



EPA's 33/50 Program Company Profile

Parker Hannifin Corporation



THE 33/50 PROGRAM

This Company Profile is part of a series of reports being developed by EPA to highlight the accomplishments of companies participating in the 33/50 Program. The 33/50 Program is an EPA voluntary pollution reduction initiative that promotes reductions in direct environmental releases and off-site transfers of 17 high-priority toxic chemicals. The program derives its name from its overall goals -- an interim goal of a 33% reduction by 1992 and an ultimate goal of a 50% reduction by 1995. The program uses 1988 Toxics Release Inventory (TRI) reporting as a baseline. In February, 1991, EPA began contacting the parent companies of TRI facilities that reported using 33/50 Program chemicals since 1988 to request their participation in the 33/50 Program. As of April, 1994, a total of 1,216 companies had elected to participate in the Program, pledging to reduce emissions of the 17 target chemicals by more than 355 million pounds by 1995. Companies are encouraged to set their own reduction targets, which may vary from the Program's national 33% and 50% reduction goals. Company commitments and reduction pledges continue to be received by EPA on a daily basis.

The 1992 TRI data revealed that releases and transfers of 33/50 Program chemicals declined by 40% between 1988 and 1992, surpassing the Program's 1992 interim reduction goal by more than 100 million pounds. This accomplishment, together with evidence from analysis of facilities' projected releases and transfers of the 17 priority chemicals, reported to TRI under the Pollution Prevention Act, offers strong encouragement that the 33/50 Program's ultimate goal of a 50% reduction by 1995 will be achieved.

EPA is committed to recognizing companies for their participation in the 33/50 Program and for the emissions reductions they achieve. The Program issues periodic Progress Reports, in which participating companies are listed and highlighted. In addition, Company Profiles, such as this one, are being prepared to provide more detailed information about companies that have written to EPA describing significant emissions reduction initiatives. Information presented in these profiles is drawn primarily from the company's written 33/50 Program communications and the annual TRI reports submitted by their facilities (including Pollution Prevention Act data reported to TRI in Section 8 of Form R). All company communications to EPA regarding the 33/50 Program are available to the public upon request.

EPA does not endorse the performance, worker safety, or environmental acceptability of any of the technical options discussed in this Profile. Mention of any product or procedure in this document is for informational purposes only, and does not constitute a recommendation of any such product or procedure, either express or implied, by EPA.

17 PRIORITY CHEMICALS TARGETED BY THE 33/50 PROGRAM

BENZENE
CADMIUM & COMPOUNDS
CARBON TETRACHLORIDE
CHLOROFORM
CHROMIUM & COMPOUNDS
CYANIDES
DICHLOROMETHANE*
LEAD & COMPOUNDS
MERCURY & COMPOUNDS
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
NICKEL & COMPOUNDS
TETRACHLOROETHYLENE
TOLUENE
1,1,1-TRICHLOROETHANE
TRICHLOROETHYLENE
XYLENES

* Also referred to as methylene chloride

For information on the 33/50 Program, contact the TSCA Hotline at (202) 554-1404 or contact 33/50 Program staff directly by phone at (202) 260-6907 or by mail at Mail Code 7408, Office of Pollution Prevention and Toxics, U.S. EPA, 401 M Street, SW, Washington, D.C. 20460.

Parker Hannifin Corporation

Parker Hannifin Corporation reduced its releases and transfers of 33/50 Program chemicals by over 1,350,000 pounds between 1988 to 1992. This 71% reduction far exceeds the company's 33/50 Program goal of a 50% reduction by 1995.

I. CORPORATE BACKGROUND

Parker Hannifin Corporation manufactures a broad array of motion control products for industrial and aerospace applications. The company is headquartered in Cleveland, OH and employs nearly 26,000 individuals worldwide at 143 manufacturing plants and 87 administrative and sales offices, company stores, and warehouses. Parker's Industrial segment, which accounts for 75% of the company's sales, is comprised of five groups: Fluid Connectors, Motion & Control, Automotive & Refrigeration, Seal, and Filtration. The company's Aerospace segment is a single group with several divisions that account for the remaining 25% of Parker's sales.

Parker Hannifin reduced releases and transfers of 33/50 Program chemicals by 71%, or 1,350,000 pounds, between 1988 and 1992.

The company designs, markets, and manufactures products for controlling motion, flow, and pressure with over 800 product lines for hydraulic, pneumatic and electromechanical applications. Some typical products manufactured by Parker include hydraulic and pneumatic cylinders, valves, hydraulic pumps, fuel pumps, quantity gauges, in-flight refueling equipment, flight control systems, air-turbine starters, sealing components and systems, fuel filters, fuel nozzles, rubber hoses, and flexible connectors.

Fifty-two of Parker's facilities in the United States reported the use of 14 33/50 Program chemicals during the years 1988-1992. Parker uses these chemicals at various stages of its manufacturing processes and operations, including:

- Dichloromethane, tetrachloroethylene, 1,1,1-trichloroethane, and trichloroethylene are used as cleaning agents in degreasing operations;

Releases and Transfers of TRI Chemicals by Parker Hannifin Corporation (1000 lbs)

	1988	1992
33/50 Chemicals		
Cadmium & Compounds	32	17
Carbon Tetrachloride	1	NR
Chromium & Compounds	31	1
Cyanide	1	9
Dichloromethane	52	NR
Lead & Compounds	5	10
Methyl Ethyl Ketone	442	67
Methyl Isobutyl Ketone	16	NR
Nickel & Compounds	5	6
Tetrachloroethylene	266	0
Toluene	89	11
1,1,1-Trichloroethane	676	366
Trichloroethylene	189	61
Xylene	105	13
33/50 Subtotal*	1,911	561
Other TRI Chemicals	613	203
Total*	2,524	764

* Columns may not sum to totals due to rounding.
NR = Not reported -- use below TRI reporting threshold.

- Methyl ethyl ketone and xylene are used as carrier solvents in the manufacture of rubber products;
- Carbon tetrachloride, methyl isobutyl ketone, xylene, and toluene are solvents in adhesives and paints used at various stages of manufacturing processes;
- Cadmium, chromium, cyanide, lead, and nickel are used in metal finishing processes such as plating or coloring; and
- Chromium, nickel, and lead are used as raw materials in steel and steel alloy that is processed in metal machining operations.

In 1988, Parker's releases and transfers of 33/50 Program chemicals were 1,911,313 pounds. This represented 76% of Parker's total releases and transfers of all TRI chemicals. Table I at the

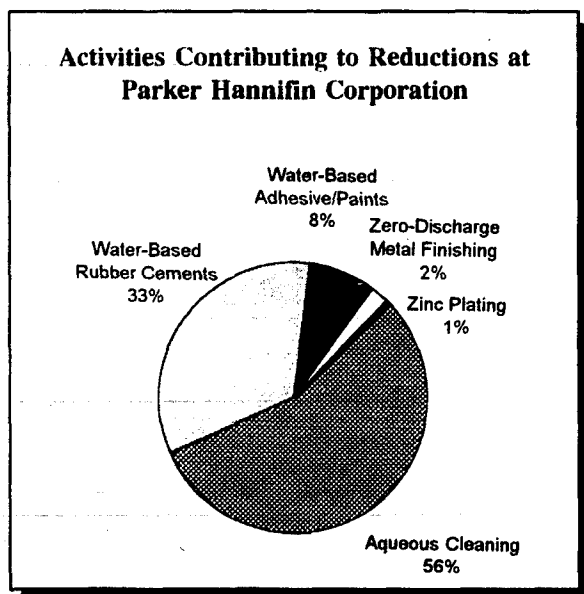
end of this profile summarizes the company's TRI releases and transfers for the period 1988 - 1992.

II. CORPORATE ENVIRONMENTAL STRATEGY

In its 1993 Annual Report, Parker Hannifin stated that "environmental progress is a goal which is beneficial to the company's business interest as well as to the quality of life around the world." As a result, the company is devoting increasing attention to improving its product manufacturing operations with a goal of achieving a cleaner environment.

In 1989, Parker aggressively embarked on a proactive approach to address environmental, health and safety concerns. The company drafted a comprehensive environmental and safety corporate policy requiring each facility to have an assigned environmental and safety coordinator. Parker also required increased environmental training for its employees, and expanded its corporate staff of environmental and safety professionals.

Parker's environmental policy places great emphasis on eliminating hazardous materials. It encourages resource conservation along with a spectrum of waste minimization projects, including recycling scrap paper, reducing emissions, and eliminating the use of toxic chemicals.



Also as part of its comprehensive approach, Parker identified growth opportunities and products that benefit the environment. Such products

include advanced smokestack emission monitoring equipment, emission-free hoses for air conditioning, leak-free fluid connectors, and improved fuel-conserving nozzles for jet engines. Parker is currently working toward full integration of its global manufacturing operations. The company expects to benefit from this integration through the transfer of leading-edge environmental technologies to and from its operations in North America and overseas.

III. 33/50 PROGRAM GOALS AND POLLUTION REDUCTION ACTIVITIES

Parker Hannifin joined the 33/50 Program in May of 1991 with a commitment to achieve a 50% reduction in its releases and transfers of 33/50 Program chemicals by 1995, using 1988 TRI data as a baseline. This translates to a pledged reduction of over 955,000 pounds. The company indicated that its goals would be achieved primarily through source reduction.

Parker believes that environmental progress is beneficial to both the business interests of the company and to the quality of life around the world.

Due to the diversity of its manufactured products and product lines, Parker has divided its reduction efforts by chemical use category (e.g., solvent cleaning, adhesives, paints). Where feasible, the reduction activities identified are implemented at the company's manufacturing facilities worldwide.

To reduce releases and transfers of 33/50 Program chemicals at its facilities in the United States, the company undertook the following activities between 1988 and 1992:

- Eliminated 756,000 pounds of releases and transfers of dichloromethane, tetrachloroethylene, 1,1,1-trichloroethane, and trichloroethylene by switching to aqueous cleaning systems for degreasing operations. Because the aqueous cleaning process requires agitation of the parts, part of the conversion involved redesigning the racks used to hold parts during cleaning to accommodate agitation.

Eliminated 453,000 pounds of releases and transfers of methyl ethyl ketone and toluene by substituting water-based solutions for solvent solutions used to carry cements in the manufacture of rubber hoses. This substitution required the addition of a drying step because of the relatively slow evaporation rate of water.

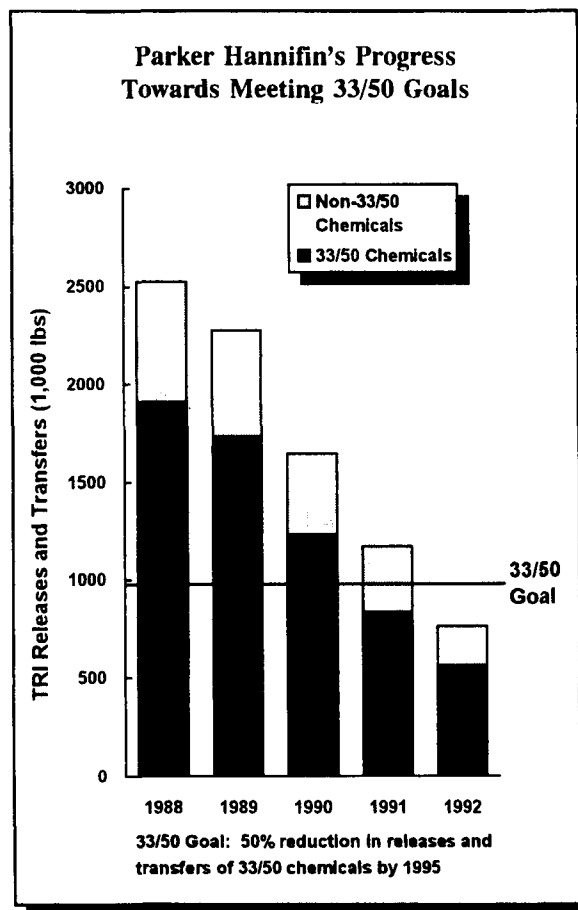
Eliminated 109,000 pounds of releases and transfers of carbon tetrachloride, methyl isobutyl ketone, and xylene by substituting water-based adhesives and paints for solvent-based adhesives and paints.

Eliminated 30,000 pounds of releases and transfers of chromium and chromium compounds used in coloring processes that are part of the metal finishing operations. This reduction was achieved through waste minimization techniques such as counter-current rinsing, reduced drag-out rates, and improved quality control.

Reduced releases and transfers of cadmium and cadmium compounds by 15,000 pounds by substituting zinc plating for all of the cadmium plating process carried out in metal finishing operations. Cyanide releases and transfers associated with the cadmium plating operations have increased. This increase is due to the fact that the company switched approximately 50% of its cyanide treatment from on-site to off-site. (Waste treated on-site is reported to TRI only for quantities not destroyed or removed, while the full quantity treated off-site is reported as a transfer). Parker estimates, however, that releases and transfers of cyanide will be eliminated by 1994 when the conversion to zinc plating will be complete at all of its facilities.

To minimize emissions of lead during machining operations, Parker is working with steel suppliers to develop low or zero lead content raw material steel.

In addition to these activities, Parker is working with steel suppliers to minimize emissions of metals during machining operations by developing



raw material steel with a low or zero lead content. This effort is currently in the development stage, but promising results are expected in the future. In the meantime, Parker achieved reductions in metal emissions through improved scrap recovery and control methods. However, because these reductions are relatively small, they are not measured by the company and therefore cannot be quantified.

IV. PROGRESS TOWARDS 33/50 REDUCTION GOALS

As a result of Parker's pollution prevention efforts, releases and transfers of 33/50 Program chemicals decreased by more than 1,350,000 pounds between 1988 and 1992. This reduction of 71% exceeds the company's Program goal of a 50% reduction more than three years ahead of schedule.

Although not part of the company's goals, Parker has also achieved a 67% reduction in releases and transfers for all non-33/50 TRI chemicals. Although some of Parker's reductions can be attributed to production decreases associated with

economic conditions, Parker achieved the majority of its reductions through pollution prevention measures, primarily substitution with water-based materials.

In its projections for 1994, submitted as part of the 1992 Pollution Prevention Act reporting data (Table II), Parker predicts further reductions in releases and transfers of 33/50 Program chemicals. When the emissions reduction projects currently underway are completed, the company expects that reductions of releases and transfers will exceed 90%.

V. SUMMARY OF PARKER HANNIFIN'S EXPERIENCE

The 33/50 Program played a major role in solidifying Parker Hannifin Corporation's envi-

ronmental program goals. When the company's CEO called together its operating Presidents to identify opportunities to eliminate 33/50 Program chemicals within their operations, the group indicated that they could exceed EPA's 50% program goal primarily by targeting solvents for elimination. The momentum created by this initiative carried over to other operations as managers saw benefits such as lower operating expenses, fewer hazards, and less risk.

As a result, Parker Hannifin achieved significant reductions in releases and transfers of 33/50 Program chemicals. Reductions between 1988 and 1992 totalled more than 1,350,000 pounds, for a 71% total reduction. Moreover, the company's projections indicate overall reductions in excess of 90% by 1995 from 1988 levels.

Table I
Parker Hannifin Corporation
TRI Releases and Transfers, 1988-1992
(All data from TRI unless otherwise noted)

Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (1) (pounds)	Percent Change 1988-1992 Total Releases and Transfers
Cadmium & Compounds	1988	0	0	0	368	31,600	31,968	
	1989	5	0	0	129	35,120	35,254	
	1990	5	0	0	55	19,254	19,314	
	1991	0	0	0	14	6,840	6,854	
	1992	0	0	0	10	17,200	17,210	-46%
Carbon Tetrachloride	1988	1,200	0	0	0	0	1,200	-100%
Chromium & Compounds	1988	500	0	0	1,004	29,635	31,139	
	1989	10	0	0	286	4,922	5,218	
	1990	260	0	0	63	2,943	3,266	
	1991	255	0	0	28	770	1,053	
	1992	5	1	0	25	1,087	1,118	-96%
Cyanide Compounds	1988	0	0	0	339	806	1,145	
	1989	5	0	0	167	3,045	3,217	
	1990	15	0	0	188	1,799	2,002	
	1991	0	0	0	40	228	273	
	1992	0	0	0	500	8,200	8,700	660%
Dichloromethane	1988	51,832	0	0	0	0	51,832	
	1989	64,541	0	0	0	0	64,541	
	1990	29,043	0	0	0	0	29,043	
	1991	18,200	0	750	0	713	19,663	-100%
Lead & Compounds	1988	270	34	0	505	4,500	5,309	
	1989	765	20	0	502	7,625	8,912	
	1990	515	16	0	264	8,035	8,830	
	1991	270	21	0	20	11,349	11,660	
	1992	250	2	0	10	10,237	10,499	98%
Methyl ethyl ketone	1988	419,927	0	0	21	21,574	441,522	
	1989	292,348	0	0	0	22,578	314,926	
	1990	260,812	0	0	0	27,760	288,572	
	1991	112,400	0	0	0	0	112,400	
	1992	67,000	0	0	0	0	67,000	-85%
Methyl isobutyl ketone	1988	16,000	0	0	0	0	16,000	-100%
Nickel & Compounds	1988	0	0	0	268	4,496	4,764	
	1989	5	0	0	266	3,384	3,655	
	1990	5	0	0	15	759	779	
	1991	0	0	0	80	11,505	11,585	
	1992	0	0	0	284	5,455	5,739	20%
Tetrachloroethylene	1988	185,664	0	0	0	80,378	266,042	
	1989	210,000	0	0	0	98,275	308,275	
	1990	48,600	0	0	0	51,693	100,293	
	1991	47,800	0	0	0	0	47,800	
	1992	4	0	0	0	0	4	-100%

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Parker Hannifin Corporation
TRI Releases and Transfers, 1988-1992
(All data from TRI unless otherwise noted)

Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/Disposal/Other (pounds)	Total Releases and Transfers (1) (pounds)	Percent Change 1988-1992 Total Releases and Transfers
Toluene	1988	89,418	0	0	0	0	89,418	
	1989	78,064	0	0	0	0	78,064	
	1990	89,338	0	0	0	0	89,338	
	1991	73,018	0	0	0	0	73,018	
	1992	10,900	0	0	0	250	11,150	-88%
1,1,1-Trichloroethane	1988	631,164	0	0	1	45,107	676,272	
	1989	627,978	0	0	0	20,061	648,039	
	1990	549,435	0	0	13	6,400	555,848	
	1991	402,529	0	0	13	2,150	404,692	
	1992	362,350	0	0	1	3,200	365,551	-46%
Trichloroethylene	1988	152,821	0	0	0	36,481	189,302	
	1989	132,900	0	0	0	37,140	170,040	
	1990	97,124	0	0	0	9,156	106,280	
	1991	114,557	0	0	0	2,600	117,157	
	1992	59,175	1	0	0	1,500	60,676	-68%
Xylene (mixed isomers)	1988	105,400	0	0	0	0	105,400	
	1989	90,500	0	0	0	0	90,500	
	1990	27,000	0	0	0	0	27,000	
	1991	25,000	0	0	0	3,400	28,400	
	1992	11,800	0	0	0	1,500	13,300	-87%
<u>33/50 Program Chemicals</u>	1988	1,654,196	34	0	2,506	254,577	1,911,313	
	1989	1,497,121	20	0	1,350	232,150	1,730,641	
	1990	1,102,152	16	0	598	127,799	1,230,565	
	1991	794,029	21	750	200	39,555	834,555	
	1992	511,484	4	0	830	48,629	560,947	-71%
Non-33/50 Program Chemicals	1988	362,899	0	0	101,155	148,619	612,673	
	1989	435,493	0	0	2,758	106,272	544,523	
	1990	360,300	0	0	836	50,456	411,592	
	1991	283,860	0	755	393	50,562	335,570	
	1992	166,105	250	0	606	36,429	203,390	-67%
All TRI Chemicals	1988	2,017,095	34	0	103,661	403,196	2,523,986	
	1989	1,932,614	20	0	4,108	338,422	2,275,164	
	1990	1,462,452	16	0	1,434	178,255	1,642,157	
	1991	1,077,889	21	1,505	593	90,117	1,162,998	
	1992	677,589	254	0	1,436	85,058	764,337	-70%
<u>Percent Change, 1988-1992</u>								
33/50 Program Chemicals		-69%	-88%	--	-67%	-81%	-71%	
Non 33/50 Program chemicals		-54%	--	--	-99%	-75%	-67%	
All TRI Chemicals		-66%	647%	--	-99%	-79%	-70%	

Notes: (1) 1991 and 1992 Total Releases and Transfers do not include off-site recycling or energy recovery.

Table II
Parker Hannifin Corporation
Pollution Prevention Act Reporting (1)

Chemical	Year	Recycled On-Site (pounds)	Recycled Off-Site (pounds)	Energy Recovery On-Site (pounds)	Energy Recovery Off-Site (pounds)	Treated On-Site (pounds)	Treated Off-Site (pounds)	Quantity Released (pounds)	Percent Change 1991-1994 Quantity Released	Total Production Related Wastes (pounds)	Percent Change 1991-1994 Production Related Wastes
<u>33/50 Program Chemicals</u>	1991	0	1,749,620	0	45,105	16,600	40,036	663,274		2,514,635	
	1992	0	1,591,755	0	29,521	8,000	115,951	533,856		2,279,083	
	1994	0	1,453,200	0	13,005	0	9,118	45,162	-93%	1,520,485	-40%
<u>Non-33/50 Program Chemicals</u>	1991	9,000	15,200,050	600	16,604	456,640	18,476	206,548		15,907,918	
	1992	6,100	14,976,649	476	57,731	527,140	24,133	172,877		15,765,106	
	1994	3	16,332,949	0	605	503,810	16,374	52,395	-75%	16,906,136	6%
<u>All TRI Chemicals</u>	1991	9,000	16,949,670	600	61,709	473,240	58,512	869,822		18,422,553	
	1992	6,100	16,568,404	476	87,252	535,140	140,084	706,733		18,044,189	
	1994	3	17,786,149	0	13,610	503,810	25,492	97,557	-89%	18,426,621	0%
<u>Percent Changes, 1991-1994</u>											
33/50 Program chemicals		--	-17%	--	-71%	-100%	-77%	-93%		-40%	
Non 33/50 Program chemicals		-100%	7%	-100%	-96%	10%	-11%	-75%		6%	
All TRI Chemicals		-100%	5%	-100%	-78%	6%	-56%	-89%		0%	

Notes: (1) Actual data for 1991 and 1992, projections for 1994.