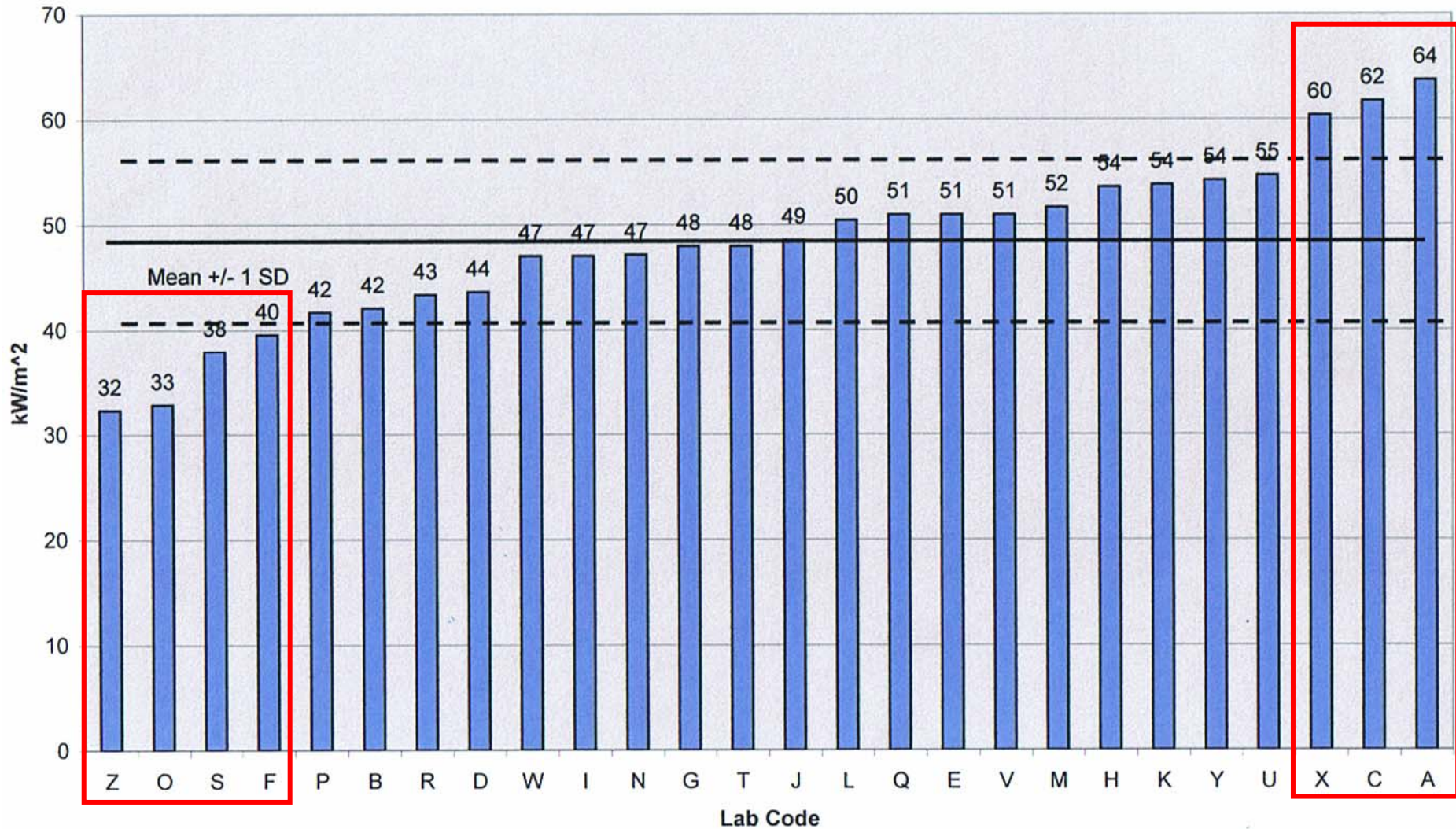
# 5500 - PEAK HRR

Mean = 48.3 SD = 7.9



# 5500 - PEAK HRR

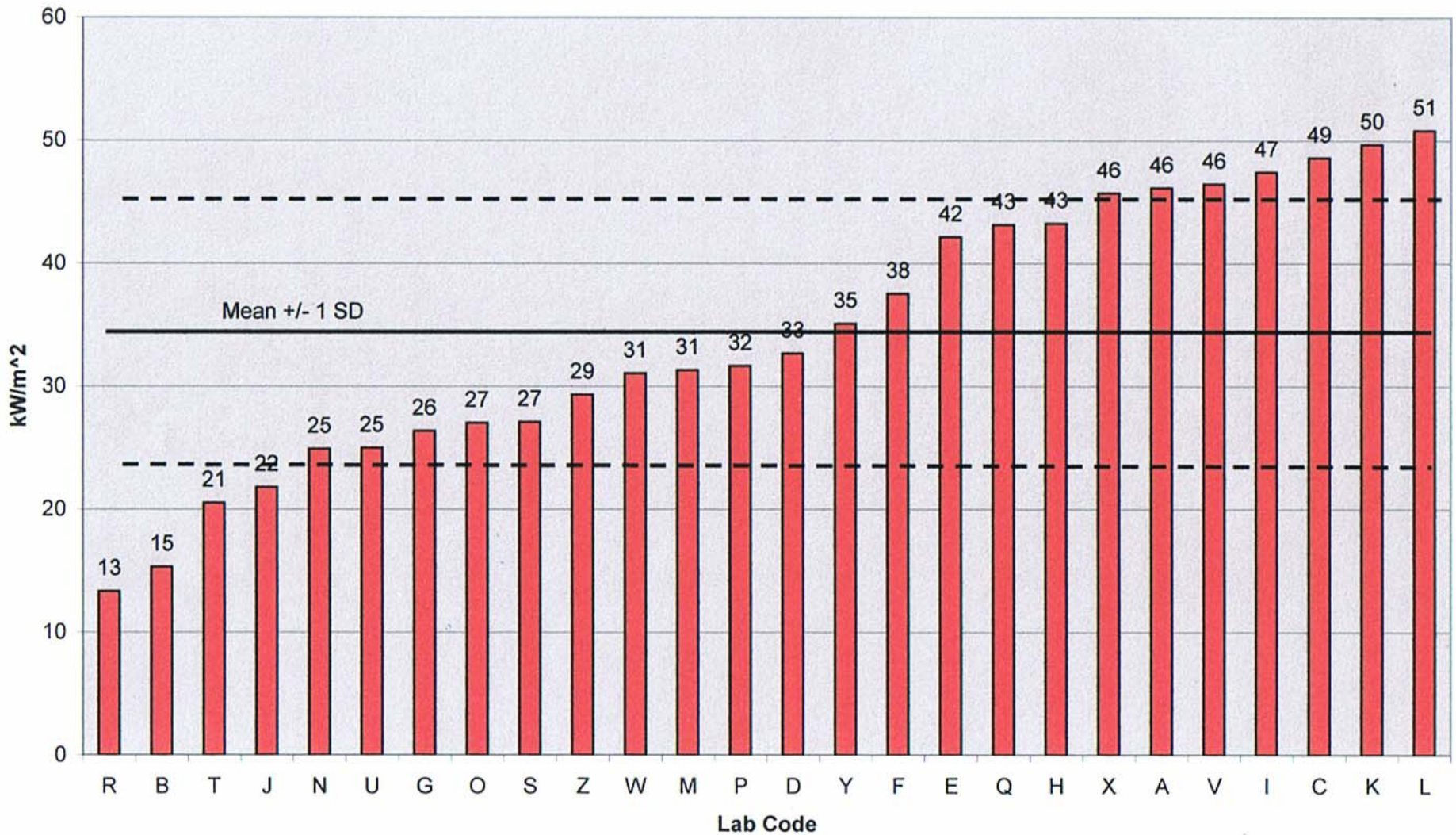
Mean = 48.3 SD = 7.9





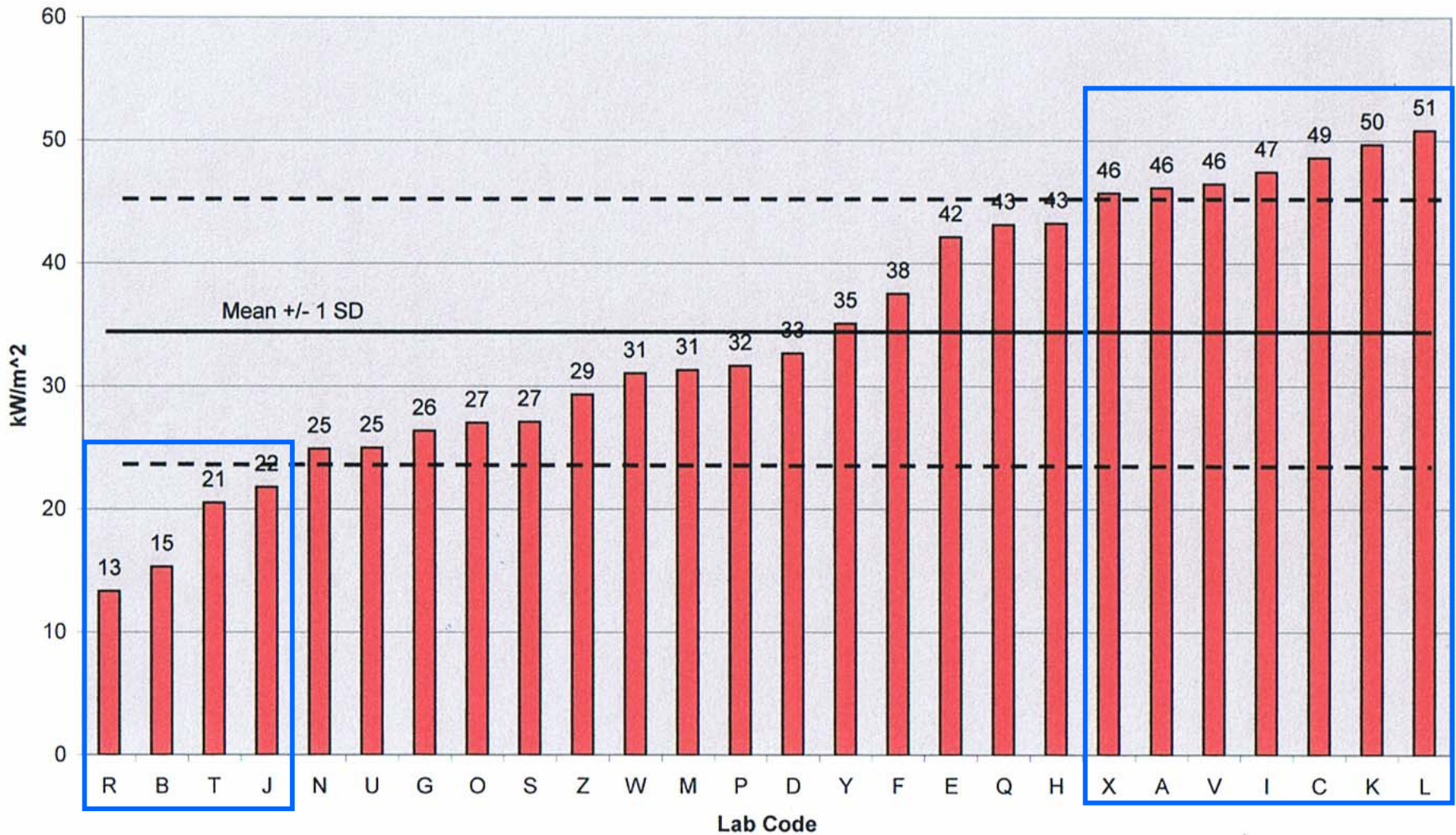
# 5300 - 2 MINUTE TOTAL HRR

Mean = 34.4 SD = 11.1



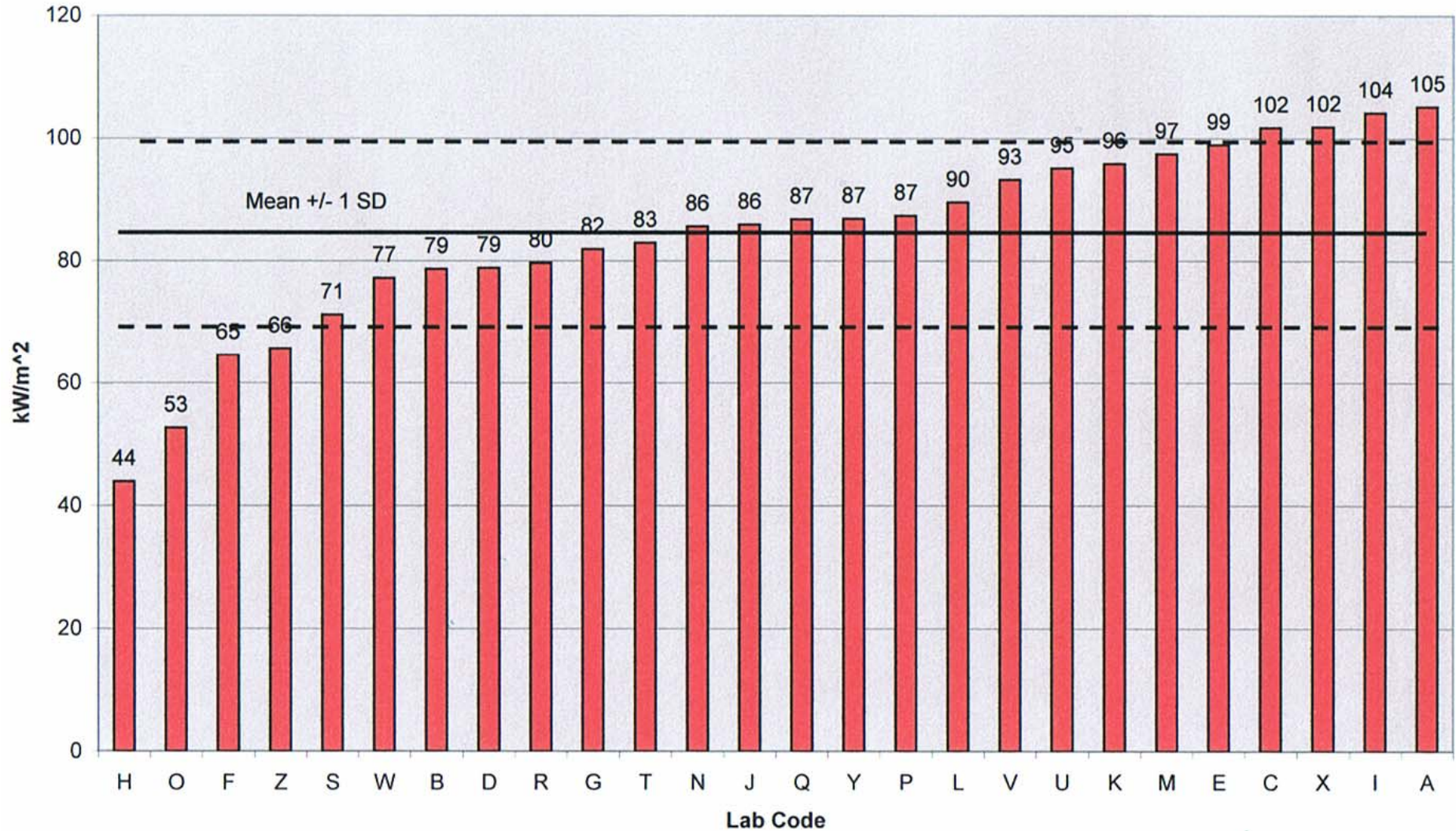
# 5300 - 2 MINUTE TOTAL HRR

Mean = 34.4 SD = 11.1



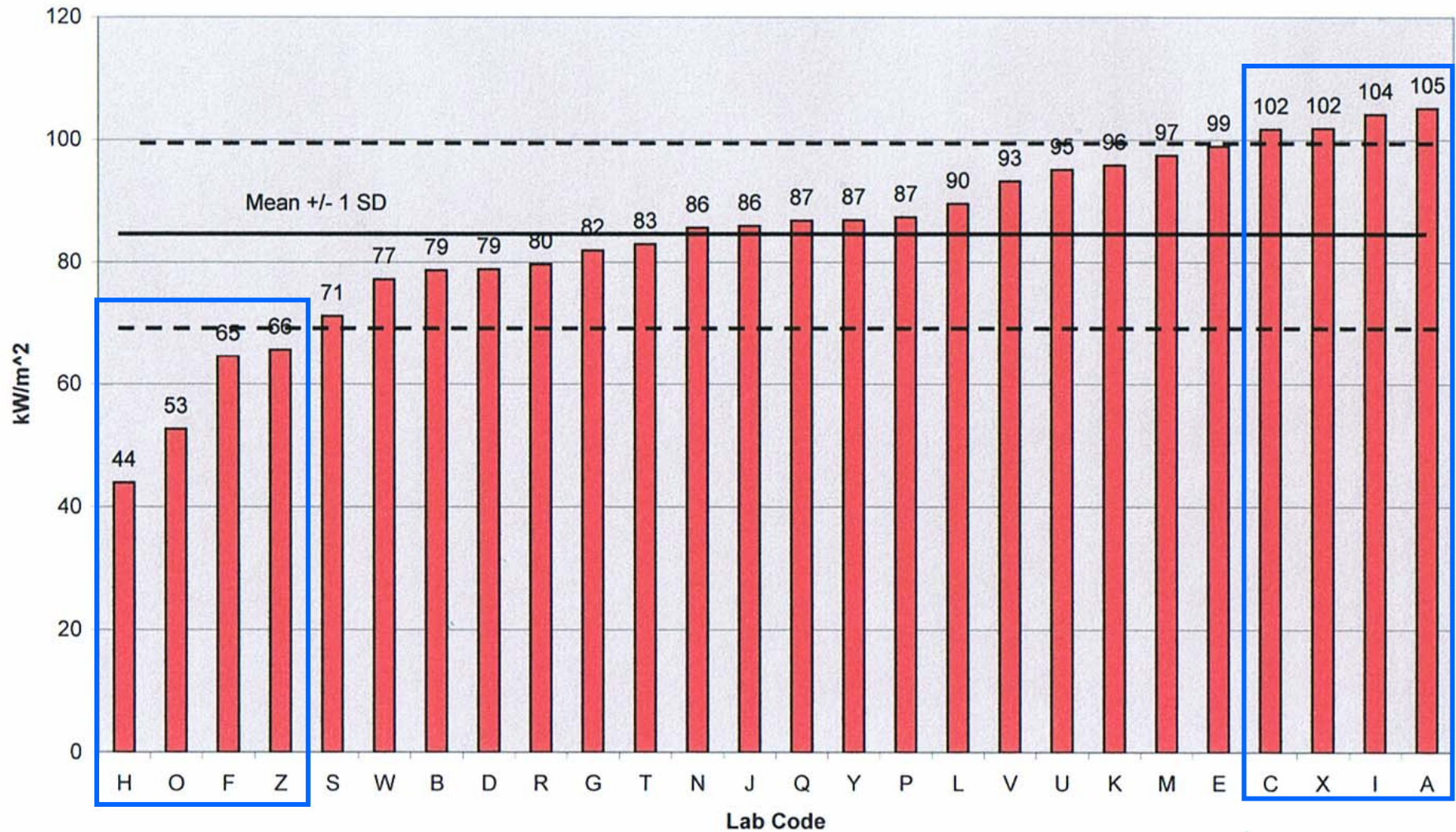
# 5400 - 2 MINUTE TOTAL HRR

Mean = 84.3 SD = 15.4



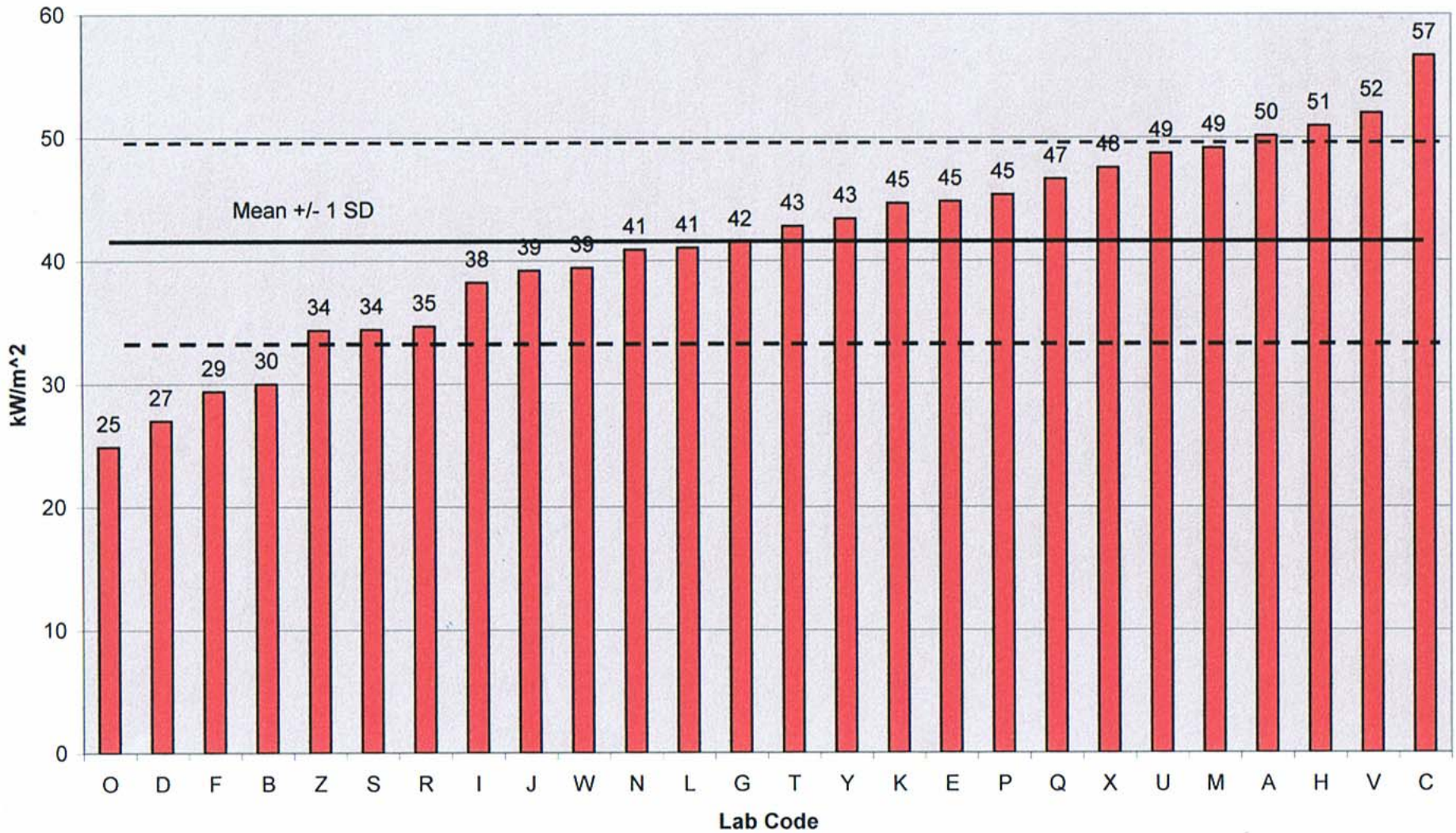
# 5400 - 2 MINUTE TOTAL HRR

Mean = 84.3 SD = 15.4



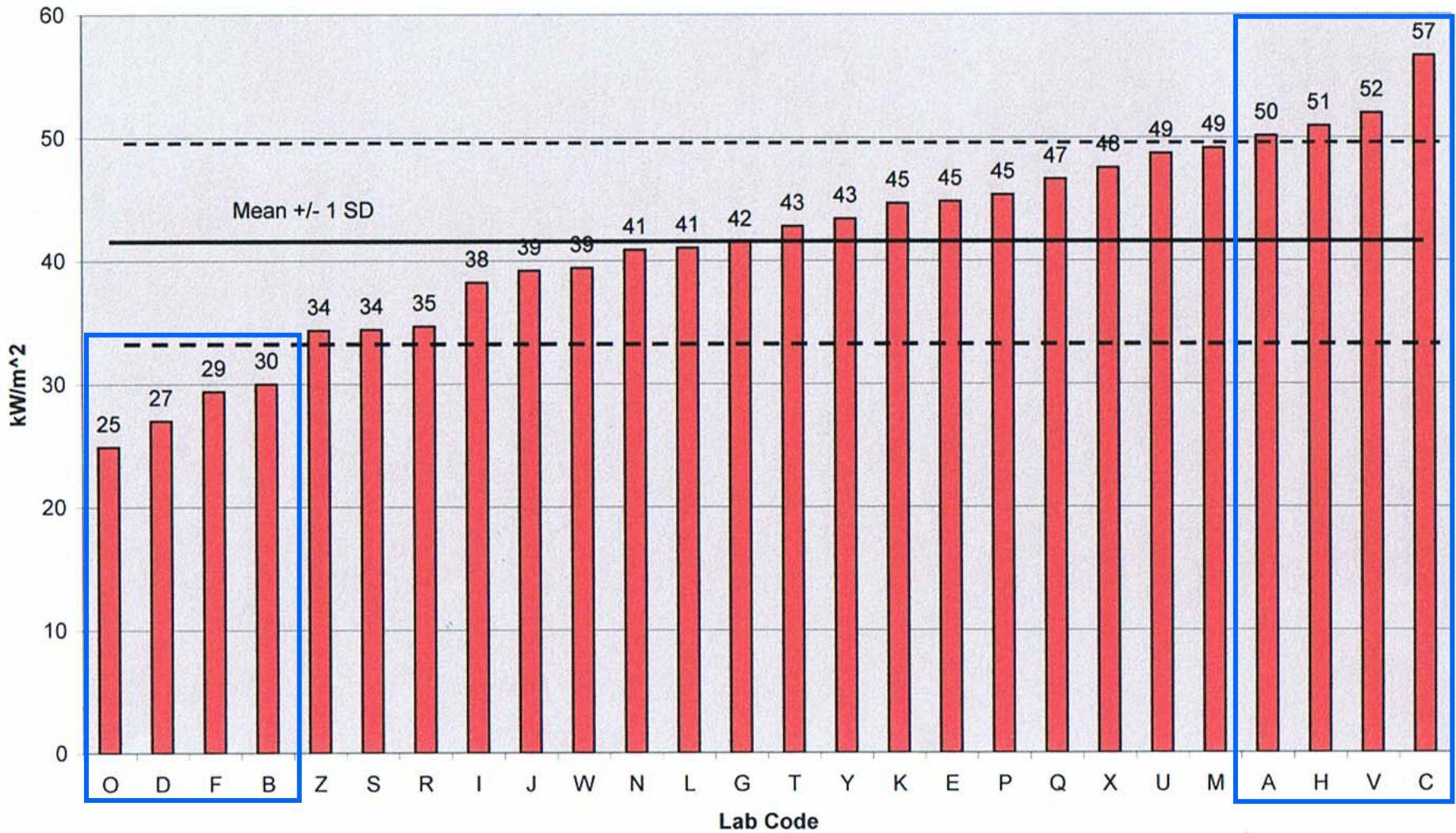
# 5500 - 2 MINUTE TOTAL HRR

Mean = 41.4 SD = 8.1



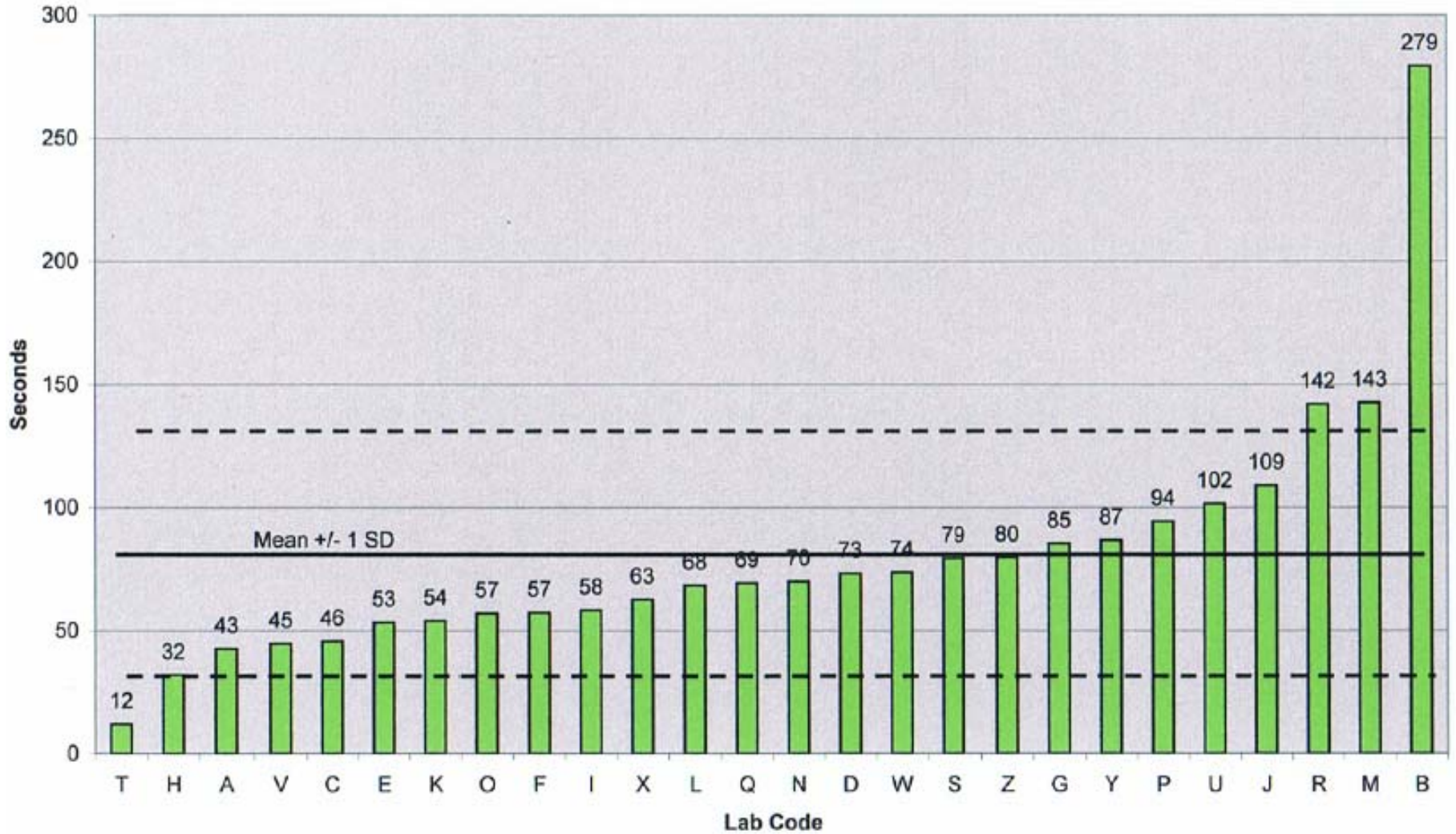
# 5500 - 2 MINUTE TOTAL HRR

Mean = 41.4 SD = 8.1



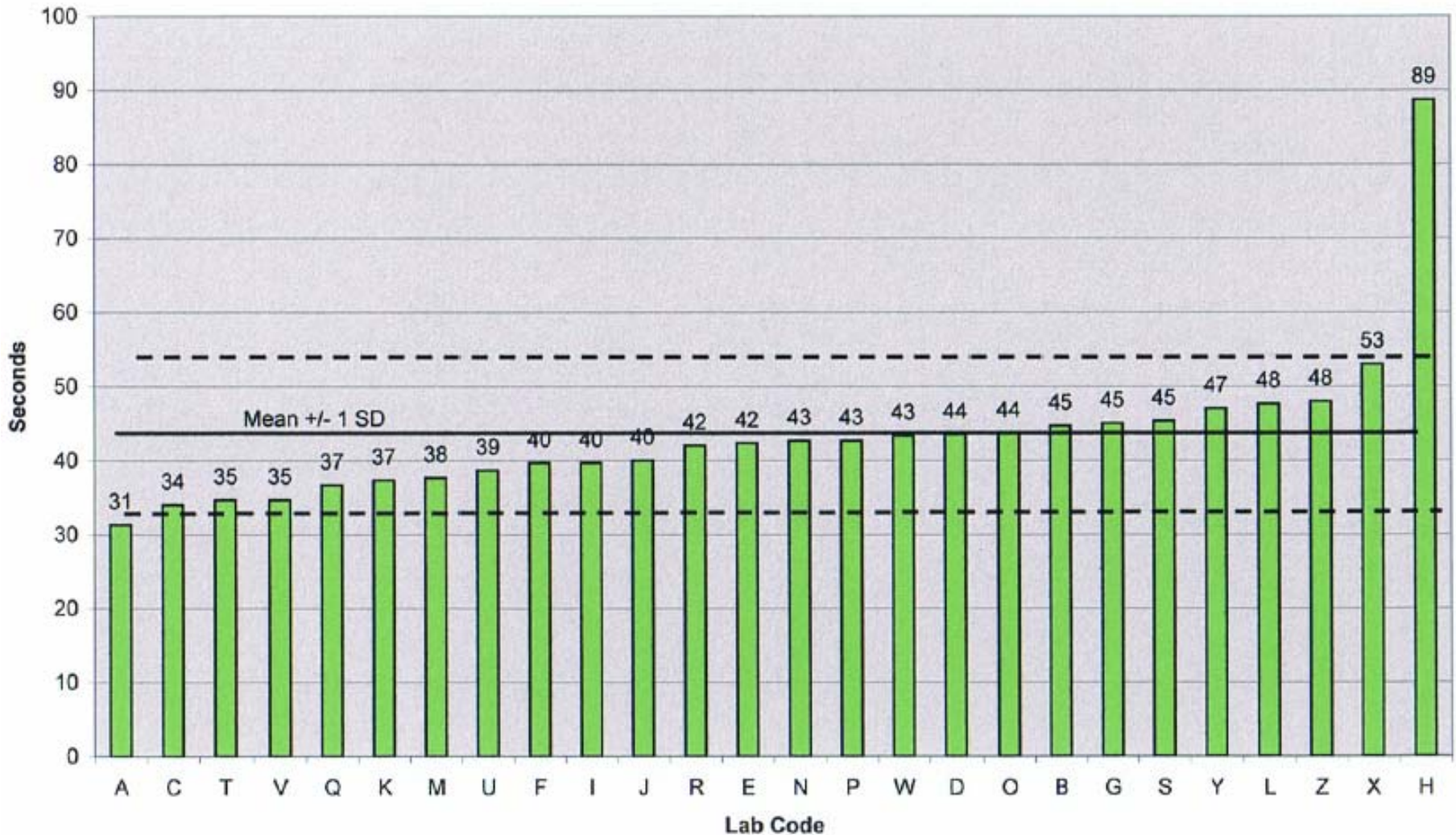
# 5300 - TIME TO PEAK HRR

Mean = 79.8 SD = 50.4



# 5400 - TIME TO PEAK HRR

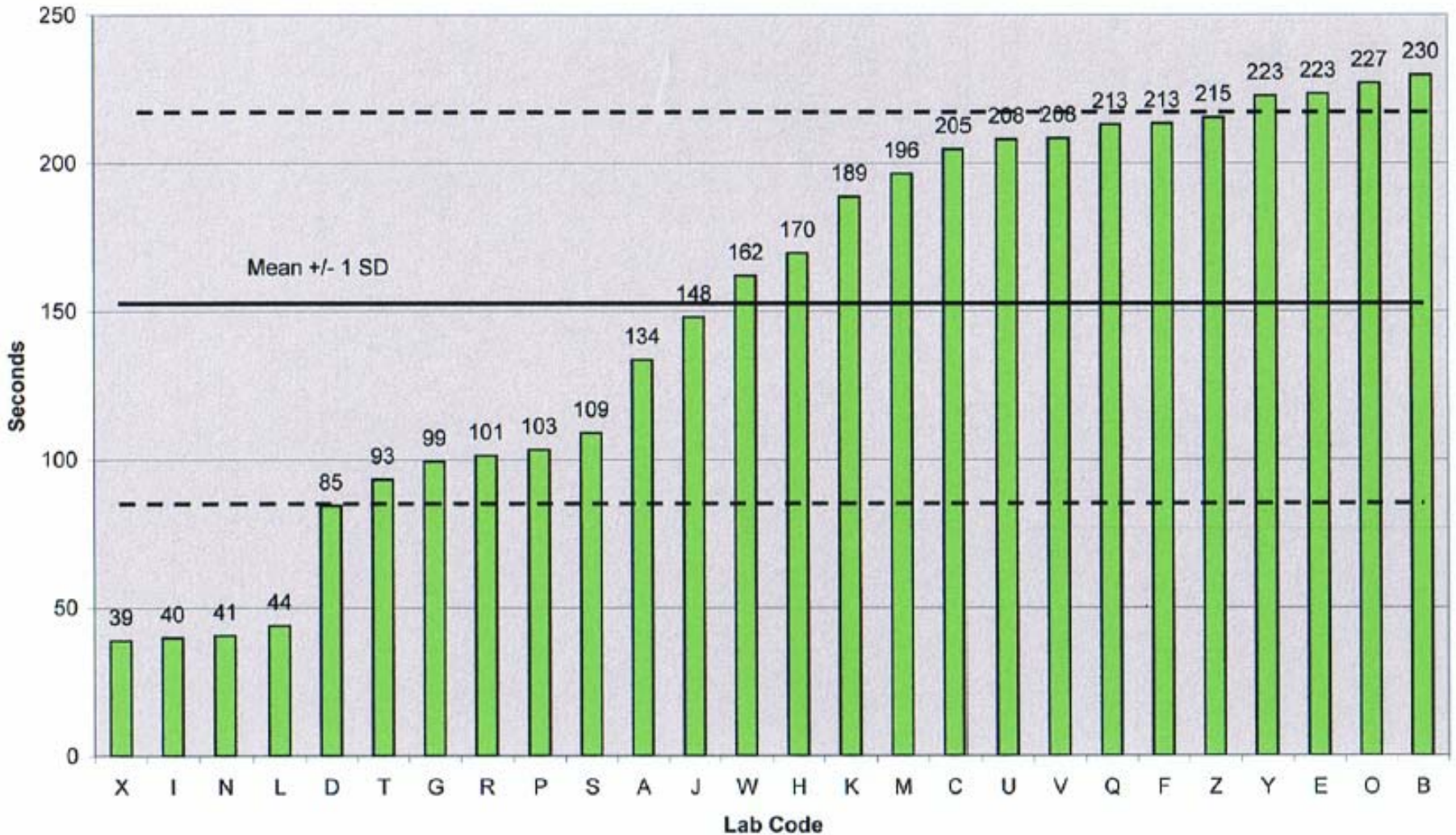
Mean = 43.2 SD = 10.5





# 5500 - TIME TO PEAK

Mean = 151 SD = 67.3



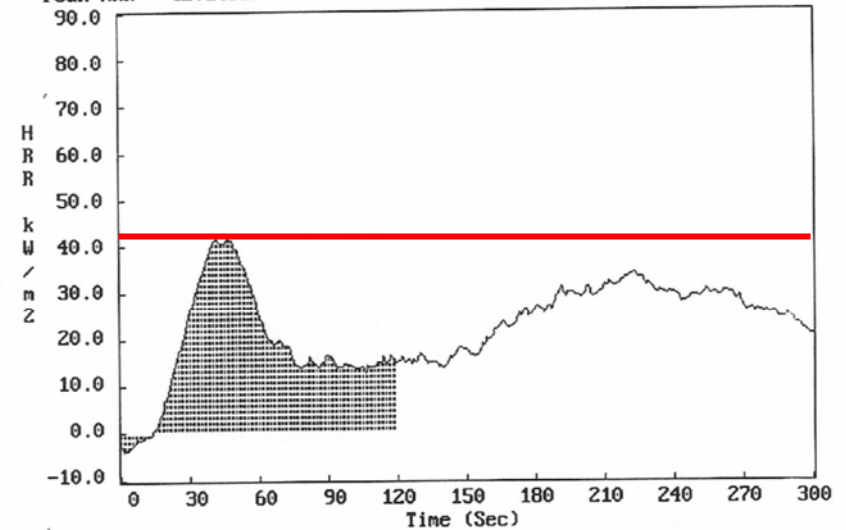
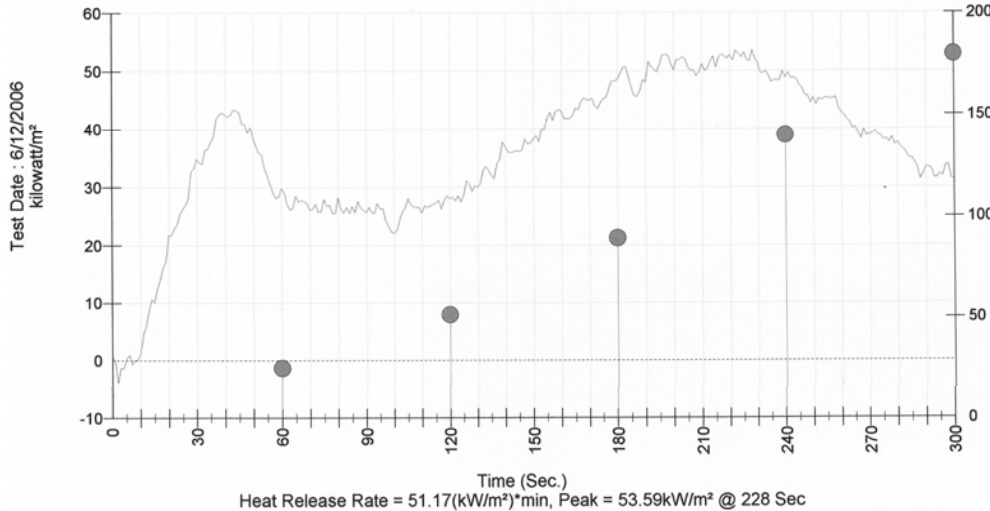
# Variance of Time to Peak

Date: 11-14-2006  
Run 3

HRR : 5500 WWRR  
Run # 1

● Heat Release Rate --->  
Baseline = 25.47 mV : Heat Release Factor = 11.221

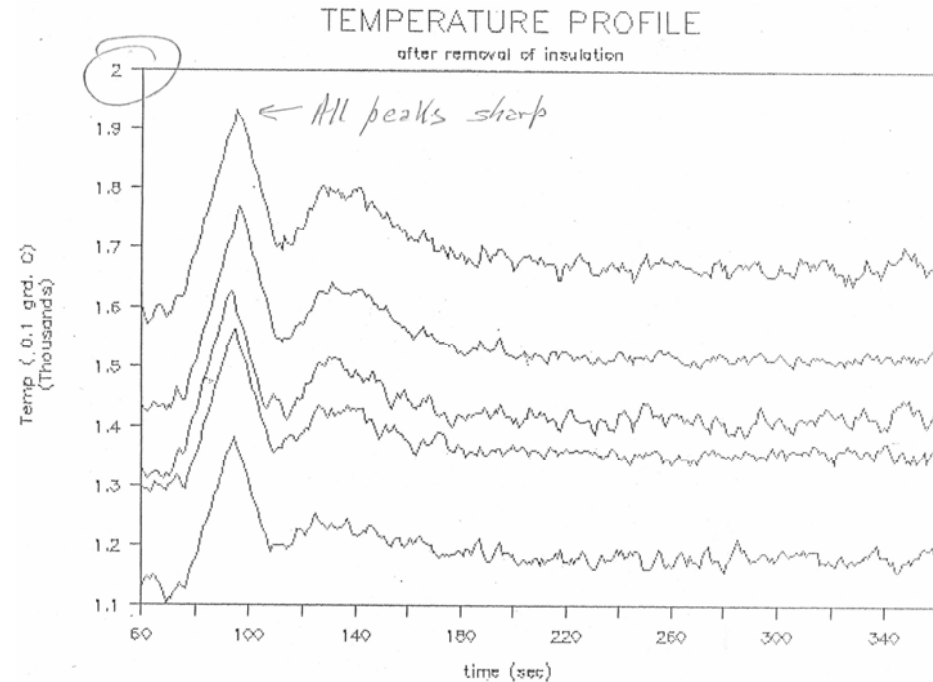
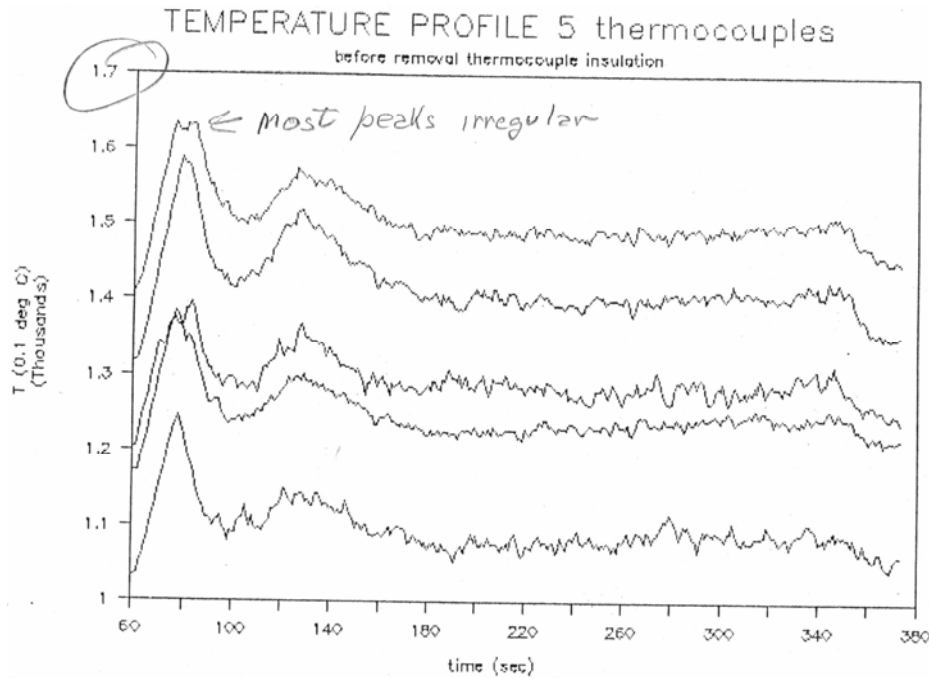
File: 061114-D.MDT  
Matl: ROUND ROBIN #5500  
Pre Comment:  
Post Comment:  
Peak HRR = 42.14338 kW/m<sup>2</sup> at 41 sec, Total = 36.65779 kW\*min/m<sup>2</sup> at 2 min.



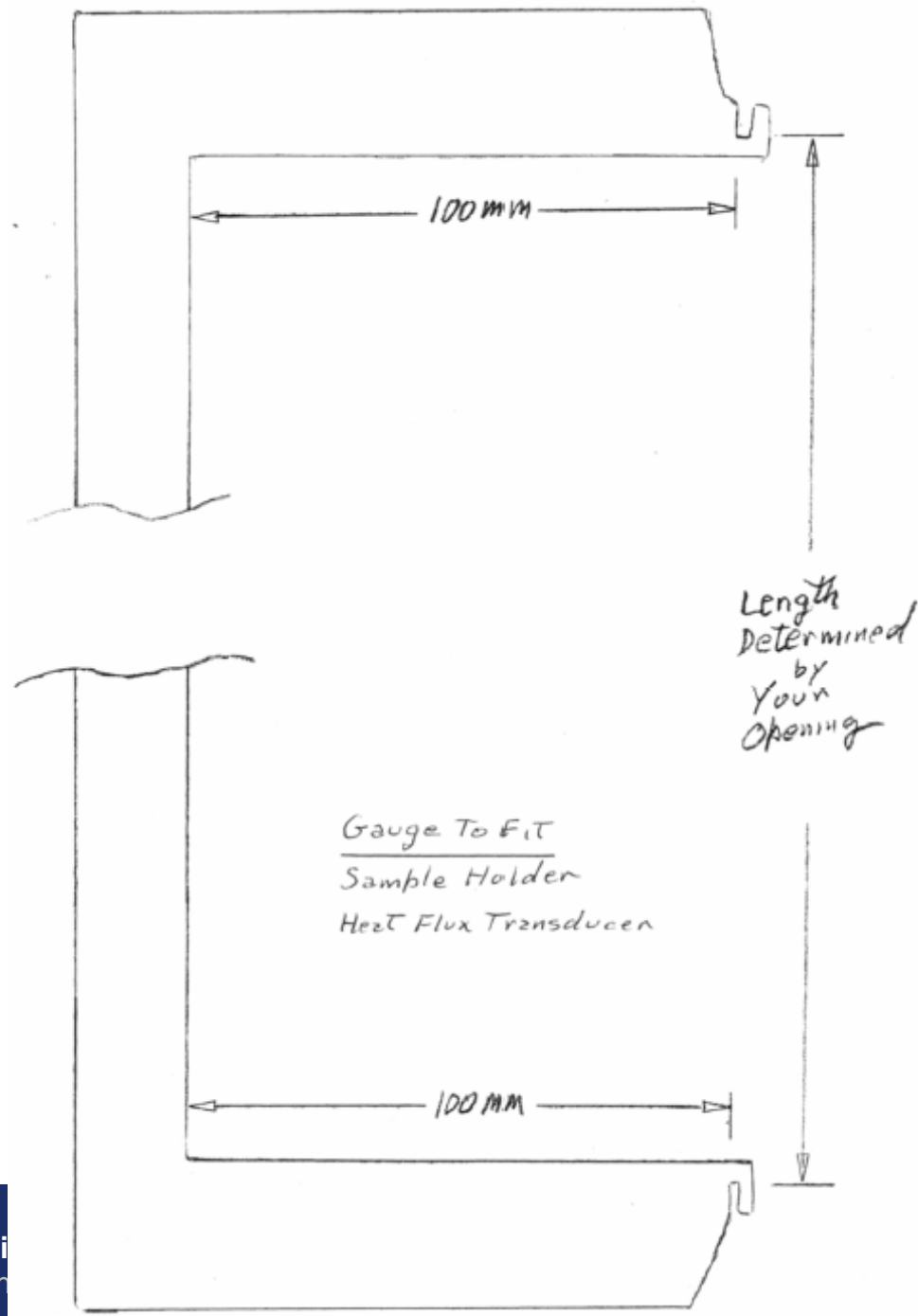
# General Observations

- ***Four labs were recently visited to inspect equipment and review testing procedures.***
- ***If these four labs are representative of ALL labs, we, the FAA, need to visit more labs.***
- ***Review of OSU Cold Inspections ...***

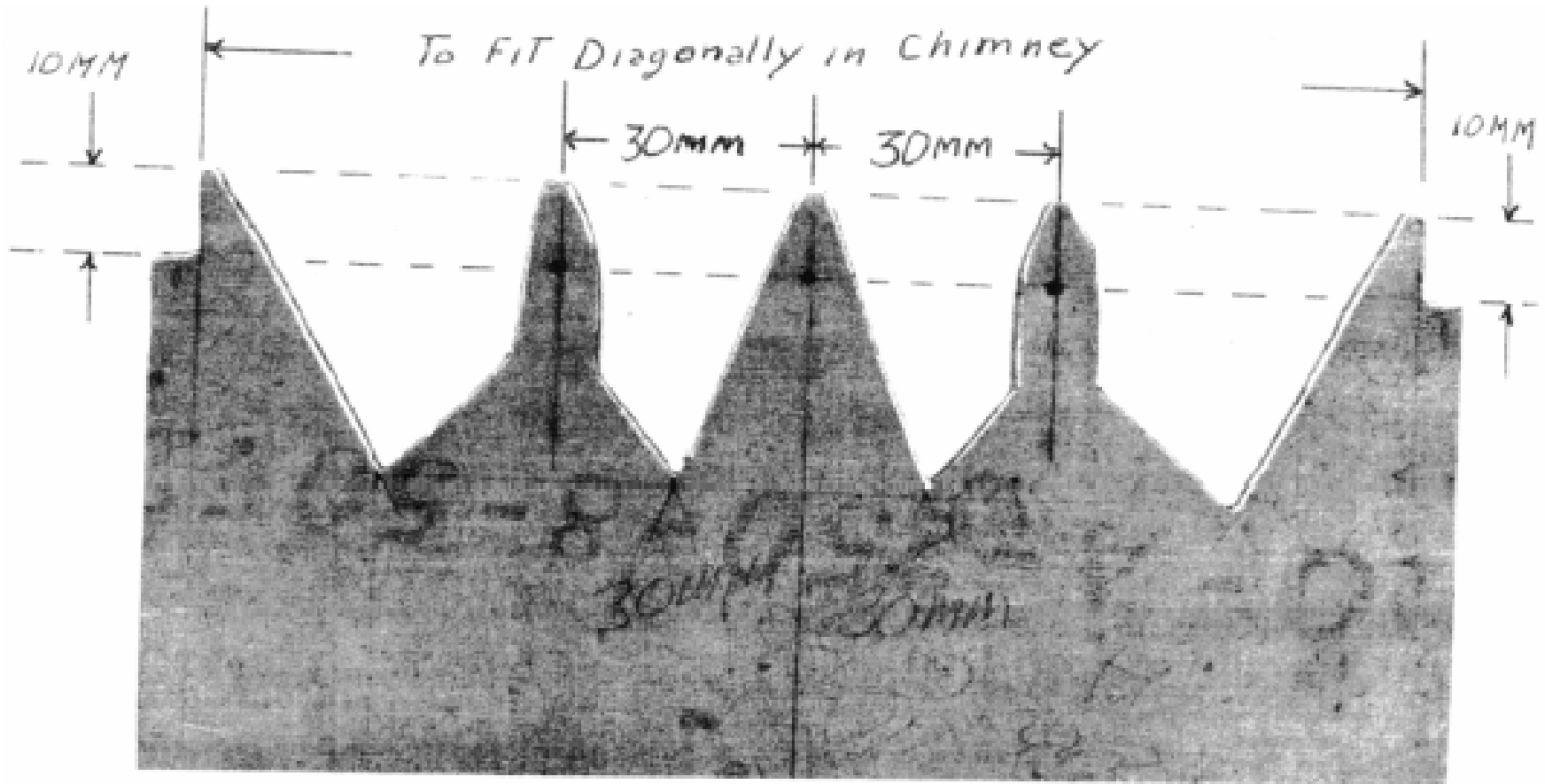
# Poor Thermocouple Fabrication



# OSU Heat Flux Gauge



# OSU Upper Thermopile



Upper Thermocouple Gauge