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Docket ID No. EPA-HQ-OAR-2003-0119

RE: Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources; Commercial and Industrial Solid Waste Incinerators. Notice of Proposed Rulemaking; June 4, 2010; 75 Fed. Reg. 31937.

Introduction

The Reusable Industrial Packaging Association (RIPA) is the North American trade association for companies that recondition and manufacture reusable industrial packagings, such as steel drums. RIPA's member companies collect, clean and restore used industrial packagings and return them to service as shipping containers. The reconditioning of used steel drums includes the cleaning and removal of paints, coatings and other adherents, followed by reshaping, reforming and certification through testing. RIPA's membership covers the vast majority of reconditioning in the U.S. and is comprised of approximately 85 U.S reconditioning companies operating in 100 locations. RIPA members operate 32 of the estimated 36 drum reclamation furnaces in the United States.

Steel drum reconditioners operate under strict environmental, health and safety regulations at the federal, state and local levels. Reconditioning provides a safe, professionally-managed outlet for millions of emptied but not clean containers that otherwise would be disposed in landfills or scrapped. Additionally, reuse of steel drums significantly reduces solid wastes, energy consumption and greenhouse gas emissions that otherwise would occur in manufacturing new steel drums.

Nearly all "removable-head" steel drums (approximately 16.5 million/year) are reconditioned by passing through a "drum reclamation furnace". Under U.S. DOT's Hazardous Materials Regulations, a condition of packaging reuse for hazmat service is that reconditioning includes: *"Cleaning to base material of construction, with all former contents, internal and external corrosion, and any external coatings and labels removed."* 49 CFR 173.28(c)(1)(i). Pyrolizing in a drum reclamation furnace, followed by shot blasting, achieves the DOT standard. No alternative mechanical process exists for cleaning these drums.

Drum reclamation furnaces have been named explicitly by EPA as operations subject to the agency's proposed New Source Performance Standards and Emission Guidelines for Commercial and Industrial Solid Waste Incinerators published June 4, 2010 ("CISWI"). However, we note that under the prior CISWI rule issued in 2000, this subcategory was exempted from regulation as a solid waste incineration unit.

Section 129 of the federal Clean Air Act (CAA), 42 U.S.C. § 7429, requires EPA to establish emission standards for various types of "solid waste incineration units." One type of unit EPA is authorized to regulate under CAA § 129 are those that incinerate "commercial or industrial waste." EPA has long referred to these types of units as "CISWI" units.

In its first final rule establishing CISWI standards (65 Fed. Reg. 75338, December 1, 2000), EPA explained the process it had undertaken to decide whether and to what extent various types of combustion units might be categorized and regulated under CAA § 129. As EPA explained, it created the "Industrial Combustion Coordinated Rulemaking" (ICCR) advisory committee under the Federal Advisory Committee Act in 1996. *Id*. at 75339. One work group of the ICCR, the Incinerator Work Group, developed various recommendations for categories and sub-categories of CISWI units for potential regulation. *Id*.

That Work Group produced a "Regulatory Options Paper" dated November 1998. This paper is posted on EPA's Website at http://www.epa.gov/ttn/atw/129/ciwi/rop.pdf, and is attached hereto as Attachment 1. As discussed in more detail below, the Regulatory Options Paper recognized and explained certain fundamental distinctions between and among *drum* reclamation units, as contrasted with *parts* and *rack* reclamation units. EPA adopted the distinctions recognized in that paper in its initial December 2000 CISWI regulations, and those distinctions continue to be reflected in the CISWI regulations as of today.

These fundamental distinctions that EPA has long recognized form the crux of the basis for RIPA's comments on the current CISWI proposal. For EPA has with absolutely no explanation – and with absolutely no supporting data – proposed to classify drum reclamation units *along with* part and rack reclamation units in a single category called "Burn-off Ovens" for purposes of establishing new and existing source CISWI standards under CAA § 129.

We will show that EPA's proposal, as it would affect drum reclamation units, would violate fundamental precepts of the CAA and the federal Administrative Procedure Act (APA) and could not withstand judicial review. We accordingly urge EPA to delete any reference to drum reclamation units in any final rule promulgated as a follow-up to the instant proposal. Assuming EPA has authority to regulate drum reclamation units under CAA § 129 (which we reserve the right to contest), we urge EPA to defer any such regulation unless and until EPA develops a record based on adequate data from drum reclamation units to support such a regulation.

EPA's Regulatory Options Paper

The Regulatory Options Paper on which EPA relied in initiating its 2000 CISWI rulemaking recommended several potential sub-categories for rulemaking. Of relevance here, the Regulatory Options Paper established two distinct categories of reclamation: “Drum Reclaimer Incinerators,” and “Parts Reclaimer Incinerators.” See Table 1, Regulatory Options Paper.

The Regulatory Options Paper set forth fundamental distinctions between the two suggested sub-categories. The paper described “Drum Reclaimer Incinerators” as follows:

> Incinerators used to reclaim steel containers (e.g., 55 gallon drums) for re-use or to prepare them for recycling by burning or pyrolyzing interior and exterior container coatings and residues (containers are empty as defined by RCRA prior to processing).

The paper described “Parts Reclaimer Incinerators” as follows:

> Incinerators used to reclaim metal parts such as paint hooks and racks, electric motor armatures, transformer winding cores, and electroplating racks for use in their current form by burning off cured paint, plastisol (i.e., polyvinyl chloride and phthalate plasticizer), varnish, or unwanted parts such as plastic spacers or rubber grommets.

EPA’s 2000 CISWI Final Rule

In its initial final 2000 CISWI Rule, EPA exempted drum reclamation units, part reclamation units, and rack reclamation units from coverage. 65 *Fed. Reg*. at 75359, 75373, December 1, 2000. EPA defined each type of unit separately in 40 C.F.R. § 60.2265 (for new units in subpart CCCC) and § 60.2875 (for existing units in subpart DDDD). The definitions still appear in EPA’s current CISWI regulations, and EPA’s current proposed regulation (June 2010) would retain these definitions without amendment.

Comparing the definitions to the descriptions in the Regulatory Options Paper, it is clear that EPA followed the paper's recommended subcategory of "Drum Reclaimer Incinerators" in defining Drum Reclamation Units. Equally clear is that EPA adapted the paper's description of "Parts Reclaimer Incinerators" by separating the subcategory into two separate definitions for "parts" and "racks" reclamation units. Note the reference to "racks" in the paper's description of "Parts Reclaimer Incinerators."

Somewhat strangely, there is no discussion in EPA's final rule preamble about these definitions and no explanation of why EPA exempted these units from coverage. Even more strangely, EPA neither proposed these definitions in the proposed rule leading up to the final 2000 CISWI rule (64 Fed. Reg. 67092, November 30, 1999) nor included any discussion in the proposed rule preamble suggesting these types of units might be exempted.

<u>EPA's Current (June 2010) Proposal</u>

EPA explains in its June 2010 preamble that its 2000 CISWI rule excluded several types of units that combust solid waste, "including rack, part, and drum reclamation units." 75 *Fed. Reg.* at 31948. EPA then states that it is proposing to regulate several types of previously exempt units, and – for the first time ever – classifies rack, part and drum reclamation units as "burn-off ovens." The only rationale EPA provides is:

> Accordingly, the proposed revisions to the CISWI rules would remove the exemptions for: Agricultural waste incinerators; cyclonic barrel burners; cement kilns; *rack, part and drum reclamation units (i.e. burn-off ovens);* chemical recovery units; and laboratory analysis units. As stated above, we are proposing to create subcategories for waste-burning kilns, energy recovery units and burn-off ovens and subject them to this proposed rule in light of the CISWI Definitions Rule vacatur.
>
> 75 Fed. Reg. at 31948, *emphasis added*.

EPA repeats this rationale a few pages later in its proposed rule preamble:

> Cement kilns and *rack, part and drum reclamation units (i.e. burn-off ovens)* were exempt from the 2000 CISWI standards and, as stated above, we are proposing to create subcategories for those units and subject them to this proposed rule in light of the CISWI Definitions Rule vacatur.
>
> 75 Fed. Reg. at 31960, *emphasis added*.

<u>EPA's Rationale Is Baseless and Illogical</u>

<u>The "CISWI Definitions Rule Vacatur" Is Irrelevant</u>

The foregoing preamble excerpts constitute the sum total of EPA's rationale for (1) regulating drum, part, and rack reclamation units that have been exempt since 2000, and (2) combining drum reclamation units with rack and part reclamation units into a new "burn-off oven" sub-category for purposes of establishing emissions standards. But the "CISWI Definitions Rule vacatur" to which EPA is referring had *nothing* to do with drum, rack, and/or part reclamation units. The case EPA is referring to is *NRDC v. EPA*, 489 F.3d 1250 (D.C. Cir. 2007). That case was limited in its scope to whether EPA had erred in exempting units that combusted wastes for *energy recovery* purposes from the definition of CISWI units. *Id*. at 1257-58.

EPA discusses the *NRDC* case in its June, 2010 preamble and, in fact, correctly states that the scope of the dispute before the Court was the legality of EPA's attempts to exempt units that combust waste for energy recovery purposes. 75 *Fed. Reg*. 31940. Yet, as EPA explains in its current proposed preamble, the brand-new "burn-off oven" sub-category is *not* being proposed for regulation because of energy recovery activity. *Id*. at 31948. The types of units EPA has now combined in this new "burn-off oven" sub-category in fact do not combust wastes for energy recovery purposes. This is clear from all of the descriptions of the units in the Regulatory Options Paper and the definitions in EPA's current CISWI regulations.

So why has EPA, after 14 years of recognizing drum reclamation units as separate and distinct from rack and parts reclamation units, suddenly decided to place all three types into a single sub-category for establishing CAA § 129 emissions standards? EPA offers *zero* explanation or rationale beyond the irrelevant references to the 2007 *NRDC* case. And even that rationale is offered only to explain why EPA believes it should now regulate drum, parts and rack reclamation furnaces, not why drum furnaces should be placed in the same sub-category as part and rack furnaces.

EPA's Record Shows Drum Reclamation Furnaces are Fundamentally Different

Perhaps EPA may have recently concluded that drum reclamation units are sufficiently similar to part and rack reclamation units to justify including them in the same sub-category, even though drum reclamation units were established in a different sub-category in its 1998 Regulatory Options Paper. EPA never states that it has reached this conclusion, but such an assumption could be implicit in EPA's proposed rule.

If this is EPA's assumption, it is wholly illogical and unfounded as we will show throughout these comments. EPA's June 2010 proposed rule preamble is a good place to start. For example, when EPA summarizes the five types of CISWI subcategories that will be regulated under the current proposal, EPA describes "burn-off ovens" as follows:

> Burn-off ovens that are used to clean residual solid waste materials *off of various metal parts* which are then reused.
>
> 75 Fed. Reg. at 31944, *emphasis added*.

Then EPA includes another summary of the types of units it is proposing to regulate:

> Burn-off ovens: These units typically are very small (<1 MMBtu/hr), batch-operated, combustion units that are used to clean residual materials off of *various metal parts*, which are then reused.
>
> 75 Fed. Reg. at 31951, *emphasis added*.

We will soon turn to other elements of this latter preamble excerpt, but for now we focus on the fact that EPA says in both preamble passages that burn-off ovens are used to clean residual materials off of metal *parts*. As shown in the descriptions contained in EPA's regulatory definitions and in EPA's Regulatory Options Paper, part and rack reclamation units clean material off of "parts." A drum, however, is not a "part." Drum reclamation units simply do not clean materials off metal parts, and EPA's descriptions of its new sub-category simply are inapplicable to drum reclamation units.

In one other preamble passage, EPA attempts to link the term burn-off oven to drums:

> In this proposed rule, CISWI units include incinerators designed to discard waste materials; energy recovery units (e.g., units that would be boilers if they did not burn solid waste) designed for heat recovery that combust solid waste materials; kilns and other industrial units that combust solid waste materials in the manufacture of a product; and *burn-off ovens that combust residual materials off racks, parts, drums or hooks so that those items can be re-used in various production processes.*
>
> 75 Fed. Reg. at 31941, *emphasis added*.

Here again, EPA's statements display a fundamental misunderstanding of the distinctions between drum reclamation units and part/rack reclamation units. They also reflect a failure to distinguish between the functions of a "part" and a "drum."

The italicized passage quoted above states that the items reclaimed from these processes are "re-used in various production processes." Items reclaimed in part and rack units, like electric motor armatures, transformer winding cores, and racks for spray painting operations, most certainly are re-used in "production processes." Reclaimed drums, by contrast, are used as containers for the movement and storage of products and other materials. Just as drums simply are not "parts," they simply are not "re-used in production processes."

It is particularly telling to compare the descriptions of drum reclamation units *vis-à-vis* part and rack reclamation units in EPA's Regulatory Options Paper. In the portion of the paper comparing and contrasting the various types of combustion devices, EPA's paper says the following of parts and rack units: "They are often called *burnoff ovens* or pyrolysis units rather than termed 'incinerators.'" The parallel description for the drum reclamation category says nothing about "burnoff ovens." It states, rather, that such a unit is a "semi-continuous tunnel furnace."

In sum, EPA has recognized since at least 1998 that part and rack reclamation units (as contrasted from drum reclamation units) may be classified as burn-off ovens and that drum reclamation units should be placed in a separate sub-category from parts and rack units for regulatory purposes. Yet, while EPA's June 2010 preamble descriptions of the proposed new burn-off oven category accurately describe part and rack reclamation units, they mischaracterize drum reclamation units. Thus, not only has EPA provided no rationale for including drum reclamation units in the same sub-category as part and rack units, all available signs point to fundamental misunderstandings on EPA's part at the present time in regard to the relevant characteristics of drum reclamation units.

EPA's Failure to Provide a Rationale Is a Fundamental Legal Flaw

CAA § 307(d) requires EPA, at the time it proposes a rule, to include a "statement of basis and purpose" that must include a summary of the "major legal interpretations and policy considerations underlying the proposed rule." This requirement, of course, is inherent in all federal agency rulemaking that proceeds under the federal Administrative

Procedure Act (APA), 5 U.S.C. §§ 551 *et seq*. An agency must set forth the reasons underlying its actions, and the reasons must be stated at the time of proposal so interested parties will have the opportunity to provide "meaningful comment." *E.g., Northeast Maryland Waste Disposal Authority v. EPA*, 358 F.3d 936, 948-49 (D.C. Cir. 2004) citing numerous Supreme Court and D.C. Circuit cases.

In *Northeast Maryland*, the D.C. Circuit reversed an EPA rule under CAA § 129 on the very grounds at issue here: EPA had failed to provide any rationale to support its sub-categorization of units in a manner that adversely affected the petitioners. In a passage revealing issues strikingly similar to those we are raising today, the Court stated:

> We thus turn to the underlying question: Did EPA explain its decision to establish subcategories based on aggregate plant capacity? We are, frankly, stunned to find that it did not. As the Agency concedes, there is *not one word* in the proposed or final rule that explains why the Agency chose to distinguish among small MWCs on the basis of the aggregate capacities of the plants at which they are located.
>
> *Id*. at 948, emphasis by the Court.

The "stunned" D.C. Circuit accordingly agreed with the petitioners that EPA's failure to provide a rationale for the sub-categorization "dooms" the rule at issue. *Id*. Citing CAA § 307(d), the APA, and numerous D.C. Circuit cases, the Court ruled that EPA's failure to have explained a rationale in the proposed rule deprived the petitioners of the ability to "comment meaningfully during the rulemaking process." *Id*. at 949.

We submit that in light of the foregoing, the D.C. Circuit would be equally stunned and would obviously reverse EPA's decision to subcategorize drum reclamation units along with parts and rack reclamation units. We thus urge EPA to suspend further action on the currently-proposed CISWI rule as it relates to drum reclamation units unless and until EPA might propose a new rule applicable to drum reclamation units with an appropriately stated rationale and – as explained further below – adequate data from drum reclamation units.

<u>Drum Reclamation Units Are Fundamentally Different in Key Respects</u>

If EPA were to re-examine the sub-categorization issue respecting drum reclamation units, we show now that EPA could not properly include such units in the same sub-category with part and rack reclamation units. Under CAA § 129(a)(2), standards for new sources must be "achievable" and based on a level of control determined in reference to the best controlled "similar" unit. When one type of unit (such as a part or rack reclamation unit) is smaller and different in many respects so as naturally to produce lower emissions than another type of unit (such as a drum reclamation unit), such types of units cannot be deemed "similar." The levels of emissions achieved by the best-controlled unit in the former category could easily not be "achievable" by units in the latter category.

In its final policy statement on source category listings in 1992, EPA explained the relevant factors for determining how various types of combustion units should be properly categorized and subcategorized:

> In response to the many comments concerning appropriate disaggregation of source categories, the Agency acknowledges potential advantages and disadvantages of defining categories either very broadly or very narrowly. Ultimately, in accordance with section 112(d), the Agency will need to identify the "best controlled similar sources" when establishing emission standards for new sources in a category and "the best performing 12 percent" of sources when establishing emission standards for existing sources in a category. Hence, the Agency recognizes that further disaggregation of many listed categories of sources may be necessary prior to promulgation of emission standards. The

> Agency has the discretion to distinguish among classes, types, and sizes of sources within a category in establishing standards.
>
> In general, the Agency has decided, at this time, in most cases, to list broad categories of major and area sources rather than very narrowly defined categories. The main reason for this decision is that, even considering the many comments received, the Agency has too little information to anticipate specific groupings of similar sources that are appropriate for defining MACT floors for the purpose of establishing standards. *Criteria that may need to be considered in defining categories of similar sources include similarities in: Process operations (including differences between batch and continuous operations), emissions characteristics, control device applicability and costs, safety, and opportunities for pollution prevention.* The Agency anticipates that all of the above criteria, and perhaps others, can be accounted for appropriately by the Agency only after gathering significant information for each listed category of sources during the course of establishing emission standards.
>
> 57 Fed. Reg. 31576, July 16, 1992.

We note that this policy was issued under CAA § 112, but it applies equally to CAA § 129 categorization and sub-categorization. Exactly the same statutory language is employed in both sections that EPA must follow in establishing standards for new and existing sources.

We will now show how and why drum reclamation units cannot be deemed "similar" to part and rack reclamation units for purposes of CAA sub-categorization. We note at the outset that the first two criteria EPA mentioned in its final categorization policy above – differences between batch and continuous operations and emission characteristics – establish an excellent starting point for analysis.

We also note that EPA has violated its long-standing policy expressed above requiring that sub-categorization decisions be made "only after gathering significant information for each listed category of sources." Perhaps EPA's erroneous assumption that drum reclamation units can be blindly lumped with part and rack units drove its decision in the proposed rulemaking to collect *absolutely no emissions data* from drum reclamation units.

EPA describes burn-off ovens in the preamble, page 31951, in this manner:

> Burn-off ovens: These units typically are very small (<1 MMBtu/hr), batch operated, combustion units that are used to clean residual materials off of various metal parts, which are then reused. The amount of waste combusted in these units is generally small (pounds per year in some cases) and the configuration of the stacks that serve these units precludes the use of some EPA test methods for measuring emissions

In contrast, drum reclamation furnaces are *continuously* operated combustion units that are typically in excess of 10 MMBtu/hr. and 1000 cubic feet capacity. Operating temperatures range from 1200^o – 1500^o F. Parts reclamation units are significantly smaller in dimension (some less than 30 cubic feet), are typically batch operated (as EPA states above), often operate fewer days per week, and operate at significantly lower temperatures, i.e., 700^o – 900^o F. We note that the continuous vs. batch contrast is the first factor EPA lists in its final criteria for sub-categorizing as quoted above.

The significant differences in design and operations create different mechanisms of pollutant formation, leading in turn to significant differences in baseline emissions levels.

<u>Number of Affected Sources</u>

In Tables 4 through 6 of the preamble, the number of sources in the subcategory "burn-off ovens" is listed as 36. Based on the subcategory description, this number of sources is intended to include both parts reclamation units and drum reclamation furnaces. This number grossly underestimates the actual population of affected sources in the U.S.

As shown in Attachment 1, the number of drum reclamation furnaces in 1998 was estimated as 44. Currently, RIPA estimates there to be 36 drum reclamation furnaces in operation.

The ROP provided in Attachment 1 estimated in 1998 that there were 332 parts reclamation units in operation in 1998. However, based on information obtained from other industry associations, RIPA understands that the current number of parts reclamation units may be in excess of 15,000[1].

MACT Floor Calculations – Parts Reclamation vs. Drum Reclamation

Based on the documents available for review in the docket, it appears that two Information Collection Requests (ICRs) were used to estimate the number of affected sources and obtain emissions data and other technical information to be used in developing the subcategory's proposed standards. Neither RIPA nor any of its members were contacted by EPA or its contractors concerning these ICRs. So far as we can tell from reviewing the available record, EPA collected absolutely no data or information relating to drum reclamation furnaces in developing its proposed rule.

In fact, in establishing the "MACT floor" for both existing and new burn-off ovens, emissions data from only 10 facilities were evaluated. All the facilities assessed were parts reclamation units which are designed to remove residual paint from hooks or racks. As shown above, parts reclamation units are fundamentally different from drum reclamation furnaces, which further supports our position that drum reclamation furnaces should be assessed separately. Their differences can be further illuminated by examining specific pollutants' emissions levels.

Particulate Matter – A batch-fed, closed chamber parts/rack reclamation unit typically has low or negligible airflow velocities and little mechanical movement. As shown in the

[1] Sources: EASA - Electrical Apparatus Service Association; PPC – Pollution Product Control Co.

photos and process drawings provided in Attachments 2 - 5, these units are relatively small in size, with a primary chamber of approximately 50 to 260 cubic feet.. In contrast, drum reclamation furnaces as shown in the attachments, operate with chain conveyor systems that move 55-gallon steel drums continuously through a tunnel-design furnace, with an induced draft fan that continuously pulls ambient air from both the tunnel entrance and exit.

The typical drum reclamation furnace has a primary combustion chamber of 700 to 1200 cubic feet. Typical actual flow rates in the primary chamber generate air velocities of approximately 35 fps; a dramatically different environment than the more static, controlled primary chamber environment of a parts/rack reclamation unit.

As described in the Burn-off Oven Clarification Request Survey contained in the docket, typical batch cycles for parts/rack reclamation units vary from 2 to 24 hours. This combustion environment is in no way comparable to a drum reclamation furnace. Both the high air velocity and the mechanical conveyor movement result in higher generation of particulate matter, on a concentration basis, for a drum reclamation furnace.

RIPA was able to obtain results of limited source testing conducted at a typical drum reclamation furnace; the results for particulate matter are shown below in comparison to the proposed CISWI limits for burn-off ovens. This comparison demonstrates that the particulate matter emission rate for a drum reclamation furnace is well above the range of values identified in EPA’s MACT Floor calculations for burn-off ovens. This corroborates RIPA’s assertion that the data collection activities and resulting MACT floor calculations for the burn-off oven subcategory cannot be used to represent actual performance levels of drum reclamation furnaces.

EMISSIONS OF PARTICULATE MATTER (PM)		
SOURCE TEST RESULTS FROM DRUM RECLAMATION FURNACE	PROPOSED CISWI EMISSION LIMIT – BURN OFF OVEN CATEGORY	
	Existing Units	New Units
134.112 mg/dscm	33 mg/dscm	28 mg/dscm

Nitrogen Oxides and Carbon Monoxide – Emissions of NO_x and CO are related to the nature of the burners used for combustion, the amount of excess air used, and the flame temperature. A comparison is provided below of the typical burner capacity and operating temperatures for parts/rack reclamation units and drum reclamation units.

Parameter	Parts/Rack Reclamation Unit	Drum Reclamation Unit
Primary Chamber Burner Capacity	< 1 MMBtu/hr	8 – 18 MMBtu/hr
Primary Chamber Operating Temperature	800 – 900 °F	1200 – 1400 °F
Secondary Chamber Burner Capacity	< 1 MMBtu/hr	8 – 16 MMBtu/hr
Secondary Chamber Operating Temperature	1400 °F	1400 – 1800 °F

As shown in this comparison, parts/rack reclamation units operate at a much lower temperature in the primary chamber, and because they are operated in batch mode would be expected to generate less NOx than a drum reclamation furnace operating at a much higher temperature. In addition, NOx concentrations would be expected to be higher in a drum reclamation furnace due to the much greater excess air in the primary chamber, the result of the large amount of induced draft of ambient air from the open entrance and exit.

The overall burner capacity of both the primary and secondary combustion chamber in a drum reclamation furnace is an order of magnitude higher than the typical parts/rack reclamation unit. Burner operation may be modulated using manual or automatic control; however, in both scenarios the drum reclamation furnace operates on a continuous basis, with fluctuations in temperature and burner function as needed to respond to changes in the nature of the empty drums processed. Because parts/rack reclamation units operate in batch mode, the combustion characteristics of each batch can be more precisely controlled with respect to the burner air/fuel ratio. These factors would result in lower emissions of both NOx and CO on a concentration basis from a parts/rack reclamation unit.

Metal Compounds – Emissions of metal compounds including lead, cadmium and mercury are typically related to the presence of metals in the materials combusted, the combustion temperature, and the presence of chlorine. As described below, the nature of materials combusted is fundamentally different between parts/rack reclamation units and drum reclamation units.

Parts/Rack Reclamation Unit (from ROP)	**Drum Reclamation Unit**
Metal parts such as paint hooks and racks, electric motor armatures, transformer winding cores, and electroplating racks for use in their current form by burning off cured paint, plastisol (i.e., polyvinyl chloride and phthalate plasticizer), varnish, or unwanted parts such as plastic spacers or rubber grommets.	RCRA Empty Steel Drums – exterior coatings, interior coatings, gasket materials, residual prior contents

While it cannot be known whether the average metals content of materials combusted in a drum reclamation unit is higher or lower than the representative parts/rack reclamation unit, the two types of units are processing different materials with presumably different metal content characteristics.

With regard to the effect of operating temperatures on metals emissions, the table below shows a comparison of how metal compounds would be expected to volatilize in the primary chamber. A review of this data show that if lead is present it would not volatilize in a typical parts/rack reclamation unit, but would instead partition to ash. For this reason, lead emissions from a drum reclamation unit would be expected to be higher on a concentration basis.

Metal Compound	Volatility Temperature (from Combustion and Incineration Processes, Nieesen 2002)	Expected Metals Volatility in Primary Chamber	
		Parts/Rack Unit	Drum Unit
		800 – 900 °F	1200 – 1400 °F
Mercury	60.8 °F (16 °C)	Volatile	Volatile
Cadmium	420.8 °F (216 °C)	Volatile	Volatile
Lead	1180.6 °F (627 °C)	Not Volatile	Volatile

Given the substantial difference in the potential to emit and a massive difference in costs to control, we believe that the test data obtained from parts reclamation units cannot and must not be used as a model air emissions profile for the regulation of drum reclamation furnaces.

RIPA was able to obtain results of limited source testing conducted at a typical drum reclamation furnace; the results for lead and cadmium are shown below in comparison to the proposed CISWI limits for burn-off ovens. This comparison demonstrates that the lead and cadmium emission rates for a drum reclamation furnace are well above the range of values identified in EPA's MACT floor calculations for burn-off ovens. This corroborates RIPA's assertion that the data collection activities and resulting MACT Floor calculations for the burn-off oven category can not be used to represent actual performance levels of drum reclamation furnaces.

EMISSIONS OF LEAD AND CADMIUM			
POLLUTANT	SOURCE TEST RESULTS - DRUM RECLAMATION FURNACE	PROPOSED CISWI EMISSION LIMIT – BURN OFF OVEN CATEGORY	
		Existing Units	New Units
Lead	0.441 mg/dscm	0.041	0.029
Cadmium	0.00894 mg/dscm	0.0045	0.0032

<u>MACT Floor Calculations – Basis for Identifying Best Performing 12% of Sources</u>

As stated in the preamble, test data collected by EPA were used to identify the best performing 12% of facilities tested within each CISWI subcategory. These data were then used to calculate emissions limits for each of the target pollutants.

Only 10 test reports were used to compile data for MACT floor calculations in the burn-off subcategory and only a few of the test reports contained data on all the target pollutants. The number of test data reports (i.e., the number of pollutant measurements) used in calculating the MACT floor for burn-off ovens for each target pollutant was:

Particulate Matter	10
Hydrogen Chloride	2
Carbon Monoxide	10
Nitrogen Oxides	10
Sulfur Dioxide	9
Dioxins/Furans	2
Lead	2
Cadmium	2
Mercury	2

This means that for 5 of the 9 target pollutants, only 2 data reports were used to identify the top performing 12% of over 15,000 sources. This analysis clearly does not meet the requirements of Clean Air Act Section 129, as it is statistically impossible to assess the performance of such a large group with so few data reports, drawn from such a select number of units of only one type.

Economic Impact Analysis

Because EPA massively underestimated the number of affected operations, the estimated cost impact in aggregate is also severely underestimated. From EPA's Regulatory Impact Analysis (Table 3-1), costs are estimated as:

Table 3-1. Summary of Capital and Annual Costs for Existing CISWI Sources

Subcategory	Number of Affected Units	Capital Costs (Million of $2008)	Annualized Costs (Million of $2008)
Burn-off Ovens	36	5.284	3.199

A review of the ERG document available in the docket "Compliance Cost Analyses for Existing CISWI Units" shows that these costs were developed solely on the compliance equipment assumed to be required for MACT floor compliance by the 36 parts/rack reclamation units identified in EPA's database as affected units. These aggregate totals for category-wide compliance costs reflect no cost impacts from the estimated 36 drum reclamation units existing in the U.S.

A review of Table 1A from the ERG document reveals the number of control devices assumed to be required for known Burn Off Ovens (considering only 36 parts/rack reclamation units) to comply with the MACT floor requirements. This is summarized below.

Controls Required to Comply with MACT Floor – Total Inventory of 36 Burn Off Ovens (considering only parts/rack reclamation units)				
Pollutant	Fabric Filter	Packed Bed Scrubber	Afterburner Retrofit	SNCR
Cadmium				
CO			22	
HCl				
Lead				
Mercury				
NOx				21
PM	2			
SO2		2		
Dioxins				
TOTALS From Table 1A – Individual Facility Listing By Pollutant	2	2	22	21
TOTALS – From Table 1A Consolidated Summary Column	21	22	26	21

Considering the true estimated number of parts/rack reclamation units to be in excess of 15,000, the number of control devices that would be required is far in excess of these projections.

With respect to drum reclamation units, no MACT floor analysis has been performed to identify the actual controls that would be required for compliance. However, for comparison purposes, RIPA has evaluated what controls may be required to comply with the MACT floor as currently proposed for existing Burn Off Ovens. Based on input from qualified industry consultants, it is expected that each drum reclamation unit would be expected to require:

Minimum Controls

- Fabric Filter – for control of PM, lead and cadmium (must include installation of exhaust gas cooling – waste heat boiler or heat exchanger)
- Low NOx Burners – for control of NOx (as an alternative to SNCR)

Potential Additional Controls

- Afterburner retrofit – for control of CO
- Packed Bed Scrubber or Spray Dryer Equipment for Reagent Injection – for control of HCl and SO2
- Activated Carbon Injection – for control of dioxins and mercury

As shown in Table 2A from ERG's Compliance Cost Analysis, the costs for fabric filters, afterburner retrofit and packed bed scrubbers are a function of the exhaust flow rate of the combustion unit. As established above, parts/rack reclamation units range in size from 288 to 3127 dscfm, as compared to drum reclamation units with exhaust flow rates ranging from 12,000 to 30,000 dscfm. This difference results in much higher per facility costs for each of the control equipment components required.

Using similar methodology to the approach represented in ERG's Compliance Cost Analyses, RIPA estimates that the total capital investment would exceed $1,000,000 for the minimum control equipment described above. If additional controls are required the total capital investment could increase dramatically to approximately $2,000,000.

These costs are estimated per facility. Thus, assuming a total of 36 drum reclamation furnaces in the U.S., the aggregate capital cost impact would be between $36,000,000 and

$72,000,000. This impact is not contemplated in any of the assumptions used in the Regulatory Impact Analysis prepared by EPA.

Small Business Impacts

In the ERG document "Economic Analysis Inputs for Existing CISWI Units" available in the docket, Table 1 provides employee data for the facilities identified as burn-off ovens. As shown in the summary below, only 2 of the 17 business identified are small entities, and most have over 1000 company and/or facility employees. This is in sharp contrast to the drum reconditioning industry: most facilities operate with an average of 50 employees and many are designated as small businesses (up to $7 million revenue).

Facility ID	Number Company Employees	Number Facility Employees	Small Entity
FLAscend	> 1000	500-999	No
GAGreat Dane Trailers	>1000	100-499	No
IACNHAmerica	>1000	100-499	No
INWabashNational855	>1000	>1000	No
KSCNHWichita		>1000	No
KYCooperStandard	>1000	100-499	No
NDCNHAmerica	>1000	500-999	No
NECNHAmericaGrandIsland	>1000	>1000	No
OHWhirlpoolClyde	>1000	>1000	No
PACNHAmericaNewHolland	>1000	500-999	No
SCCCryovac	>1000	>1000	No
SCINVISTACamdenPlant	>1000	500-999	No
SCINVISTASpartanburg	>1000	100-499	No

TNVolvoPenta	100-499	100-499	Yes
TXMadix	500-999	100-499	No
VANewportNewsShipbuildingDryDock	>1000	>1000	No
VAQuadrantEPP	100-499	50-99	Yes

Costs for Alternative Disposal Method

In Section C of "Compliance Cost Analyses for Existing CISWI Units", EPA states:

> Certain CISWI units may have waste disposal alternatives other than combustion available to them. These alternatives may prove to be less costly than the controls and monitoring required for compliance with the proposed CISWI standards. For example, facilities currently using burn-off ovens may be able to utilize sand blast chambers or some alternate technology to clean their parts….
>
> For burn-off ovens, sandblasting was considered as an alternative disposal method. As shown in Table 7C, an estimated operational cost of $53.75 over 2000 hrs per year for each burn-off oven was assumed, with an additional 10 percent assumed for contingency costs. The result was an estimated flat rate of $118,250 per year to utilize an abrasive blasting service.

It must be emphasized that no such alternative disposal option exists for Drum Reclamation Units. As described above, Under U.S. DOT's Hazardous Materials Regulations, a condition of packaging reuse for hazmat service is that reconditioning includes: *"Cleaning to base material of construction, with all former contents, internal and external corrosion, and any external coatings and labels removed."* 49 CFR 173.28(c)(1)(i). Oxidation in a drum reclamation furnace, followed by shot blasting, achieves the DOT standard. No alternative mechanical process exists for cleaning these drums.

Drum reconditioning businesses represented by RIPA could neither absorb the projected initial capital cost of retrofitting their furnaces, nor sustain the annual O&M expenses, which would vary greatly by state. As a consequence, it is likely that these operations would be regulated out of business. The resulting loss of capacity to safely manage emptied industrial shipping containers would ripple through the tens of thousands of companies throughout the U.S. that rely on steel drums for shipping products. In most cases, there are no good alternatives to a steel drum, based upon safety and environmental considerations. The indirect costs on these other industries are likely to be large. Moreover, the negative impact on the environment as emptied containers accumulate would be significant.

Jobs Impact

RIPA's members are companies that provide essential, environmentally sound services to a wide variety of manufacturing, shipping, distributing and agricultural industries. An informal survey of RIPA's members reveals that furnace operations would likely cease at many, if not all, of its 32 furnace locations were the proposed standards and guidelines issued as final. RIPA estimates that over 1200 jobs would be directly lost within the reconditioning industry and several thousand more would be indirectly lost as suppliers and service providers shutter their operations. These job losses must be considered in assessing the economic impact of any final standards and guidelines.

Schedule for Promulgation

EPA has indicated its intention to issue the final CISWI rule by December 16, 2010, based at least in part on its understanding that it is subject to a court order to do so. However, neither the District Court order in the Sierra Club case[2], nor the appellate decision in the 2007 NRDC case discussed above, include a mandate for the issuance of a final rule under CAA §129 for CISWI's burn-off subcategory by any particular date. It

[2] *Sierra Club v. Jackson*, 1:01CV01537 (D.D.C. 2006).

simply is not there. The agency, therefore, should take the time necessary to gather the appropriate technical and economic data, and to consider the comments submitted by RIPA and many other parties.

As mentioned elsewhere in these comments, we do not believe the statutory requirements of the Clean Air Act have been followed in developing a rule that would impact drum reclamation furnaces. We find it impossible for the agency to select the best 12% of units for this (or any) category when so few facilities have been tested and when the agency failed to test a single drum reclamation furnace, despite having knowledge of their existence. No court order, even if there were one, would mandate non-compliance with the CAA requirements.

In addition, the Administrative Procedure Act, 5 U.S. Code 553(c) demands, "After consideration of the relevant material presented, the agency shall incorporate in the rules adopted a concise general statement of their basis and purpose." The agency cannot short-cut the time necessary to consider the material presented in comments because of a fictional sense of a court order demanding a final rule by a specific date, regardless of the comments. *See, e.g. American Mining Congress v. EPA*, 907 F.2d 1179, 1191 (D.C. Cir.1990) ("a court cannot excuse [EPA's] obligation to engage in reasoned decision making under the APA").

<u>Conclusion</u>

The business of collecting and processing emptied steel drums for reuse is one of the original green industries in the United States. Many of the firms engaged in this business have been in continuous operation for over a century, and a study by Franklin Associates shows the services they provide to literally tens of thousands of companies throughout the U.S. that use steel drums to transport various products reduces energy consumption, solid waste generation and greenhouse gas emissions.[3] This is because energy does not

[3] *"Life Cycle Inventory of Single-Trip and Multi-Trip Steel Drum Systems in the U.S., Europe, and Japan,"* Franklin Associates, January 1999.

have to expended to transform the collected package into usable scrap (e.g., shredding, baling) or for smelting, melting, and reforming the material into new, usable products. Reusable industrial packagings are simply reconditioned (e.g. cleaned, reformed and tested) in highly efficient processes so that they can be reused over and over again.

In this proposed rulemaking, EPA has made numerous technical, economic and data collection errors that render it wholly impracticable from a regulatory perspective. As we have shown, EPA has failed to provide a rationale for regulating drum reclamation furnaces in the "burn-off oven" category of CISWI. RIPA has provided technical and emission data showing that drum reclamation furnaces are fundamentally different than part or rack reclamation units and, therefore, should not be regulated as if they are equivalent operations. Further, we have shown that the agency's failure to provide a rationale for co-regulation of drum reclamation furnaces and part and rack reclamation units is legally flawed.

RIPA has shown that EPA failed to collect emissions data *from a single drum reclamation furnace* in the development of this proposed rulemaking. This fact alone should be sufficient to bring this regulatory effort to a halt. From where does EPA draw its authority – practically or legally - to regulate air emissions from the estimated 36 drum reclamation furnaces now operating in the U.S. without having the benefit of a single bit of emissions data? We believe the answer is that the agency does not have a basis to regulate these facilities at this time, and to do so would be irrational and illegal.

RIPA has also shown that the economic impact analysis developed by the agency is fatally flawed. EPA has vastly underestimated the number of facilities that would be affected in the burn-off oven category by many orders of magnitude. EPA asserts that the total number of affected units, i.e. part and rack reclamation units and drum reclamation furnaces, is 36. Since EPA failed to collect data from any drum reclamation units, we assume that none of the 36 drum reclamation furnaces were counted in this number, meaning that the agency analysis is off by at least one order of magnitude. However, we have been informed by industry sources that the actual number of parts and rack reclamation units exceeds 15,000! Clearly, EPA needs to go back to the drawing board and develop more responsible estimates of the number of affected units.

This failure to estimate reasonably the number of affected units has, without doubt, rendered useless the proposed economic impact analysis developed by the agency. RIPA estimates that the total capital investment required to comply with this proposed rulemaking would exceed $1,000,000 for installation of the minimum control equipment needed. If additional controls are required the total capital investment could approach or even exceed $2,000,000 per facility. Assuming that 36 drum reclamation furnaces are operating in the U.S., the aggregate capital cost impact ranges from about $36,000,000 to as much as $72,000,000. These enormous potential costs are not contemplated in any of the assumptions used in the Regulatory Impact Analysis prepared by EPA and would be devastating to businesses that are largely classified as "small" by the government.

Based upon RIPA's economic assumptions, this proposed rule would almost certainly push many if not all companies operating drum reclamation furnaces out of business. As such, the rule would result in the loss of at least 1,200 U.S. jobs in 21 states, not counting related indirect job losses in the industries served by steel drum reconditioners and who provide services to the steel drum reconditioning industry.

Importantly, RIPA has shown that EPA is not under any legal obligation to promulgate this rule, at this time.

For these reasons, RIPA respectfully asks EPA to bring to a halt efforts to regulate drum reclamation furnace operations under the instant CISWI rulemaking. If, after further review of the industry and data directly related thereto, the Agency determines some regulatory action is required, RIPA would be pleased to cooperate in this effort.

Please feel free to contact me if you require additional information about the steel drum reconditioning industry, or clarification of these comments.

Sincerely,

Paul W. Rankin

President

Attachments

Attachment 1	Industrial Commercial Waste Incineration, Regulatory Options, November 1998
Attachment 2	Photo: “Paint Stripping Furnace” *i.e.*, Parts and Rack Burn-off Oven, Pollution Control Products Co.
Attachment 3	Process Flow Diagram: “Controlled Pyrolysis Furnace” *i.e.*, Parts and Rack Burn-off Oven, Pollution Control Products Co.
Attachment 4	Photo: Drum Reclamation Furnace, RIPA
Attachment 5	Diagram: Drum Reclamation Furnace, RIPA

INDUSTRIAL COMMERCIAL WASTE INCINERATION

REGULATORY OPTIONS

November 1998

INDUSTRIAL COMMERCIAL WASTE INCINERATION (ICWI)
Regulatory Options
November 1998

Section 129 of the Clean Air Act directs the Environmental Protection Agency (EPA) to develop regulations for industrial and commercial waste incineration units (ICWI). This paper outlines the regulatory options which have been identified thus far in development of these regulations. Identification of regulatory options, however, is an on-going process. As additional information becomes available, various analyses are undertaken, and new ideas emerge. Regulatory options therefore expand and contract - new options are added and existing options abandoned - throughout the regulatory development process. Thus, options evolve as regulatory development proceeds, and the options identified at one point are usually different from those identified at another point. Accordingly, the regulatory options several months from now may differ in many respects from those identified in this paper.

Much of the work to date on development of regulations for ICWI has been devoted to analyzing data contained in two databases:

- **Inventory database** -- *a detailed listing of industrial and commercial combustion units derived from existing State and federal databases.*

- **Information collection request (ICR)/survey database** -- *responses from an information collection request (ICR) providing updated and detailed information for facilities identified in the inventory database.*

The inventory database was developed from information available from the AIRS (Aerometric Information Retrieval System) and OTAG (Ozone Transport Assessment Group) databases and then supplemented with information available from DOD (Department of Defense) and nineteen States who were not participants in OTAG or maintained additional databases outside AIRS. The resulting inventory database initially contained about 8,000 facilities believed to have one or more incinerator units.

An Information Collection Request (ICR) was developed and forwarded to these facilities to collect additional information. The responses were entered into a separate database--the ICR Survey database.

The ICR survey database indicates that most of the incinerator units identified in the inventory database have been shut down or otherwise do not exist. In addition, a large number of incinerator units were found to be burning solid wastes covered by other regulations (e.g., hospital and infectious medical waste, municipal waste, sewage sludge, and hazardous waste). Taking all of these factors into consideration, the best current estimate of the number of ICWI incinerator units in the inventory and ICR databases that are in operation is about 1,200. This estimate could increase or decrease as more information becomes available.

The inventory and ICR databases represent most of the wood, wood waste, and drum and parts reclaimer units currently operating in the U.S., and over 50% of the remaining incineration subcategories, with the exception of poultry farm incinerators. Poultry farm units, typically rated at <100 lb/hr, have probably never been regulated or permitted due to their small size. Although not all incineration units are captured within the databases, the databases are considered at this point as representative of the cross-section of incinerators and provide a sufficient basis to proceed with regulatory development.

Another database, an emissions database, is currently under development. This database will contain hazardous air pollutant (HAP) emission data compiled from emission source tests at ICWI units. Collection of HAP emission data will continue throughout the regulatory development process, but, by the end of this year, the emission database will contain all of the HAP emission data from ICWI units which have been identified. This includes both emission tests contained in state files as well as emission tests in the possession of owners and operators of ICWI units. As a result, the information in this database will begin to factor into the identification and consideration of regulatory options.

Based on the information in the inventory and the ICR survey databases, four potential ICWI subcategories have been identified at this point:

- **Wood and Other Biomass Waste Incinerators**

- **Pathological Waste Incinerators**

- **Drum and Parts Reclaimer Incinerators**

- **Miscellaneous Industrial and Commercial Waste Incinerators**

Possible descriptions of each potential subcategory are summarized in Table 1 and presented in Attachment A. Whether ICWI should be divided into subcategories for regulation or the number of subcategories that may be appropriate remains uncertain. As regulatory development proceeds, additional subcategories may be added or these four subcategories may be recombined into a single category with no regulatory subcategorization. Also, although several subcategories are under consideration at this point in time, the ICWI regulation is currently envisioned as a single rulemaking (i.e., a single regulation).

Based on the information currently available, it appears that most existing ICWI units have minimal or no control devices in place. The exception may be drum and parts reclaimer incinerators (i.e., furnaces and burnoff ovens) which appear to operate thermal oxidizers. A number of ICWI units may utilize good combustion practices, however. Good combustion practices generally consist of:

- Firebox residence time, temperature, and turbulence
- Stoichiometric ratio (air/waste)
- Combustion air and waste distribution

- # Operator training
- # Waste composition and handling
- # Maintenance practices

If appropriate, good combustion might serve as a basis for regulation through requirements for burner and air control adjustments, operator training, waste quality and handling practices, documented operating and maintenance procedures, and routinely scheduled inspections and maintenance. Because of the variety of unit designs and waste types among ICWI units, it may be appropriate to consider good combustion practices for each potential subcategory. On the other hand, if there are practical and general good combustion practices applicable to all ICWI units, no subcategorization of ICWI may be appropriate and a single set of regulatory requirements based on good combustion practices may be considered.

One issue associated with operator training is the definition of an "operator". At this point, the following definition is under consideration: an operator means an individual(s) whose work duties include the operation, evaluation, and/or adjustment of the combustion system. Additional specificity could be necessary, however, to distinguish "operators" from mechanics, engineers, and others who may occasionally evaluate or adjust the combustion system.

Another issue associated with operator training is how prescriptive possible regulatory requirements might be. This includes details such as:

- # Training and qualification criteria
- # Training programs and qualification exams
- # Training program materials and documentation of qualification

Again, because of the variety of unit designs and waste types among ICWI units, it may be appropriate to consider operator training requirements for each potential subcategory. On the other hand, it may be appropriate to consider a general requirement for all ICWI units that owners and operators of ICWI units develop and implement an operator training program tailored to their equipment and site.

Waste composition and handling practices may also be appropriate for consideration. Such practices might consist of handling or separation procedures for some types of waste materials. Alternatively, given the diversity of wastes and the differences in design of ICWI units, it may be appropriate to consider a general requirement that owners and operators develop a waste handling/separation program, tailored to their site, focused on certain wastes or waste contaminants. These practices could be supplemented by waste accounting and record keeping.

Finally, maintenance practices may also be appropriate for consideration. As with operator training, however, because of the variety of unit designs and waste types among ICWI units, it may be appropriate to consider maintenance practice requirements for each potential subcategory. Conversely, it may be appropriate to consider a general requirement for ICWI units that owners and operators develop an equipment maintenance program tailored to their equipment and their site.

TABLE 1. POTENTIAL SUBCATEGORIES

POTENTIAL SUB-CATEGORY	POTENTIAL GROUPING	MATERIAL COMBUSTED	UNITS IN DATA BASE	FLOOR LEVEL OF CONTROL	REGULATORY ALTERNATIVES ABOVE FLOOR
Wood and Other Biomass Wastes	Milled and Engineered Wood Wastes	Wastes and residues resulting from wood-working	About 20 units for all groupings of wood and other biomass waste	Undetermined at this time; however, few of the units surveyed report controls and it may not be possible to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, ESPs, afterburners, and secondary combustors
Wood and Other Biomass Wastes	Harvested Wood and Biomass Wastes	Wastes and residues resulting from land clearing, orchard, silviculture, nursery, green-house, agricultural, and forest management activities and sawmill operations	(See above)	Undetermined at this time; however, few of the units surveyed report controls and it may not be possible to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, ESPs, afterburners, and secondary combustors
Wood and Other Biomass Wastes	Construction, Demolition, and Treated Wood Wastes	Wastes and residues resulting from: (1) the construction, remodeling, repairing, and demolition of individual residences, commercial buildings, and other structures, and (2) the treatment of wood products that are impregnated or otherwise treated with various preservatives for the purpose of protecting or other-wise extending the structural properties of the wood	(See above)	Undetermined at this time; however, few of the units surveyed report controls and it may not be possible to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, ESPs, afterburners, and secondary combustors

TABLE 1. POTENTIAL SUBCATEGORIES (Continued)

POTENTIAL SUB-CATEGORY	POTENTIAL GROUPING	MATERIAL COMBUSTED	UNITS IN DATA BASE	FLOOR LEVEL OF CONTROL	REGULATORY ALTERNATIVES ABOVE FLOOR
Pathological Waste Incinerators	<100 lb/hr	Animal remains primarily at poultry farms; small animal crematories, veterinary centers, humane societies, and pharmaceutical companies	About 600 units for all groupings of pathological waste	Undetermined at this time; however, it appears no units operate controls and it may not be possible to identify a floor for existing units or new units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, and ESPs
Pathological Waste Incinerators	100 to 500 lb/hr	Animal and human remains primarily at human crematories; also animal crematories, veterinary clinics, humane societies, and pharmaceutical companies	(See above)	Undetermined at this time; however, it appears very few units operate controls and it may not be possible to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, and ESPs
Pathological Waste Incinerators	>500 lb/hr	Animal remains primarily at university research hospitals, large animal control facilities, and large pharmaceutical research facilities	(See above)	Undetermined at this time; however, it appears very few units operate controls and it may not be possible to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers, and ESPs

TABLE 1. POTENTIAL SUBCATEGORIES (Continued)

POTENTIAL SUB-CATEGORY	POTENTIAL GROUPING	MATERIAL COMBUSTED	UNITS IN DATA BASE	FLOOR LEVEL OF CONTROL	REGULATORY ALTERNATIVES ABOVE FLOOR
Drum Reclaimer Incinerators	Undetermined	Incinerators used to reclaim steel containers (e.g., 55 gallon drums) for re-use or to prepare them for recycling by burning or pyrolyzing interior and exterior container coatings and residues (containers must be empty as defined by RCRA prior to processing)	44	Undetermined at this time; however, a number of units operate thermal oxidizers and this may serve to identify a floor for existing and new units	Possibilities include good combustion practices, spray dryers, wet scrubbers, ESPs, and fabric filters
Parts Reclaimer Incinerators	Undetermined	Incinerators used to reclaim metal parts such as paint hooks and racks, electric motor armatures, transformer winding cores, and electroplating racks for use in their current form by burning off cured paint, plastisol (i.e., polyvinyl chloride and phthalate plasticizer), varnish, or unwanted parts such as plastic spacers or rubber grommets	332	Undetermined at this time; however, a number of units operate thermal oxidizers and this may serve to identify a floor for existing and new units	Possibilities include good combustion practices, spray dryers, wet scrubbers, and fabric filters
Miscellaneous Industrial and Commercial Waste Incinerators	Undetermined	By-products of industrial operations (including combinations with less that 30% municipal-type solid waste or less than 10% medical waste), environmental control device sludges, waste by-products, maintenance residues, off-test and out-dated materials, and packaging materials	203	Undetermined at this time; however, 12% of the units surveyed report controls for one or more of the following pollutants: PM, NOx, SOx, HCl, and CO and this may serve to identify a floor for existing units	Possibilities include good combustion practices, source separation, particulate controls, scrubbers and ESPs

ATTACHMENT A

POTENTIAL SUBCATEGORY DEFINITION SHEETS

POTENTIAL SUBCATEGORY: Wood and Other Biomass Waste Incinerators

POPULATION STATISTICS:

Twenty two units were identified within the database as combusting various types of wood materials. The identified incineration units are believed to reasonably represent the domestic population of wood incinerators and to include the bulk of existing units. The geographic coverage of the database includes all States where such units would be expected to be concentrated. Due to the economic incentive to burn wood materials as a fuel to provide energy, the population of wood incinerators may be static or in decline.

All seven units identified as incineration units combusting various materials consisting of wood are small to very small in size. These units were also found to have no specific pollution control and were operating infrequently on an as needed or batch basis.

Of the 18 units identified in the database as combusting biomass materials (e.g., materials associated with agricultural activities), no units were found to be incinerators actually combusting non-wood biomass agricultural types of materials. Incineration units burning biomass waste are probably few in number.

MATERIALS COMBUSTED:

Milled Solid and Engineered Wood Wastes. Wastes and residues resulting from woodworking manufacturing activities. The specific characteristics of these materials vary depending on the specie of wood (e.g., pine, oak, and poplar) and the engineered wood (e.g. particle board, plywood, and fiberboard) in question.

Harvested Wood and Biomass Wastes. Wastes and residues resulting from land clearing, orchard, silviculture, nursery, greenhouse, agricultural, and forest management activities and sawmill operations. The combustion characteristics of these materials vary, and the moisture content may range from 20 to 60%. Some wastes may contain residual chemical compounds from pesticide and herbicide treatment of vegetation.

Construction, Demolition, and Treated Wood Wastes. *Construction wastes* are wastes and residues resulting from the construction, remodeling, and repairing of individual residences, commercial buildings, and other structures. The composition is variable and generally includes pallets, forming and framing lumber, treated lumber, shingles, tar-based products, plastics, plaster, wallboard, insulation material, and plumbing, heating, and electrical parts. *Demolition wastes* are generally the same as construction wastes but may include broken glass, painted or contaminated lumber, chemically treated lumber, white goods, and reinforcing steel. *Treated wood wastes* are wastes and residues resulting from the treatment of wood products that are impregnated or otherwise treated with various preservatives (e.g., creosote, copper compounds, arsenic compounds, and pentachlorophenol) for the purpose of protecting or otherwise extending the structural properties of the wood. The composition is variable and contains such contaminants as organic and inorganic chemicals, metals, oils, paint, solvents, and pigments.

COMBUSTION DEVICE:

Includes single and multi-chamber and fluidized bed incinerators of various sizes, and also open burning, air curtain incinerators and teepees. The types of waste typically combusted in each of these combustion devices is illustrated in the following matrix.

COMBUSTION DEVICE	WOOD AND WOOD WASTE TYPE		
	Milled solid and engineered wood	Harvested wood and biomass	Construction, demolition, and treated
Open burning		✔	
Air curtain		✔	
Teepee	✔		
Incinerator	✔		✔

FLOOR LEVEL OF CONTROL:

It may be difficult to identify a MACT floor, based on the absence of any control devices among those units found in the inventory and survey databases. State regulations and permits were not found for these units, except for several opacity limits.

REGULATORY ALTERNATIVES ABOVE FLOOR:

Possible above-the-floor alternaitves are yet to be evaluated, but good combustion practices, source separation, particulate controls, scrubbers, ESPs, afterburners, and secondary combustors may be appropriate for consideration.

A list of wood and wood waste facilities, unit types, and controls is presented below.

ID Number	Facility Name	Unit Type	Type of Controls
450130037	Malphrus Construction #2	Air Curtain	None
220330013	La Skid and Pallet	Air Curtain	None
19059W350	Stylecraft, Inc	Incinerator	None
19059W350	Stylecraft, Inc	Incinerator	None
19059W350	Stylecraft, Inc	Incinerator	None
300670003	Park Lumber Company	Teepee	None
470830063	Imperial Fabricating Company	Incinerator	None
470890001	Burroughs-Ross Colville	Open Burning	None

47163A280	City of Kingsport	Air Curtain	None
47005A246	City of Alcoa	Air Curtain	None
120990233	Marks Landscaping & Paving	Air Curtain	None
530470015	Zosel Lumber	Incinerator	None
511750050	Atlantic Wood	Air Curtain	None
160490002	L.D. McFarland	Air Curtain	None
170312435	Service Products Inc	Incinerator	None
390775014	R.R. Donnelley & Sons	Incinerator	None
482010110	Cagle Constructors	Air Curtain	None
482010110	Cagle Constructors	Air Curtain	None
482010110	Cagle Constructors	Air Curtain	None
550750390	Fruday Canning Corp	Incinerator	None

POTENTIAL SUBCATEGORY: Pathological Waste Incinerators

POPULATION STATISTICS:

Less than 100 lb/hr - possibly several thousand units, however, many of these units are not permitted or registered and therefore are under-represented in the database.

Typical user profile **-** primarily poultry farmers; secondary small animal crematories, veterinary centers, humane societies, and pharmaceutical companies.

Annual operating hours per unit **-** Most of these units operate "as needed" and, as a result, operate on an intermittent basis.

Typical waste profile **-** primarily poultry carcasses; secondarily small animal remains, the bags/containers used to collect and transport the waste material, and animal bedding.

Typical design profile **-** for poultry units: single chamber systems; fueled with #2 fuel oil, LP gas, or natural gas; no air or temperature controls; manual operating system; batch fed.

100 to 500 lb/hr - possibly 500 units

Typical user profile **-** primarily human crematories; secondarily animal crematories; veterinary clinics; humane societies; and pharmaceutical companies.

Annual operating hours per unit **-** 700

Typical waste profile **-** primarily human remains and associated containers; secondarily animal remains, the bags/containers used to collect and transport the waste material, and animal bedding.

Typical design profile - retort and in-line systems; fueled with natural gas, LP gas, or #2 fuel oil; limited air controls and temperature controls; manual control system; batch fed.

Over 500 lb/hr - possibly 100 units

Typical user profile **-** primarily animal disposal systems for hospitals, animal control facilities, and research facilities.

Annual operating hours per unit **-** 1000

Typical waste profile **-** primarily animal remains, the bags/containers used to contain them, and animal bedding.

Typical design profile **-** multi-chamber design; fueled with natural gas, LP gas, or #2 fuel oil; air and temperature controls; automatic control systems; mechanical feed with intermittent charging.

MATERIALS COMBUSTED:

Pathological waste consists of human or animal remains, anatomical parts and/or tissue, the bags/containers used to collect and transport the waste material, and animal bedding.

COMBUSTION DEVICE:

These combustors are generally single or multiple chamber designs. They are fueled with fossil fuel and operate with excess air. The wastes are fed as single batches or intermittently fed.

A crematory incinerator is a pathological waste incinerator which is primarily used to reduce single batches of human or animal remains and their containers (pathological waste) to their basic elements with the intent of recovering the cremated remains for memorialization purposes.

Pathological waste combustors can be classified into the following design categories:

Retort incinerators - multiple chamber incinerator designs in which the secondary chamber is located directly beneath the primary chamber. The purpose of this configuration is that the hearth of the primary chamber is heated by the products of combustion flowing through the secondary chamber.

In-line incinerators - similar to the retort design in that the chambers share a common wall. In the in-line design the secondary chamber is not underneath the hearth, but is behind the primary chamber.

Multi-chamber incinerators - multiple chamber incinerator designs consisting of separated primary and secondary chambers. The secondary chamber is generally located above the primary chamber with the two chambers having no common ceilings, hearth, or walls between them. The temperature in the secondary chamber has little or no influence on the primary chamber temperature.

FLOOR LEVEL OF CONTROL (EXISTING):

Typically these combustors have no add-on emission control devices, thus it may be very difficult to identify a MACT floor for existing units. Good combustion practice may or may not serve to identify a MACT floor.

REGULATORY ALTERNATIVES ABOVE FLOOR:

CONTROL OPTION	PM[a]		Op[b]	SO_2	HCl	NOx	CO	Pb	Cd	Hg	D/F	COMMENTS
	f	t										
No control												Many incinerators are uncontrolled due to their small size, absence of regulations, and/or absence of demonstrated cost effective control technology.
Good combustion design and practice	**X**	**X**	**X**				**X**				**X**	Control of temperature and feed rate and use of supplemental combustion/secondary chamber.
Baghouse/ESP	**X**	**X**	**X**					**X**	**X**	**X**		There are no baghouse systems being manufactured for units this small. ESPs tend to be extremely expensive for small incinerator applications.
Thermal oxidizer/afterburner			**X**									Only applicable to single chamber units.
Cyclone/multiclone		**X**	**X**									Probably not very effective on these units because particle sizes are small.
Wet scrubber (low pressure or venturi)		**X**	**X**	**X**	**X**							Some control of metals may occur, such as mercury.
Dry acid gas/PM scrubbing system, including baghouse (DSI, dry sorbent injection system)	**X**	**X**	**X**	**X**	**X**			**X**	**X**	**X**	**X**	Can be a highly effective control system, although cost may be prohibitive, especially for small units like these. Carbon injection for Hg control can be added at little incremental cost.
Semi-dry acid gas/PM scrubbing system (spray dryer and baghouse)	**X**	**X**	**X**	**X**	**X**			**X**	**X**	**X**	**X**	Performs even better than DSI system, but costs are significantly higher. Carbon injection for Hg control can be added at little incremental cost.
Low-NOx burners, combustion chamber design, SNCR (ammonia injection)						**X**						Applicability of low-NOx burners to these types of small incinerators is questionable due to high excess air requirements.

[a]f = fine particulate matter; t = total particulate matter. [b]Op = opacity

POTENTIAL SUBCATEGORY: Drum Reclaimer Incinerators

POPULATION STATISTICS:

There are 38 facilities with 44 units in the database. In recent years steel drum production rates have remained unchanged and the number of drum reclamation furnaces is not expected to increase.

MATERIALS COMBUSTED:

The drum reclaimer furnace is used to reclaim steel containers, most often 55-gallon drums, for reuse. Drums are prepared for cleaning by abrasive shot blasting by being processed through the furnace, where interior and exterior coatings and residues are burned or pyrolyzed. Drums must be empty as defined by RCRA prior to furnace processing, and thus, not subject to Section 3005 permitting requirements. Natural gas is most often fired as the primary fuel in drum furnaces.

COMBUSTION DEVICE:

The typical drum reclaimer furnace is a semi-continuous tunnel furnace with heat inputs from 1.2 MMBtu/hr to 15.6 MMBtu/hr.

FLOOR LEVEL OF CONTROL:

Based on the inventory database, it is possible that the use of thermal oxidation could serve to identify a MACT floor.

REGULATORY ALTERNATIVES ABOVE FLOOR:

Since the floor control does not control acid gases, a spray dryer or wet scrubber may be considered. Similarly, Cd and Pb are not controlled in a thermal oxidizer and an ESP or fabric filter may be considered.

POTENTIAL SUBCATEGORY: Parts Reclaimer Incinerators

POPULATION STATISTICS:

There are 332 units in the database.

MATERIALS COMBUSTED:

This type of incinerator is used to reclaim metal parts for reuse in their current form. Coatings such as cured paint, plastisol, or varnish or unwanted parts such as plastic spacers or rubber grommets are burned off a wide variety of metal parts in these units. Plastisol coatings are comprised of polyvinyl chloride and phthalate plasticizer. Plastisol and paint both may contain heavy metal pigments. Metal parts fed to these primarily batch units include paint hooks/racks, electric motor armatures, transformer winding cores, and electroplating racks.

COMBUSTION DEVICE:

Parts reclaimer burnoff units are typically small, batch, fossil fuel-fired units. The database shows a range of heat inputs from 0.2 MMBtu/hr to 3.7 MMBtu/hr. They are often called burnoff ovens or pyrolysis units rather than termed "incinerators". Operations consist of loading the cold burnoff oven with metal parts, igniting the thermal oxidizer, if present, and main burner (both usually natural gas-fired), and allowing the combustible coating or part to pyrolyze into an fragile ash-like material (often over a period of hours) which may be then mechanically removed or abrasive-blasted off the metal part. Because of the wide variety of parts recycled in these units, facility size varies widely, from small electric motor repair shops to large automobile assembly plants.

FLOOR LEVEL OF CONTROL:

Based on both the inventory and survey databases, it is possible that the use of thermal oxidation might serve to identify a MACT floor for parts reclaimer burnoff units. Practices such as thermal oxidizer preheat and the removal of excess combustible materials (e.g., paper, rope, cloth, and visibly loose coatings/parts) may also serve to identify a MACT floor.

REGULATORY ALTERNATIVES ABOVE FLOOR:

The database lists a number of units controlled by a wet scrubber or a fabric filter in addition to a thermal oxidizer. Control alternatives above the floor might also include spray dryers and good combustion practices.

A summary of control devices for parts reclaimer burnoff units in the databases is presented below.

Air Pollution Control Devices for Parts Reclaimer Units listed in the ICR survey database			
ICR Database Control Device Code(s)	Description of Control Device/ Technique	Number of Units With Device	Percent of Total Units
019	Catalytic Afterburner	1	<1%
021	Direct Flame Afterburner	42	13%
022	Direct Flame Afterburner	6	2%
025	Staged Combustion	1	<1%
076	Multiple Cyclone w/o Flyash Reinjection	2	<1%
086	Water Curtain	3	1%
101	High Efficiency Particulate Air Filter	1	<1%
212	Air to Fuel Ratio Control	2	<1%
021 & 021	Direct Flame Afterburner	1	<1%
021 & 025	Direct Flame Afterburner & Staged Combustion	3	1%
021 & 028	Direct Flame Afterburner & Steam Injection	1	<1%
022 & 022	Direct Flame Afterburner	2	<1%
029 & 212	Low Excess Air & Air to Fuel Ratio Control	1	<1%
206 & 212	Low NOx Burners & Air to Fuel Ratio Control	2	<1%
021 & 028 & 025	Direct Flame Afterburner & Steam Injection & Staged Combustion	1	<1%
024 & 206 & 212	Mod. Furnace & Low NOx Burners & A to F Ratio	2	<1%
---	Approximate units not listed	261	79%

Air Pollution Control Devices for Parts Reclaimer Units listed in the inventory database			
CODE(S)	DESCRIPTION	Number	Percent
000	none	38	11%
002	Wet Scrubber - medium efficiency	1	<1%
003	Wet Scrubber - low efficiency	1	<1%
020	Catalytic Afterburner	2	<1%
021	Direct Flame Afterburner	66	20%
022	Direct Flame Afterburner	4	1%
024	Modified Furnace/Burner Design	1	<1%
078	Baffle	1	<1%
099	Other Devices	1	<1%
101	High Efficiency Particulate Air Filter	1	<1%
256	No code description available (unknown)	1	<1%
021 & 002	Direct Flame Afterburner & Wet Scrubber	1	<1%
021 & 003	Direct Flame Afterburner & Wet Scrubber	1	<1%
021 & 004	Direct Flame Afterburner & Gravity Collector	1	<1%
021 & 006	Direct Flame Afterburner	3	1%
021 & 016	Direct Flame Afterburner & Fabric Filter	1	<1%
021 & 028	Direct Flame Afterburner & Steam Injection	1	<1%
021 & 033	Direct Flame Afterburner	1	<1%
021 & 099	Direct Flame Afterburner	3	1%
021 & 020 & 016	Direct Flame Afterburner & Catalytic Afterburner & Fabric Filter	1	<1%

Air Pollution Control Devices for Parts Reclaimer Units listed in the inventory database			
CODE(S)	DESCRIPTION	Number	Percent
021 & 016 & 053	Direct Flame Afterburner & Fabric Filter & Venturi Scrubber	1	<1%
---	Approximate units not listed	201	61%

POTENTIAL SUBCATEGORY: Miscellaneous Industrial and Commercial Waste Incinerators

POPULATION STATISTICS:

Nationwide, there are 203 units in this potential subcategory. This includes incinerators in the twenty four (24) Standard Industrial Classification (SIC) groupings including the following: 13, 20, 22, 23, 24, 26, 28, 29, 30, 33, 34, 35,36, 37, 42, 46, 49, 51, 55, 73, 75, 87, 92, 97. These SIC groupings include the following industries:

Aircraft
Catalyst manufacturing
Government/municipality
Industrial organic and inorganic chemicals
Metal products
Oil and gas
Petrochemical
Photo processing
Pharmaceutical
Tire and rubber

Incinerators in this potential subcategory are located in 29 states as follows:

Arkansas (4), Alabama (2), California (21), Connecticut (9), Georgia (2), Iowa (6), Idaho (1), Illinois (3), Indiana (11), Kansas (1), Louisiana (13), Massachusetts (6), Maine (3), Michigan (13), North Carolina (9), North Dakota (2), Nebraska (2), New Jersey (7), Ohio (5), Pennsylvania (15), Puerto Rico (12), South Carolina (8), Tennessee (8), Texas (36), Virginia (9), Washington (6), Wisconsin (5), West Virginia (2).

MATERIAL COMBUSTED:

Byproducts of industrial operations, including combinations with less that 30% trash or less than 10% medical waste, environmental control device sludges, industrial process biosolids, waste byproducts, maintenance residues, off-test and out-dated materials, and packaging materials. Some of the waste descriptions mention the following materials:

Aqueous waste, commercial and industrial wastes, decorative laminate/cast polymer scrap, industrial sludge, industrial wastewater sludge, liquid wastes, medical waste (less than 10 percent of total feed), municipal solid waste (below 30 percent of feed), plastics, waste oil, pathological wastes, finishing wastes and paint wastes.

Attached is a list of the wastes burned and, as shown, no particular waste or wastes predominates.

COMBUSTION DEVICE:

All types of incinerators are used in this potential subcategory, including, but not limited to, single and multiple chamber (including multiple hearth), fluid bed, rotary kilns, and tray types. The breakdown of units is as follows:

Multiple Chamber	45.2%
Single Chamber	25.4%
Rotary	9.7%
Fluidized Bed	2.3%
Otherwise classified	1.4%
Unclassified	16.0%

A more detailed list of combustion devices is attached.

Air pollution control devices are generally add-on units. The database contains information on controls device on 58 of 203 units. Of these 58 units, the database indicates that they were equipped with 124 control devices: 45 units have control devices for particulates (58%), 25 units have controls for CO (32%), 17 units have SOx control devices (22%), 20 units have devices for controlling NOx (26%) and 20 have control devices for HCl (26%). Many of the 58 units with controls appear to have redundant controls; however, this may actually be multiple incinerator units which are not accurately depicted in the database.

PM control equipment listed in the database include wet scrubbers, wet cyclone separators, venturi scrubbers, single cyclones, packed columns, multiple cyclones, mist eliminators, impingement plate scrubbers, ESP, afterburners, chemical neutralization, and fabric filters.

CO control equipment listed in the database include air/fuel ratio control, afterburners, and staged combustion.

SOx control equipment listed in the database include venturi scrubbers, sodium alkali scrubbing systems, packed absorption, mist eliminators, impingement plate scrubbers, sorbent injection, chemical neutralization, and alkalized fly ash scrubbers.

NOx control equipment listed in the database include air/fuel ratio control, ammonia injection, chemical neutralization, impingement plate scrubbers, low NOx burners, low excess air firing, packed absorption column, staged combustion, and venturi scrubbers.

HCl control equipment listed in the database include wet scrubbers, venturi scrubbers, packed columns, mist eliminators, sorbent injection, chemical neutralization, and flyash alkaline scrubbing.

A further breakout of the air pollution control devices is attached.

MACT FLOOR:

Although more than 12 percent of the units have some types of controls, there is also a large percentage with no control. Significant numbers of units (i.e. more than 12 percent) reported some type of control for particulates, SO_2, HCl, NOx, or CO. The analysis of the data is incomplete, and it is unknown at this point how many units control multiple pollutants. Control for one or more of these pollutants could serve to identify a MACT floor.

REGULATORY ALTERNATIVES ABOVE FLOOR:

Possibilities include good combustion practices, source separation, particulate controls, scrubbers, and ESPs.

LIST OF MISCELLANEOUS INDUSTRIAL AND COMMERCIAL WASTE DESCRIPTIONS, NUMBER OF UNITS, AND PERCENTAGE OF UNITS IN DATABASE

1,4 butanediol heavy ends, 1, 0.42%
5% office paper, 95% paint sweepings and paint booth, 1, 0.42%
50-500 ppm PCB's/other (unidentified), ,1 0.42%
98% water, 2% anti-static liquid mixed with water, 1, 0.42%
Activated sludge from a pharmaceutical manufacturing plant wastewater treatment, 1, 0.42%
Aniline/other (unidentified), 1, 0.42%
Biological secondary sludge from aerobic treatment of industrial wastewater, 1, 0.42%
By-product waste, 1, 0.42%
Carbon black, 2, 0.84%
Coal tar waste/mixed industrial, 1, 0.42%
Confidential papers, 1, 0.42%
Contaminated trash from ammunition production lines, 1, 0.42%
Coproduct of partial acidation process, 1, 0.42%
Decorative laminate/cast polymer scrap, 1, 0.42%
Diesel fuel, 2, 0.84%
Disposal of pyrophoric samples, 1, 0.42%
Distillate from reactors containing approximately 7 NT % TOC, 1, 0.42%
Distillate or water by-product generated by condensation, 1, 0.42%
Ethyl acetate isopropanol, 1, 0.42%
Fabric scraps and lint, 1, 0.42%
Fiber paint booth filters & paper waste ,1, 0.42%
Fiberglass overspray filters loaded with overspray from finish system ,1, 0.42%
Fibers waste, 2, 0.84%
Fumes from reactors, 1, 0.42%
Gauzes, dispensary wastes, oily rags, floor sweepings, plastics, paper, and cardboard, 1, 0.42%
Illegal drugs and combustible contraband, 1, 0.42%
Industrial sludge, 1, 0.42%
Industrial solid waste (non-hazardous) ,1, 0.42%
Industrial waste materials, 1, 0.42%
Industrial waste/waste oil ,1, 0.42%
Industrial wastewater sludge, 6, 2.52%
Industrial wastewater sludge from bulk pharma-chemical manufacturing, 1, 0.42%
Lacquer dust from spray booth clean up as well as scrapings and filters, 1, 0.42%
Lead-free, chrome- free paint sludge (~10% solvent, ~90% solids), 1, 0.42%
Liquid hydrocarbon wastes containing salts and catalyst, 1, 0.42%
Liquid waste from air oxidation process, 1, 0.42%
LPG, 10 ,4.20%
Medical waste, 1, 0.42%
Microfiche (15%), paper (5%), and Mylar/mixed, 1, 0.42%
Mineral spirits fumes burned off without condensation, 2, 0.84%
Mixture containing 2/3 common trash, 1/3 non-hazardous chemicals (plastics, foam etc.), 1, 0.42%
Mixture of combustible waste such as non-recycled paper, cardboard carton, floor sweepings, 1, 0.42%
Molded paper articles containing nitrocellulose, 1, 0.42%
Molded paper articles containing nitrocellulose, 1, 0.42%
Multiple effect evaporator concentrate; concentrated blowdown from cooling tower, 1, 0.42%
Municipal/commercial solid waste: type 0 - trash, 3, 1.26%
N-methyl pyrrolidine residue, 1, 0.42%
Natural gas, 43, 18.07%
NCGS from pulping operations, 1, 0.42%
Nitric acid fumes as No 3 and NO 2, 2, 0.84%
No. 2 distillate, 15, 6.30%

No. 6 residual oil, 1, 0.42%
Non-hazardous industrial solid waste, including off-spec pharmaceutical and other, 1, 0.42%
Non-hazardous liquid distillates generated from pioneer's, 1, 0.42%
Non-hazardous, non-RCRA, non-DOT regulated polyols, 1, 0.42%
Off spec pharmaceutical products & packaging components, 1, 0.42%
Off-gas from air oxidation process, storage tank vents, distillation vents, 1, 0.42%
Off-specification diaper raw materials and trim waste, paper, corrugated cartons, plastic, 1, 0.42%
Oil filters & process filters oil & gas, 1, 0.42%
Oil filters, oil field trash, process filters ,1, 0.42%
Oil soaked pads - oil absorbent bags from floor drains, 1, 0.42%
Oily absorbents used for soaking up spilled motor and hydraulic oils, 1, 0.42%
Organic fumes from condensation reaction of unsaturated polyester resin, 1, 0.42%
Oxidized waxes and petroleum, 1, 0.42%
Paint booth filters & paint dust, 1, 0.42%
Paint both filters containing cured 2-part urethane paint; floor sweepings, 1 ,0.42%
Paint filters and varnish dust, 1, 0.42%
Pallets, 2, 0.84%
Paper mill sludge from waste treatment plant-deink tissue mill, 1, 0.42%
Paper slurry containing nitrocellulose, 2 ,0.84%
Pathological: animal remains, 1, 0.42%
Petrochemical process gas, 1, 0.42%
Phosphate cleaner & paint waste, 1, 0.42%
Phosphate cleaner waste, 1, 0.42%
Plastics ,5, 2.10%
Polypropylene carpet backing, 1, 0.42%
Process off-gas from herbicide production, 1, 0.42%
Process wax composed of fillers and resins, 1, 0.42%
Pulp mill non-condensible gases , 1, 0.42%
PVC/styrene/abs/hdpe/ldpe/ (plastics), 1, 0.42%
Quantity of wax, 1, 0.42%
Rectified methanol from pulpmill condensates, 1, 0.42%
Refined petroleum contaminated debris, 1, 0.42%
Regulated medical waste such as discarded wipes, gauze, gowns, gloves, bandages, 1, 0.42%
Residue from herbicide intermediate production, 1, 0.42%
Returned pharmaceutical products with packaging (non-hazardous), 1, 0.42%
Single chamber incinerator, 1, 0.42%
Solids from manufacturing and product storage, 1, 0.42%
Solids/other (unidentified), 1, 0.42%
Stoddard calibration fluid, 1, 0.42%
Sulfur-free organic by-product/other (unidentified), 1, 0.42%
Tablets, capsules, non-corrugated carton, 1, 0.42%
Tar oil; similar to no 6 fuel oil, 16,000 btu/lb, 1, 0.42%
Turpentine and methanol from foul condensate stripper, 1, 0.42%
Undefined solid waste (explosives), 1, 0.42%
Undefined solid waste (fertilizer)/other (unidentified), 1, 0.42%
Undefined solid waste (laboratory waste)/other (unidentified), 1, 0.42%
Undefined solid waste (metal coating)/finishing waste, 3, 1.26%
Undefined solid waste (photofinishing)/photo processing, 1, 0.42%
Undefined solid waste (toilet preparations; cosmetics, 1, 0.42%
Undefined waste (plastics, synthetic materials, etc), 1, 0.42%
Unknown/finishing wastes, 1, 0.42%
Used air filters from paint booths, dirty rags, drip paper from paint booths, 1, 0.42%
Vapor from stoddard calibration fluid, 1, 0.42%
Vegetable oil, coconut oil, rice oil, silicone oil, 1, 0.42%
Vent gases produced in manufacturing and product storage, 1, 0.42%

Vinyls/other (unidentified), 1, 0.42%
Volatile organic compounds from pioneer's, 1, 0.42%
Waste activated charcoal and waste diatomaceous earth used as filter media, 1, 0.42%
Waste carbon black, 1, 0.42%
Waste ethical drugs, sweeping, etc., waste narcotic controlled drugs, 1, 0.42%
Waste excess activated sludge from permitted wastewater treatment plant, 1, 0.42%
Waste fluids, 3, 1.26%
Waste fluids/other (unidentified), 2, 0.84%
Waste from fibers processing, primarily fishing, 2, 0.84%
Waste lint/other (unidentified), 1, 0.42%
Waste lubrication oils, 1, 0.42%
Waste oil, 7, 2.94%
Waste type 1, 1, 0.42%
Waste water sludge from auto painting, 1, 0.42%
Water used to wet rags for wiping off furniture parts is evaporated in the incinerator, ,1 0.42%
Water vapor with varying amounts of organics, 1, 0.42%
Water with varying amounts of organics, 1, 0.42%
Wax composed of fillers and resins, 1, 0.42%
Wood: dried milled lumber, 1, 0.42%
Unspecified, 18, 7.56%
Total in database, 238

LIST OF MISCELLANEOUS INDUSTRIAL AND COMMERCIAL WASTE COMBUSTION DEVICES AND NUMBER OF DEVICES IN DATABASE

Catalytic, 2
Extrusion incinerator, 1
Excess air, fluid bed, single batch fed, 2
Fluidized-bed, 1
Suspension firing, fluid bed, continuously fed, 2
Burn-off oven, multi-chamber, excess air, intermittent batch fed, 2
Burn-off oven, multi-chamber, starved air, single batch fed, 1
Fixed hearth, multi-chamber, excess air, intermittent batch fed, 10
Fixed hearth, multi-chamber, excess air, single batch fed, 3
Fixed hearth, multi-chamber, intermittent batch fed, 4
Fixed hearth, multi-chamber, single batch fed, 2
Fixed hearth, multi-chamber, starved air, intermittent batch fed, 3
Multi-chamber, continuously fed, 2
Multi-chamber, continuously fed, down fired, 3
Multi-chamber, continuously fed, sudden expansion, 3
Multi-chamber, excess air, automatic feeder, 8
Multi-chamber, excess air, continuously fed, 3
Multi-chamber, excess air, intermittent batch fed, 4
Multi-chamber, excess air, starved air, 4
Multi-chamber, intermittent batch fed, 3
Multi-chamber, intermittent batch fed, continuously fed, 3
Multi-chamber, single batch fed, 12
Multi-chamber, starved air, single batch fed, 4
Multiple chamber (could be starved or excess air), 5
Multiple hearth, 1
Multiple hearth, continuously fed, 4
Multiple hearth, excess air, continuously fed, 2
Pathological, fixed hearth, multi-chamber, excess air, starved air, intermittent batch fed, medical, 2
Pathological, multi-chamber, intermittent batch fed, medical waste, rocking kiln, 6
Spreader stoker, multi-chamber, excess air, single batch fed, 2
Suspension firing, multi-chamber, intermittent batch fed, 2
Rotary hearth, 3
Rotary kiln, 4
Rotary kiln, multi-chamber, continuously fed, 2
Rotary kiln, multi-chamber, excess air, intermittent batch fed, 5
Fire tube, induced draft, rotary kiln, multi-chamber, excess air, continuously fed, 3
Metals recovery, rotary hearth, 4
Single chamber, 13
Single chamber, continuously fed, 12
Single chamber, down-fired thermal oxidizer liquid incinerator, 3
Single chamber, excess air, continuously fed, 11
Single chamber, excess air, fluid bed, continuously fed, 3
Single chamber, excess air, single batch fed, 1
Single chamber, single batch fed, 3
Burn-off oven, single chamber, excess air, intermittent batch fed, 2
Fixed hearth, single chamber, excess air, 2
Single chamber, single batch fed, with after burner, 2
Suspension firing, single chamber, excess air, continuously fed, 3
Burn-off oven, 2
Continuously fed, 5
Excess air, continuously fed, 4

Furnace, 1
Incinerator, 3
Incinerator, metals recovery, pathological, single batch fed, 4
Oxidation plant, 1
Pathological, fixed hearth, starved air, single batch fed, 3
Suspension firing, excess air, continuously fed, 2
Unspecified incinerator, 6
Unspecified incinerator/UR 1500, 2
Used oil heater, 1
Total in database, 316

LIST OF MISCELLANEOUS INDUSTRIAL AND COMMERCIAL WASTE INCINERATION EMISSION CONTROL DEVICES AND NUMBER OF DEVICES IN DATABASE

Direct flame afterburner, 20
Direct flame afterburner - heat exchange, 2
Electrostatic precipitator, high efficiency, 3
Fabric filter, high temperature, 3
Fabric filter, medium temperature, 6
Impingement plate scrubber, 1
Mist eliminator, high velocity, 4
Mist eliminator, low velocity, 1
Multiple cyclone w/o fly, 2
Packed-gas absorption column, 4
Single cyclone devices, 5
Venturi scrubber, 15
Wet cyclonic separator, 5
Wet scrubber, high efficiency, 6
Wet scrubber, medium efficiency, 3

POLLUTION CONTROL PRODUCTS CO. | Paint Stripping Furnace

***Extends the Life of Tooling and Helps Increase Production and Profits* by Removing Paints, Epoxies, Powder Coatings and other Combustible Materials from Conveyorized Paint Hangers, Racks and Hooks – Safe and Pollution-Free!**

TWO MODELS AVAILABLE:

Controlled Pyrolysis (PTR)
Basic, yet highly effective, this patented system anticipates/prevents overheating. Includes primary and backup water spray as standard equipment. Multiple built-in safety features. Perfect choce for low level of combustibles materials.

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Excellent choice for varying load sizes or high combustible amounts. Faster overheat response time than PTR. Built to FM standards with high fire afterburner (required in some states). Operator need only to press the start button, the furnace evaluates the load and self-adjusts the cleaning cycle.

Fully Automatic and Self Adjusting
Simply load your paint hanger, set the cycle time and the furnace does the work with shorter cycle times.

Most Efficient Heat Distribution
Safe and uniform control through our patented design.

Industry Leading Experience
Over 7,000 installations in 45 countries worldwide.

Save Time, Money and Materials
Reduces paint usage and improves the quality of the finished product. Will lower your reject rate.

Great Value
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For a Free Test Cleaning call Sales at 214-358-1539
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SPECIFICATIONS AND DATA Exhibit B (page 2 of 2)

Cabinet: Heavy–gauge sheet steel supported by structural steel angles and channels. All-welded construction with sealed seams to prevent leakage gives maximum fuel economy.

Floor: Hard castable refractory, 3"-4" thick, reinforced with structural steel channels. Allows easy removal of ashes.

Doors: Equipped with cam-type lock assemblies, tadpole sealing gaskets, and stay-open hooks. Doors open 270°.

Explosion Relief: Unique grAvity-sealed top relief automatically opens to relieve excess pressure, then closes, preventing air from reaching combustible material.

Insulation: Walls, ceiling, and doors covered with 3" of a two-layered lightweight ceramic fiber blanket insulation anchored on stainless steel pins, wire mesh and locking washers. Contains no asbestos. Perforated metal liner protects insulation from mechanical damage. Furnace insulation rated at 2300°F (1275°C).

Vent Stack: Made in 36" long lightweight sections for easy erection. Stainless steel metal exterior lined with high-temperature ceramic fiber in hard form. Sections snap together.

Fuels: Natural gas, Propane gas, or #2 fuel oil.
Gas pressure required: 11inches W.C.

Electrical Service: 110-125 volts, 50-60 hertz, single-phase 5-10 amp. draw.

Water Supply: Minimum pressure 40 psi; maximum 100 psi for water injection system. Maximum flow rate 5-7gpm (15 liter/min).

Normal Cycle Time: 3-5 hours plus cooling time. Timer adjustable 0-12 hours with dual frequency dial for 50 and 60 hertz. (Automatic features available)

Normal Cycle Temperature: 750°-800°F (399-430°C)

Pollution Standards: Meets latest E.P.A. Standards Safety and Health Standards: Meets latest O.S.H.A. Federal Standards. Can be equipped to meet N.F.P.A. 86.

Insurance Standards: Meets most state and local codes. Can be equipped to meet Factory Mutual or IRI Standards.

Anti Corrosive Vapor Barrier: Prevents corrosive vapors from condensing on inside furnace walls. Greatly extends useful life of furnace.

Combustion Chamber Protection Guard: A heavy-duty steel barrier, built around the upper and lower combustion chambers, protects from errant or careless loading.

Multi Style Carts Available: Can uniquely meet your individual loading requirements through several different cart styles (standard with oven).

Commercial Gas Burners: Features include superior no--clog nozzle design, easy maintenance, and heavy-duty construction. Burners are equipped with a patented automatic self-cooling system that inhibits burner damage.

COMMON SIZES

(Dimensions in inches)

PTR/PRC MODEL NO.	OUTSIDE DIMENSIONS INCL. BURNERS & CONTROLS			INSIDE DIMENSIONS (DOOR OPENING)			CART USABLE DIMENSIONS			APPROX. SHIPPING WEIGHT IN CRATE (LBS)
	Width	Depth	Height	Width	Depth	Height	Width	Depth	Height	
27F	62	70	42	36	42	32	27	39	19	2,080
52	68	72	55	42	48	44	33	45	36	2,630
71	68	84	61	42	60	50	33	57	42	2,750
88	71	85	74	48	52	60	39	48	46	3,720
111	77	87	80	54	54	66	45	50	52	4,200
150	83	97	86	60	64	72	51	60	58	5,100
177	83	97	98	60	64	84	51	60	70	5,200
188	83	85	113	60	52	99	51	48	85	5,500
222	83	121	86	60	88	72	51	84	58	5,700
243	95	97	104	72	64	90	63	60	74	5,900
260	91	121	98	66	88	84	57	84	68	6,240
300	85	157	87	60	124	72	51	120	58	7,300
308	91	121	110	66	88	96	57	84	80	6,460
340	109	121	98	84	88	84	75	84	68	6,730
390	109	121	111	84	88	96	75	84	80	7,440
448	121	133	99	96	100	84	87	96	68	8,440
482	97	169	99	72	136	84	63	132	68	8,000
512	121	133	111	96	100	96	87	96	80	8,470
577	121	145	111	96	112	96	87	108	80	9,040
608	121	133	129	96	100	114	87	96	99	8,820
680	121	157	117	96	124	102	87	120	87	10,130
748	121	169	117	96	136	102	87	132	87	10,260
885	133	157	132	108	124	117	99	120	102	10,820

* Many other standard sizes available.

Exhibit A (page 1 of 2)

Written Description of Process Flow Diagram

Cleaning Parts in a Controlled Pyrolysis® Furnace

A. Metal Parts (1) with hydrocarbon coatings (Paint, Varnish, Grease, Oil, Etc.) are loaded into the Controlled Pyrolysis® Furnace (2) through Door (3).

B. Furnace (2) is started.

C. Door (3) is closed once the Afterburner lights.

D. Metal Parts (1) are slowly heated to 700-900^{O}F by Primary Burner (4), decomposing the coating on the Metal Parts (1) into Vapors and Pyrolysis Gases.

E. Vapors and Pyrolysis Gases are heated in furnace Secondary Chamber (5) with oxygen to 1400-1600^{O}F to complete reactions: Carbon becomes Carbon Dioxide; Hydrogen becomes water vapor

F. CO_2, H_2O, and Particulate Matter are emitted through the insulated stack (6).

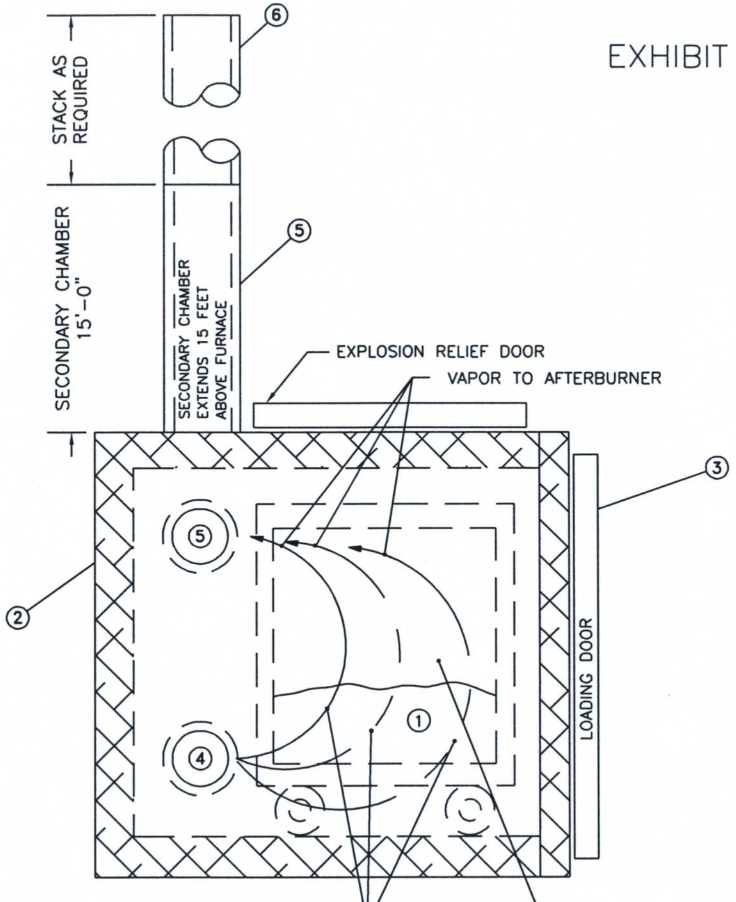
G. When the cleaning process is completed (by a timer), the Furnace (2) is allowed to cool and the Metal Parts (1) are removed from the Furnace (2) through the Door (3).

"Controlled Pyrolysis" is a registered trademark of:

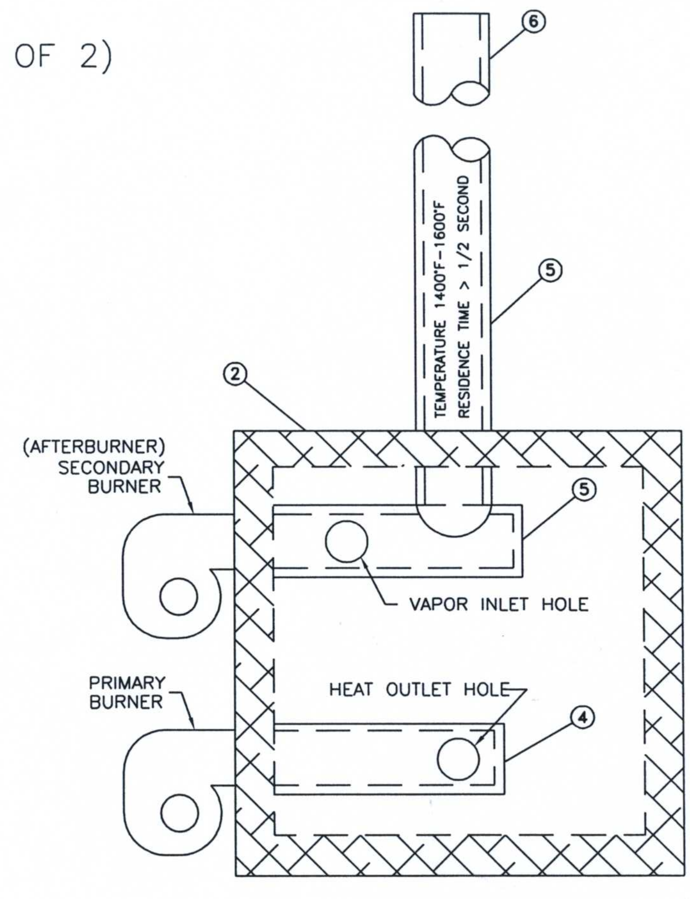
Pollution Control Products Co.

Factories: 2677 Freewood Drive
Dallas, Texas 75220
USA

EXHIBIT A (PAGE 2 OF 2)



SIDE VIEW



FRONT VIEW
DOORS & CART REMOVED

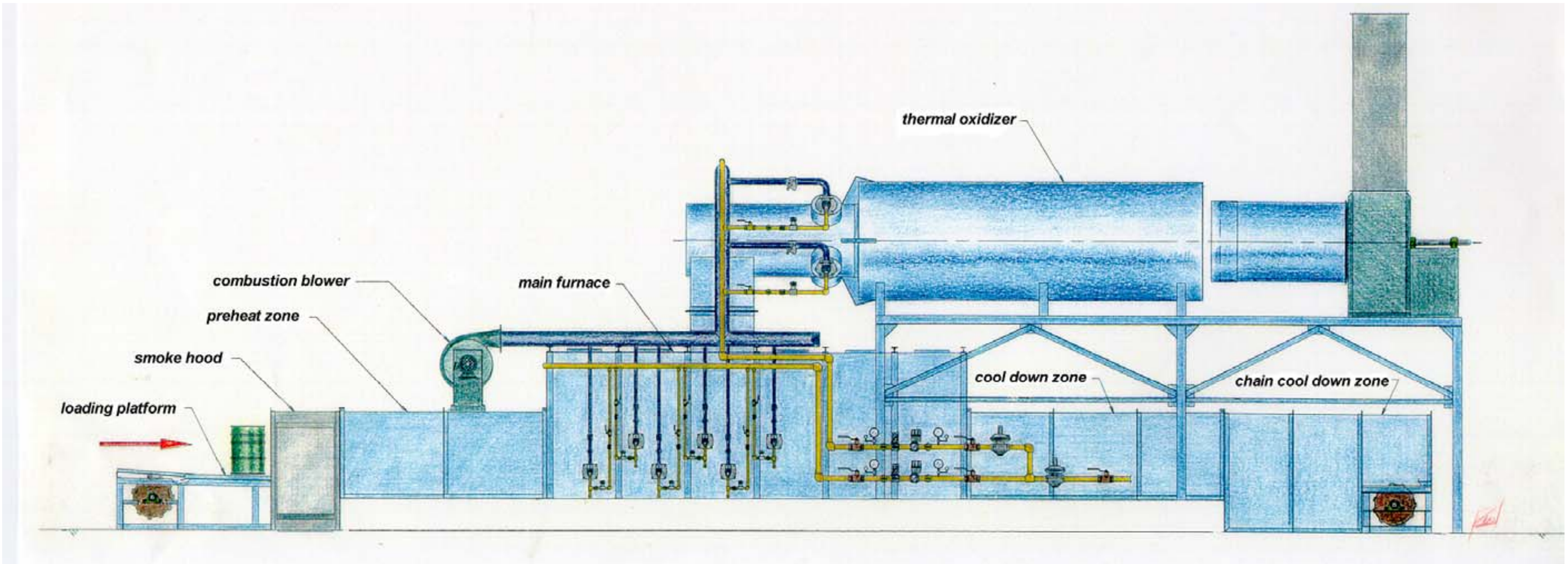
NOTES:
1) BOTH CHAMBERS & STACK ARE LINED WITH 2300°F REFRACTORY FIBER INSULATION.

POLLUTION CONTROL PRODUCTS CO.
2677 FREEWOOD ST. DALLAS, TX 75228

COMBUSTION FLOW DIAGRAM

C-FLEX#					
CAD FILE 9405-03B	SCALE NONE		DR. BY G. LYON		DATE 5-5-94
LAYER FLOW-DIA	SER NO.		CHKD. BY KRM		DATE 5-5-94
PLT DATE 11/16/99	SHEET 1	OF 1		DWG. NO. COMBUSTIONFLOW	

Photo of Typical Drum Reclamation Furnace



Typical Drum Reclamation Furnace