

SAE/ISO Standard for Fire Containment Covers



Federal Aviation
Administration



Presented to: International Aircraft Systems Fire
Protection Working Group. Long Beach, CA

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- **The FAA has requested that SAE develop a standard for Fire Containment Covers (FCC's).**
- **FAA TSO C90 will be revised to reference the new standard.**
- **ISO is also developing a standard for FCC's**
- **SAE and ISO have agreed to attempt to make the standards identical**



SAE Standards for Works In Progress

WIP - Not available for purchase at this time.

Document Number: AS6453

Project Number:

Project Initiation:

Revision Number:

Title: Air Cargo Pallet Fire Containment Covers

Issuing Committee:

Age-2a Cargo Handling Committee

Scope:

The scope of this project is to develop a specification for a fire containment cover (FCC) for shipping pallets on aircraft to contain a fire for extended over water operation of up to 4 hours (777 ETOPS requirements). The specification will describe the type of material required, testing required, and in-service requirements.

Rationale:

Fire on board an aircraft during flight is becoming an increasing problem that is without a current solution. Recent FAA NPRMs and regulatory activity has focused on this problem and there are a number of industry groups currently working on a solution including, ULD cargo net manufacturers, operators, and the ISO. One operator already has a solution to the problem. The SAE is behind on developing guidance and a solution utilizing this technology.

[Return to Works In Progress List](#)

Current ISO Status:

ISO/DIS 14186 is listed as in Stage 40.60, Close of Voting

International harmonized stage codes

STAGE	SUBSTAGE						
	00 Registration	20 Start of main action	60 Completion of main action	90 Decision Substages			
				92 Repeat an earlier phase	93 Repeat current phase	98 Abandon	99 Proceed
00 Preliminary stage	00.00 Proposal for new project received	00.20 Proposal for new project under review	00.60 Close of review			00.98 Proposal for new project abandoned	00.99 Approval to ballot proposal for new project
10 Proposal stage	10.00 Proposal for new project registered	10.20 New project ballot initiated	10.60 Close of voting	10.92 Proposal returned to submitter for further definition		10.98 New project rejected	10.99 New project approved
20 Preparatory stage	20.00 New project registered in TC/SC work programme	20.20 Working draft (WD) study initiated	20.60 Close of comment period			20.98 Project deleted	20.99 WD approved for registration as CD
30 Committee stage	30.00 Committee draft (CD) registered	30.20 CD study/ballot initiated	30.60 Close of voting/ comment period	30.92 CD referred back to Working Group		30.98 Project deleted	30.99 CD approved for registration as DIS
40 Enquiry stage	40.00 DIS registered	40.20 DIS ballot initiated: 5 months	40.60 Close of voting	40.92 Full report circulated: DIS referred back to TC or SC	40.93 Full report circulated: decision for new DIS ballot	40.98 Project deleted	40.99 Full report circulated: DIS approved for registration as FDIS
50 Approval stage	50.00 FDIS registered for formal approval	50.20 FDIS ballot initiated: 2 months. Proof sent to secretariat	50.60 Close of voting. Proof returned by secretariat	50.92 FDIS referred back to TC or SC		50.98 Project deleted	50.99 FDIS approved for publication
60 Publication stage	60.00 International Standard under publication		60.60 International Standard published				
90 Review stage		90.20 International Standard under periodical review	90.60 Close of review	90.92 International Standard to be revised	90.93 International Standard confirmed		90.99 Withdrawal of International Standard proposed by TC or SC
95 Withdrawal stage		95.20 Withdrawal ballot initiated	95.60 Close of voting	95.92 Decision not to withdraw International Standard			95.99 Withdrawal of International Standard

- Tech Center was requested to run tests to determine if wording on allowable gaps between the bottom edge of the FCC and the pallet were needed in the SAE Standard.
- Four FCC tests were conducted to determine damage tolerance and bottom edge gap effects.
- Test 1: FCC with moderate damage.
- Test 2: FCC with minimal damage.
- Test 3: Undamaged FCC with a 2.5” air gap between lower edge of FCC and pallet.
- Test 4: Undamaged FCC with a 1” air gap between lower edge of FCC and pallet.



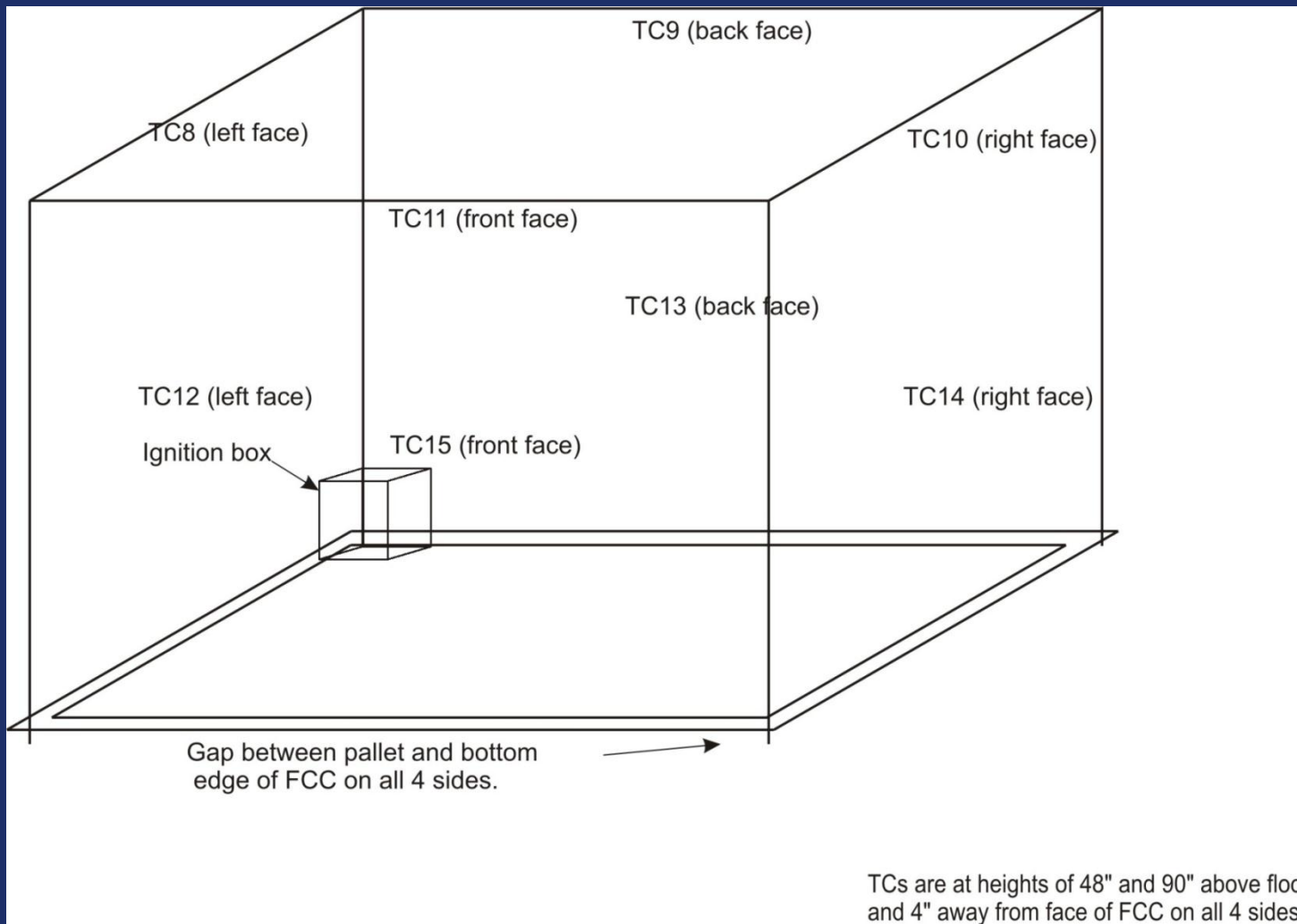
- 4” steel channel all around lower edge of frame to catch lower edge of FCC and keep a constant air gap present for the duration of the 2 hour test.



2.5" gap between pallet rail and lowest edge of channel

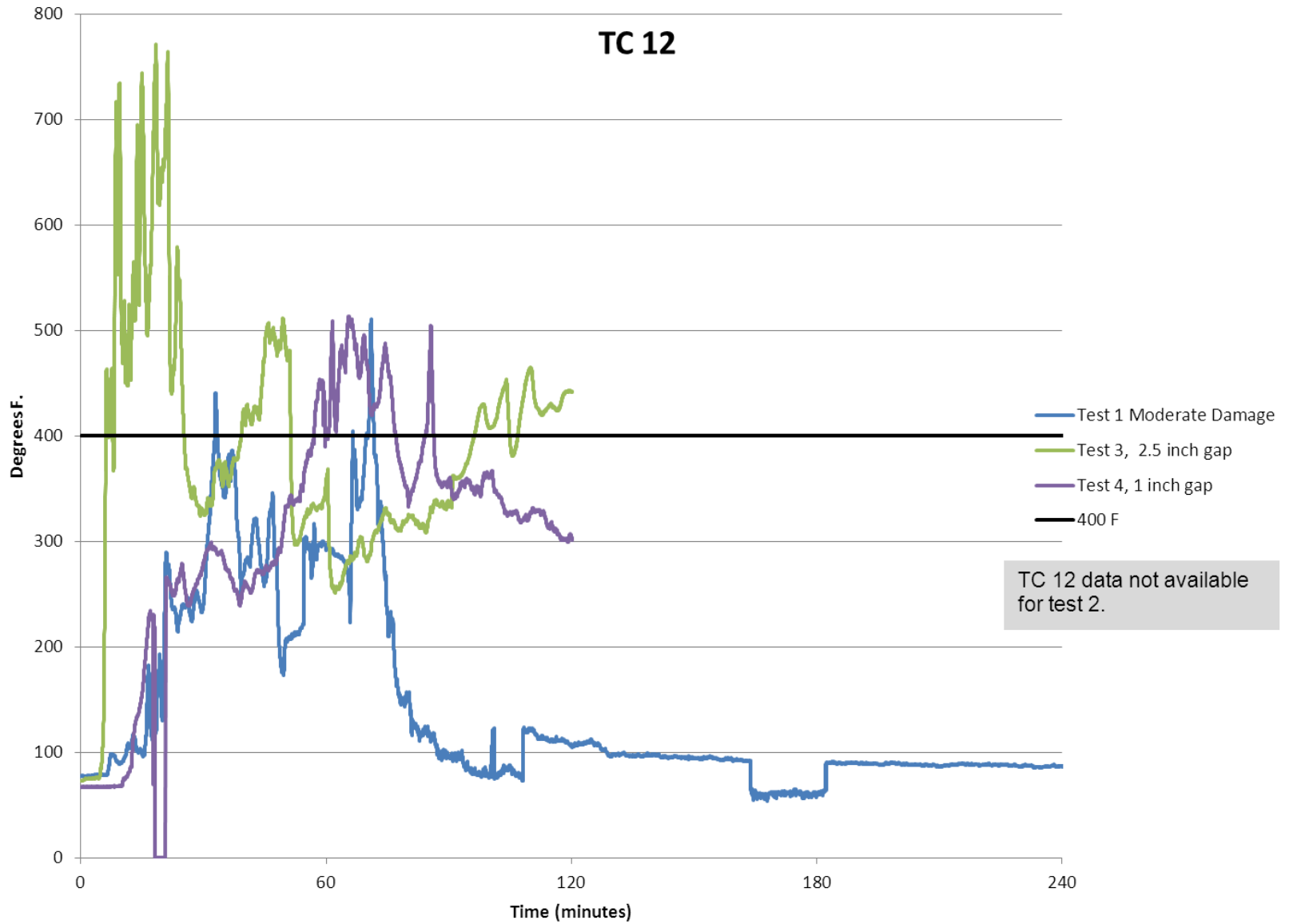


- Fire load was cardboard boxes filled with shredded newspaper. Metal poles visible outside FCC are for mounting thermocouples at 48" and 90" above floor, 4" from sides of FCC on all four sides (only 2 are visible in picture)



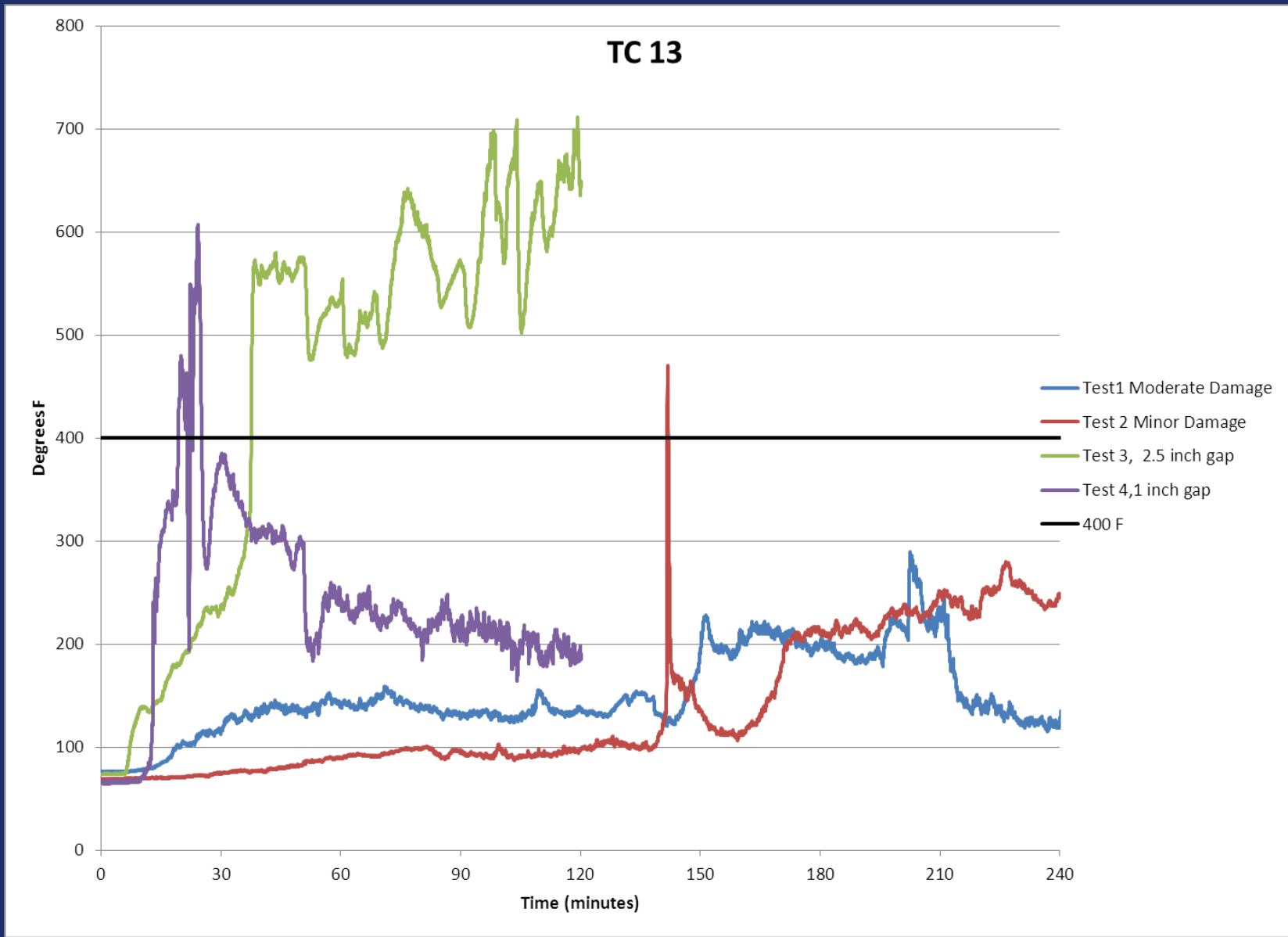
•Thermocouple locations

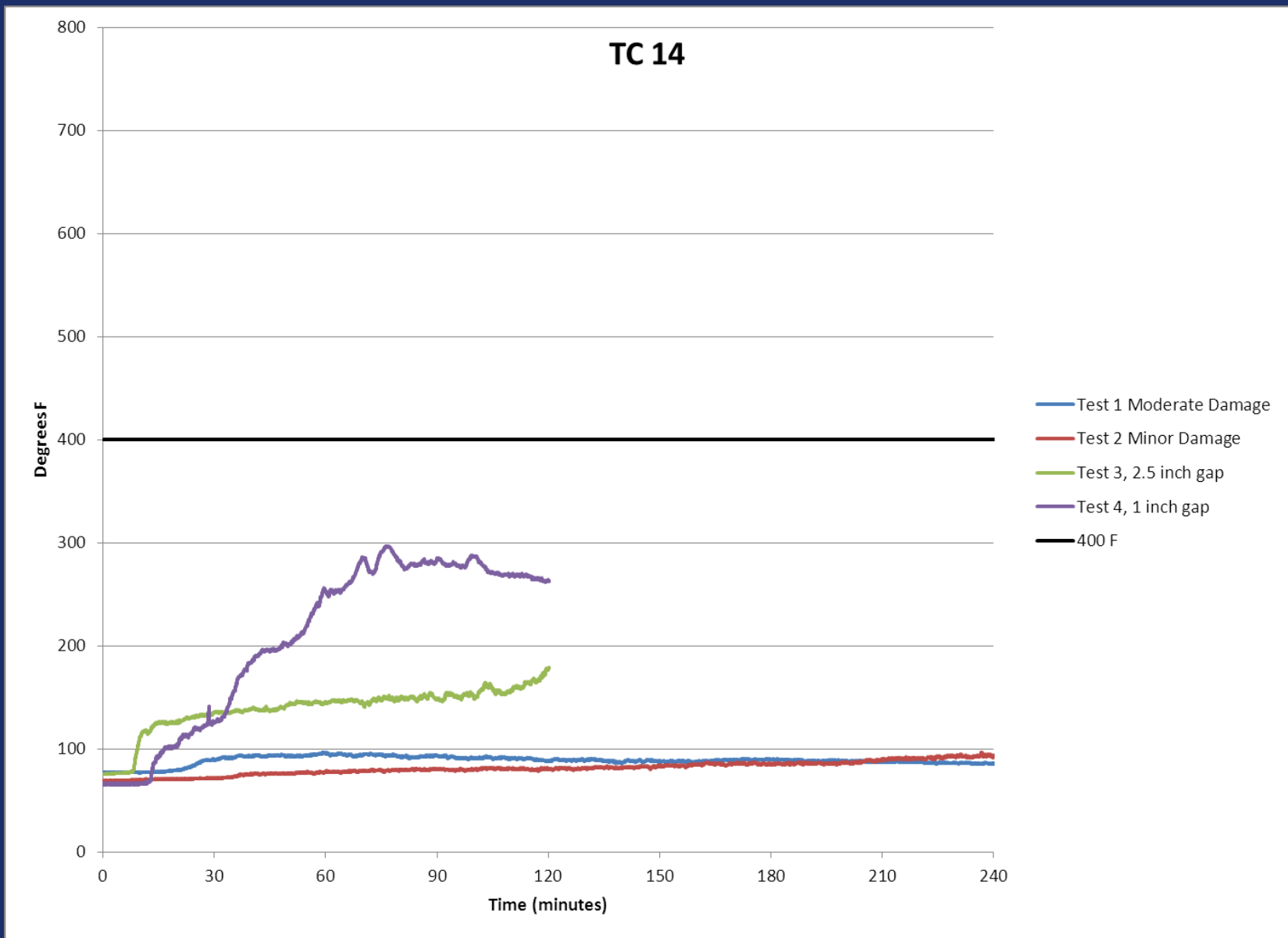
TC 12

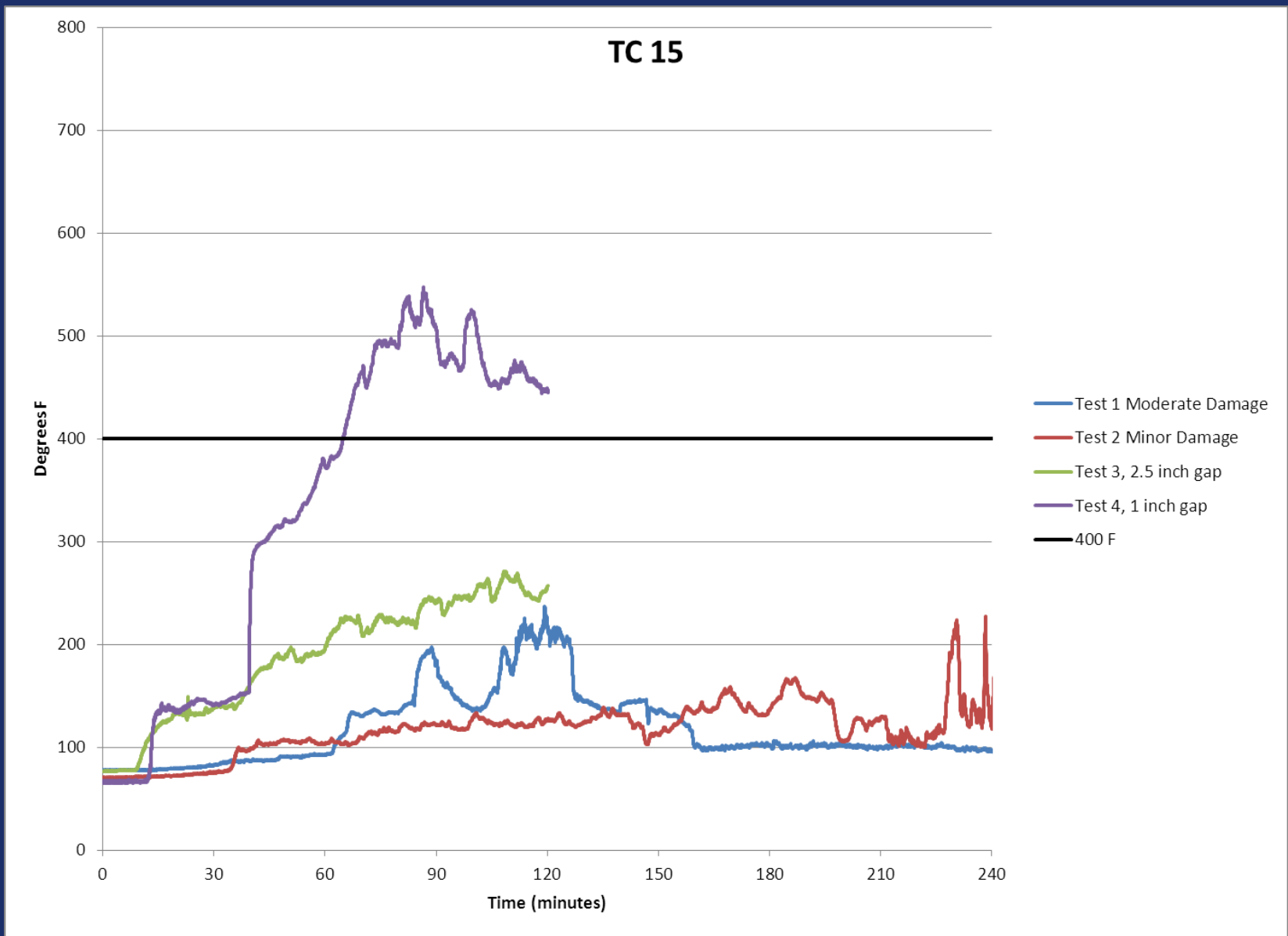


TC 12 data not available for test 2.









•Conclusions

- All 4 tests failed due to exceeding 400° F on thermocouples 4” away from outside surface of FCC’s per draft SAE/ISO Standards.
- All 4 test fires were contained by the FCC’s but not extinguished.
- Small sections of the exteriors of the FCC’s briefly ignited in most test due to ignition of off-gassing resins.
- Cargo net on exterior of FCC’s ignited in all tests. (Net sample was tested to the 12 second vertical bunsen burner test and failed. Current regulations do not require this test but the draft SAE/ISO Standards do)

The Fire Containment Covers used in the previously described tests were prototypes units that were not fully developed by the manufacturer. The cargo nets were not treated with a fire retardant as the production units will be. Development work is continuing to address the observed off-gassing resin ignition. The FCC's were considered to have failed the draft SAE/ISO Standards as they were written at the time. The final version of the Standards may be different.

For these reasons, the testing was inconclusive in achieving the objective of determining the need for specific language in the draft standards for allowable gaps along the lower edge of the FCC. Additional testing to address this issue is planned.