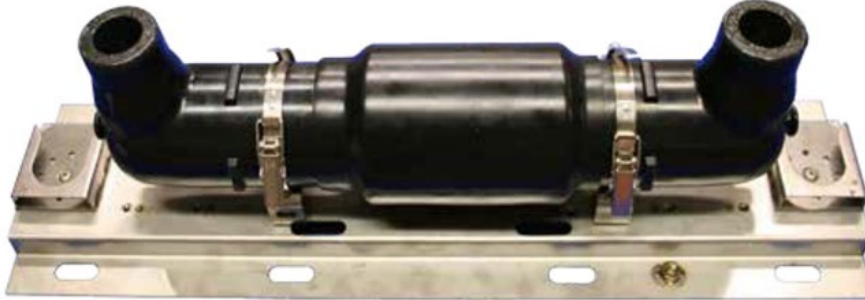


**Fuses, 15.5 kV, Full-Range, Current-Limiting, Molded****1. Scope**

This standard covers the requirements for 15.5 kV, full-range, molded, current-limiting fuses (MCLFs) and accessories.

Molded current-limiting fuses are also known as modular or encapsulated fuses.

This standard applies to the following Seattle City Light (SCL) stock numbers:

Stock No.	Description
015058	Fuse, 25 A
015059	Fuse, 40 A
015060	Fuse, 65 A
015061	Wall mounting bracket assembly
015062	Tilt mounting bracket assembly

**2. Application**

MCLFs are designed with a fuse element that has both low and high fault current interrupting capability. The low current section clears faults in less than one half cycle. The high current section limits the system available fault current to prevent disruptive failures by limiting let-through current and energy released into the faulted equipment.

MCLFs are designed to operate in a solidly grounded, wye-connected, 27 kV looped radial electrical distribution system. In rare cases where transformers or loads are delta-connected, the 17.2 kV MCL fuses specified in SCL 6839.45 shall be used. FCLs are dead-front, fully submersible, and designed to be used in underground and in-building vaults.

Use with loadbreak bushing inserts, Stock No. 686449.

For fuse time-current characteristics curves, see appendices A through D.

Standard Coordinator  
Muneer Shetab

Standards Engineering Supervisor  
Brett Hanson

Division Director  
Bob Risch

*Muneer Shetab*

*Brett Hanson*

*Bob Risch*

### 3. Industry Standards

Fuses and accessories shall meet the applicable requirements of the latest revision of the following industry standards:

**IEEE C37.40**; IEEE Standard Service Conditions and Definitions for External Fuses for Shunt Capacitors; Supplement to IEEE Std C37.40-1993

**IEEE C37.41**; IEEE Standard Design Tests for High-Voltage (>1000V) Fuses

**IEEE C37.47**; IEEE Standard Specification for High-Voltage (>1000V) Distribution Class Current-Limiting Type Fuses and Fuse Disconnecting Switches

**IEEE 386**; IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V

**IEEE C37.42**; IEEE Standard Specification for High-Voltage (>1000V) Fuses and Accessories

**IEEE 592**; IEEE Standard for Exposed Semiconducting Shields on High Voltage Cable Joints and Separable Connectors

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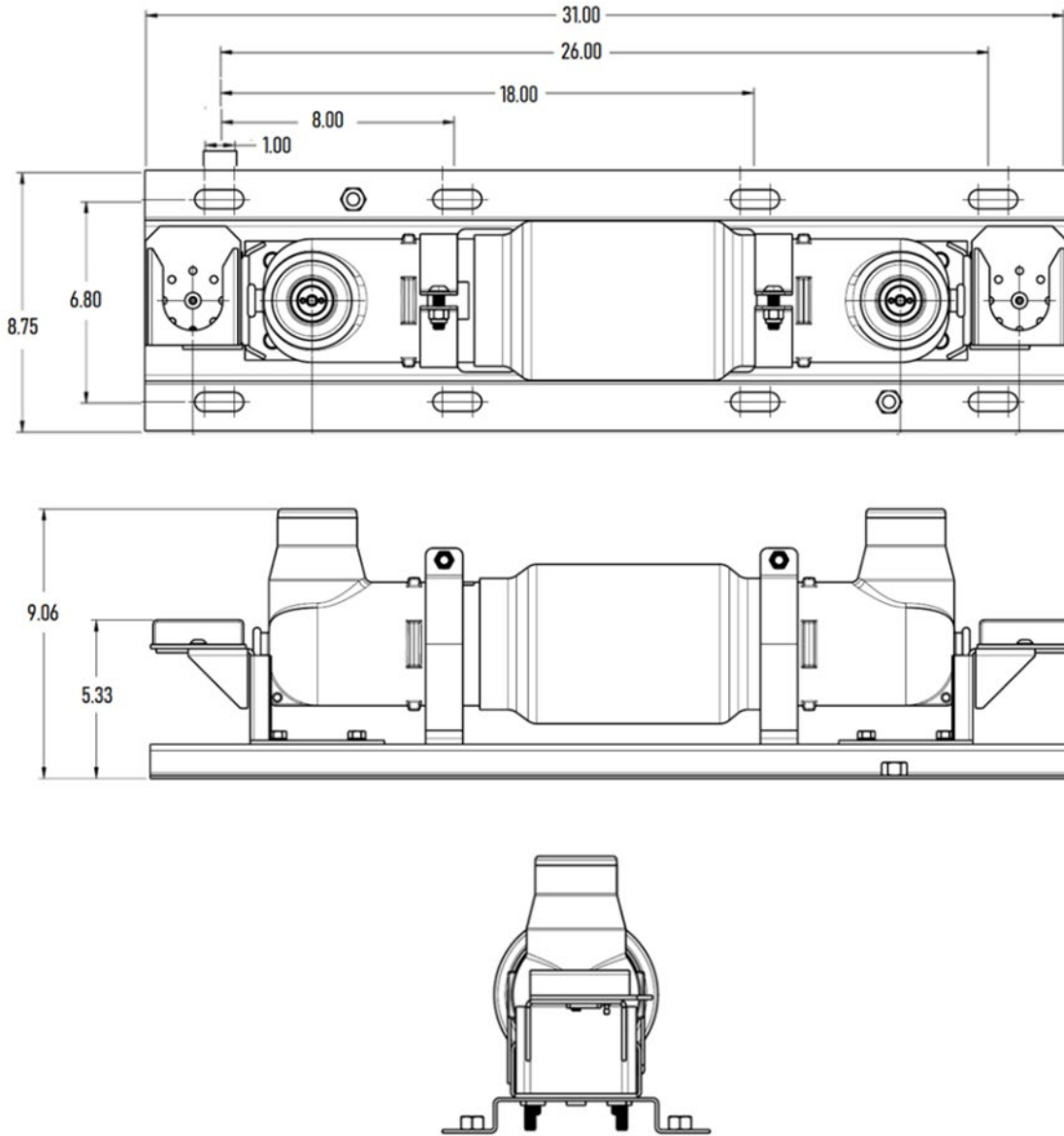
### 4. Requirements

MCLFs are encapsulated in rubber with a standard 200 A separable connector interface for connection between cable or between a cable and apparatus bushings.

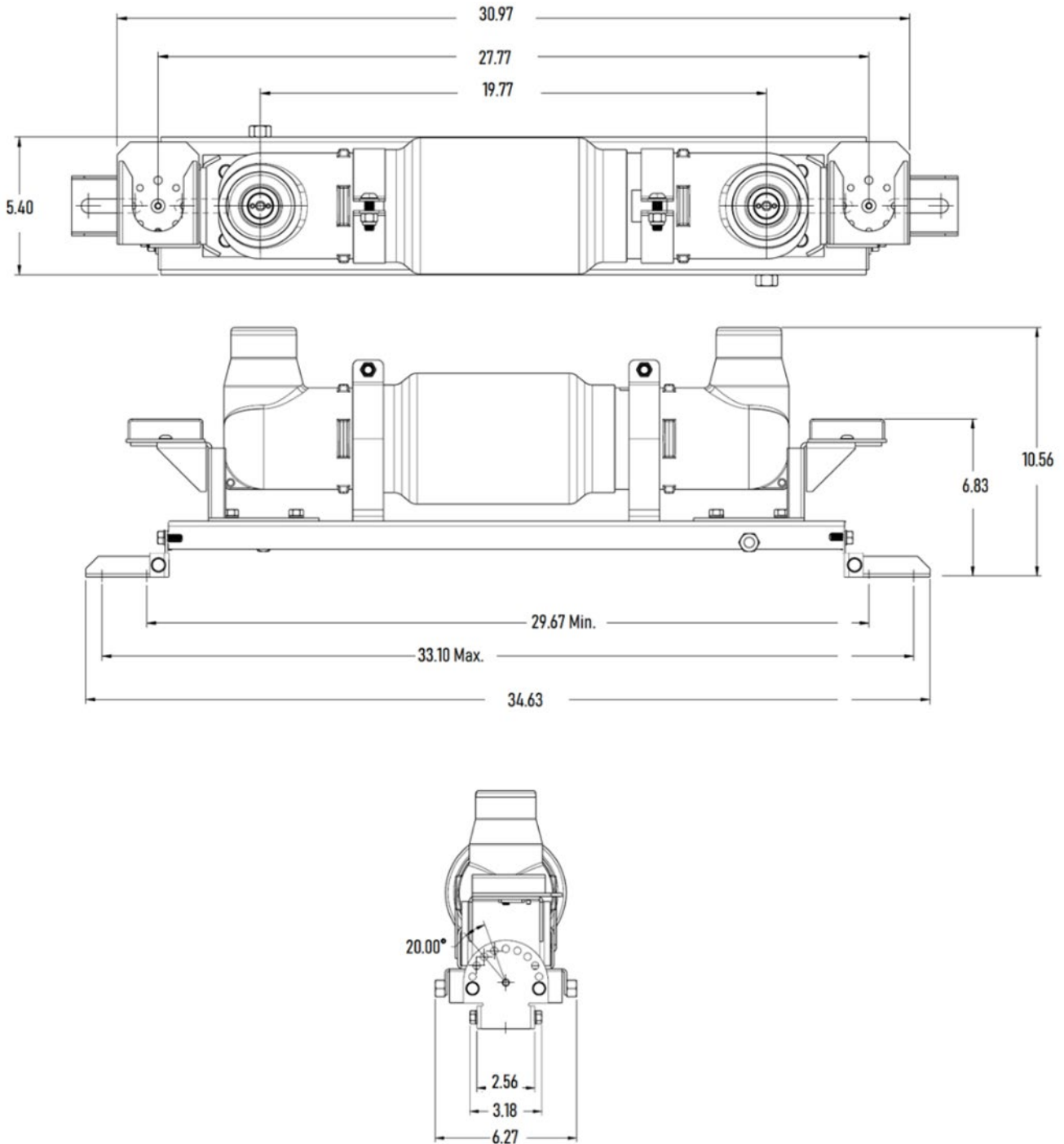
Fuses shall meet the following requirements:

<b>Class per IEEE C37.42</b>	A
<b>Terminals</b>	200 A deepwell on both ends
<b>Fuse type</b>	Non-expulsion, submersible
<b>Rated maximum voltage, kV</b>	15.5
<b>One minute withstand voltage, kV</b>	40
<b>Rated lightning impulse withstand voltage (BIL), kV</b>	125
<b>Rated current, A (rms)</b>	25, 40, 65
<b>Rated minimum interrupting current, kA (rms), symmetrical</b>	50
<b>Fuse tube material</b>	Reinforced fiberglass or equivalent
<b>Mold material</b>	EDPM rubber or equivalent

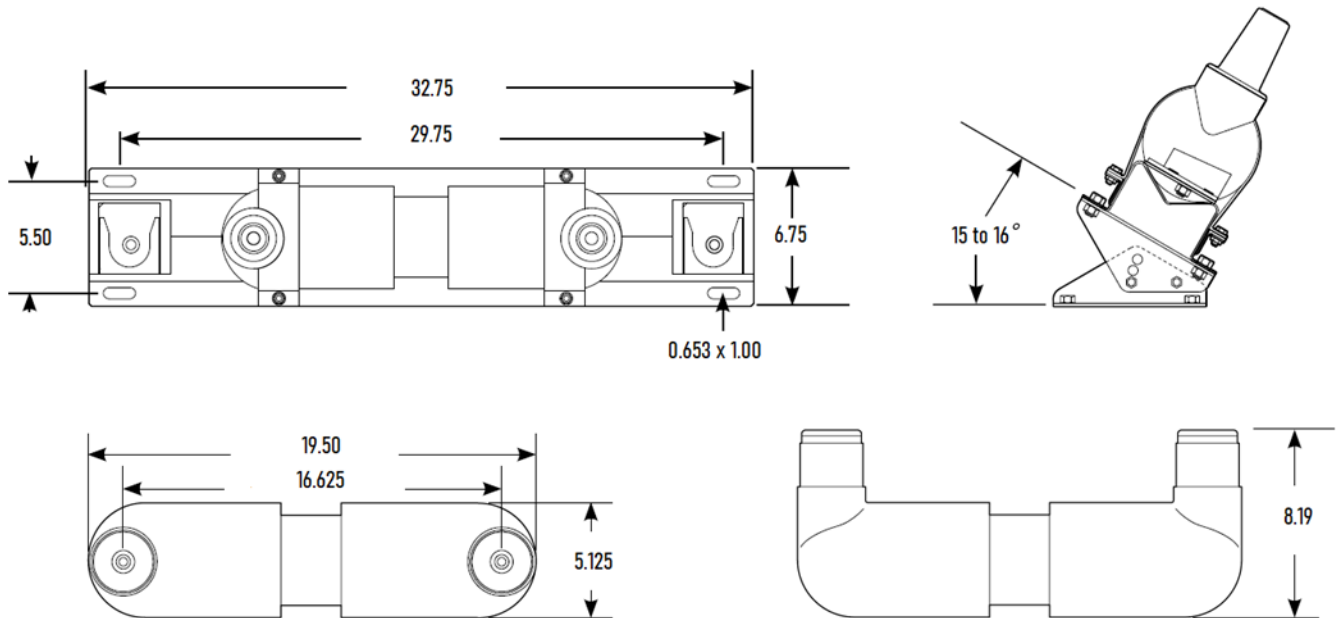
**Figure 4a. Eaton Wall Mounting Fuse Assembly and Dimensions (in)**



**Figure 4b. Eaton Tilt Mounting Assembly and Dimensions (in)**



**Figure 4c. Elastimold Wall Mounting and Tilt Mounting Assembly and Dimensions (in)**



## 5. Testing

Data that establishes compliance with the requirements of the standards listed in Section 3 and this standard shall be provided upon request.

## 6. Marking

Fuse units shall be marked according to the requirements of IEEE C37.42, Section 10.2, which includes:

- Manufacturer name or symbol
- Manufacturer type or identification
- Rated current
- Rated maximum voltage
- Rated maximum interrupting current
- Identifying date code (month and year)

## 7. Packaging

Fuse units shall be individually packaged in heavy duty, clear plastic bags or cardboard boxes, as appropriate for their size and weight, to prevent damage and/or contamination during shipping, handling, and storage.

Each standard package shall be legibly marked with the following information:

- Manufacturer identification
- Product description
- Seattle City Light stock number
- Quantity

Each shipping container shall be legibly marked with the following information:

- Manufacturer identification
- Product description
- Quantity
- Seattle City Light stock number

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## 8. Issuance

Stock Unit: EA

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## 9. Approved Manufacturers

Stock No.	Description	ABB / Elastimold/ Thomas & Betts	Eaton/Cooper Power Systems
015058	Fuse, 25 A	M25CLF025-22	155F025EMF0202
015059	Fuse, 40 A	M25CLF040-22	155F040EMF0202
015060	Fuse, 65 A	M25CLF065-22	155F065EMF0202
015061	Wall mounting bracket assembly	WMBQ	HBQRS1
015062	Tilt mounting bracket assembly	TMA-EM	CBQRS3F1

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## 10. References

**SCL Material Standard 6839.45**; Fuses, 17.2 kV, Full-Range, Current-Limiting, Molded

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## 11. Sources

**Cooper Power Series, Fusing Equipment Catalog Data CA132025EN**, Edison Modular Fuse, Vault Application Products, April 2015

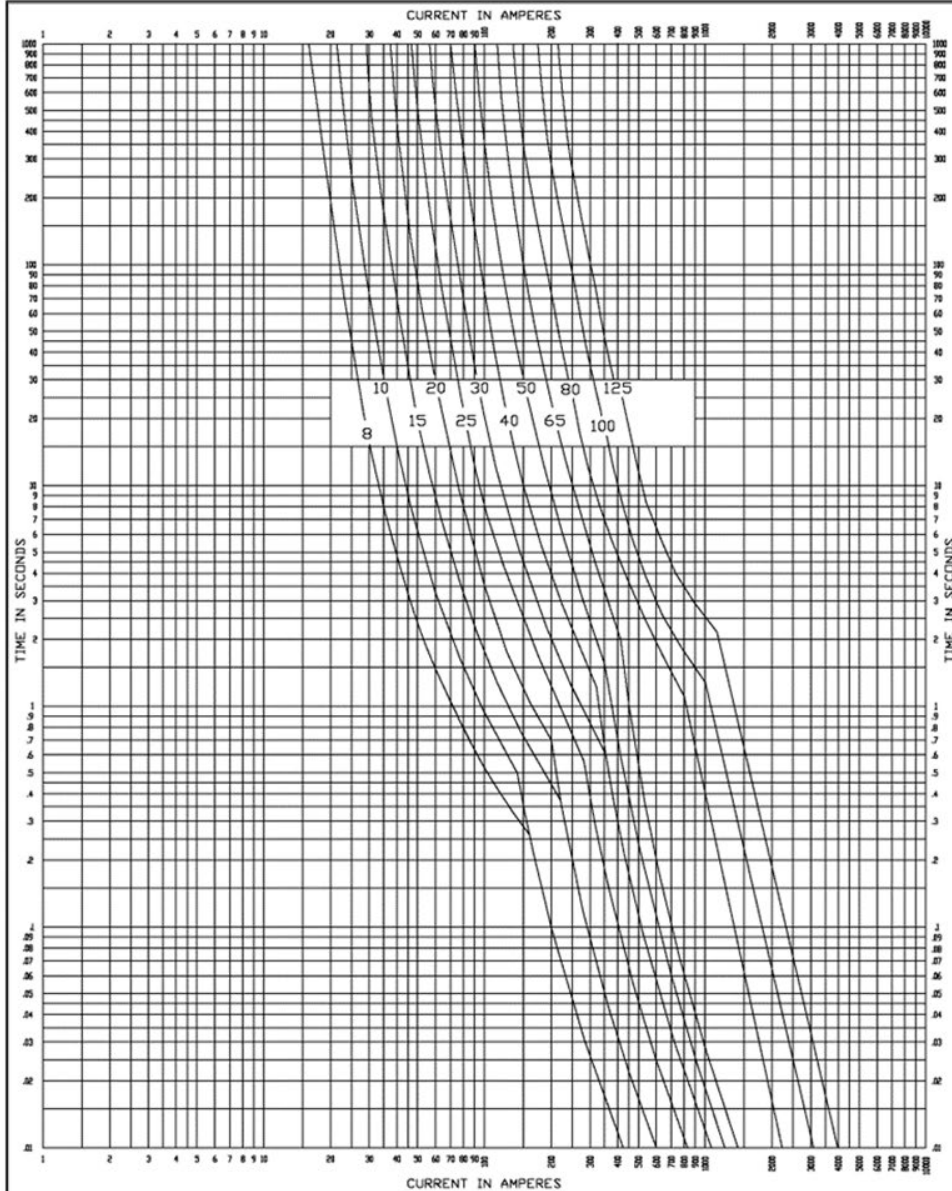
**Thomas & Betts Catalog**, Elastimold Molded Current-Limiting Fuses (MCLF)

**SCL Material Standard 6839.45**; "Fuses, 17.2 kV, Full-Range, Current-Limiting, Molded"

**SCL Material Standard 6840.10**; "Fuses, 15.5 kV, Full-Range, Current-Limiting, Type X, Hinge-Mounted"

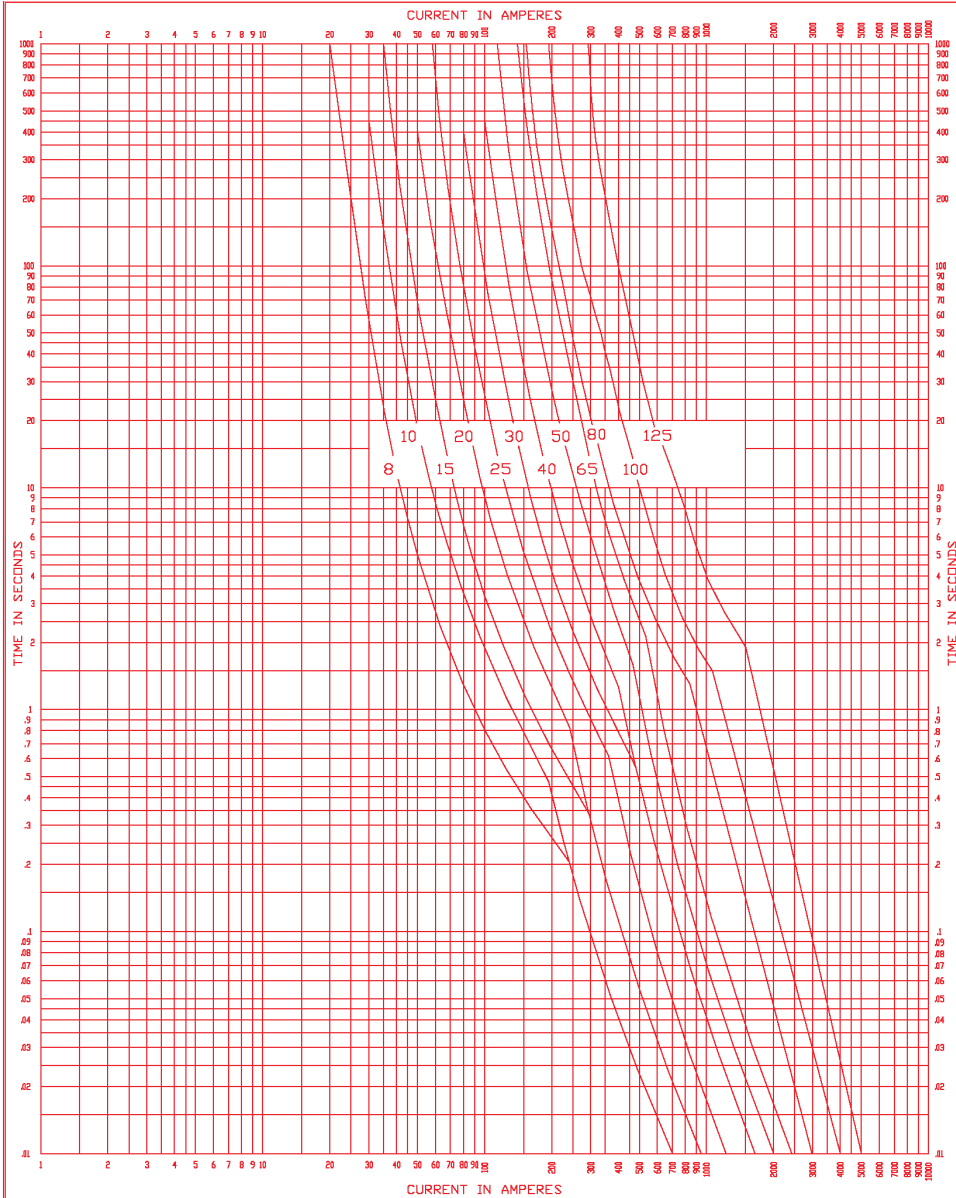
**Shetab, Muneer**; Standards Engineer, subject matter expert, and originator of 6839.55.

## Appendix A. Eaton (Cooper Power Systems) Minimum Melting Time-Current Fuse Curves



<p><b>COOPER Power Systems</b> COMPONENTS AND PROTECTIVE EQUIPMENT</p>		<b>TIME-CURRENT CHARACTERISTIC CURVES</b> MINIMUM MELT TCC ON THE 15.5 & 17.2kV EDISON MODULAR FUSE (EMF)	
		Tests made at LDW Volts ac at HIGH pf at 25°C with no initial load	
DRAWN BY JLR DATE 08/05/08	CHK'D NRH DATE 08/14/08	Standards used as basis for data: ANSI C37.47-1981 (R1992)	
REPLACES --- DWG NO. 42	REV 03 01312	REQ NO. 24503 N 00	MINIMUM TEST POINTS PLOTTED SO VARIATIONS SHOULD BE PLUS THIS DRAWING WAS PRODUCED ON A CAD SYSTEM, ANY MANUAL REVISION WILL VOID IT.
FUSE RATINGS: 15.5KV (8 THRU 125 AMPS) 17.2KV (8 THRU 100 AMPS)			Reference Data R240-91-162 Page 1 of 2

## Appendix B. Eaton (Cooper Power Systems) Total Clearing Time-Current Fuse Curves



<p><b>COOPER Power Systems</b> COMPONENTS AND PROTECTIVE EQUIPMENT</p>		<b>TIME-CURRENT CHARACTERISTIC CURVES</b>	
		TOTAL CLEARING TCC ON THE 15.5 & 17.2kV EDISON MODULAR FUSE (EMF)	
DRAWN BY	JLR	CHK'D	NRH
DATE	08/05/08	DATE	08/14/08
REPLACES	--	REV	03
REG NO.	24503	MAXIMUM TEST POINTS PLOTTED SO VARIATIONS SHOULD BE MINUS	
DWG NO.	42 01312 N 00	THIS DRAWING WAS PRODUCED ON A CAD SYSTEM, ANY MANUAL REVISION WILL VOID IT.	
FUSE RATINGS: 15.5KV (8 THRU 125 AMPS) 17.2KV (8 THRU 100 AMPS)			

Reference Data  
 R240-91-162  
 Page 2 of 2



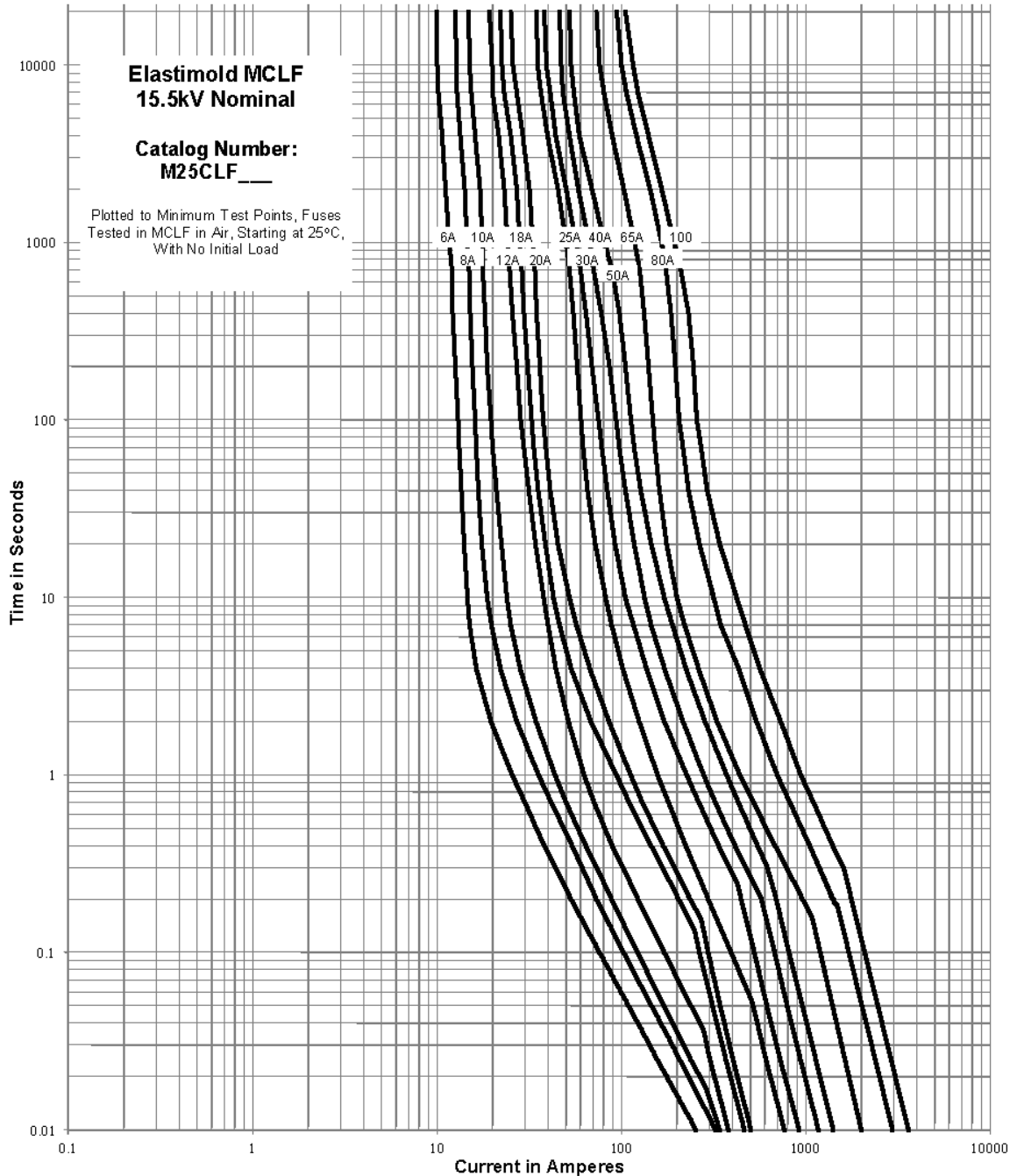
## Appendix C. ABB (Hi-Tech) Minimum Melting Time-Current Fuse Curves



**ELASTIMOLD® MCLF**  
Molded Full-Range Current-Limiting Fuses

Publication #FC-029b Date: 8-04

**Minimum Melting Time-Current Curves 15.5kV Nominal Voltage Rating**



## Appendix D. ABB (Hi-Tech) Total Clearing Time-Current Fuse Curves



### ELASTIMOLD® MCLF Molded Full-Range Current-Limiting Fuses

Publication #FC-076b Date: 8-04

Total Clearing Time-Current Curves 15.5kV Nominal Voltage Rating

