



Printers'
National
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Center

Printing
Environmental Technology
Fact Sheet

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**Toxic Release Inventory for Printing and Publishing (SIC27)
1996 Releases and 1988-1996 Trend Analysis**

In March 1999, EPA released a special report on information contained in the Toxic Release Inventory (TRI) that it has been collecting since 1988. The report entitled "1996 Toxics Release Inventory Public Data Release – 10 Years of Right-to-Know: Industry Sector Analysis." contains data on 15 industrial sectors not presented in previous Toxic Release Inventory reports and includes a variety of manufacturers, along with printing and publishing. The report provides detailed emission releases and source reduction information on an industry sector basis. The first chapter provides an overview of all releases and Chapter 8 focuses on releases just from the printing industry. The information contained in the report addresses the following areas of reporting as dictated by TRI:

- Release Reporting – Both On-Site and Offsite
- Other On-Site Waste Management
- Transfers Off-Site For Further Waste Management
- Production Related Wastes
- Non-Production Related Wastes

Presented below is a summary of the release reporting components of Chapters 1 and 8. More detailed information on releases and waste management can be found in the full report. The full report along with additional information on TRI can be accessed at www.epa.gov/opptintr/tri/pdr96/2drhome.htm

Appendix I contains information on key terms and reporting applicability. The attachment includes details on applicability of TRI and definitions for the categories contained in each of the reporting fields. Appendix II contains a list of common TRI chemicals that could be found in various printing operations and the products where they may be found.

1996 and 1988-1996 National Data For All Industries

In 1996, a total of 21,626 facilities submitted 71,381 forms to TRI; either Form R or the simpler Form A, as shown in Table 1. Facilities must submit a separate form for each chemical subject to reporting under TRI will have its own form. For the printing industry (SIC 27), a total of 241 facilities submitted 483 forms, making printing one of the more infrequent reporting industries. On a percent basis, printers only accounted for 1.11% of all facilities filing reports and 0.68% of all forms submitted.

Table 1. TRI Facilities and Forms, by Industry 1996

SIC Code	Industry	Total Facilities	Total Forms	Form R's	Form A's
20	Food	1,993	3,541	2,545	996
21	Tobacco	29	61	61	
22	Textiles	307	657	622	35
23	Apparel	25	51	49	
24	Lumber	765	1,926	1,446	480
25	Furniture	453	1,250	1,224	26
26	Paper	491	2,363	2,250	113
27	Printing	241	483	475	8
28	Chemicals	3,855	21,098	18,288	2,810
29	Petroleum	401	3,231	2,990	241
30	Plastics	1,824	3,747	3,404	343
31	Leather	89	223	209	14
32	Stone/Clay/Glass	640	1,716	1,517	199
33	Primary Metals	1,902	6,603	6,138	465
34	Fabricated Metals	2,883	7,416	6,895	521
35	Machinery	1,087	2,791	2,619	17
36	Electrical Equip.	1,233	3,121	3,031	90
37	Transportation Equip	1,248	4,331	4,117	214
38	Measure/Photo	291	707	661	4
39	Miscellaneous	362	766	710	5
	Multiple Codes	1,271	4,520	4,195	325
	No Codes	236	779	701	7
	TOTALS	21,626	71,381	64,147	7,234

As seen from the Table 2 below, the total amount of on and off-site releases by all industry sectors totaled 2.43 billion pounds in 1996. The 2.43 billion pounds included 1.45 billion pounds of air emissions of which 355.3 million pounds were from fugitive emissions and 1.10 billion pounds from stack or point sources. Discharges to surface water totaled 173.3 million pounds. Underground injection accounted for 204.3 million pounds and 99.6% of the total was reported to Class I injection wells. Land releases were 309.1 million pounds, including 26.5 million pounds released to RCRA subtitle C landfills. Transfers to disposal (off-site releases) totaled 294.7 million pounds.

The printing industry had a total of 28,446,019 pounds of chemicals released either on or off site. The releases by the printing industry were only 1.17% of the total released by all of industry. A total of 13,782,537 pounds were released as fugitive air emissions and 14, 579,092 pounds were released as point air emissions. 1,670 pounds were discharged to surface water and none to injection wells. Other on-site land releases accounted for 13,650 pounds and 89,070 pounds were transferred off-site for disposal.

Table 2. TRI On-Site and Off-Site Releases, by Industry, 1996

SIC	Industry	AIR		Surface Water Discharges	Underground Injection		RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Offsite Releases	Total On-and Off site Releases
		Fugitive or Nonpoint	Stack or Point		Class I Wells	Class II-V Wells					
		LBS	LBS		LBS	LBS				LBS	
20	Food	21,810,437	47,255,169	8,983,229	1,010	29,548	28,506	4,438,103	82,546,002	757,393	83,303,395
21	Tobacco	61,394	3,453,344	179,701	0	0	0	0	3,694,439	458,133	4,152,572
22	Textiles	3,217,057	13,125,828	348,877	0	0	0	173,620	16,865,382	462,148	17,327,530
23	Apparel	130,287	1,663,532	7,320	0	0	0	534	1,801,673	63,177	1,864,850
24	Lumber	4,636,576	23,856,213	76,874	0	0	6,039	9,807	28,585,509	7,657,171	36,242,680
25	Furniture	4,813,779	30,910,342	43	0	0	0	26,641	35,750,805	125,858	35,876,663
26	Paper	18,227,534	185,722,017	16,008,715	0	0	602,265	4,160,489	224,721,020	2,842,352	227,563,372
27	Printing	13,782,537	14,579,092	1,670	0	0	0	13,650	28,376,949	89,070	28,466,019
28	Chemicals	93,363,107	299,070,993	90,420,803	200,317,453	197,441	2,689,697	68,276,606	754,336,100	30,842,063	785,178,163
29	Petroleum	27,968,469	24,132,610	10,567,225	2,310,233	8,664	5,685	1,236,941	66,229,827	2,657,431	68,887,258
30	Plastics	27,540,757	77,774,998	27,815	750	0	48,918	398,367	105,791,605	10,617,686	116,409,291
31	Leather	747,962	1,906,965	53,526	0	0	0	6,611	2,715,064	1,526,825	4,241,889
32	Stone/Clay/Glass	1,870,677	28,158,910	45,443	500	500	105,977	2,416,616	32,598,623	6,141,803	38,740,426
33	Primary Metals	38,722,723	105,958,141	31,988,843	930,779	0	22,192,029	193,591,686	393,384,201	171,150,982	564,535,183
34	Fabricated Metals	23,613,262	45,578,614	351,080	563	7	204,331	572,609	70,320,466	19,933,901	90,254,367
35	Machinery	6,665,652	12,373,145	34,089	0	0	7,144	121,101	19,201,131	2,859,589	22,060,720
36	Electrical Equip.	6,351,489	17,401,668	1,462,615	22	5	210,430	225,890	25,652,119	16,113,258	41,765,377
37	Transportation Equip.	28,283,393	74,410,242	224,148	0	0	86,685	618,616	103,623,084	7,729,685	111,352,769
38	Measure/Photo	2,698,043	10,503,368	1,297,561	0	0	0	2,531	14,501,503	848,568	15,350,071
39	Misc.	1,929,982	7,478,283	2,364	0	0	11,957	8,189	9,430,775	839,283	10,270,058
	Multiple SIC Codes	26,982,381	66,599,536	10,964,363	11,400	10	180,840	5,680,956	110,419,486	10,359,532	120,779,018
	No Codes	1,854,254	4,905,200	241,905	0	520,224	74,466	628,674	8,224,723	660,188	8,884,911
	TOTALS	355,271,752	1,096,818,210	173,288,209	203,572,710	756,399	26,454,969	282,608,237	2,138,770,486	294,736,096	2,433,506,582

1988-1996 TRI Release Data Trend

In examining the data from 1988 to 1996, as shown in Table 3, the nationwide total on- and off-site releases decreased from 3.35 billion pounds to 1.82 billion pounds. This amounted to a reduction of 1.53 billion pounds or 45.6%. From 1995 to 1996, the reported on and off site releases reported a net change of a decreased 97.3 million pounds or 3.8%. Seven of the twenty SIC groups showed increases from 1995 to 1996.

In comparing data from 1996 to 1988, the printing industry has shown a dramatic decrease in total releases from 1988 and steady decrease from 1994-1996. The printing industry has shown a total decrease of 32,803,873 pounds or 53.8 percent decrease from 1988-1996. The year 1988 is critical because it was the first year for which TRI reporting was required. Table 3 provides more details on the total releases from the printing industry.

Table 3. Change In total On-Site and Off-Site Releases, by Industry 1988 and 1994-1996

SIC Code	Industry	1988 Lbs.	1994 Lbs.	1995 Lbs.	1996 Lbs.	1988-1996 Change	
							%
20	Food	8,377,717	6,013,560	5,120,357	5,120,503	-3,257,214	-38.9
21	Tobacco	341,927	134,771	95,226	73,415	-268,512	-78.5
22	Textiles	35,798,377	16,346,332	15,655,607	15,280,411	-20,517,966	-57.3
23	Apparel	1,025,697	1,380,947	1,259,986	1,741,831	716,134	69.8
24	Lumber	32,981,807	32,986,266	30,434,637	27,116,641	-5,865,166	-17.8
25	Furniture	62,363,120	52,134,945	41,530,300	35,651,541	-26,711,579	-42.8
26	Paper	207,603,004	185,334,196	178,774,984	172,799,131	-34,803,873	-16.8
27	Printing	61,187,518	34,386,679	30,895,852	28,269,786	-32,803,873	-53.8
28	Chemicals	1,047,782,223	537,482,685	539,600,255	513,043,111	-534,739,112	-51.0
29	Petroleum	72,780,821	46,877,100	42,593,318	43,076,652	-29,704,169	-40.8
30	Plastics	158,313,799	125,462,108	114,765,358	105,358,191	-52,955,608	-33.4
31	Leather	13,023,617	5,104,391	4,026,421	3,813,502	-9,210,115	-70.7
32	Stone/Clay/ Glass	40,539,364	17,359,182	19,053,390	23,263,716	-17,275,648	-42.6
33	Primary Metals	629,353,951	433,885,649	455,029,353	496,662,641	-132,691,310	-21.1
34	Fabricated Metals	160,369,759	99,572,056	90,440,941	77,610,533	-82,759,226	-51.6
35	Machinery	69,747,296	27,120,215	22,851,633	19,162,054	-50,585,242	-72.5
36	Electrical Equip.	132,719,036	36,671,754	31,457,129	33,753,037	-98,965,999	-74.6
37	Transportation Equip	208,391,846	128,139,353	114,746,256	105,231,558	-103,160,288	-49.5
38	Measure/Photo	58,084,824	14,328,227	12,955,213	10,358,619	-47,726,205	-82.2
39	Miscellaneous	32,592,710	15,350,168	13,285,855	9,843,403	-22,749,307	-69.8
	Multiple Codes	308,351,079	149,011,079	122,436,826	91,157,789	-217,193,290	-70.4
	No Codes	11,229,042	17,704,243	8,281,275	5,376,979	-5,852,063	-52.1
	TOTALS	3,352,958,534	1,982,785,906	1,895,290,172	1,823,765,044	-1,529,193,490	-45.6

1996 and 1988-1996 Printing and Publishing TRI Release Data

In reviewing the details associated with TRI reports submitted by printers (Table 4), the predominant reporting category by printing process type is publication rotogravure. For 1996, this category was the source of with 172 forms, or 35.6% of the total submitted by printing facilities. Commercial printing via lithography accounted for 95 forms or 19.5% of the total. There were 71 forms (14.7%) reported with multiple SIC codes. The most common multiple SIC code category in the same facility is rotogravure and lithographic printing operations. The other common combinations are lithographic printing and bookbinding, lithographic printing and periodicals, lithographic printing and other nonclassifiable printing, and publication rotogravure printing and other nonclassifiable printing.

The entire printing and publishing industry had about 28.4 million pounds of on-site releases of TRI chemicals in 1996. The 28.4 million pounds represents 99.7% of all releases from printing and publishing. Publication rotogravure printing reported the largest amounts of on-site releases for all printers representing 17.4 million pounds total, 61.0% of the total releases from the printing and publishing sector. Lithographic commercial printing had the third largest amount of on-site releases with 951,000 pounds or about 3.4% of the total on-site releases.

The multiple codes group ranked second in the printing and publishing sector in all categories, except off-site releases. The multiple-codes forms reported 8.6 million pounds of total releases, all of it as on-site releases. This amount represented 30.4% of the sector's on-site releases and total releases.

There was a total of 89,070 pounds of TRI chemicals released off-site, representing 0.3% of all releases. The publication gravure segment had 49,002 pounds or 55%. Lithographic commercial printing had the third largest amount of on-site releases with 951,000 pounds or about 3.4% of the total on-site releases and 4,500 pounds or 5% of the total off-site releases. Platemaking services (SIC 2796) reported the second-largest amount of off-site releases (transfers to disposal), with 15,000 pounds (16.4% of the sector's total). Miscellaneous commercial printing (SIC 2759) reported the third largest off-site releases with 14,000 pounds (15.6%).

Table 4. Summary of TRI Information by 4-digit SIC Code, 1996: Printing and Publishing, SIC27

SIC Code	Industry	Total Release Rank	Total Production Related Waste Rank	Total Facilities	Total Forms	Total Form As	Total On-Site Releases	Total Off-Site Releases	Total Releases
2721	Periodicals	10	13	1	1	0	15,429	0	15,429
2731	Book Publishing	14	14	3	3	3	0	0	0
2732	Book Printing	6	7	6	11	0	149,725	0	149,725
2741	Misc. Publishing	8	11	1	1	0	18,669	0	18,669
2752	Commercial Printing – Litho	3	3	57	95	0	951,368	4,520	955,888
2754	Commercial Printing – Gravure	1	1	63	172	2	17,309,198	49,002	17,358,200
2759	Commercial Printing – NEC*	4	4	36	51	0	821,554	13,870	835,424
2771	Greeting Cards	12	9	3	4	0	18	2,235	2,235
2782	Blankbooks & Looseleaf Binders	11	8	1	1	0	6,414	0	6,414
2789	Bookbinding & Related Work	9	10	1	2	0	18,270	0	18,270
2791	Typesetting	13	12	0	1	0	0	69	69
2796	Platemaking Services	7	5	39	53	2	110,657	14,596	125,253
	Multiple SIC Codes	2	2	23	71	1	8,637,462	0	8,637,462
	Invalid SIC Codes	5	6	7	17	0	338,185	0	338,185
	TOTAL			241	483	8	28,376,949	89,070	28,466,019

* Not Elsewhere Classified

As can be seen in Table 5, air releases represent 99.6% or 28.4 million pounds of the printing and publishing sector's reported releases in 1996. Publication rotogravure reported 17.3 million pounds of air emissions or about 61.0% of all air releases for the sector. Multiple-code printing facilities reported 8.6 million pounds (30.5%). Commercial lithographic printers reported the third largest air emissions at 951,000 pounds (3.4%). The two subsegments of the printing and publishing, which reported the largest toluene releases, not shown in Table 5, were publication rotogravure (SIC 2754)

and multiple-codes, with air emissions of 15.0 million and 7.7 million pounds, respectively. The printing and publishing sector reported off-site releases (transfers to disposal) of 89,000 pounds with publication rotogravure accounting for 49,000 pounds, 55.0% of the total.

TABLE 5. TRI On-site and Off-site Releases In Pounds, 1996: Printing and Publishing, SIC 27

SIC	Industry	Total Air Emissions	Surface Water Discharge	Underground Injection Wells		On-Site Land Releases		Total On-Site Releases	Off-site Transfers For Disposal	Total On & Off-Site Releases
				Class I	Class II-V	RCRA Subtitle C Landfill	Other Land Releases			
2754	Commercial Printing – Gravure	17,307,788	1,410	0	0	0	0	17,309,198	49,002	17,358,200
	Multiple Codes	8,637,212	250	0	0	0	0	8,637,462	4,778	8,642,240
2752	Commercial Printing – Litho	951,368	0	0	0	0	0	951,368	4,520	955,888
2759	Commercial Printing – NEC*	821,304	0	0	0	0	250	821,554	13,870	835,424
	Invalid SIC Code	338,175	10	0	0	0	0	338,185	0	338,185
2732	Book Printing	149,725	0	0	0	0	0	149,725	0	149,725
2796	Platemaking Services	97,257	0	0	0	0	13,400	110,657	14,596	125,253
2741	Misc. Publishing	18,669	0	0	0	0	0	18,669	0	18,669
2789	Bookbinding & Related Work	18,270	0	0	0	0	0	18,270	0	18,270
2721	Periodicals	15,249	0	0	0	0	0	15,429	0	15,429
2782	Blankbooks & Looseleaf Binders	6,414	0	0	0	0	0	6,414	0	6,414
2771	Greeting Cards	18	0	0	0	0	0	18	2,235	2,253
2791	Typesetting	0	0	0	0	0	0	0	69	69
2731	Book Publishing	0	0	0	0	0	0	0	0	0
	TOTALS	28,361,629	1,670	0	0	0	13,650	28,376,949	89,070	28,466,019

* Not Elsewhere Classified

In terms of the specific chemicals being reported by printers and publishers, the top 15 chemicals accounted for more than 99% of the sector's air emissions, on-site releases, and total releases. As can be seen in Table 6, toluene, a common rotogravure ink solvent, accounted for the largest single chemical released, far eclipsing the next largest chemical release. Xylenes ranked second at 1.3 million pounds and glycol ethers ranked third at 1.2 million pounds. For xylenes, not shown here, the multiple-codes group reported 652,000 pounds of total releases, and publication rotogravure reported 527,000 pounds. Publication rotogravure, commercial lithographic printing, and miscellaneous commercial printing each reported releasing more than 275,000 pounds of glycol ethers.

Table 6. Chemicals With Largest Total On- and Off-Site Releases, 1996 Printing and Publishing

CAS #	Chemical	Total Air Emissions	Surface Water Discharge	Underground Injection Wells		On-Site Land Releases		Total On-Site Releases	Off-site Transfers For Disposal	Total On & Off-Site Releases
				Class I	Class II-V	RCRA Subtitle C Landfill	Other Land Releases			
108-88-3	Toluene	23,119,979	290	0	0	0	0	23,120,269	17,521	23,137,790
1330-20-7	Xylene (Mixed Isomers)	1,332,661	396	0	0	0	0	1,333,057	20	1,333,077
	Glycol Ethers	1,185,026	260	0	0	0	0	1,185,286	1,830	1,187,116
78-93-3	Methyl Ethyl Ketone	885,640	0	0	0	0	0	885,640	500	886,140
67-63-0	Methanol	437,219	0	0	0	0	0	437,219	1,500	438,719
108-10-1	Methyl Isobutyl Ketone	330,385	0	0	0	0	0	330,385	250	330,635
67-63-0	Isopropyl Alcohol (Manufacturing)	305,058	0	0	0	0	0	305,058	0	305,058
75-09-2	Methylene Chloride	176,524	0	0	0	0	0	176,524	0	176,524
110-54-3	n-Hexane	73,748	0	0	0	0	0	73,748	4,960	78,708
95-63-6	1,2,4-Trimethylbenzene	74,844	0	0	0	0	0	74,844	2,200	77,044
107-21-1	Ethylene Glycol	72,544	0	0	0	0	0	72,544	0	72,544
7664-41-7	Ammonia	63,887	0	0	0	0	0	63,887	0	63,877
127-18-4	Tetrachloroethylene	48,402	0	0	0	0	0	48,402	0	48,402
872-50-4	N-Methyl-2-Pyrrolidone	39,223	0	0	0	0	0	39,223	0	39,223
71-55-6	1,1,1-Trichloroethane	35,219	0	0	0	0	0	35,219	0	35,219
	TOTALS	28,361,629	1,670	0	0	0	13,650	28,376,949	89,070	28,466,019

As can be seen in Table 7, the printing and publishing sector reported 61.2 million pounds of total on-site and off-site releases in 1988 and 28.3 million pounds of total releases in 1996. This represents a reduction of 53.8% or 32.9 million pounds of reported releases. The largest reduction in reported releases, by weight, is attributable to reductions in air releases. Other reported on-site releases decreased by large percentages, 66.6% to as much as 100%.

Total reported off-site releases were also dramatically reduced from during the 1988 to 1996 period. In 1988 a total of 493,000 pounds was reported and in 1996, only 84,000 pounds were reported, representing a decrease of 82.9%.

Table 7. Comparison of TRI On-Site and Off-Site Releases, Other Waste Management, and Transfers Off-Site For Further Waste Management, 1988 and 1994-1996: Printing and Publishing SIC Code 27

	1988 Number	1994 Number	1995 Number	1996 Number	Change 1988 to 1996 Percent
Total Facilities	356	283	263	232	-34.8
Total Forms	688	542	501	452	-34.3
Form Rs	688	542	493	447	-35.0
Form As	NA	NA	8	5	NA
	Pounds	Pounds	Pounds	Pounds	Pounds
<u>On-site Releases</u>					
Total Air Emissions	60,581,384	34,323,896	30,822,855	28,170,356	-53.5
Fugitive Air	33,224,229	19,917,668	17,856,994	13,693,054	-58.8
Point Source Air	27,357,135	14,406,228	12,965,861	14,477,302	-47.1
Surface Water Discharges	32,091	843	14,372	1,670	-94.8
Underground Injection	40,000	0	0	0	-100.0
On-Site Land Releases	40,816	1,370	4,600	13,650	-66.6
Total On-Site Releases	60,694,291	34,326,109	30,841,827	28,185,676	-53.6
<u>Off-Site Releases</u>					
Transfers Off-Site To Disposal	493,227	60,570	54,025	84,110	-82.9
Total On-Site and Off-Site Releases	61,187,518	34,386,679	30,895,852	28,269,786	-53.8
<u>Other On-Site Waste Management</u>					
Recycled On-Site	NA	187,310,903	187,529,232	168,357,066	NA
Energy Recovery On-Site	NA	263,890	269,429	199,336	NA
Treated On-Site	NA	9,024,252	64,762,241	61,173,022	NA
Total Other On-Site Waste Management	NA	196,599,045	252,561,082	229,729,424	NA
<u>Transfers Off-Site For Further Waste Management</u>					
Transfers To Recycling	NA	6,228,807	5,561,178	3,638,700	NA
Transfers To Energy Recovery	NA	3,310,669	3,711,781	3,594,420	NA
Transfers To Treatment	4,505,946	531,812	426,612	376,604	-91.0
Transfers To POTWs	1,751,776	233,217	209,444	159,617	-90.9
Other Off-Site Transfers	396,671	22,740	3,866	0	-100.0
Total Transfers Off-site for Further Waste Management	NA	10,327,275	9,912,881	7,769,341	NA

NA – Not Required To Be Reported In That Year

Table 8 presents historical release data by printing and publishing industry subsegment per four-digit SIC code from 1988-1996. The publication rotogravure subsegment showed the largest decrease in total on-site and off-site releases, from 31.6 million to 17.2 million pounds. The multiple-codes group ranked second for decreases, reporting 17.2 million pounds in 1988 and 8.6 million pounds in 1996. Commercial lithography (SIC 2752) ranked third, with 2.8 million pounds in 1988 and 956,000 pounds in 1996. In all three of these subsegments, reported reductions occurred principally in air emissions, with smaller decreases in off-site releases (transfers to disposal).

Platemaking services (SIC 2796) reported the largest increase in total releases, from 83,000 pounds in 1988 to 125,000 pounds in 1996. Increases in this subsegment were reported in air emissions, on-site land releases, and off-site releases (transfers to disposal). However, the reported releases for this subsegment have decreased in recent years.

Two other subsegments reported increases from 1988 to 1996: bookbinding and related work (SIC 2789); and periodicals (SIC 2721). For bookbinding and related work, the increase was due to the fact that no reports were submitted in 1988 and 18,000 pounds of releases were reported in 1996. The periodical publishing subsegment reported 3,000 pounds of releases in 1988 and 15,000 pounds in 1996. The only releases reported for these two subsegments were air emissions.

Table 8. TRI On-Site Releases By 4-Digit SIC code, 1988 and 1994-1996: Printing and Publishing

SIC	Industry	Yr.	On-site Releases				Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds			
2711	Newspapers	96	No reports received						
		95	No reports received						
		94	No reports received						
		88	44,185	0	0	0	44,185	11,300	55,485
2721	Periodicals	96	15,429	0	0	0	15,429	0	15,429
		95	32,319	0	0	0	32,319	0	32,319
		94	30,314	0	0	0	30,314	0	30,314
		88	3,118	0	0	0	3,118	0	3,118
2731	Book Publishing	96	No reports received						
		95	10,080	0	0	0	10,080	0	10,080
		94	No reports received						
		88	42,003	0	0	0	42,003	0	42,003
2732	Book Publishing	96	138,357	0	0	0	138,357	0	138,357
		95	176,606	0	0	0	176,606	0	176,606
		94	162,363	0	0	1,100	163,463	0	163,463
		88	343,645	0	0	0	343,645	90	343,645
2741	Misc. Publishing	96	No reports received						
		95	No reports received						
		94	No reports received						
		88	108,457	0	0	0	108,457	0	108,457
2752	Commercial Printing, Lithography	96	951,368	0	0	0	951,368	4,520	955,888
		95	1,100,222	13,401	0	4,240	1,117,863	9,250	1,127,113
		94	1,448,145	0	0	0	1,448,145	6,755	1,454,900
		88	2,637,427	0	40,000	40,000	2,717,427	81,033	2,798,460
2754	Commercial Printing, Gravure	96	17,186,028	13,401	0	0	17,187,438	49,002	17,236,440
		95	19,107,315		0	0	19,108,026	15,442	19,123,468
		94	21,591,192		0	20	21,591,550	18,525	21,610,075
		88	31,377,396		0	0	31,407,496	174,689	31,582,185
2759	Commercial Printing, nec*	96	781,838	0	0	250	782,088	8,910	790,998
		95	894,686	0	0	250	894,936	14,867	909,803
		94	1,354,579	0	0	250	1,354,829	23,443	1,378,272
		88	808,574	0	0	0	808,574	0	808,574
2761	Manifold Business Forms	96	No reports received						
		95	No reports received						
		94	17,900	0	0	0	17,900	0	17,900
		88	508,612	0	0	313	508,925	11,133	520,058

* Not Elsewhere Classified

Table 8 (Cont.) TRI On-Site Releases By 4-Digit SIC Code, 1988 and 1994-1996:Printing and Publishing

SIC	Industry	Yr.	On-site Releases				Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds	
			Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds				
2771	Greeting Cards	96	18	0	0	0	18	2,235	2,253	
		95	17	0	0	0	17	0	17	
		94	23,916	0	0	0	23,916	0	23,916	
		88	226,904	0	0	0	226,904	1,500	228,404	
2782	Blankbooks & Looseleaf Binders	96	6,414	0	0	0	6,414	0	6,414	
		95	20,400	0	0	0	20,400	0	20,400	
		94	20,200	0	0	0	20,200	0	20,200	
		88	219,237	0	0	0	219,237	1,400	220,637	
2789	Bookbinding & Related Work	96	18,270	0	0	0	18,270	0	18,270	
		95	13,000	0	0	0	13,000	0	13,000	
		94	13,000	0	0	0	13,000	0	13,000	
		88	No report received							
2791	Typesetting	96	0	0	0	0	0	69	69	
		95	No report received							
		94	No report received							
		88	0	0	0	0	0	3,800	3,800	
2796	Platemaking Services	96	97,247	0	0	13,400	110,647	14,596	125,243	
		95	249,766	0	0	110	249,876	1,550	251,426	
		94	253,447	0	0	0	253,447	6,418	259,865	
		88	82,599	0	0	0	82,599	0	82,599	
	Multiple within SIC Code 27	96	8,637,212	250	0	0	8,637,462	4,778	8,642,240	
		95	8,830,095	250	0	0	8,830,345	5,334	8,835,679	
		94	8,927,889	250	0	0	8,928,139	5,069	8,933,208	
		88	17,203,655	1,840	0	503	17,205,998	142,875	17,348,873	
	Invalid SIC Code within SIC Code 27	96	338,175	10	0	0	338,185	0	338,185	
		95	388,175	10	0	0	388,359	7,582	395,941	
		94	480,951	255	0	0	481,206	360	481,566	
		88	6,975,572	151	0	0	6,975,723	65,407	7,041,130	
	Total for SIC Code 27	96	28,170,356	1,670	0	13,650	28,185,676	84,110	28,269,786	
		95	30,822,855	14,372	0	4,600	30,841,827	54,025	30,895,582	
		94	34,323,896	843	0	1,370	34,326,109	60,570	34,386,679	
		88	60,581,384	32,091	40,000	40,816	60,694,291	493,227	61,187,518	

*nec: not elsewhere classified

Summary and Conclusion

The total number of reports and forms submitted by the printing and publishing industry only accounted for 1.11% of all facilities filing reports and 0.68% of all forms submitted. The releases reported by the printing industry were only 1.17% of the total released by all of industry.

The subsegment that dominates the releases from the printing and publishing industry is publication rotogravure. This is because gravure printing, in particular, uses inks that dry by solvent evaporation. The second highest release subsegment comprises multiple code facilities, which are dominated by publication rotogravure printing being used in conjunction with other print processes. Commercial lithographic printing was the third highest release reporting subsegment in the printing and publishing sector. To put the emissions from each of these subsegments into perspective, they accounted for 0.713%, 0.35% and 0.039%, respectively, of TRI releases by all industry.

In terms of chemicals released in the printing and publishing sector, toluene was ranked the highest, xylene was ranked second and glycol ethers were ranked third. For some unknown reason, isopropyl alcohol continues to be reported under TRI. According to the TRI reporting regulations, the use of isopropyl alcohol is not reportable. The only reportable activity

associated with isopropyl alcohol is in its manufacturing via the strong acid process, which is no longer used in the United States. Since printers do not manufacturer isopropyl alcohol, they should not be reporting.

Nevertheless, the most compelling statistic is that the printing and publishing industry has made great strides in reducing its total releases of all chemicals and this can be seen in the data. From 1988 through 1996, the printing and publishing showed a total 53.8 percent decrease in TRI-reported releases. The more recent data from 1994-1996 also shows the commitment the printing and publishing industry has made to implement successful pollution prevention and other release reduction activities.

Appendix I For TRI Summary Report

The *1996 TRI Public Data Release* published in May 1999 provides an overview of the information collected through TRI. It describes the benefits and limitations of the data, explains key terms, and discusses factors such as toxicity and exposure that should be considered when reviewing TRI data. This section presents selected summary information from the May 1999 document to facilitate the understanding of the industry-specific analyses in the chapters that follow. This includes characteristics of TRI data, key concepts, and supplemental economic information that are specifically referred to throughout this volume. Readers are encouraged to consult the earlier publication for additional information.

Who Reports and What Must Be Reported Under TRI?

Manufacturing facilities with the equivalent of 10 or more full-time employees that use certain chemicals above specified thresholds must report their releases, transfers, and waste management quantities to TRI. Thresholds for manufacturing and processing are currently 25,000 pounds for each listed chemical, while the threshold for "otherwise using" is 10,000 pounds per chemical. Manufacturing facilities include those in SIC codes 20 to 39.

A facility must report to TRI if it:

- Conducts manufacturing operations within Standard Industrial Classification (SIC) codes 20 through 39 (or is a federal facility in any SIC code),
- Has 10 or more full-time equivalent employees, and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year.

Since its inception under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), TRI has collected data on the amounts of chemicals that facilities release to the environment on-site and transfer off-site to other locations for waste management. Passage of the federal Pollution Prevention Act in 1990 expanded the information that TRI collects. The additional data on waste management include quantities recycled, burned for energy recovery, treated, and released on-site or off-site. A facility that is subject to reporting must provide certain information on the fate of the chemicals subject to reporting.

Information reported by facilities includes:

- Basic information identifying the facility;
- Name and telephone number of a contact person;
- Environmental permits held;
- Amounts of each listed chemical released to the environment at the facility;
- Amounts of each chemical shipped from the facility to other locations for recycling, energy recovery, treatment, or disposal;
- Amounts of each chemical recycled, burned for energy recovery, or treated at the facility;
- Maximum amount of chemical present on-site at the facility during the year;
- Types of activities conducted at the facility involving the toxic chemical; and
- Source reduction activities.

Types of Forms

Facilities subject to reporting must submit one of two forms. These forms are called Form R and the new Form A. Form R is a 5-page form that requires very detailed information about the chemical being reported. Form A is a 2-page form that requires less information about the chemical being reported.

However, in order to use Form A, several conditions must be present and they are as follows:

- 1) The facility must have a total annual reportable amount of a listed toxic chemical under 500 pounds, and;
- 2) The facility does not manufacture, process, or otherwise use more than 1 million pounds of the listed chemical

The total annual reportable amount is defined as the sum of the waste management categories that would be reported to TRI: quantities released (including disposal), recovered as a result of on-site recycling operations, combusted on-site for energy recovery, and treated at the facility, plus amounts transferred off-site for recycling, energy recovery, treatment, and disposal. These amounts correspond to total production-related waste in this report.

If the facility does not exceed the 500-pound annual reportable amount (total production-related waste) and does not manufacture, process, or otherwise use more than 1 million pounds of the listed chemical, the facility can submit a certification statement (Form A) instead of the complete TRI reporting form (Form R). Form A certifies that the facility met the conditions outlined above for the listed chemical, but does not require reporting of any amounts of the toxic chemical released or otherwise managed as waste.

TRI On-Site and Off-Site Releases

A release is a discharge of a toxic chemical to the environment. Reportable releases are those that may occur on-site at the facility or as a result of transferring chemicals off-site for disposal. There are certain types of activities that may contribute releases to the various media and some of them are reportable. Box 1-7 lists on-site waste management activities that are reportable to TRI. Box 1-8 describes transfers *off-site for further* waste management.

On-site releases include emissions to the air, discharges to bodies of water, releases at the facility to land, as well as into underground injection wells. Releases are reported to TRI by media type. Chemicals in waste transferred off-site for disposal are also considered released to the environment. On- and off-site releases thus include releases to the environment at the facility (reported in Section 5 for Form R) plus off-site transfers to disposal (reported in Section 6 of Form R).

Air Emissions - Releases to air are reported either as point source or fugitive emissions. Point source emissions, also referred to as stack emissions, occur through confined air streams, such as stacks, vents, ducts, or pipes. Fugitive emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Surface Water Discharges - Releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff, are also reportable to TRI.

Underground Injection - Underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into Class I, II, III, IV or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment. The different types of authorized injection activities are described below:

- Class I industrial, municipal and manufacturing wells inject fluids into deep, confined and isolated formations below potable water supplies.
- Class II oil and gas related wells that re-inject produced fluids for disposal, enhanced recovery of oil, or hydrocarbon storage.
- Class III wells are associated with the solution mining of minerals.
- Class IV wells may inject hazardous or radioactive fluids directly or indirectly into USDW, only if the injection is part of an authorized CERCLA/RCRA clean up operation.
- Class V wells, which include all types of injection wells that do not fall under I - IV, may inject only if they do not endanger USDW, public health or the environment. Class V wells are, generally, shallow drainage wells, such as floor drains connected to dry wells or drain fields.

Beginning with the 1996-reporting year, facilities separately report amounts injected into Class I wells and into all other wells.

On-site Land Releases - On-site releases to land occur within the boundaries of the reporting facility. Releases to land include disposal of toxic chemicals in landfills (in which wastes are buried), land treatment/application farming (in which a waste containing a listed chemical is applied to or incorporated into soil), surface impoundments (which are uncovered holding areas used to volatilize and/or settle waste materials), and other land disposal methods (such as waste piles) or releases to land (such as spills or leaks). Beginning with the 1996-reporting year, facilities separately report amounts released to RCRA Subtitle C landfills from amounts released to other on-site landfills.

Transfers Off-site to Disposal - Toxic chemicals in waste that are transferred to a facility for disposal generally are either released to land at an off-site facility or are injected underground.

TRI On-site Waste Management

Waste management activities are reported in Section 8 of Form R. These amounts do not include one-time events such as accidental releases or remediation (clean up).

Recycled On-site - This is the quantity of the toxic chemical recovered at the facility and made available for further use. It is not the quantity that entered an on-site recycling or recovery operation.

Used for Energy Recovery On-site - This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as released).

Treatment On-site - This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered any treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as released).

TRI Transfers Off-site for Further Waste Management

An off-site transfer, reported in Section 6 of Form R, is the transfer of toxic chemicals in waste to a facility that is geographically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for the purposes of recycling, energy recovery, treatment, or disposal. The quantities reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers to disposal, these quantities do not necessarily represent entry of the chemical into the environment. Transfers to disposal represent an off-site release.

Transfers Off-site to Recycling - Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. Once they have been recycled, these chemicals may be returned to the originating facility for further processing or made available for use in commerce.

Transfers Off-site to Energy Recovery - Toxic chemicals in waste sent off-site for purposes of energy recovery are combusted off-site in industrial furnaces (including kilns) or boilers that generate heat or energy for use at that location. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers Off-site to Treatment - Toxic chemicals in waste that are transferred off-site may be treated through a variety of methods, including biological treatment, neutralization, incineration, and physical separation. These methods typically result in varying degrees of destruction of the toxic chemical. In some cases (such as stabilization or solidification), the chemical is not destroyed but is prepared for further waste management, such as contained disposal.

Transfers to Publicly Owned Treatment Works (POTWs) - A POTW is a wastewater treatment facility that is owned by a state or municipality. Wastewaters from facilities reporting under TRI are transferred through pipes or sewers to a POTW. Treatment or removal of a chemical from the wastewater depends upon the nature of the chemical, as well as the treatment methods present at the POTW. In general, chemicals that are easily utilized as nutrients by microorganisms, or have a low solubility in water, are likely to be removed to some extent. Chemicals that are volatile and have a low solubility in water may evaporate into the atmosphere. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed, but are not destroyed and may be disposed of in landfills or discharged to receiving waters.

Other Off-site Transfers - In this report, toxic chemicals in waste that were reported as transfer-red off-site but for which the off-site activity (i.e., treatment, disposal, energy recovery, or recycling) was not specified or was not an accepted code have been classified as "other off-site transfers."

Appendix II – TRI Chemicals Possibly Found In Printing

Chemical	Where Found	CAS #	RQ
Ammonia	Water-Based Inks and Coatings	7664-41-7	100 lbs.
Barium*	Some Red Pigments	7440-39-3	N/A
Benzene (Including Benzene In Gasoline)	Trace (less than 0.1%) Contaminant In Some Cleaning Solvents Namely, Aromatic Hydrocarbon Blends	71-43-2	10 lbs.
n-Butyl alcohol	Flexo/Gravure Ink Solvent	71-36-3	5000 lbs.
Cadmium & Compounds	Some Orange, Red, and Yellow Pigments	7440-43-9	10 lbs.
Chromium (hexavalent) & Compounds	Film Cleaners, Some Fountain Solutions, Gravure Cylinder Preparation and Some Brown, Orange, and Red Pigments	7440-47-3	5000 lbs.
Cobalt & Compounds	Sheetfed Offset Ink Catalyst For Drying	7440-48-4	N/A
Copper & Compounds	Some Blue and Green Pigments and Component In Some Water-Based Coatings	7440-50-8	5000 lbs.
Cumene	Component In Some Cleaning Solvents Containing Aromatic Hydrocarbon Blends	98-82-8	5000 lbs.
Cyclohexane	Component In Some Cleaning Solvents Component In Spray Adhesive	110-82-7	1000 lbs.
Dibutyl Phthalate	Plasticizer In Some Inks and Coatings	84-74-2	10 lbs.
Diethanolamine	Film Developer	111-42-2	100 lbs.
Diethylene glycol dimethyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	111-96-6	N/A
Diethylene glycol butyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	112-34-5	N/A
Diethylene glycol ethyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	111-90-0	N/A
Diethylene glycol methyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	111-77-3	N/A
Ethyl benzene	Component In Some Cleaning Solvents Containing Aromatic Hydrocarbon Blends Flexo/Gravure Water & Solvent-Based Inks	100-41-4	1000 lbs.
Ethylene glycol dimethyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	110-71-4	N/A
Ethylene glycol butyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	111-76-2	N/A
Ethylene glycol ethyl ether acetate	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	110-80-5	N/A
Ethylene glycol methyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute	109-86-4	N/A
Ethylene glycol propyl ether	Component In Some Cleaning Solvents Fountain Solution Additive – IPA Substitute Some Water-Based Coatings	2807-30-9	N/A
Ethylene glycol	Fountain Solution Additive - IPA Substitute Component In Copper Plating Solution Flexo/Gravure Water & Solvent-Based Inks	107-21-1	5000 lbs.
Formaldehyde	Some Film Developing Chemistry	50-00-0	100 lbs.

Chemical	Where Found	CAS #	RQ
Glycol Ethers & Their Acetates	Component In Some Cleaning Solvents Fountain Solution Additive - IPA Substitute Flexo/Gravure Water & Solvent-Based Inks Litho Plate Developers Component In Glass Cleaner	xx-xx-x	
Hexane	Component In Some Cleaning Solvents Component In Film Cleaner Component In Spray Adhesive Flexo/Gravure Solvent-Based Inks	110-54-3	5000 lbs.
Hydrochloric acid	Muratic Acid –Maintenance Area Component In Copper Plating Solution	7647-01-0	5000 lbs.
Hydroquinone	Film Developing Chemistry	123-31-9	100 lbs.
Isophrone	Screen Printing Ink Solvent	78-59-1	5000 lbs.
Lead Chromate	Some Yellow Pigments	7758-97-6	N/A
Manganese & Compounds	Sheetfed Offset Ink Catalyst For Drying Some Red and White Pigments	7439-96-5	N/A
Methanol	Component In Some Cleaning Solvents Ink Jet Ink Solvent Component In Stay Open-Ink Drying Retardant Component In Compressed Propane Solvent In Some Adhesives Flexo/Gravure Solvent-Based Inks	67-56-1	5000 lbs.
Methyl Chloroform - 1,1,1-Trichloroethane	Component In Stay Open-Ink Drying Retardant Solvent In Some Adhesives Component In Some Cleaning Solvents Component In Various Maintenance Products	71-55-6	1000 lbs.
Methyl ethyl ketone	Component In Some Cleaning Solvents Ink Jet Ink Solvent Flexo/Gravure Solvent-Based Inks	78-93-3	5000 lbs.
Methyl isobutyl ketone	Component In Some Cleaning Solvents	108-10-1	5000 lbs.
Methylene chloride	Component In Some Cleaning Solvents Copper Plating Solution Component In Blanket Fix Component In Film Cleaner	75-09-2	1000 lbs.
Naphthalene	Component In Some Cleaning Solvents Containing Aromatic Hydrocarbon Blends	91-20-3	100 lbs.
Nitric Acid	Component In Some Cleaners	7697-37-2	1000 lbs.
Phosphoric Acid	Component In Fountain Solution Concentrate Component In Some Cleaning Solutions	7664-38-2	5000 lbs.
Perchloroethylene	Component In Film Cleaner Component In Some Lubricants Some Flexo Plate Developers Component in Spotting Fluids used by Screen Printing Industry	127-18-4	100 lbs.
Propylene Oxide	Component In Some Inks	75-56-9	100 lbs.
Phenol	Some Film & Plate Developing Chemistry	108-95-2	1000 lbs.

Chemical	Where Found	CAS #	RQ
Sulfuric Acid	Battery Acid	7664-93-9	1000 lbs.
Toluene	Component In Some Cleaning Solvents Publication Rotogravure Ink Solvent	108-88-3	1000 lbs.
Toluene diisocyanates	Flexo/Gravure Water & Solvent-Based Inks	26471-62-5	100 lbs.
Vinyl Acetate	Component In Some Adhesives	108-05-4	5000 lbs.
Xylenes (isomers & mixture)	Component In Some Cleaning Solvents Component In Stay Open-Ink Drying Retardant Flexo/Gravure Ink Solvent	1330-20-7	100 lbs.
Zinc & Compounds	Component In Water-Based Coatings	7646-85-7	1000 lbs.

	Component In Some Lubricants Some White Pigments		
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The following list of HAPs can be found in materials used in offset printing and is provided to assist in the identification of HAPs.

Hazardous Air Pollutant	Chemical Abstract Service (CAS)#	Material Where Found
Cumene	98-82-8	Blanket Conditioner Blanket/Roller Wash
Ethyl Benzene	100-41-4	Metering Roller Cleaner Blanket/Roller Wash
Ethylene Glycol	107-21-1	Fountain Solution
n-Hexane	110-54-3	Spray Adhesive
Naphthalene	91-20-3	Blanket/Roller Wash
Methanol	67-56-1	Stay Open Blanket/Roller Wash
Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6	Blanket/Roller Wash
Methylene Chloride (Dichloromethane)	75-09-2	Metering Roller Cleaner Blanket/Roller Wash
Methyl Ethyl Ketone	78-93-3	UV Cleaning Solution
Toluene	108-88-3	Metering Roller Cleaner Blanket Wash
Xylene	1330-20-7	Blanket Conditioner Blanket/Roller Wash
Glycol Ethers	Various	Fountain Solution Blanket/Roller Wash
Ethylene Glycol Monobutyl Ether - also known as Butyl Cellosolve - also known as 2-Butoxyethanol	111-76-2	Fountain Solution Blanket/Roller Wash
Ethylene Glycol Monomethyl Ether - also known as 2-Methoxyethanol	109-86-4	Fountain Solution Blanket/Roller Wash
Ethylene Glycol Monoethyl Ether - also known as 2-Ethoxyethanol	110-80-5	Fountain Solution Blanket/Roller Wash
Ethylene Glycol Dimethyl Ether - also known as 1, 2-Dimethoxyethane	110-71-4	Fountain Solution Blanket/Roller Wash
Diethylene Glycol Mono-n-Butyl Ether - also known as Butyl Carbitol	112-34-5	Fountain Solution Blanket/Roller Wash
Diethylene Glycol Monomethyl Ether - also known as 2-(Methoxyethoxy) Ethanol	111-77-3	Fountain Solution Blanket/Roller Wash
Diethylene Glycol Monoethyl Ether -also known as 2-(Ethoxyethoxy) Ethanol	111-90-0	Fountain Solution Blanket/Roller Wash
Diethylene Glycol Dimethyl Ether - also known as 2-Methoxyethyl Ether	111-96-6	Fountain Solution Blanket/Roller Wash
Diethylene Glycol Diethyl Ether - also known as 2-Ethoxyethyl Ether	112-36-7	Fountain Solution Blanket/Roller Wash
The following chemicals are not to be included in the Glycol Ethers Category		
Diethylene Glycol	111-46-6	
Propylene Glycol Methyl Ether	107-98-2	
Dipropylene Monomethyl Ether	34590-94-8	
All Other Propylene Glycol Ethers		