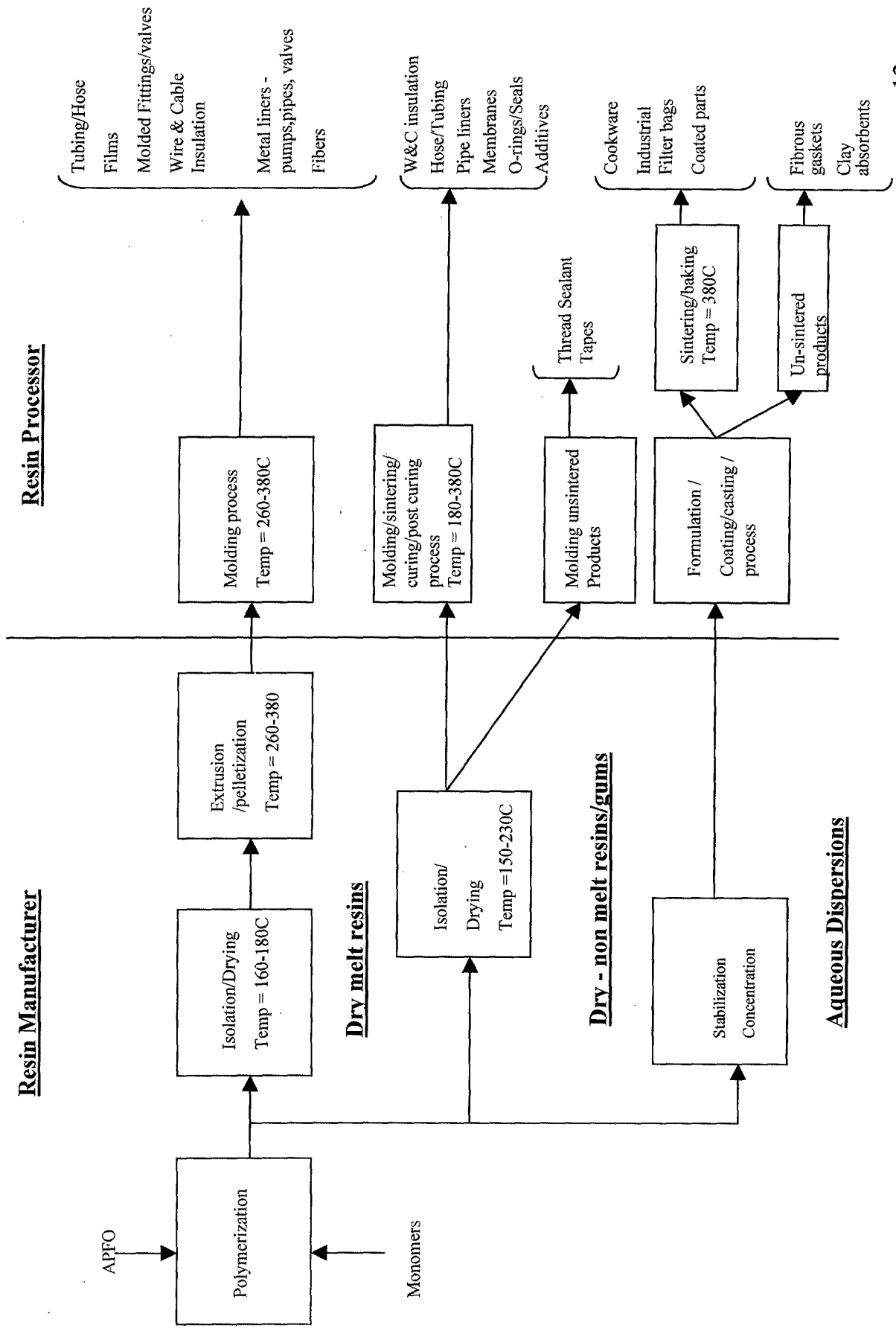


FMG Presentation to Fluoropolymer Technical Workgroup

ECA Framework Item 8

- Objective: Determination of incineration byproducts of fluoropolymer-containing articles
- The industry group recommends that incineration testing be included in an ECA
- To facilitate the creation of an ECA for incineration testing the industry group recommends the following;
 - Using the 3M incineration protocol as a model, the industry group will develop a protocol and submit it for review by the interested parties
 - The interested parties will review the protocol and submit questions
 - The protocol will be finalized in a technical meeting to be scheduled

Fluoropolymer Industry Overview



Selection Criteria

- Fluoropolymer production process
 - Melt/Extrusion - polymer is melted to create finished polymer
 - Polymer drying - polymer is dried to create finished polymer
 - Liquid Dispersion - finished polymer is an aqueous dispersion
- Consumer applications - applications where the general public may routinely come in contact with articles containing a fluoropolymer
- Industrial applications - applications that are used in an industrial, commercial, or occupational/professional setting
- High heat processing - applications where the article during manufacture receives thermal exposure (>250C and 5 minutes) above where APFO is expected to be driven off or destroyed
- Low heat processing - applications where the article during manufacture may not receive such thermal exposure
- Volume/Exposure Potential? - volume and exposure potential assessed to select from potential applications
- Supply - applications supplied by one or more of the four LOI signatories

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**EPA ECA Proposal for
Fluoropolymer Incineration Testing**

Rationale

Incineration testing of fluoropolymers and fluoropolymer treated articles was not included in the FMG LOI commitments. The degradents of perfluorinated materials vary greatly as a function of incineration temperature and residence time. Thermodynamically, at a temperature of about 1200°C a destruction efficiency of 99.99% for a C-F chemical bond can be obtained. Information on the extent of destruction and full characterization of the types of degradents formed at lower incineration temperatures is unknown. This is further confounded because, based on US information, there are three types of incinerators in operation across the US: 1) medical waste incinerators operating around 650°C; 2) municipal waste incinerators (static grate) operating between 400-600°C; and 3) chemical (hazardous waste) incinerators operating up to 1300°C; and it is expected that the extent of destruction and types of degradents will vary across each incinerator type.

ECA Proposal

It is proposed that incineration testing be conducted to meet the following data needs:

- ▶ Define by test, the temperature needed to provide 99.99% destruction of each perfluorinated test substance/material, both as the manufactured perfluoro compound and the article employing the perfluoro compound.
- ▶ Create an incineration temperature profile versus characterized degradents

Test substances:

- ▶ Tier 1: EPA recommends, as a starting point, that testing be conducted for each of the 12 fluoropolymer products identified by FMG.
- ▶ Tier 2: Depending on test results, an additional representative number of product formulations and articles in commerce may need to be tested. EPA recommends that the formulations and articles be determined by members of a technical subgroup on Incineration Testing.

Test Method: Testing is to be conducted using methods equivalent to those described or reviewed in "Guidelines for Determination of Poly-halogenated Dibenzo-p-dioxins and Dibenzofurans in Commercial Products" (see 40CFR, section 766.1 through 766.18) and/or the 3M protocol.

Although the average residence time may vary across incinerators, testing under this ECA proposal should satisfy a 2 second residence time. Incineration testing within these three (3) temperature ranges will provide data that is crucial in determining potential pathways into the environment of perfluoro compounds and their degradents which may be precursors to PFOA.

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The laboratory equipment needed to define temperatures, residence times and by-products produced includes a high temperature tubular furnace with carrier gas connected to a gas chromatograph followed by a mass spectrometer. Note: a GC-GC-MS arrangement will likely be necessary for sub-ppm data generation. Thermogravimetric analysis will be used before initiating the laboratory incineration testing to document the low temperature (<500 °C) behavior of the test compounds (or articles) and to verify gasification of material following ASTM E1641, Decomposition Kinetics by Thermogravimetric Analysis.

EPA GLP Data Quality and Quality Assurance Requirements: All testing must conform with EPA GLP Data Quality and Quality Assurance requirements.

Data Reporting: The final report on each test substance tested must include a detailed description of the specific test conditions used, the test data including any associated calculations, spectra and curves. Details of specific data to be reported shall, at a minimum, include information similar to those outlined under 40 CFR, section 761.70 for Incineration.