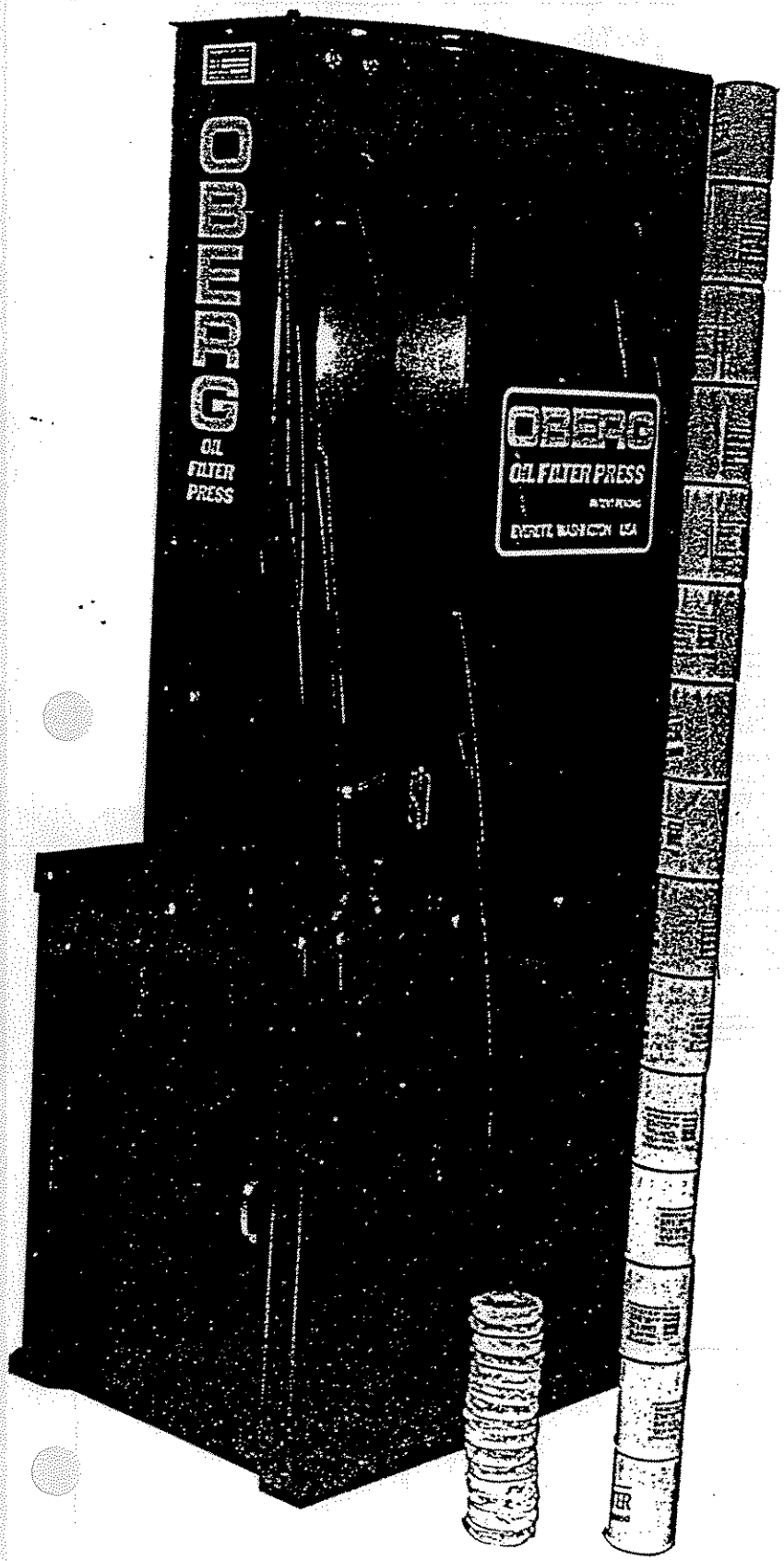
AB 701a-pt 02



Two Models Available

P100 – Automotive Filters

- *14,137 Lbs. Force*
- *Reduces Filter Size 6:1*
- *Increases 55 Gallon Drum Capacity From 200 To 1100 Filters.*

P200 – Heavy Duty Truck And Industrial Filters

- *25,132 Lbs. Force*
- *Reduces Filter Size 4:1*
- *Increases 55 Gallon Drum Capacity from 100 to 400 Filters.*

Includes built-in safety features to prevent operation when the door is open. Built to meet OSHA standards. All electrical components are U.L. rated.

Storage cabinet accepts two 15 gallon drums to automatically separate waste oil from pressed filters.

Dimensions and Specifications

DIMENSIONS	Model P100	Model No. P200
1. Overall Height	69″	81″
2. Overall Width	25″	25″
3. Overall Length	32½″	32½″
4. Shipping Weight	425 Lbs.	497 Lbs.
5. Waste Oil Capacity	15 Gal.	15 Gal.

SPECIFICATIONS		
1. Cycle Time	8 Sec.	35 Sec.
2. Cavity Size	7½″×7½″×8″	9″×9″×16″
3. Electrical	110V, 15 Amp 1 HP, Hi/Lo Pump	110V, 15 Amp 1 HP, Hi/Lo Pump
4. Operating Pressure–Max.	2,000 PSI	2,000 PSI
5. Hydraulic Pressing Force	14,137 Lbs.	25,132 Lbs.
6. Operation	Auto. Cycle/ Shut Off	Auto Cycle/ Shut Off

UNITED MARKETING INTERNATIONAL, INC.
FIVE YEAR LIMITED WARRANTY

United Marketing International, Inc. (UMI) will warrant each new product to be free from defects in workmanship and material for a period of five years from the date of purchase provided the product is properly installed and subjected to normal use and service. This warranty is void if the product is modified or changed in any way.

Customers requiring warranty assistance should contact the dealer from whom they purchased the product. In turn the dealer will contact UMI and receive a returned goods authorization number if product return is required. UMI will determine the method of satisfying the warranty. If UMI determines the product should be returned to the factory, it must be accompanied by proof of purchase and a clear notation of the exact problem encountered. The product must be returned freight pre-paid. If a thorough inspection of the product by the factory indicates defects in workmanship, UMI's sole obligation shall be to repair or replace the product itself and not the cost of installation or removal. No other warranty except as stated above is implied or expressed.

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Appendix 3

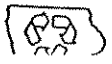
TCLP Test Parameters and Regulatory Limits

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

Iowa Waste Reduction Center/University of Northern Iowa
319/273-2079 or 800/422-3109

Parameter	Regulatory Level	EPA Hazardous Waste Number
* Arsenic	5.0 mg/l	D004
* Barium	100.0 mg/l	D005
Benzene	0.5 mg/l	D018
* Cadmium	1.0 mg/l	D006
Carbon tetrachloride	0.5 mg/l	D019
Chlordane	0.03 mg/l	D020
Chlorobenzene	100.0 mg/l	D021
Chloroform	6.0 mg/l	D022
* Chromium	5.0 mg/l	D007
m-Cresol	200.0 mg/l	D024
o-Cresol	200.0 mg/l	D023
p-Cresol	200.0 mg/l	D025
Cresols (total)	200.0 mg/l	D026
1,4-Dichlorobenzene	7.5 mg/l	D027
1,2-Dichloroethane	0.5 mg/l	D028
1,1-Dichloroethylene	0.7 mg/l	D029
2,4-Dinitrotoluene	0.13 mg/l	D030
* Endrin	0.02 m/l	D012
Heptachlor	0.008 mg/l	D031
Hexachlorobenzene	0.13 mg/l	D032
Hexachloro-1,3-butadiene	0.5 mg/l	D033
Hexachloroethane	3.0 mg/l	D034
* Lead	5.0 mg/l	D008
* Lindane	0.4 mg/l	D013
* Mercury	0.2 mg/l	D009
* Methoxychlor	10.0 mg/l	D014
Methyl ethyl ketone	200.0 mg/l	D035
Nitrobenzene	2.0 mg/l	D036
Pentachlorophenol	100.0 mg/l	D037
Pyridine	5.0 mg/l	D038
* Selenium	1.0 mg/l	D010
* Silver	5.0 mg/l	D011
Tetrachloroethylene	0.7 mg/l	D039
* Toxaphene	0.5 mg/l	D015
Trichloroethylene	0.5 mg/l	D040
Vinyl chloride	0.2 mg/l	D043
* 2,4,-D	10.0 mg/l	D016
* 2,4,5-TP	1.0 mg/l	D017
2,4,5-Trichlorophenol	400.0 mg/l	D041
2,4,6-Trichlorophenol	2.0 mg/l	D042

* Former EP Toxicity Parameters



Appendix 4

EPA Regulatory Memorandum

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 30 1990

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Regulatory Determination on Used Oil Filters

FROM: Sylvia Lowrance, Director
Office of Solid Waste

TO: Robert L. Duprey, Director (8HWM-RI)
Hazardous Waste Management Division
EPA Region VIII

Thank you for your memorandum of August 30, 1990, requesting a regulatory interpretation of the status of used oil filters under the new Toxicity Characteristic (TC). In your memorandum, you inquired about used oil filters that are crushed in vehicle maintenance shops, where a certain portion of the residual used oil in the filter is separated from the filter. The answers to the specific questions you asked are listed below.

1. The Toxicity Characteristic Leaching Procedure (TCLP) is performed on used oil filters by crushing, cutting or grinding the waste (filter plus contents) until the pieces are smaller than 1 centimeter in their narrowest dimension (and thus are capable of passing through a 9.5 mm standard sieve). See Step No. 7.3 of the TCLP. The surface area criterion referred to in Step 7.3 does not apply to used oil filters. (Note: If the generator recycles both the used oil and metal, you do not need to test because recycling of both types of materials is exempted from hazardous waste regulation as discussed below.)

2. and 3. Assuming a used oil filter exhibits the TC, you had inquired whether the act of crushing filters is regulated treatment or exempt recycling. Generally, the types of used oil filter crushers you described would not be regulated if the used oil was being recycled (see 40 CFR 261.6(a)(2)(iii) and (a)(3)(iii)). That is, since the purpose of the crushing is to remove the used oil for recycling, we view the crushing to fall within the used oil recycling exemption. The crushing may be performed on- or off-site, for profit or not. The determining factor is whether the used oil will be recycled. The filter may be shipped off-site for crushing under the used oil exemption, providing the oil is collected for recycling.

4. Generally, automotive oil filters are not considered to be containers because they are designed to filter particulates from oil that circulates through them, not devices for the storage of oil. As a result, a filter could not be an "empty container" under 40 CFR 261.7. However, as described next, a drained or crushed filter is considered scrap metal, and scrap metal is exempt from regulation when recycled.

Under the definition of "solid waste," EPA has determined that "recycled hazardous scrap metal is a solid waste when disposed of or recycled" (see 50 FR 624, January 4, 1985). However, pursuant to section 261.6(a)(3)(iv), hazardous scrap metal is exempted from Subtitle C regulation when recycled. The scrap metal recycling exemption in 40 CFR 261.6(a)(3)(iv) is applicable to used oil filters (scrap metal) that are going to be recycled. However, an undrained or uncrushed oil filter would contain too much oil to qualify for the scrap metal exemption. The January 4, 1985 preamble provided examples of items qualifying for the exemption, such as bars, turnings, rods, sheets, wire (i.e., scrap metal that is going to be recycled to recover their metal content) and examples that do not qualify, including metal-containing waste with a significant liquid component, such as spent batteries.

To increase the probability that the used oil filter (hazardous scrap metal) will qualify for the scrap metal recycling exemption, the generator or recycling facility should drain (gravity) the filter for an amount of time sufficient to ensure that all free-flowing oil is removed. The amount of drain time will vary based on a number of variables, including the size of the filter and temperature (both ambient and that of the filter). Alternately, the generator or recycling facility could crush the oil filter using the most appropriate crushing method that will force excess residual oil from the filter. We will be examining this issue further, but we currently have no information indicating that substantial amounts of oil will remain in the filter after either sufficient draining or adequate crushing. As a best operating practice, the Agency recommends that the generator or recycling facility both drain and crush used oil filters to be certain that the used oil filters would qualify for the hazardous scrap metal recycling exemption.

If the crushed or drained filter will be recycled, it is unnecessary to determine whether it exhibits the TC because the scrap metal exemption is applicable. It would also be unnecessary to manifest these used oil filters if they will be recycled. However, if the filter will be disposed of, the generator must determine if it is hazardous under the TC. If the filter is hazardous waste, the Part 262 and 268 regulations apply to the generator, and Parts 264 and 265 apply to the treatment, storage and disposal facilities. Non-hazardous waste filters may be disposed in a Subtitle D facility.

Finally, in the sales brochures you sent, there was mention of an open container used to accumulate the used oil after the filter was crushed. (Currently, used oil accumulation by generators is not regulated if the used oil is recycled, but EPA did propose that such containers be kept closed. See 50 FR 49252, November 29, 1985.) Storage or accumulation of characteristically hazardous used oil is regulated if the used oil is to be disposed of; in that case, the containers must be closed except when adding or removing the used oil (per §265.173(a)).

Please contact Daryl Moore at (202) 475-8551 if you have any additional questions on the applicability of the Federal hazardous waste regulations with respect to used oil filters.

cc: Waste Management Division Directors, Regions I - VII and IX - X
Jeff Denit
RCRA/Superfund Hotline
Regional TC Contacts

MOTOR VEHICLE OIL FILTER RECYCLING - REVISITED

James A. Olson, Waste Management Specialist
Iowa Waste Reduction Center, University of Northern Iowa,
Cedar Falls, Iowa, 50614-0185

Jerry A. Ohlemeier, P.E.
Gray Automotive Products Co.
P.O. Box 728, St. Joseph, Missouri, 64502

April 21, 1992

ABSTRACT: Oil filter compaction, with subsequent recycling of the recovered oil and scrap metal, has been demonstrated as a successful method to eliminate landfill disposal of used oil filters and achieve resource conservation (Konefes, 1991). Oil filter compaction yields greater oil recovery than drainage alone. This is especially true for filters that are equipped with anti-backflow devices. While extended filter drainage periods and puncturing filters prior to drainage achieve increased oil recovery, compaction provides the maximum recovery. Approximately 90% of the residual oil contained in oil filters may be recovered by compaction. Conversely, drainage is only capable of achieving mean oil recovery in the range of 56% to 78%. The effectiveness of oil recovery, through compaction of used oil filters, is dependent on the magnitude of the applied compression force. The greater the force, the greater the volume of oil "squeezed" from the filter. Within a working compression force range of 8,000 to 100,000 pounds, total oil recovery of 81% to 98% was observed. Likewise, oil filter volume reductions of 56% to 87% were measured. Drainage prior to compaction resulted in negligible oil recovery benefits; 3% or less.

INTRODUCTION

Work conducted by the Iowa Waste Reduction Center (IWRC) during the summer of 1990 demonstrated a method of used motor vehicle oil filter recycling. The method involved drainage and compaction of used filters for oil extraction and scrap metal recovery. Recovered oil was available for recycling through existing used oil reclamation and fuel blending markets. Crushed filter canisters were shredded at scrap metal facilities and smelted in conjunction with other scrap metals. This initial work estimated that 6.6 million used oil filters are generated in Iowa annually, containing approximately 400,000 gallons of oil. Recycling of used oil filter components would contribute as much as 350,000 gallons of used oil and 3,000 tons of scrap metal into state recycling markets annually (Konefes, 1991). This filter recycling methodology has been successfully applied nationally as a waste management practice in vehicle maintenance facilities and through establishment of service companies which provide off-site oil filter recycling. Eight used oil filter recycling companies have begun operation in Iowa based on the demonstration of successful filter recycling.

Since this initial work, practical and regulatory concerns have surfaced regarding optimum processes to facilitate oil filter recycling. Some of the more common issues are as follows:

- Definition of filter "draining and crushing"
- Effect of draining prior to crushing
- Filter compaction versus dismantling
- Direct smelting of filter scrap metal versus shredding prior to smelting
- Air emissions associated with oil filter metal smelting

The intent of this paper is to evaluate the effect of filter compaction force in relation to oil recovery and volume reduction. The effect of drainage prior to filter compaction will also be discussed in relation to observed oil recovery. The final three issues referenced above warrant extensive evaluation efforts beyond the scope of this paper.

MATERIALS AND METHODS

Filter compaction tests were designed to establish the relationship of compaction force to oil recovery and filter volume reduction. Data was provided by Gray Automotive Products Company, St. Joseph, MO (manufacturer of the QuickPac filter press equipment) and MBI Industries, Arlington, WA (manufacturer of Main Squeeze brand presses).

Gray's evaluation tested three each of the following filters:

- Luber-finer #LFP-670
- Pennzoil PZ-1
- Pennzoil PZ-9A

These filters were selected as representative of filters that are used on large diesel engines, large cars and trucks, and small cars. All nine filters were new. The "out of box" weight and height of each filter was recorded. The three Luber-fine filters were filled with Shell Rotella T 15W40 oil until saturated. The remaining filters were saturated with Pennzoil 10W40 motor oil. The saturated weight of each filter was recorded. Each saturated filter was inverted on a grate and allowed to drain 5 minutes. The weight of the filters after drainage was recorded.

The final step was to compact the filters under varying compression forces. This was accomplished using a hydraulic press equipped with an electronic load cell to measure compression force. Drained, preweighed filters were placed in the press and subjected to an initial compression force of 8,000 pounds. At this point, the compression force was released and the filter height and weight was recorded. Filters were then placed back into the press and subjected to increasing forces of 12,000, 16,000, 20,000, 30,000, 40,000, 50,000, 60,000, 80,000, and 100,000 pounds. Compression was discontinued at each of the above test points and filter height and weight was recorded.

Data provided by MBI were obtained through compaction of two new Security brand oil filters, type SO-40 and SO-1A. The filters were weighed initially, saturated with new 10W-40 motor, and reweighed to determine their saturated weight. The filters were inverted and compacted at varying forces ranging from 10,000 to 71,000 pounds with 6 intermediate points. The filters were weighed at each interval to determine the volume of oil remaining in the filters.

The second aspect of the study addresses the effect of draining prior to compaction. Data were provided by Gray Automotive Products Company. The following draining methods were evaluated:

- 5 minute draining period
- 24 hour draining period
- Puncturing the filter housing prior to draining for 24 hours

Filters selected for use in this experiment were the same type used in the Gray compression test discussed above, prepared in the same manner. A total of 12 filters from each of the three filter size categories were tested. Original heights and before and after oil saturation weights were recorded. For each size category, six filters were inverted and allowed to drain for 5 minutes, 3 filters drained for 24 hours, and an additional 3 filters were punctured and drained for 24 hours. Each filter was weighed after the appropriate drainage period to calculate oil recovery. All filters were then compacted using a Gray QuickPac QP100 pneumatic filter press operating at 16,000 pounds of compression force. Filter weights after compaction were recorded to determine total oil recovery.

REGULATORY REVIEW

Currently, used oil is regulated under federal Environmental Protection Agency (EPA) regulations that exempt used oil from the hazardous waste management requirements provided the oil is destined for recycling. The used oil exemption does not however, apply to oil contaminated solid wastes (oily wastes). In general, EPA regulations require generators of solid waste to determine if the waste is hazardous or non-hazardous prior to disposal. For oil filters, this determination would require laboratory Toxicity Characteristic Leaching Procedure (TCLP) analysis. The TCLP tests for up to 39 chemical parameters including lead, chromium, and benzene. If the concentration of any one of the parameters exceeds a set regulatory limit, then the filters are hazardous and would require disposal through a permitted hazardous waste management company. At the present time, this determination requirement would apply to both compacted and non-compacted filters if they are to be disposed in a municipal landfill. If used oil filters are to be recycled for scrap metal recovery, then EPA scrap metal exemptions would negate the hazardous/non-hazardous determination requirement and recycling through a scrap metal yard or smelter is acceptable.

Proposed regulations regarding used oil were published by EPA in the September 23, 1991 Federal Register. The proposed rules dealt with the used oil filter issue, stating:

> "As a best operating practice, based on the information available to EPA, the Agency recommends that the generator or recycling facility both drain and crush used oil filters to remove as much of the oil as possible. EPA is proposing an exclusion for used oil filters that have been drained and crushed from regulation as hazardous waste..... Such an exclusion would allow crushed and drained oil filters to be managed as solid waste under RCRA subtitle D" (non-hazardous, solid waste regulations) "by exempting them from any listings or characteristics of hazardous waste, including the TC." (56 FR48024)

This implies that drained and crushed oil filters will not be subject to hazardous/non-hazardous waste determination (TC) and that municipal landfilling would be acceptable. Individual states could, however, provide more stringent requirements regarding oil filter disposal including outright landfill bans. Final regulations are scheduled for publication in May of 1992.

Many states have or are in the process of regulating used oil filter management on a local basis. Following is a brief summary of the types of oil filter management regulations currently in place in the 50 states and District of Columbia:

TCLP required prior to disposal - 23
Drain and landfill - 22
Banned from solid waste landfill disposal - 2
No Policy - 2
Crush and landfill - 1
Mandatory recycling - 1

As an example of some more stringent state regulation, Rhode Island defines used oil filters as hazardous unless recycled. Recyclers of used oil filters must keep records that show that all fractions of the oil filter element are, at a minimum, 90% recycled. In Texas, used oil filters have to be processed for waste oil and scrap metal recovery. Florida requires generators of used oil filters to make a proper hazardous waste determination prior to landfill disposal. If the filters are recycled, generators are exempt from the hazardous waste regulations and do not need to test their filters.

RESULTS

The first phase of the study evaluated the effect of compression force in relation to the resulting oil recovery. Figures 1 and 2 summarize the data. Graphical representations for individual filter type or category (i.e. small, medium, and large) are given separately. The Y-axis of the figure shows the average (mean) mass of each filter category/type in relation to the variables described for the X-axis. The percentage values adjacent to the data points represent the mass of oil recovered in relation to the mass of oil present in the saturated filter. As may be seen in figure 1, simple drainage for 5 minutes resulted in an average oil recovery of 43%, 56%, and 72% for small, medium, and large filters respectively. Additional oil recovery was obtained when the filters were subjected to a compression. Oil recovery at the 8,000 pounds force ranged from 81% for the large category to 90% for both the small and medium filters. Increased compression forces produced small but increased volumes of oil recovery for both the small and medium categories. Total recovery of 98% was obtained at 100,000 pounds of force in both cases for an increase of 8% over the total compression force range. The large filters exhibited a slightly greater reliance on compression force in terms of measured oil recovery. An additional 15% recovery was observed between the 8,000 and 100,000 pound compression force range with a minimum of 81% and a maximum of 96% oil recovery.

Figure 2 shows a second set of data generated from compaction of two medium category filters. Although oil recovery rates are slightly less than reported in Figure 1, the observed trends and relationships are analogous.

Figure 1

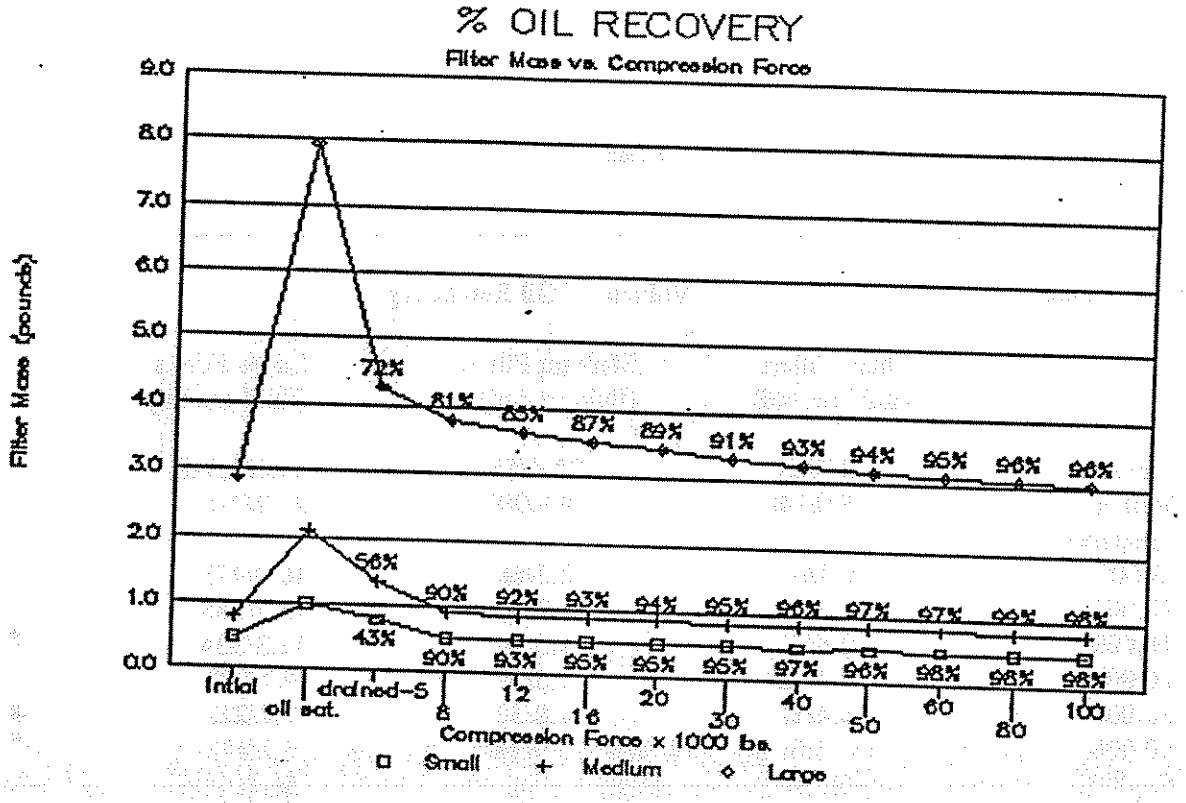


Figure 2

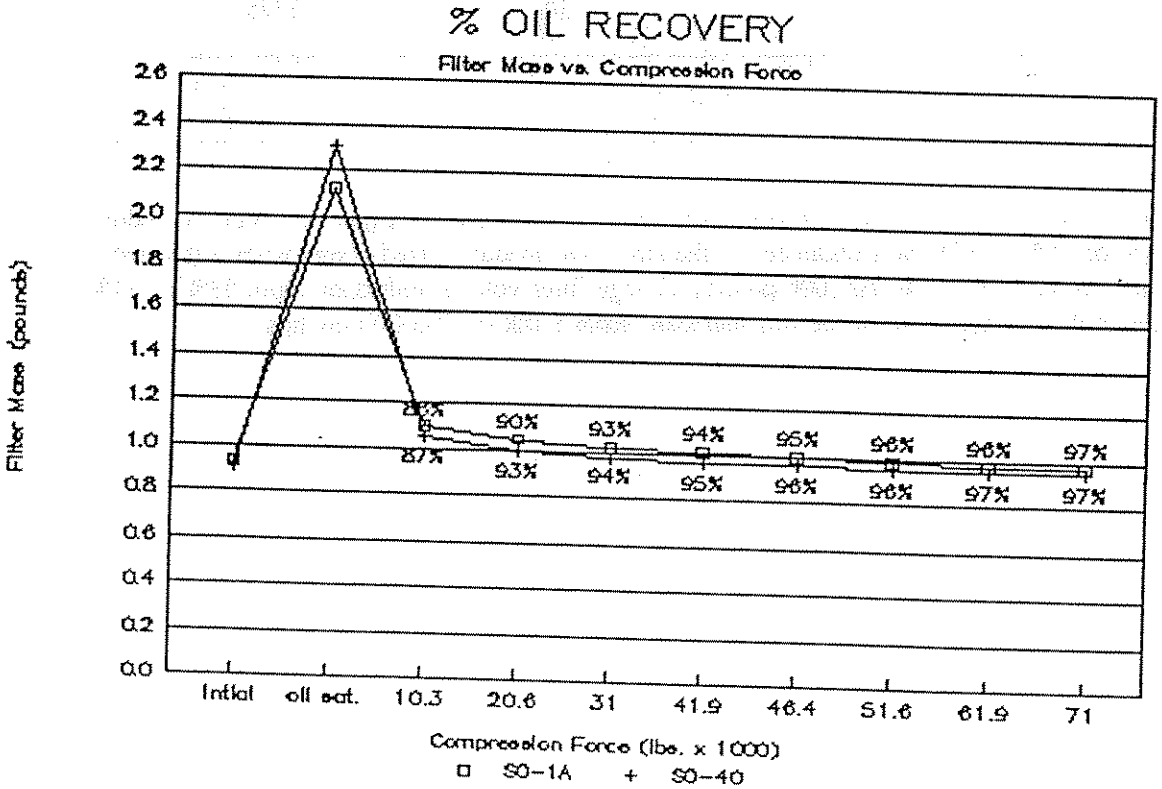


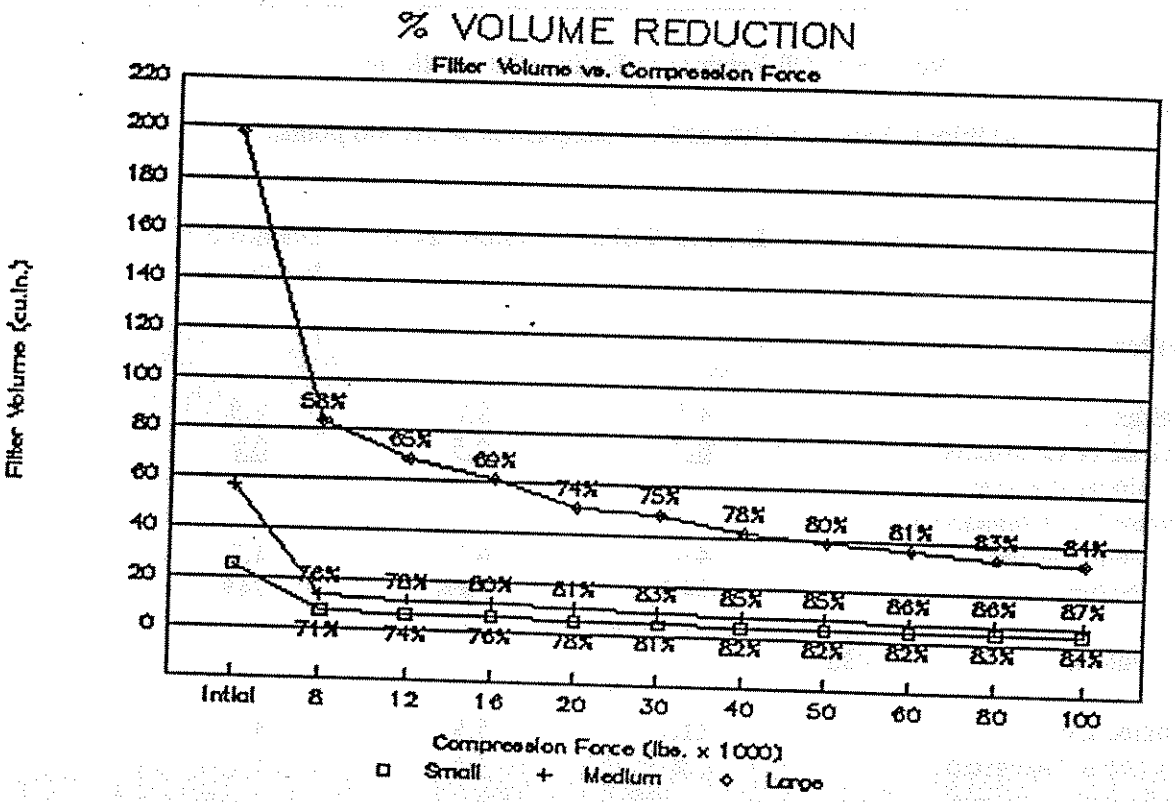
Table 1 summarizes the Figure 1 data in terms of the volume of oil remaining in the filters at each evaluation point.

Table 1

Filter Status	Volume of Oil Remaining		
	Small Filters (fluid oz./ml)	Medium Filters (fluid oz./ml)	Large Filters (fluid oz./ml)
Saturated	8.7/257	22.4/663	86.1/2,548
Drained	5.0/148	9.9/293	24.2/716
Compacted			
8,000	0.9/67	2.3/68	16.0/473
12,000	0.5/15	1.7/50	13.1/388
16,000	0.4/12	1.5/44	11.3/334
20,000	0.4/12	1.3/38	9.7/287
30,000	0.4/12	1.0/30	7.7/228
40,000	0.2/6	0.9/26	6.2/183
50,000	0.3/9	-	5.1/151
60,000	0.2/6	0.5/15	4.5/133
80,000	0.2/6	0.3/9	3.8/112
100,000	0.1/3	0.3/9	3.3/98

Filter volume reduction in relation to compression force is illustrated in Figure 3. Volume reduction in the range of 71% to 87% was obtained for the small and medium sized filters when subjected to compression forces of 8,000 to 100,000 pounds. Large filter volume reduction from 58% to 84% was seen as the applied compression force was increased from 8,000 to 100,000 pounds.

Figure 3



The second phase of the study evaluated the relationship between filter draining and compaction. In this case, the compaction force remained constant (16,000 pounds) and the method of draining varied in the following ways:

- Filter drainage for 5 minutes.
- Filter drainage for 24 hours.
- Puncturing the filter prior to drainage for 24 hours.

Table 2 summarizes data quantifying the volume of oil remaining in the filters when the filters were saturated with oil and after they were subjected to draining only and draining and compaction for each of the draining methods identified above.

Table 2

Volume of Oil Retained in Drained Filters (fl. oz.)
&
Additional Recovery Obtained by Compaction at 16,000 pounds

	Saturated	Drained 5 Min.	Drained 24 Hr.	Drained & Punctured
Small Filters	8.7			
Drained Only		4.8	5.2	2.3
Drained & Compacted		0.7	0.5	0.6
Additional Recovery Obtained by Compaction				
Fluid Ounces		4.1	4.7	1.7
Percent		84%	90%	74%
Medium Filters	23.5			
Drained Only		11.1	5.9	4.4
Drained & Compacted		1.8	1.6	1.7
Additional Recovery Obtained by Compaction				
Fluid Ounces		9.3	4.3	2.7
Percent		84%	73%	61%
Large Filters	86.3			
Drained Only		25.6	17.3	17.0
Drained & Compacted		13.3	12.5	12.0
Additional Recovery Obtained by Compaction				
Fluid Ounces		12.3	4.8	5.0
Percent		48%	28%	29%

As may be seen in the table, the large filters contained 86.3 ounces of oil when saturated. Draining for 5 minutes allowed recovery of 60.7 ounces of oil leaving 25.6 ounces in the filters. Draining for 24 hour and 24 hours with punctured filters resulted in additional oil recovery of 8.3 and 8.6 ounces. A volume of 17.3 and 17.0 ounces remained in the filters respectively. Compaction of the filters resulted in additional oil recovery of 12.3, 4.8, and 5.0 ounces respectively for the 5 minute, 24 hour, and 24 hour punctured filter draining procedures. Compaction of the large filters resulted in a 48%, 28%, and 29% additional oil recovery as compared to the volume obtained for each draining procedure.

Table 2 shows similar data for the medium and small categories of filters. Although the magnitude of oil recovered after compaction is understandably less, the resulting percentage increase is significantly greater than that observed in the large category. This is likely due to the fact that the small and medium filters were manufactured with an anti-backflow devices. The large filters were not equipped with this type of mechanism. Anti-backflow equipped filters maintain oil in the filter to hasten lubrication during engine start up. These types of filters are commonly installed on vehicles where the filters are installed in a horizontal fashion. The anti-backflow device prevents drainage of oil from the outside (between the filter media and wall of the canister) portion of the filter. Filter compaction would appear to force this "trapped" oil out of the filters resulting in the higher percentage of oil recovery attributed to compaction as compared to the large category which was not equipped with the anti-backflow devices.

In a previous study (Konefes, 1991), it was estimated that 6.6 million oil filters are generated annually in the State of Iowa. Using data from this study, in conjunction with the 6.6 million filters referenced above, the following estimates of the amount of oil remaining in used filters can be calculated:

- Oil Saturated Filters — 1,475,000 gallons
- Filters Drained for 5 Minutes — 590,000 "
- Filters Punctured and Drained for 24 Hours — 290,000 "
- Compacted Filters (16,000 lbs. force) — 155,000 "

Simply draining filters for 5 minutes would allow recovery of 885,000 gallons of oil leaving 590,000 gallons unrecovered. Puncturing the filter and draining for 24 hours, the optimum draining procedure, would allow recovery of an additional 300,000 gallons of oil but would ultimately leave 290,000 gallons in the filters. Compaction of previously drained filters provides still greater oil recovery, estimated at an additional 135,000 gallons. Compaction yields the greatest oil recovery; 89%. On a national basis, compaction of oil filters would yield an estimated 13,500,000 gallons of oil beyond what could be recovered using the most effective draining procedure.

Table 2 also suggests that drainage prior to compaction has little effect on the ultimate volume of oil that may be recovered from oil filters. The amount of oil recovered from the compaction of the small and medium filters varied by as little as 0.2 fluid ounces regardless of the drainage procedure used prior to compaction. Oil recovery from the large category of filters varied by a maximum 1.3 ounces.

DISCUSSION

Given the constraints of this study, general conclusions may be formulated. Oil filter compaction yields greater oil recovery than drainage alone. This is especially true for filters that are equipped with anti-backflow devices. While extended filter drainage periods and puncturing filters prior to drainage achieve increased oil recovery, compaction provides the maximum recovery. As demonstrated in this and a previous study (Konefes, 1991), approximately 90% of the residual oil contained in oil filters may be recovered by compaction. Conversely, drainage is only capable of achieving mean oil recovery in the range of 56% to 78%.

Oil filter volume reduction and oil recovery are dependent upon the amount of compression force applied to the filter. Figures 1 and 2, showing percent oil recovery versus compression force, may be used as a general guide to determine what level of compression is necessary to obtain desired oil recovery. Adequate data are not available however, to recommend standards by which oil filter compression equipment can be judged or environmental protection standards set.

Draining (with or without filter perforation) prior to compaction, yields negligible oil recovery advantages (3% or less) and need not be performed by the individual used oil filter generator.

Establishment of oil filter compaction standards, applicable to the needs of the environment and generator and scrap metal industries, involves numerous parameters outside the scope of this work. For example, filters that will ultimately be landfilled may require compaction at higher compression forces to limit the amount of oil that may leach from the filter and potentially contaminate groundwater. Lesser forces may be desirable for filters that will be smelted due to energy benefits available from the oil remaining in the filter. Filter shredding may be most practical at an intermediate compression point in order to facilitate efficient shredder operation.

Additional factors involved in setting compaction standards involve equipment, labor, and energy costs. In general, compaction equipment costs escalate proportionally to the magnitude of the available compression force. Energy requirements necessary to obtain greater compression forces would generally increase as a function of equipment capacity, as well. A point of diminishing return would likely occur between cost and increased oil recovery.

Development of criteria to make informed filter compaction standards will require additional and more extensive research. The IWRC may address the questions and concerns regarding compaction standards through continued research and sharing of information. We would appreciate the receipt of any and all information related to oil filter recycling processes. This information could then be consolidated and distributed to facilitate in the development of used oil filter management technology and standards.

LITERATURE CITED

Konefes, John L. and Olson, James A., 1991, Motor Vehicle Oil Filter Recycling Demonstration Project, Iowa Waste Reduction Center, University of Northern Iowa.

Acknowledgements. - We would like to thank Gray Automotive Products Company, P.O. Box 728, St. Joseph, MO 64502 (800/821-7320) and MBI Industries, 1911 64th Ave. N.E., Arlington, WA 98223 (206/328-3004) for providing much of the data used in the preparation of this report.

Used Oil Filter Recycling Fact Sheet

Did You Know?

Every year the equivalent of

- **109 trucks of steel (4,905,000 pounds of steel)**

  4,235,915 registered vehicles in Wisconsin[1], 12,000 average miles traveled per year
  5,000 miles per oil change = 10,166,196 filters generated each year in Wisconsin
  10 ounces of steel per filter[2] = 6,353,873 pounds of recyclable steel
  77% not recycled[6] = 4,892,481 pounds of recyclable steel being landfilled
  45,000 pounds per truck = 109 trucks of steel

- **125 trucks of contaminated paper (101,250 cubic feet)**

  10,166,196 filters generated per year in Wisconsin
  93% car filters[1] = 9,454,562 car filters generated each year in Wisconsin
  250 car filters per drum[3] = 37,818 drums of car filters per year
  7% truck filters[1] = 711,634 truck filters generated each year in Wisconsin
  65 truck filters per drum[3] = 10,948 drums of truck filters per year
  48,766 total drums
  300 drums per 30 yard container[3] = 163 trucks of contaminated paper
  77% not recycled[6] = 125 trucks of contaminated paper

- **45 trucks of oil (270,000 gallons)**

  10,166,196 filters generated in Wisconsin
  11 average ounces of oil contained in a car filter when removed from a vehicle[4]
  5.6 average ounces remaining in filter after puncturing and draining 24 hours[5]
  1.2 average ounces of oil remaining in paper after puncturing, draining and compaction[4]
  4.4 average ounces of free flowing oil in filter after puncturing & draining, not absorbed in paper
  44,977,715 total ounces of oil = 351,388 gallons of oil
  6,000 gallons per truck = 59 trucks of oil
  77% not recycled[6] = 45 trucks of oil

end up in Wisconsin landfills due to dumping of used oil filters.

Don't Allow This Environmental Threat
to Happen In Your Community!
STOP THE LANDFILL DISPOSAL OF USED OIL FILTERS!

Without recycling filters, the equivalent volume of oil of an Exxon Valdez spill could be landfilled every year in the United States. Five states have already taken action to prevent this. Let's do our part in Wisconsin.

[1] Wisconsin Department of Transportation, Vehicle Registration - Analysis of current and non-expiring vehicles, July 1, 1996

[2] Filter Manufacturer's Council, Components of Typical Oil Filters, Facsimile Transmittal, Amy Barker, October 24, 1996

[3] United Recyclers, Inc., Jim Taylor, July 17, 1997 Telephone Interview, Facsimile Transmittal, July 17, 1997

[4] Motor Vehicle Oil Filter Recycling Demonstration Project, Iowa Waste Reduction Center, University of Northern Iowa, John Konefes,

[5] Motor Vehicle Oil Filter Reycling-Revisited, Iowa Waste Reduction Center, University of Northern Iowa, James Olson, April, 1992

[6] Used Oil Filter Recycling Surveys, University of Wisconsin-Green Bay, Stephanie Johnson, May, 1997

Environmental Products & Services for the Workplace

Ontario Region
Federal Programs
Division

Fact Sheet #3:

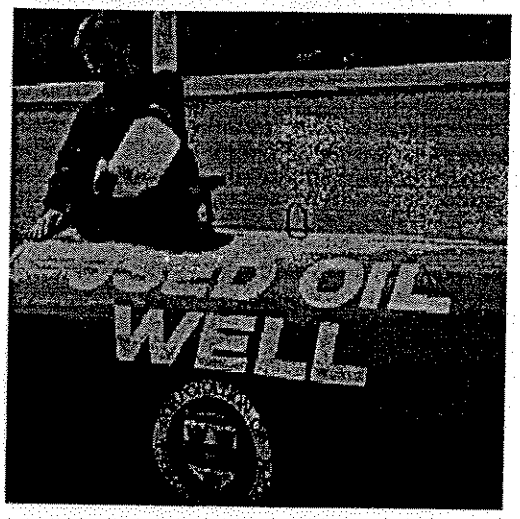
OIL AND OIL FILTER MANAGEMENT

Recycling Used Oil and Oil Filters

After an oil filter has been drained and crushed to reclaim the oil for recycling, 12% of the oil remains in the filter. Furthermore if an oil filter is simply drained, up to 44% of the oil can remain in the filter, which means that this quantity of oil will likely leach out into a landfill where it is dumped. Used oil contains traces of metals and other contaminants not normally found in unused oil. Whether this oil comes from filters in a landfill or is poured down the sewers, it poses a serious threat to the environment. If not disposed of properly, used oil will contaminate drinking water, affect wildlife and of course it could incur huge costs when it comes to clean-up and site remediation. By collecting and recycling oil, collection companies can help you preserve the quality of the soil and water supply and can reuse a non-renewable resource.

There are many environmental companies that collect used oil, used oil filters, solvents and anti-freeze for recycling. The oil filters are collected from facilities which subscribe to a waste oil collection service and are then transported to a treatment plant where they are shredded in a large grinder. The oil from the shredded filters is collected for re-refining, the metal particles from the filter are collected and sent to a smelter for processing into steel, and finally the filter medium is used as a fuel in a cement kiln where it is completely incinerated. The result is that very little material from the oil filter ends up in a landfill.

The used oil collected from the oil filters and in bulk from the motor vehicle servicing industry is cleaned and treated at a refinery for re-use. The re-refining process produces industrial fuels, asphalt extender for extending the life of paved roads, and of course automotive and industrial oils.



With the oil re-refining process, 100% of the used oil that is collected can be returned to the consumer in the form of the above-mentioned products. Some companies which provide oil collection and refining services:

- Safety-Kleen (800) 265-2444
- Lacombe Waste Oil (800) 263 5048
- Laidlaw Waste Systems (613) 224-4463

Check the Yellow Pages under Oil-Waste and Recycling Services for an oil collection company in your area.
This publication has been created by:

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  Environmental Protection Branch-Ontario Region
  ENVIRONMENT CANADA
  49 Camelot Drive, Nepean, Ontario, K1A 0H3
  Phone: (613) 952-8675
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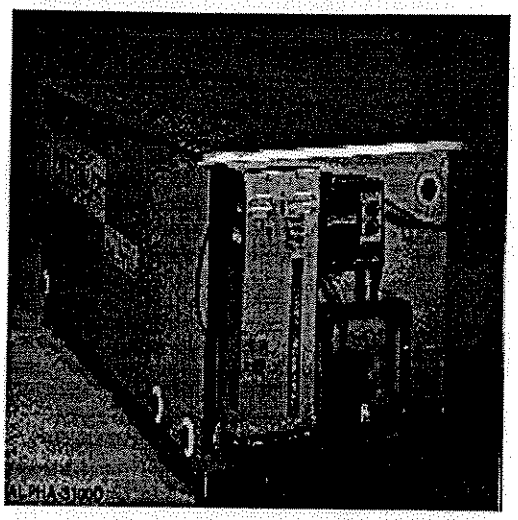
Oil-Water Separators

You think you're responsible, a good friend to the environment. You crush and recycle your oil filters and you store your used oil safely in an aboveground tank to be picked up and recycled. But as you carry an armload of crushed oil filters to the recycling canister or a greasy engine part to the solvent bath a couple drops of oil fall to the floor. Each drop of oil that reaches the floor can potentially reach the storm sewers through the floor drains and contaminate a body of surface water or groundwater. In a garage that services a large fleet of vehicles, those drops of oil or gas can add up to many litres of petroleum product escaping down the drain each year.



Aboveground oil/water separator

If your facility generates waste from vehicle washing, engine washing, radiator flushing and general auto maintenance, an oil-water separator connected to the floor drains can separate and recover oil from the runoff water before it reaches the storm sewers. This oil can then be sent for recycling. Another use for an oil-water separator is the recycling of wastewater from steam cleaning, floor cleaning and pressure washing. Running the wastewater through the oil-water separator cleans the water which allows it to be reused. The benefits of this process are a reduced water bill and less waste sent to a disposal service.
An oil-water separator uses the natural differences in density between hydrocarbons and water to separate them. A series of baffles in the separator slows down the flow of water through the tank to allow enough time for the oil to rise to the top and the suspended solids in the water to settle to the bottom. The water level is constant at all times so that the layer of oil at the top is forced to spill over the overflow weir and into a collection bin. Many oil-water separators can be equipped with sorbent filters and oil skimmers to remove larger quantities of hydrocarbons. Oil-water separators can treat wastewater or runoff water so that the concentration of hydrocarbons is reduced to levels acceptable for discharge to the sewer system.

Some companies which manufacture oil-water separators:

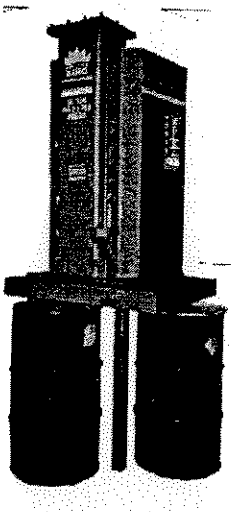
- CANCO Environmental Inc. (905) 567-4059
- ECOSTAR (800) 809-2801
- Great Lakes Environmental (708) 543-1169
- Landa (800)-472-3890

Oil Filter Presses

As mentioned in the previous article, oil filters will be picked up and converted to other products by an oil recycling company at your request. However, it may suit your needs, financially or otherwise, to dispose of the oil filters yourself. In this case, you should consider using a filter press to crush used oil filters and ensure that as much of the oil is removed and recovered prior to disposal of the filters.

Oil filter presses come equipped to handle both commercial and automotive filter sizes. A filter press can crush the larger commercial filter down to one-sixth of its full size in under a minute and reduces an automotive filter to a ninth of its regular size in under thirty seconds. The 3000 psi of force exerted on the filters squeezes out most of the oil retained by the filter after draining. The oil recovered by the filter press is stored in a storage tank; these tanks can range in capacity from 20 to

50 litres. The filter press is also equipped with drainage piping to empty out the recovered oil into a 45 gallon drum which can fit underneath the press.



Oil Filter Press

Features such as a safety switch which prevents the press from operating with the door open and an easy access drain tray make most filter presses safe and easy to clean. Types of presses range from wall mounting to free standing and can cost anywhere from $1500 to $10 000.

Two companies which distribute oil filter presses are:

- Industrial Diesel Products (416) 745-9379, and
- McMaster-Carr Supply Company (708) 833-0300

Disclaimer

Reference herein to any specific products, process, or service by trade name, trademark, manufacture, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by Environment Canada

American Petroleum Institute

STEP

National Used Oil Collection Study

MAY 1996

Overview of Used Oil Filter Collection Efforts

Officials from the following nine jurisdictions indicated that they have now implemented formal used oil filter collection programs:

- Arkansas
- California
- Connecticut
- District of Columbia
- Minnesota
- Oklahoma
- Rhode Island
- South Carolina
- Texas

Unfortunately, little data is available for actual numbers of oil filters collected per state. However, a recent survey conducted by the Filter Manufacturers Council indicates that filter recycling is growing. The Council surveyed 69 filter processors (companies that prepare filters for final disposition at steel mills by dismantling, shredding or crushing). Of these companies, 36 provided information about filter processing rates. In 1994, these 36 companies processed an estimated 56 million used oil filters. However, the same companies had already processed approximately 44 million filters as of June 30, 1995. These figures are not exact because, in some instances, 55-gallon drums or tons of filters processed must be converted to actual numbers of filters. If these companies simply maintained the same processing rate for the remainder of 1995—and evidence indicates that the processing industry is growing—the companies would have managed close to 90 million filters in 1995. Considering that waste-to-energy recovery facilities were not included in this survey and more than 30 processing companies did not respond, the recycling rate for all used oil filters (passenger car and heavy duty truck filters) could reach 25 percent prior to the beginning of 1996. This figure is based on the approximately 420 million filters sold in 1993. One should note that filters were first recycled in late 1991. An estimate of filters sold per state is included as Table 20—Estimated Light Duty Oil Filters Sold in Each State in 1994.

A separate survey conducted by the Motor and Equipment Manufacturers Association and the Car Care Council found that many consumers are willing to recycle both used oil and filters. The survey was conducted at maintenance check points in 14 states as part of National Car Care Month in October of 1994. Of the 900 participants completing survey questions regarding used oil and filter disposal, 42 percent indicated they take used oil filters to service outlets or government-operated recycling centers, as opposed to disposing of the filters as solid waste. These survey respondents showed an even higher tendency to return used oil to service outlets or government-operated collection centers at 85 percent.

Additional information about filter recycling efforts can be obtained by contacting the Filter Manufacturers Council through the Used Filter Hotline at 1-800-993-4583 (1-800-99-FILTER). This service provides a summary of oil filter disposal regulations for all 50 states, the District of Columbia, Puerto Rico, and 10 Canadian provinces. The hotline also lists over 120 companies providing filter management services throughout the country and indexes these companies by the states they serve.

Canadian Environmental Protection Act

Priority Substances List
Assessment Report

Waste Crankcase Oils

Government of Canada
Gouvernement du Canada

Environment Canada
Environnement Canada

Health Canada
Santé Canada

Canada

CANADA'S GREEN PLAN

similar to that of WCOs accidently spilled on land. (For more detail, see text on Spills later in this subsection.)

Waste crankcase oils disposed of with large amounts of organic matter are expected to remain with the refuse in the landfill due to adsorption of the constituents to cellulose, hemicellulose, and other organic matter (CH2M HILL ENGINEERING LTD., 1992). A similar situation is expected for WCOs disposed of on land with a high soil organic content (Raymond *et al.*, 1976). In contrast, at sites with little adsorbent material and permeable soils, there is a greater potential for constituents of WCOs to migrate to groundwater, particularly those constituents and degradation products that are water-soluble (Raymond *et al.*, 1976).

Field studies have shown that 55 to 82% of hydrocarbons in WCOs from cars and 23 to 53% of hydrocarbons in WCOs from diesel trucks are biodegraded in soils of varying composition over a period of one year following a single application (Raymond *et al.*, 1976). After approximately 300 days, up to 60% of waste crankcase oils applied to Canadian soils were biodegraded (*i.e.*, by weight) (Parker *et al.*, 1983). Similarly, aged oily sludges applied to field plots had half-lives ranging from 270 to 410 days (Loehr *et al.*, 1992). In general, the half-life of alkanes (C_{12}-C_{26}), naphthalenes, and other aromatics was less than 30 days. However, 20 to 25% of the applied sludge (typically high molecular weight substances) was slow to degrade and tended to accumulate in the soil (Loehr *et al.*, 1992). Biodegradation rates would likely increase in soils that had received previous applications of WCOs because of acclimatization by micro-organisms (Neal *et al.*, 1977; Elsavage and Sexstone, 1989). In general, the relative order of biodegradability is n-alkanes > branched alkanes > low-molecular-weight-aromatics > cycloalkanes (Atlas, 1981; CDM, 1986; Leahy and Colwell, 1990).

Sewers. Waste crankcase oils disposed of to sewer water initially form a surface film (Hansen, 1975). Laboratory studies suggest that volatile organics, semivolatile organics, and metals partition from the oil phase to the aqueous phase in sewers (Surprenant *et al.*, 1983). In the aqueous phase, metals such as zinc, copper, and cadmium are in dissolved form, while most hydrocarbons are associated with particulate matter (Hunter *et al.*, 1979).

Metals and organics can be removed from wastewater treatment plants. Their removal efficiency, however, is dependent upon the type of compound and the specific treatment process (Monteith, 1987).

Spills. Weathering processes cause a number of physical and chemical changes to the initial surface film of WCOs formed after a spill to water (Hansen, 1975; Payne and Phillips, 1985). Organic compounds with high vapour pressures (*e.g.*, toluene, benzene) are volatilized to the atmosphere, while semi-volatile compounds (*e.g.*, benzo(*a*)pyrene, naphthalene) and metals partition to the water or sediment phases (Surprenant *et al.*, 1983). Other weathering processes include sinking, emulsification, agglomeration, photodegradation, and biodegradation (Payne and Phillips, 1985). In laboratory experiments, aromatic acids, methyl esters, polyphenols, and peroxides have been detected as photo- and biodegradation products of WCOs and other related petroleum

disposed of in a solid waste disposal facility, provided the material is not listed or identified as hazardous waste.

Note: The Department encourages the recycling of used oil including oil-soaked rags and similar materials, by the use of laundering services, burning for energy recovery and other recycling methods.

Note: Disposal of petroleum contaminated soil and materials into solid waste disposal facilities shall be done in accordance with the applicable provisions of chs. NR 419, 506 and 722.

(c) Oil drained or removed from materials containing or otherwise contaminated with oil is subject to regulation as used oil.

Note: The Department encourages that solid waste material from which oil is removed, such as used oil filters that have been drained in accordance with s. NR 605.05 (1) (v), be recycled. If the material cannot be recycled, it should be properly characterized and disposed of in accordance with the requirements of chs. NR 500 to 520 and NR 600 to 685.

(d) No person may mix oil with other material for the purpose of avoiding the prohibition of s. 159.07 (1m) (b) Stats.

(3) No person may burn waste oil in a solid waste treatment facility without energy recovery.

Note: According to 159.07 (1m) (b), Stats., no person may dispose of waste oil in a solid waste disposal facility or burn waste oil without energy recovery in a solid waste treatment facility.

(4) No person may use used oil for dust suppression or road treatment.

(5) The land treatment of used oil is prohibited, except as allowed by ch. NR 518.

(6) No person may place noncontainerized or bulk used oil in any salt dome formation, underground mine or cave.

(7) Except as allowed by s. NR 590.14, no person may burn off-specification used oil for energy recovery, except in any of the following devices:

(a) Industrial furnaces identified in s. NR 590.03.

(b) Boilers, as defined in s. NR 590.03, and as identified as follows:

1. Industrial boilers located on the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes.

2. Utility boilers used to produce electric power, steam, heated or cooled air, or other gases or fluids for sale.

(c) Hazardous waste incinerators subject to regulation under ch. NR 665 or 40 CFR 266 Subpart H.

(8) Except as allowed by s. NR 590.14 (2), no person may mix hazardous waste with used oil without first obtaining a license to treat hazardous waste pursuant to ch. NR 680.

History: Cr. Register, May, 1995, No. 473, eff. 6-1-95.

NR 590.06 Applicability of other regulations. (1) GENERAL. The provisions of this chapter do not exempt any person from any other regulations, except as explicitly stated in this chapter.

Note: The following regulations may apply:

(a) Chapters NR 158, "Notification of the Discharge of Hazardous Substances," and NR 705 - "Discharge Reporting and Source Confirmation for Underground Storage Tank Systems."

(b) Chapters NR 500 to 520 - "Solid and Hazardous Waste Management."

(c) Chapters NR 600 to 685 - "Hazardous Waste Management."

(d) Chapter ILHR 10 - "Flammable and Combustible Liquids."

(e) Chapters NR 700 to 736, "Investigation and Remediation of Environmental Contamination."

(2) USED OIL DISCHARGES. (a) In the event of a discharge of used oil, appropriate immediate action shall be taken to protect human health and the environment, including notifying appropriate authorities, diking the discharge area, and remediating affected areas. Spill response actions shall follow chs. NR 700 to 736.

(b) If a discharge of used oil occurs, the person managing the oil shall do all of the following:

1. Comply with the requirements of s. 144.76, Stats., and chs. NR 158 and 705.

2. Telephone the division of emergency government.

Note: The division of emergency government's 24-hour toll-free number is 1-(800)943-0003.

3. Notify the department of natural resources.

4. If the discharge occurs in the course of transport, give notice as required by 49 CFR 171.15, October 1, 1993, to the national response center at (800) 424-8802.

5. If the discharge occurs in the course of transport, report in writing as required by 49 CFR 171.16, October 1, 1993, to the director, office of hazardous materials regulations, materials transportation bureau, U. S. DOT, Washington, D.C. 20590.

(c) A bulk shipment water transporter who has discharged used oil shall give the same notice as required by 33 CFR 153.203, July 1, 1993, for oil and hazardous substances.

Note: The publications containing the CFR references may be obtained from:

Superintendent of Documents
U.S. Government Printing Office
P.O. Box 371954
Pittsburgh, PA 15250-7954
(202) 783-3238

(d) The removal and subsequent containerization, transportation and management of spilled used oil shall be in compliance with the provisions of this chapter and chs. NR 500 to 520 and 600 to 685 applicable to solid and hazardous waste management.

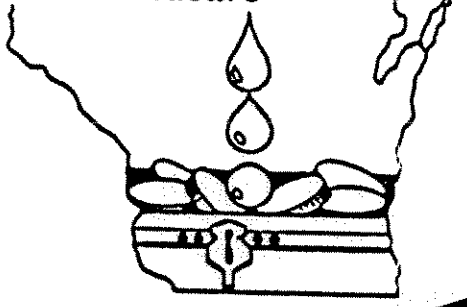
(e) If the department determines that immediate removal of the used oil is necessary to protect human health or the environment, the department may authorize the removal of the waste by transporters who do not have transportation licenses or EPA identification numbers.

History: Cr. Register, May, 1995, No. 473, eff. 6-1-95.

NR 590.07 Notification. (1) EXISTING ACTIVITIES. Except as provided in sub. (5), any person subject to subchs. IV to

GROUNDWATER

GROUNDWATER
Wisconsin's buried treasure



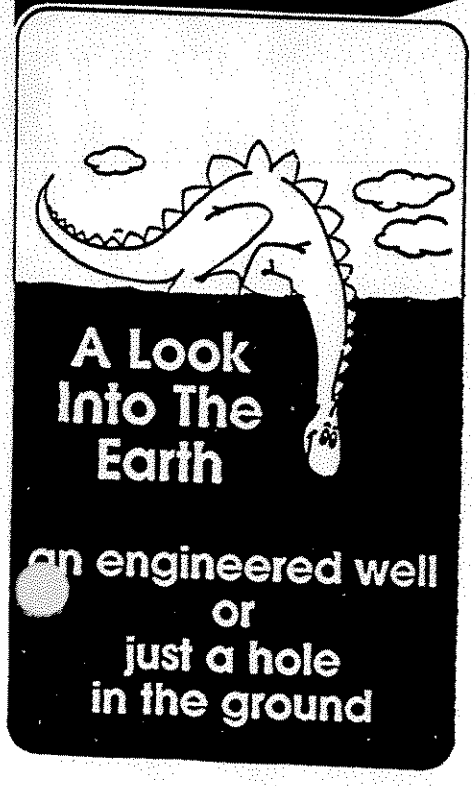
TECHNICAL GUIDE 1995

Improve Ground Water Protection by Sharing Information

1995 Continuing Education Program

For Well Drillers & Pump Installers

Jointly By
DNR - Dept. of Natural Resources
and
Wisconsin Water Well Association



Developed to help maintain and improve knowledge, ability, stature, service of the people in the Ground Water industry.

Assembled by The Wisconsin Water Well Association

ENVIRONMENT

Ground Water

A Critical Key to Small Community Prosperity

Protection of America's ground water resources is critical to the future growth and economic viability of rural and small communities, according to officials of the National Rural Water Association (NRWA).

Over 97% of households outside of metropolitan areas and **one half of the overall U.S. population rely on ground water as their primary source of drinking water.**

Demands on ground water, which provides almost one-fourth of all fresh water used in the United States, have tripled since 1950 to over 90 billion gallons per day.

Ground water has provided the earth, which has been recycling its water for over 3 billion years, with **a key fresh water storage facility**.

Groundwater Provides

97%

of all Rural Drinking Water

50%

of all U.S. Drinking Water

25%

of all U.S. Fresh Water

Until the 1970s ground water was considered to be naturally protected.

However, **between 1971 and 1985 a number of ground water pollution problems were reported.** It became apparent that because of increased usage and past environmental practices, **utilities needed to protect this most valuable resource.**

Once their ground water is contaminated, local communities are faced with finding additional sources, constructing expensive treatment plants, or even replacing water lines. These options all require large expenditures that could prove financially devastating to small communities.

Water utility professionals are very concerned and are **taking action at the local level to protect their ground water sources.** Across the nation over **300 communities,** working with the NRWA, rural water associations, the U.S. Environmental Protection Agency, local Water Well Associations, and the National Ground Water Association, have implemented **local ground water protection plans to ensure a safe quality water supply for their future.**

These wellhead protection plans are a simple five-step process that can be implemented at the local level for little or no cost. State Rural Water Associations in each state provide on-site assistance to water utilities in designing and implementing their plans.

United States Environmental Protection Agency

Solid Waste and Emergency Response (OS-305)

EPA530-F-92-006
May 1992

Office of Solid Waste

EPA

Environmental Fact Sheet

No Hazardous Waste Listing for Used Oil that Is Being Disposed

The Environmental Protection Agency (EPA) has determined that listing of used oil as hazardous waste is not necessary because the toxicity characteristic (TC) rule controls the disposal of hazardous waste. The Agency believes this approach is the most practical one for protecting human health and the environment while encouraging and promoting recycling of this valuable resource.

Background

In November 1985, EPA proposed to list all used oils as hazardous waste. Due to the potential stigma that might be attached to a hazardous waste, EPA issued a decision in 1986 not to list as hazardous used oil that is being recycled. The Agency thought that listing could discourage recycling, resulting in increased incidences of improper disposal of used oil.

The basis for the 1986 rule was legally challenged in 1988. The court ruled that EPA had to make a listing decision based on the statutory criteria which relate to whether a material is toxic. Subsequently, the Agency re-evaluated the basis for making a listing determination for used oil, and issued a Supplemental Proposal in September 1991 that presented three options for listing used oil, and proposed exempting used oil filters from hazardous waste regulation.

Action

The Agency has determined that it is unnecessary to list used oil being disposed of as hazardous waste. Further, EPA determined that crushed or drained used oil filters are not hazardous and need not be regulated when recycled or disposed.

Used Oil. EPA has been collecting and analyzing data on the composition of various types of used oils since 1988. The Agency believes it is also important to consider the effects of other regulations issued since that time. EPA has issued regulations on hazardous waste storage tanks and underground storage tanks. The 1973 Spill Prevention Control Countermeasure requirements are being revised per the Oil Pollution Act of 1990. The toxicity characteristic (TC) rule, issued in 1990, subjected many

NOTE: This fact sheet describes a federal rule which is not effective in Wisconsin until an equivalent state rule is developed. It may take as long as two years to develop an equivalent state rule. 3/93 WIDNR, SW/3

more wastes to federal hazardous waste regulations, including used oil being disposed.

Relying on existing laws and regulations, the Agency has revised some of its conclusions. EPA recognizes the variability of constituent concentrations between different used oil streams, and believes it is not appropriate to list used oil as hazardous. The Agency also believes that used oil which becomes hazardous through use or adulteration can be controlled through the TC when it is destined for disposal. Therefore, this rule makes the determination that listing of used oil as hazardous waste is not necessary since the toxicity characteristic rule controls the disposal of hazardous solid waste.

The TC provides regulatory limits on lead, benzene, and other contaminants that may be present when used oil is produced. Under current regulations, a used oil handler must determine (through testing or knowledge) that the used oil does not exceed the regulatory limits for TC constituents. Used oil that fails the TC must be disposed according to hazardous waste regulations. Used oil that does not exceed the toxicity characteristic is not a hazardous waste.

Used Oil Filters. As proposed in September 1991, the Agency has determined that properly drained used oil filters do not exhibit the toxicity characteristic. Therefore, it is not necessary to list used oil filters as a hazardous waste. EPA continues to encourage recycling of used oil removed from filters, and recycling of the filters and their components

Contact

For additional information or to order a copy of the *Federal Register* notice, contact the RCRA Hotline, Monday-Friday, 8:30 a.m. to 7:30 p.m. EST. The national, toll-free number is (800) 424-9346; TDD (800) 553-7672 (hearing impaired); in Washington, D.C., the number is (703) 920-9810, TDD (703) 486-3323.

Copies of documents applicable to this rulemaking may be obtained by writing: RCRA Information Center (RIC), U.S. Environmental Protection Agency, Office of Solid Waste (OS-305), 401 M Street SW, Washington, D.C. 20460.

U02F-5000

SUMMARY OF SUPERFUND SITES WITH USED OIL DAMAGES

August 3, 1992

Prepared for:

U.S. Environmental Protection Agency
Office of Policy, Planning, and Evaluation
401 M Street, S.W.
Washington, D.C. 20460

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SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
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EPA Contract No.: 68-W0-0027
SAIC Project No.: 01-1026-03-2616-000