DOCKETED

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Project Title:	Appliance Efficiency Pre-Rulemaking for Commercial Tumble Dryers and Air Filter Labeling
TN #:	222331
Document Title:	Presentation - CASE TEAM 1-24-2018 Status Update - Commercial Tumble Dryer
Description:	This presentation from the IOU CASE TEAM provides a status update and review of recent activities.
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Commercial Tumble Dryer CASE Team Status Update

Mary Anderson, Pacific Gas and Electric Company
on behalf of the California Investor-Owned Utilities

January 24, 2018

Two key areas of CASE Team activity since August 2017 workshop

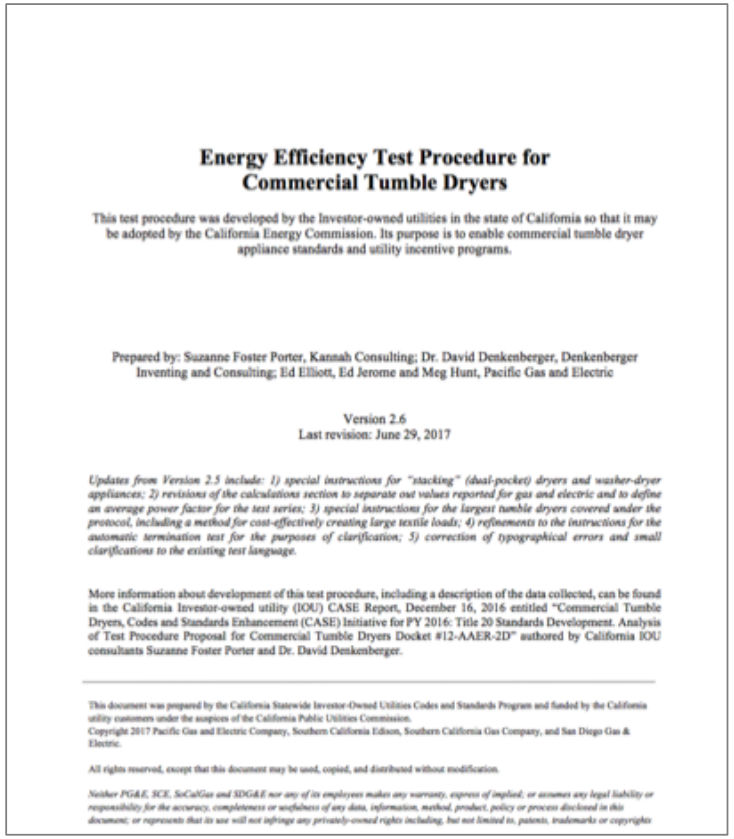
Industry Outreach

- Traveled to industry location for multiple in-person meetings
- Met with manufacturers about test protocol to get feedback
- Received important comments to help shape CASE Team work in 2018

Technical Investigation

- Conducted engineering analysis to document cost of improving the efficiency of dryers (release expected end of Q1)
- Reviewed stakeholder comments on docket and prepared response to those comments
- Undertook preliminary investigation of comments received from conversations with industry and planned additional 2018 investigations based on comments

Additional industry comments on test protocol



Energy Efficiency Test Procedure for Commercial Tumble Dryers

This test procedure was developed by the Investor-owned utilities in the state of California so that it may be adopted by the California Energy Commission. Its purpose is to enable commercial tumble dryer appliance standards and utility incentive programs.

Prepared by: Suzanne Foster Porter, Kannah Consulting; Dr. David Denkenberger, Denkenberger Inventing and Consulting; Ed Elliott, Ed Jerome and Meg Hunt, Pacific Gas and Electric

Version 2.6
Last revision: June 29, 2017

Updates from Version 2.5 include: 1) special instructions for "stacking" (dual-pocket) dryers and washer-dryer appliances; 2) revisions of the calculations section to separate out values reported for gas and electric and to define an average power factor for the test series; 3) special instructions for the largest tumble dryers covered under the protocol, including a method for cost-effectively creating large textile loads; 4) refinements to the instructions for the automatic termination test for the purposes of clarification; 5) correction of typographical errors and small clarifications to the existing test language.

More information about development of this test procedure, including a description of the data collected, can be found in the California Investor-owned utility (IOU) CASE Report, December 16, 2016 entitled "Commercial Tumble Dryers, Codes and Standards Enhancement (CASE) Initiative for PY 2016: Title 20 Standards Development. Analysis of Test Procedure Proposal for Commercial Tumble Dryers Docket #12-AAER-2D" authored by California IOU consultants Suzanne Foster Porter and Dr. David Denkenberger.

Version 2.6 (June 29, 2017) [available at CEC docket no. 17-AAER-01]

- Definition of basic model may be too burdensome (Section 4)
- Time interval to move textiles in procedure may be too short to accommodate the largest loads (Section 5.7)
- Humidity tolerances in the test procedure may be a concern for the most humid climates (Section 5.2.1)
- Cost of shipment of a dryer to a third-party lab needs to be considered
- Consideration of CSA gas dryer protocols (7.1-2017; 7.2-2016) should be given to minimize burden to manufacturers
  - CSA test cloth should be evaluated as an option against the IEC test cloth currently specified
- Research and data drive CASE team decision-making about how/whether to incorporate comments

	Residential: AHAM HLD-1-2010, IEC 61121:2012, DOE 2013, NEEA 2017	Residential-Platform CSA 7.1-2017 and Commercial CSA 7.2-2016	California Commercial Tumble Dryer
Purpose	Performance + Efficiency or Efficiency only	Safety + Performance (7.2 includes Efficiency)	Efficiency
Fuels covered	Gas and Electric	Gas only	Gas and Electric
Test series	1 to 5 runs per test series	1 run per dryer	5 to 6 runs per test series
Load material	IEC-specified cotton, DOE 50/50 test cloths, real world	CSA 100% cotton test cloths	IEC-specified cotton
Textile allowed age	Age-weighted load, 80 total runs OR 25 total runs	Not specified	Age-weighted load, 80 total runs
Termination method	Timed, automatic termination or technician termination	Technician termination	Timed and automatic termination
IMC	40% to 70%	100%	60% and 75%
RMC	0% to 8%	Not specified	1.5% to 8%
Settings	Range	High/max heat	Range
Program time measured?	Sometimes	No	Yes
Efficiency metric	Pounds bone dry textile per KWh	Btu per pound of water evaporated	Pounds bone dry textile per KWh

Areas for possible harmonization with CSA

Efficiency metric

- Current commercial tumble dryer efficiency protocol (Version 2.6): pounds of bone dry textiles per kWh
- CSA metric: btu per pound of water removed

CSA test cloths

- Used for more than ten safety tests and in the one efficiency test
- CASE Team plans a study to examine the four Rs (repeatability, reproducibility, representativeness, and reasonableness) of these cloths relative to currently-specified IEC cotton test cloths

Measurement of gas standby use

- For dryers with constant pilot used for ignition
- CASE Team did not encounter any product with constant pilot, but may exist

Other

- Room temperature measurement (four probes sensors instead of one)
- Tests of additional gas types beyond natural gas and propane
- Tighter inlet test pressure specifications
- Detailed burner set-up instructions
- Exhaust simulator set up

Specific requests for stakeholder input

Basic model

- List of custom items typically added to a dryer shell, preferably sorted by the expected impact on the efficiency of the dryer
  - Large = greater than 10% change in the site energy factor (EF)
  - Medium = 4 to 10% change in the EF
  - Small = less than 4% change to the EF
  - Very small = less than 2% change to the EF
- Proposed definition of basic model that balances accuracy with testing burden

Test details

- **Textile transfer time:** given the importance of minimizing changes in temperature and moisture in the test cloths, suggestions for timeframes needed to conduct textiles transfers in the test procedure (section 5.7), possibly by load size
- **Humidity tolerances:** what are the specific concerns and limitations associated with humidity in the test chamber? CASE Team has some data on this it plans to examine

CSA harmonization

- Viability of Btu per pound of water removed as an efficiency metric
- Efficiency data collected according to CSA 7.2-2016 with CSA test cloths
- Known suppliers of CSA test cloths
- Dryer models known to employ continuous pilot lights
- Value of harmonizing with other areas, including:
  - Room temperature measurement protocol
  - Tests of fuels other than natural gas and propane
  - Tighter inlet test pressure specification
  - Burner set-up instructions
  - Exhaust simulator

CASE Team 2018 Test Procedure Plans

Receive comments

- Consider all stakeholder comments made to the docket or submitted directly to the CASE Team by February 23, 2018
- Open invitation to all manufacturers to meet with the CASE Team to share comments on the test protocol
- CEC docket no. 17-AAER-01 or Mary Anderson at M3AK@pge.com and Suzanne Foster Porter sfosterporter@kannahconsulting.com (Q1 2018)

Technical research

- Conduct additional lab testing and technical investigation in consideration of comments received from manufacturers
- CSA test cloth evaluation for repeatability, reproducibility, representativeness, and reasonableness against the currently-specified IEC cotton cloths
- Other testing and investigations, TBD (Q2 and Q3 2018)

Revise test protocol

- Revise test protocol based on comments, investigations and testing
- Issue a revised version of the test protocol for stakeholder consideration (Q3 or Q4 2018)

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