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1981 WORLD PRODUCTION AND SALES OF FLUOROCARBONS
FC11 AND FC12

Submitted by the Chemical Manufacturers Association

1981 WORLD PRODUCTION AND SALES OF FLUOROCARBONS FC-11 AND FC-12
CHEMICAL MANUFACTURERS ASSOCIATION

August 25, 1982

PREPARED FOR
Chemical Manufacturers Association
by
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Alexander Grant

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CERTIFIED PUBLIC ACCOUNTANTS

MEMBER FIRM
GRANT THORNTON INTERNATIONAL

Chemical Manufacturers Association

In connection with the fluorocarbon research program being conducted by Chemical Manufacturers Association, we have, at your request, compiled the following schedules of production and sales data from responses furnished to us by participating companies.

- Schedule 1 - Listing of Reporting Companies
- Schedule 2 - A Tabulation of the Total Production of FC-11 on an Annual Basis for the Period 1931 Through 1981 (From Reporting Companies)
- Schedule 3 - A Tabulation of the Total Production of FC-12 on an Annual Basis for the Period 1931 Through 1981 (From Reporting Companies)
- Schedule 4 - A Tabulation of the Deviation Estimate of Total Production of FC-11 and FC-12 Applying the Submitted Estimate of Probable Error (From Reporting Companies)
- Schedule 5 - A Tabulation of the Total FC-11 Sales by Category for Years 1976 Through 1981 (From Reporting Companies)
- Schedule 6 - A Tabulation of the Total FC12 Sales by Category for Years 1976 Through 1981 (From Reporting Companies)
- Schedule 7 - A Tabulation of the Total FC-11 and FC-12 Sales by Hemisphere for the Period 1931 Through 1981 (From Reporting Companies)
- Schedule 8 - A Tabulation of the Total Production of FC-11 and FC-12 on an Annual Basis From Four India and Argentina Companies

Schedule 9 - A Tabulation of the Estimated Production of FC-11 of Countries Other Than Those Listed in Schedule 1 and Other Than India and Argentina Companies

Schedule 10 - A Tabulation of the Estimated Production of FC-12 of Countries Other Than Those Listed in Schedule 1 and Other Than India and Argentina Companies

We have compiled these tabulations from questionnaires submitted directly to us from the chemical manufacturers solicited by Chemical Manufacturers Association. We made no attempt to independently verify the information submitted in the questionnaires.

Alexander Grant & Company

Washington, D.C.
August 25, 1982

LISTING OF REPORTING COMPANIES

The following is a listing of the reporting companies inclusive of any related subsidiaries and/or joint ventures that reported production and release data:

1. Akzo Chemie B.V. (Holland)
2. Allied Chemical Corporation (U.S.)
 - (a) Allied Chemical Canada Limited (Canada)
 - (b) Quimobasicos, S.A. (Mexico)
3. Asahi Glass Co., Ltd. (Japan)
4. Australian Fluorine Chemical Pty. Ltd. (Australia)
5. CHLOE' Chimie (France) (Formerly Rhone-Poulenc Industries) and S.I.C.N.G. Theosaloniki (Greece)
6. Daikin Kogyo Co., Ltd. (Japan)
7. E.I. du Pont de Nemours & Company, Inc. (U.S.)
 - (a) Du Pont de Nemours (Nederland) N.V.
 - (b) Ducilo S.A. (Argentina)
 - (c) Du Pont do Brasil S.A. (Brazil)
 - (d) Halocarbuos S.A. (Mexico)
8. Du Pont Canada, Inc. (Canada)
9. Essex Chemical Corporation (Racon) (U.S.)
10. Hoechst AG (West Germany)
 - (a) Hoechst Iberica (Spain)
 - (b) Hoechst do Brasil Quimica e Farmaceutica S.A.
11. Imperial Chemical Industries PLC (England)
 - (a) African Explosives & Chemical Industries, Ltd.

12. I.S.C. Chemicals Ltd. (England)
13. Kaiser Aluminum & Chemical Corporation (U.S.)
14. Kali-Chemie Aktiengesellschaft (West Germany)
 - (a) Kali-Chemie Iberia SA (Spain)
15. Mitsui Fluorochemicals Co., Ltd. (Japan)
16. Montefluos S.p.A. (Formerly Montedison S.p.A. (Italy)
17. Pennwalt Corporation (U.S.)
18. Showa Denko, K.K. (Japan)
19. Ugine Kuhlmann, Produits Chimiques (France)
 - (a) Pacific Chemical Industries Pty. Ltd. (Australia)
 - (b) Ugimica S.A. (Spain)
 - (c) Produven (Venezuela)
20. Union Carbide Corporation (U.S.)
(Union Carbide ceased production in 1977. Sales by Union Carbide have been included by category in this report.)

A TABULATION OF THE DEVIATION ESTIMATE OF TOTAL PRODUCTION OF
 FC-11 AND FC-12 APPLYING THE SUBMITTED ESTIMATE OF PROBABLE ERROR

(From reporting companies)

(Millions of pounds)

| <u>Chemical</u> | <u>Total production</u> | <u>Deviation (note 2)</u> |
|-----------------|-----------------------------|-------------------------------|
| FC-11 | 11,309.8 ----- | 141.1 ----- |
| FC-12 | 15,672.9 ----- | 177.8 ----- |

A TABULATION OF THE TOTAL FC-11 SALES BY CATEGORY FOR YEARS 1976 THROUGH 1981

(From reporting companies)

(Millions of pounds)

| <u>Year</u> | <u>Sales</u> | | | | | <u>Total sales</u> |
|-------------|----------------------|---------------------------------------|-------------------------------------|---------------------------|-----------------------|--------------------|
| | <u>Refrigeration</u> | <u>Blowing agent closed cell foam</u> | <u>Blowing agent open cell foam</u> | <u>Aerosol propellant</u> | <u>All other uses</u> | |
| 1976 (a) | 59.3 | 114.8 | 99.0 | 429.9 | 46.2 | 749.2 |
| 1977 (a) | 54.5 | 143.8 | 114.9 | 362.9 | 30.4 | 706.5 |
| 1978 (a) | 60.0 | 145.7 | 117.1 | 316.4 | 41.7 | 680.9 |
| 1979 (a) | 67.2 | 176.6 | 113.8 | 246.0 | 34.6 | 638.2 |
| 1980 (a) | 64.0 | 185.3 | 117.1 | 231.7 | 40.4 | 638.5 |
| 1981 | <u>61.0</u> | <u>215.4</u> | <u>111.3</u> | <u>207.2</u> | <u>37.7</u> | <u>632.6</u> |
| Total | 366.0 ----- | 981.6 ----- | 673.2 ----- | 1,794.1 ----- | 231.0 ----- | 4,045.9 ----- |

(a) Revised from previously reported data.

A TABULATION OF THE TOTAL FC-12 SALES BY CATEGORY FOR YEARS 1976 THROUGH 1981

(From reporting companies)

(Millions of pounds)

| Sales | | | | | | |
|-------------|-------------------------|---------------------------------------|-------------------------------------|---------------------------|-----------------------|-------------------------|
| <u>Year</u> | <u>Refrigeration</u> | <u>Blowing agent closed cell foam</u> | <u>Blowing agent open cell foam</u> | <u>Aerosol propellant</u> | <u>All other uses</u> | <u>Total sales</u> |
| 1976 (a) | 281.8 | 14.2 | 18.8 | 523.1 | 67.6 | 905.5 |
| 1977 (a) | 344.1 | 22.4 | 28.8 | 410.5 | 38.2 | 844.0 |
| 1978 (a) | 351.6 | 39.9 | 18.7 | 360.9 | 49.2 | 820.3 |
| 1979 (a) | 363.4 | 39.8 | 33.1 | 315.2 | 35.9 | 787.4 |
| 1980 (a) | 357.7 | 52.6 | 27.1 | 304.5 | 30.2 | 772.1 |
| 1981 | <u>368.3</u> | <u>47.0</u> | <u>34.9</u> | <u>281.3</u> | <u>43.0</u> | <u>774.5</u> |
| Total | <u>2,066.9</u> ----- | <u>215.9</u> ----- | <u>161.4</u> ----- | <u>2,195.5</u> ----- | <u>264.1</u> ----- | <u>4,903.8</u> ----- |

(a) Revised from previously reported data.

A TABULATION OF THE TOTAL FC-11 AND FC-12 SALES BY HEMISPHERE

For the period 1931 through 1981 (from reporting companies)

(Millions of pounds)

| | <u>Northern Hemisphere</u> | <u>Southern Hemisphere</u> | <u>Total sales</u> |
|-------|----------------------------|----------------------------|--------------------|
| FC-11 | 10,848.2 ***** | 461.6 ***** | 11,309.8 ***** |
| FC-12 | 14,880.1 ***** | 792.8 ***** | 15,672.9 ***** |

A TABULATION OF THE TOTAL PRODUCTION OF FC-11 AND FC-12 ON AN ANNUAL BASIS FROM FOUR INDIA AND ARGENTINA COMPANIES (NOTE 3)

(Millions of pounds)

| | <u>FC-11</u> | <u>FC-12</u> |
|----------|--------------|--------------|
| 1968 | .1 | .6 |
| 1969 | .1 | .7 |
| 1970 | .1 | 1.0 |
| 1971 | .2 | 1.4 |
| 1972 | .3 | 1.9 |
| 1973 | 1.3 | 2.8 |
| 1974 | 1.7 | 3.7 |
| 1975 | 1.8 | 3.7 |
| 1976 | 1.8 | 5.6 |
| 1977 (a) | 1.2 | 4.8 |
| 1978 (a) | 1.1 | 4.7 |
| 1979 (a) | 1.2 | 4.6 |
| 1980 | .5 | 2.4 |
| 1981 | <u>.5</u> | <u>2.4</u> |
| | <u>11.9</u> | <u>40.3</u> |

(a) Revision of previous submitted data to reflect a more accurate estimate.

A TABULATION OF THE ESTIMATED PRODUCTION OF PC-11
 OF COUNTRIES OTHER THAN THOSE LISTED IN SCHEDULE 1 AND
 OTHER THAN INDIA AND ARGENTINA COMPANIES (NOTE 4)

(Millions of pounds)

| <u>Year</u> | <u>Production</u> | <u>Year</u> | <u>Production</u> |
|-------------------------|-------------------|-------------|-------------------|
| 1949 | - | 1965 | 2.2 |
| 1950 | .2 | 1966 | 2.5 |
| 1951 | .2 | 1967 | 3.0 |
| 1952 | .3 | 1968 | 3.5 |
| 1953 | .3 | 1969 | 5.6 |
| 1954 | .3 | 1970 | 6.3 |
| 1955 | .4 | 1971 | 7.4 |
| 1956 | .5 | 1972 | 9.1 |
| 1957 | .6 | 1973 | 10.1 |
| 1958 | .7 | 1974 | 15.5 |
| 1959 | .8 | 1975 | 18.8 |
| 1960 | .9 | 1976 | 22.1 |
| 1961 | 1.1 | 1977 | 26.1 |
| 1962 | 1.3 | 1978 | 30.8 |
| 1963 | 1.6 | 1979 | 36.4 |
| 1964 | 1.8 | 1980 | 42.9 |
| | | 1981 | <u>50.6</u> |
| | | | 303.9 |
| | | | ----- |
| Total production | | | |

A TABULATION OF THE ESTIMATED PRODUCTION OF FC-12
 OF COUNTRIES OTHER THAN THOSE LISTED IN SCHEDULE 1 AND
 .. OTHER THAN INDIA AND ARGENTINA COMPANIES (NOTE 4)

(Millions of pounds)

| <u>Year</u> | <u>Production</u> | <u>Year</u> | <u>Production</u> |
|-------------------------|-------------------|-------------|-------------------|
| 1949 | - | 1965 | 14.8 |
| 1950 | 1.2 | 1966 | 17.5 |
| 1951 | 1.5 | 1967 | 20.6 |
| 1952 | 1.7 | 1968 | 24.3 |
| 1953 | 2.0 | 1969 | 30.4 |
| 1954 | 2.4 | 1970 | 33.7 |
| 1955 | 2.8 | 1971 | 40.3 |
| 1956 | 3.3 | 1972 | 46.1 |
| 1957 | 3.9 | 1973 | 50.2 |
| 1958 | 4.7 | 1974 | 63.9 |
| 1959 | 5.5 | 1975 | 79.1 |
| 1960 | 6.5 | 1976 | 93.3 |
| 1961 | 7.6 | 1977 | 110.1 |
| 1962 | 9.0 | 1978 | 130.0 |
| 1963 | 10.6 | 1979 | 153.4 |
| 1964 | 12.6 | 1980 | 181.0 |
| | | 1981 | 213.5 |
| | | | <u>213.5</u> |
| Total production | | | 1,377.5 |
| | | | <u>-----</u> |

NOTES TO 1981 WORLD PRODUCTION AND SALES OF
FLUOROCARBONS FC-11 AND FC-12

NOTE 1 - PRODUCTION AMOUNTS

These amounts exclude any production of a product used as an intermediate for chemical or plastic production.

NOTE 2 - CALCULATION OF DEVIATION

The deviation presented in Schedule 4 was computed by the square root of the sum of the squares method. A 95% confidence level was used for this calculation.

NOTE 3 - INDIA AND ARGENTINA PRODUCTION AMOUNTS

The amounts included were compiled based on previous years' data for the following companies:

- (1) Tool Research S.A.
- (2) I.R.A., S.A.
- (3) Agis Chemical Industries, Ltd.
- (4) Navin Fluorine Industries

Tool Research S.A. and I.R.A., S.A. both located in Argentina, ceased manufacturing in 1979. Hence, 1980 estimates are India only. Also, during 1981, Everest Refrigerants, Ltd. came under new ownership and is known as Agis Chemical Industries, Ltd.

NOTE 4 - PRODUCTION OF OTHER COUNTRIES

The data reported as the estimated production of countries other than those listed in Schedule 1 and other than India and Argentina Companies were compiled as follows:

- (1) USSR - 1968-1975 production by USSR was published and showed approximately 18% growth per annum. The same growth rate has been assumed for the years before and after this period.
- (2) Eastern Europe - Estimated assuming production is 15% of that of USSR.
- (3) People's Republic of China - Assumed to be zero.

FLUOROCARBON PRODUCTION AND RELEASE SUMMARY - WORLD TOTAL

MILLION KILOGRAMS

FC-11

FC-12

| YEAR | ANNUAL | | CUMULATIVE | | | ANNUAL | | CUMULATIVE | | |
|------|------------|----------|------------|----------|------------|------------|----------|------------|----------|------------|
| | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED |
| | 1971 | 266.6 | 229.7 | 1974.2 | 1699.9 | 303.9 | 360.5 | 337.5 | 3376.0 | 3028.6 |
| 1972 | 311.1 | 259.1 | 2285.3 | 1959.0 | 360.6 | 401.7 | 368.3 | 3777.7 | 3396.9 | 475.2 |
| 1973 | 354.3 | 296.5 | 2639.5 | 2255.5 | 423.7 | 447.4 | 408.1 | 4225.0 | 3805.1 | 525.6 |
| 1974 | 377.5 | 327.0 | 3017.1 | 2582.5 | 479.9 | 473.5 | 443.5 | 4698.5 | 4248.6 | 567.4 |
| 1975 | 323.4 | 318.3 | 3340.5 | 2900.7 | 489.9 | 418.5 | 434.6 | 5117.0 | 4683.1 | 561.0 |
| 1976 | 180.7 | 125.3 | 1691.2 | 1228.0 | 820.8 | 488.4 | 428.0 | 8872.0 | 8100.1 | 602.0 |
| 1977 | 332.8 | 313.7 | 4024.0 | 3539.8 | 544.6 | 434.9 | 410.3 | 6007.6 | 5519.4 | 638.4 |
| 1978 | 321.3 | 294.6 | 4347.3 | 3814.4 | 578.1 | 433.2 | 384.9 | 6440.7 | 5904.2 | 697.5 |
| 1979 | 306.5 | 276.1 | 4653.9 | 4110.5 | 613.2 | 428.8 | 388.4 | 6869.6 | 6292.6 | 748.7 |
| 1980 | 309.3 | 264.8 | 4963.2 | 4375.2 | 662.4 | 433.4 | 392.5 | 7303.0 | 6685.1 | 800.4 |
| 1981 | 310.1 | 264.3 | 5273.3 | 4639.5 | 712.9 | 449.2 | 412.2 | 7752.2 | 7097.4 | 848.7 |

FC-11

FLUOROCARBON PRODUCTION AND RELEASE - EXPANDED DATA - REPORTING COMPANIES ONLY
MILLION KILOGRAMS

FC-11
CUMULATIVE

MILLION KILOGRAMS

FC-11

| YEAR | ANNUAL | | TOTAL | | | REFRIGERATION HERMETICALLY SEALED | | | REFRIGERATION NON-HERMETIC | | | BLOWING AGENTS CLOSED CELL FOAM | | | OPEN CELL+AEROSOLS+ ALL OTHER PRODUCTION | | |
|------|--------|-------|--------|--------|-------|--------------------------------------|-----|-------|-------------------------------|------|-------|------------------------------------|------|-------|---|--------|-------|
| | PROD | REL | PROD | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | TOTAL | REL | UNREL |
| 1931 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1932 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1933 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1934 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1935 | .0 | .0 | .1 | .0 | .1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1936 | .1 | .0 | .2 | .0 | .2 | .0 | .0 | .0 | .1 | .0 | .1 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1937 | .1 | .0 | .3 | .1 | .3 | .0 | .0 | .0 | .2 | .0 | .2 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1938 | .1 | .1 | .4 | .1 | .3 | .0 | .0 | .0 | .3 | .1 | .3 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1939 | .1 | .1 | .5 | .2 | .3 | .0 | .0 | .0 | .4 | .1 | .3 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1940 | .2 | .1 | .7 | .3 | .4 | .0 | .0 | .0 | .5 | .2 | .3 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1941 | .3 | .1 | 1.0 | .4 | .6 | .0 | .0 | .0 | .7 | .3 | .4 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1942 | .3 | .1 | 1.3 | .5 | .8 | .0 | .0 | .0 | 1.0 | .4 | .6 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1943 | .4 | .2 | 1.7 | .7 | 1.0 | .0 | .0 | .0 | 1.3 | .5 | .8 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1944 | .4 | .2 | 2.0 | 1.0 | 1.1 | .0 | .0 | .0 | 1.7 | .7 | 1.0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1945 | .4 | .3 | 2.4 | 1.2 | 1.2 | .0 | .0 | .0 | 2.0 | .9 | 1.1 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1946 | .7 | .6 | 3.1 | 1.9 | 1.3 | .0 | .0 | .0 | 2.4 | 1.2 | 1.2 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1947 | 1.3 | 1.3 | 4.4 | 3.1 | 1.4 | .0 | .0 | .0 | 2.5 | 1.5 | 1.0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1948 | 3.0 | 2.3 | 7.4 | 5.5 | 2.1 | .0 | .0 | .0 | 2.5 | 1.8 | .8 | .0 | .0 | .0 | .7 | .4 | .3 |
| 1949 | 4.5 | 3.8 | 11.9 | 9.3 | 2.8 | .0 | .0 | .0 | 2.7 | 2.1 | .7 | .0 | .0 | .0 | 2.0 | 1.4 | .6 |
| 1950 | 6.6 | 5.5 | 18.6 | 14.8 | 4.1 | .0 | .0 | .0 | 3.0 | 2.3 | .7 | .0 | .0 | .0 | 4.8 | 3.4 | 1.4 |
| 1951 | 9.1 | 7.6 | 27.6 | 22.4 | 5.6 | .0 | .0 | .0 | 3.5 | 2.5 | .9 | .1 | .0 | .1 | 9.1 | 7.0 | 2.1 |
| 1952 | 13.6 | 11.0 | 41.2 | 33.4 | 8.4 | .0 | .0 | .0 | 4.0 | 2.8 | 1.3 | .2 | .0 | .1 | 15.3 | 12.2 | 3.1 |
| 1953 | 17.3 | 15.0 | 58.5 | 48.3 | 11.0 | .0 | .0 | .0 | 4.9 | 3.1 | 1.8 | .4 | .0 | .2 | 23.8 | 19.6 | 4.2 |
| 1954 | 20.9 | 18.6 | 79.4 | 66.9 | 13.7 | .0 | .0 | .0 | 6.0 | 3.5 | 2.5 | .6 | .1 | .3 | 36.5 | 30.2 | 6.3 |
| 1955 | 26.3 | 23.0 | 105.6 | 89.9 | 17.3 | .0 | .0 | .0 | 7.4 | 4.1 | 3.3 | .9 | .2 | .5 | 52.7 | 44.7 | 8.0 |
| 1956 | 32.5 | 28.7 | 138.1 | 118.6 | 21.5 | .0 | .0 | .0 | 9.0 | 4.9 | 4.2 | 1.3 | .3 | .7 | 72.3 | 62.6 | 9.6 |
| 1957 | 33.9 | 32.2 | 172.0 | 150.8 | 23.8 | .0 | .0 | .0 | 11.1 | 5.9 | 5.2 | 1.8 | .4 | 1.0 | 96.9 | 84.8 | 12.1 |
| 1958 | 29.5 | 30.2 | 201.6 | 181.0 | 23.6 | .0 | .0 | .0 | 14.1 | 7.2 | 6.9 | 2.4 | .6 | 1.3 | 127.3 | 112.3 | 15.0 |
| 1959 | 35.6 | 30.9 | 237.1 | 211.8 | 28.8 | .0 | .0 | .0 | 17.7 | 8.9 | 8.8 | 3.0 | .8 | 1.8 | 158.2 | 143.0 | 15.2 |
| 1960 | 49.7 | 40.5 | 286.9 | 252.4 | 38.8 | .0 | .0 | .0 | 21.7 | 11.0 | 10.6 | 3.9 | .6 | 2.2 | 183.9 | 171.3 | 12.6 |
| 1961 | 60.5 | 52.1 | 347.3 | 304.5 | 48.0 | .0 | .0 | .0 | 26.6 | 13.7 | 12.9 | 6.0 | 1.1 | 2.9 | 215.1 | 199.8 | 15.3 |
| 1962 | 78.1 | 65.4 | 425.4 | 369.9 | 61.9 | .0 | .0 | .0 | 32.4 | 16.9 | 15.5 | 8.8 | 1.6 | 4.5 | 258.5 | 237.2 | 21.3 |
| 1963 | 93.3 | 80.0 | 518.7 | 449.9 | 76.6 | .0 | .0 | .0 | 38.5 | 20.8 | 17.8 | 14.5 | 2.2 | 6.6 | 311.4 | 285.4 | 26.0 |
| 1964 | 111.1 | 95.0 | 629.8 | 544.9 | 94.3 | .0 | .0 | .0 | 45.4 | 25.3 | 20.1 | 22.7 | 3.5 | 11.0 | 378.8 | 345.7 | 33.1 |
| 1965 | 122.8 | 108.3 | 752.6 | 653.2 | 110.7 | .0 | .0 | .0 | 52.5 | 30.5 | 22.1 | 33.9 | 5.3 | 17.4 | 458.4 | 419.3 | 39.1 |
| 1966 | 141.0 | 121.3 | 893.7 | 774.5 | 132.6 | .0 | .0 | .0 | 60.4 | 36.3 | 24.2 | 47.3 | 8.0 | 25.9 | 552.8 | 506.5 | 46.4 |
| 1967 | 159.8 | 137.6 | 1053.4 | 912.1 | 157.1 | .0 | .0 | .0 | 70.1 | 42.8 | 27.3 | 64.1 | 11.5 | 35.8 | 656.2 | 605.4 | 50.8 |
| 1968 | 183.1 | 156.8 | 1236.5 | 1068.9 | 186.2 | .0 | .0 | .0 | 80.1 | 49.9 | 30.1 | 83.9 | 16.1 | 48.0 | 772.9 | 715.6 | 57.3 |
| 1969 | 217.3 | 181.9 | 1453.8 | 1250.8 | 224.8 | .0 | .0 | .0 | 90.6 | 57.8 | 32.7 | 109.3 | 21.9 | 61.9 | 905.3 | 840.3 | 65.0 |
| 1970 | 238.1 | 206.6 | 1691.9 | 1457.4 | 259.9 | .0 | .0 | .0 | 102.8 | 66.5 | 36.3 | 140.9 | 29.5 | 79.8 | 1055.3 | 981.6 | 73.6 |
| | | | | | | | | | 116.1 | 76.2 | 39.9 | 175.1 | 39.0 | 101.9 | 1231.9 | 1145.2 | 86.7 |
| | | | | | | | | | | | | | 50.4 | 124.7 | 1426.2 | 1330.8 | 95.3 |

FC-11

FLUOROCARBON PRODUCTION AND RELEASE - EXPANDED DATA - REPORTING COMPANIES ONLY
 MILLION KILOGRAMS
 FC-11
 CUMULATIVE

FC-11

| YEAR | ANNUAL | | TOTAL | | | REFRIGERATION HERMETICALLY SEALED | | | REFRIGERATION NON-HERMETIC | | | BLOWING AGENTS CLOSED CELL FOAM | | | OPEN CELL+AEROSOLS+ ALL OTHER PRODUCTION | | |
|------|--------|-------|--------|--------|-------|--------------------------------------|-----|-------|-------------------------------|-------|-------|------------------------------------|-------|-------|---|--------|-------|
| | PROD | REL | PROD | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | TOTAL | REL | UNREL |
| 1971 | 263.2 | 226.9 | 1955.1 | 1684.3 | 300.1 | .0 | .0 | .0 | 130.9 | 86.7 | 44.2 | 217.6 | 64.6 | 153.0 | 1635.9 | 1533.0 | 102.9 |
| 1972 | 306.9 | 255.8 | 2262.0 | 1940.1 | 355.8 | .0 | .0 | .0 | 147.8 | 98.5 | 49.4 | 269.3 | 82.0 | 187.3 | 1878.7 | 1759.6 | 119.1 |
| 1973 | 349.1 | 292.4 | 2611.1 | 2232.5 | 417.7 | .0 | .0 | .0 | 167.3 | 111.5 | 55.8 | 331.4 | 103.2 | 228.1 | 2151.5 | 2017.7 | 133.8 |
| 1974 | 369.7 | 321.4 | 2980.8 | 2553.9 | 471.5 | .0 | .0 | .0 | 187.9 | 126.0 | 61.8 | 393.3 | 127.2 | 266.1 | 2444.3 | 2300.7 | 143.6 |
| 1975 | 314.1 | 310.9 | 3294.8 | 2864.9 | 479.4 | .0 | .0 | .0 | 204.5 | 141.8 | 62.7 | 448.8 | 153.0 | 295.7 | 2691.0 | 2570.0 | 121.0 |
| 1976 | 339.8 | 316.7 | 3634.7 | 3181.5 | 507.7 | .0 | .0 | .0 | 231.4 | 159.4 | 72.0 | 500.9 | 180.8 | 320.1 | 2957.0 | 2841.4 | 115.6 |
| 1977 | 320.5 | 303.9 | 3955.1 | 3485.5 | 529.0 | .0 | .0 | .0 | 256.1 | 178.4 | 77.7 | 566.1 | 212.8 | 353.2 | 3192.3 | 3094.2 | 98.1 |
| 1978 | 308.9 | 283.6 | 4264.0 | 3769.1 | 558.9 | .0 | .0 | .0 | 283.3 | 199.1 | 84.3 | 632.2 | 247.8 | 384.4 | 3412.5 | 3322.2 | 90.2 |
| 1979 | 289.5 | 263.7 | 4553.5 | 4032.7 | 589.0 | .0 | .0 | .0 | 313.8 | 221.5 | 92.3 | 712.3 | 287.9 | 424.4 | 3595.7 | 3523.3 | 72.4 |
| 1980 | 289.6 | 250.8 | 4843.1 | 4283.6 | 632.2 | .0 | .0 | .0 | 342.8 | 245.8 | 97.0 | 796.3 | 331.9 | 464.4 | 3776.6 | 3705.9 | 70.7 |
| 1981 | 286.9 | 248.2 | 5130.0 | 4531.8 | 675.2 | .0 | .0 | .0 | 370.5 | 271.7 | 98.8 | 894.0 | 381.8 | 512.2 | 3942.5 | 3878.3 | 64.1 |

FC-12

FLUOROCARBON PRODUCTION AND RELEASE - EXPANDED DATA - REPORTING COMPANIES ONLY
MILLION KILOGRAMS
FC-12
CUMULATIVE

FC-12

| YEAR | ANNUAL | | TOTAL | | | REFRIGERATION HERMETICALLY SEALED | | | REFRIGERATION NON-HERMETIC | | | BLOWING AGENTS CLOSED CELL FOAM | | | OPEN CELL+AEROSOLS+ ALL OTHER PRODUCTION | | |
|------|--------|-------|--------|--------|-------|--------------------------------------|------|-------|-------------------------------|-------|-------|------------------------------------|------|-------|---|--------|-------|
| | PROD | REL | PROD | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | TOTAL | REL | UNREL |
| 1931 | .5 | .1 | .5 | .1 | .5 | .0 | .0 | .0 | .5 | .0 | .5 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1932 | .1 | .1 | .7 | .1 | .6 | .0 | .0 | .0 | .7 | .1 | .6 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1933 | .3 | .1 | 1.0 | .2 | .8 | .0 | .0 | .0 | 1.0 | .2 | .8 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1934 | .7 | .2 | 1.7 | .4 | 1.3 | .1 | .0 | .1 | 1.6 | .4 | 1.2 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1935 | 1.0 | .3 | 2.7 | .8 | 2.0 | .1 | .0 | .1 | 2.6 | .7 | 1.9 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1936 | 1.7 | .5 | 4.4 | 1.3 | 3.2 | .2 | .0 | .1 | 4.2 | 1.2 | 3.1 | .0 | .0 | .0 | .1 | .1 | .0 |
| 1937 | 3.1 | .8 | 7.5 | 2.1 | 5.6 | .3 | .0 | .3 | 7.2 | 1.9 | 5.3 | .0 | .0 | .0 | .1 | .1 | .0 |
| 1938 | 2.8 | 1.2 | 10.3 | 3.3 | 7.3 | .4 | .0 | .3 | 9.9 | 3.0 | 6.9 | .0 | .0 | .0 | .2 | .2 | .0 |
| 1939 | 3.9 | 1.7 | 14.2 | 5.0 | 9.6 | .5 | .0 | .5 | 13.7 | 4.6 | 9.1 | .0 | .0 | .0 | .3 | .3 | .0 |
| 1940 | 4.5 | 2.3 | 18.8 | 7.3 | 12.0 | .7 | .0 | .6 | 18.1 | 6.8 | 11.4 | .0 | .0 | .0 | .4 | .4 | .0 |
| 1941 | 6.3 | 3.0 | 25.0 | 10.3 | 15.4 | .9 | .0 | .8 | 24.2 | 9.6 | 14.6 | .0 | .0 | .0 | .5 | .5 | .0 |
| 1942 | 5.9 | 3.7 | 31.0 | 13.9 | 17.8 | 1.1 | .1 | 1.0 | 29.9 | 13.1 | 16.8 | .0 | .0 | .0 | .6 | .6 | .0 |
| 1943 | 8.2 | 4.5 | 39.2 | 18.5 | 21.7 | 1.4 | .1 | 1.3 | 37.8 | 17.4 | 20.4 | .0 | .0 | .0 | .8 | .8 | .0 |
| 1944 | 16.7 | 6.1 | 55.9 | 24.6 | 32.7 | 2.0 | .1 | 1.8 | 54.0 | 23.1 | 30.9 | .0 | .0 | .0 | 1.0 | 1.0 | .0 |
| 1945 | 20.1 | 8.0 | 76.0 | 32.6 | 45.3 | 2.7 | .2 | 2.5 | 73.4 | 30.5 | 42.9 | .0 | .0 | .0 | 1.4 | 1.4 | .0 |
| 1946 | 16.6 | 13.9 | 92.7 | 46.5 | 48.5 | 2.9 | .3 | 2.7 | 80.4 | 39.3 | 41.1 | .0 | .0 | .0 | 1.9 | 1.9 | .0 |
| 1947 | 20.1 | 21.3 | 112.8 | 67.9 | 47.8 | 3.2 | .4 | 2.9 | 88.9 | 49.6 | 39.2 | .0 | .0 | .0 | 11.7 | 7.0 | 4.7 |
| 1948 | 24.8 | 24.8 | 137.6 | 92.6 | 48.4 | 3.6 | .5 | 3.1 | 99.3 | 61.0 | 38.3 | .0 | .0 | .0 | 23.5 | 17.9 | 5.7 |
| 1949 | 26.1 | 26.6 | 163.7 | 119.2 | 48.6 | 4.0 | .6 | 3.4 | 110.3 | 72.5 | 37.8 | .0 | .0 | .0 | 38.1 | 31.1 | 7.0 |
| 1950 | 34.6 | 29.5 | 198.3 | 148.7 | 54.5 | 4.5 | .8 | 3.8 | 124.9 | 83.9 | 41.0 | .0 | .0 | .0 | 53.5 | 46.1 | 7.4 |
| 1951 | 36.2 | 32.4 | 234.5 | 181.1 | 59.2 | 5.1 | 1.0 | 4.1 | 140.2 | 95.3 | 44.9 | .0 | .0 | .0 | 73.8 | 64.1 | 9.7 |
| 1952 | 37.2 | 33.7 | 271.7 | 214.8 | 63.7 | 5.7 | 1.2 | 4.5 | 155.9 | 107.1 | 48.8 | .0 | .0 | .0 | 95.1 | 84.9 | 10.2 |
| 1953 | 46.5 | 37.9 | 318.2 | 252.7 | 73.5 | 6.4 | 1.5 | 4.9 | 175.5 | 120.0 | 55.5 | .0 | .0 | .0 | 117.0 | 106.5 | 10.5 |
| 1954 | 49.1 | 42.9 | 367.4 | 295.6 | 81.0 | 7.1 | 1.8 | 5.4 | 196.2 | 134.4 | 61.8 | .0 | .0 | .0 | 144.3 | 131.3 | 13.1 |
| 1955 | 57.6 | 48.2 | 425.0 | 343.8 | 91.8 | 8.0 | 2.1 | 5.9 | 220.4 | 150.7 | 69.7 | .1 | .0 | .0 | 173.2 | 159.4 | 13.8 |
| 1956 | 68.7 | 56.1 | 493.6 | 399.9 | 106.1 | 9.0 | 2.5 | 6.6 | 249.4 | 169.2 | 80.2 | .1 | .1 | .0 | 207.1 | 190.9 | 16.2 |
| 1957 | 74.2 | 63.8 | 567.8 | 463.7 | 118.3 | 10.1 | 2.9 | 7.2 | 279.3 | 189.8 | 89.5 | .2 | .2 | .0 | 247.4 | 228.1 | 19.3 |
| 1958 | 73.4 | 66.9 | 641.2 | 530.6 | 126.6 | 11.3 | 3.3 | 8.0 | 311.8 | 213.0 | 98.8 | .3 | .3 | .0 | 292.3 | 270.8 | 21.5 |
| 1959 | 87.6 | 74.8 | 728.8 | 605.4 | 141.6 | 12.5 | 3.8 | 8.7 | 345.3 | 238.8 | 106.5 | .5 | .4 | .1 | 333.9 | 314.0 | 19.8 |
| 1960 | 99.4 | 89.1 | 828.3 | 694.5 | 154.5 | 13.8 | 4.3 | 9.5 | 380.7 | 267.1 | 113.6 | .8 | .6 | .1 | 388.8 | 362.4 | 26.4 |
| 1961 | 108.5 | 99.7 | 936.8 | 794.2 | 165.9 | 15.2 | 4.9 | 10.3 | 418.8 | 297.7 | 121.1 | 1.1 | .9 | .2 | 453.7 | 422.4 | 31.2 |
| 1962 | 128.1 | 114.5 | 1064.9 | 908.7 | 182.8 | 16.6 | 5.5 | 11.2 | 458.6 | 330.5 | 128.2 | 1.6 | 1.4 | .3 | 525.0 | 490.7 | 34.3 |
| 1963 | 146.4 | 133.9 | 1211.3 | 1042.7 | 198.9 | 18.2 | 6.1 | 12.0 | 500.7 | 365.2 | 135.5 | 2.8 | 2.2 | .6 | 614.6 | 571.4 | 43.2 |
| 1964 | 170.1 | 155.5 | 1381.4 | 1198.1 | 217.8 | 19.7 | 6.9 | 12.9 | 544.5 | 402.0 | 142.5 | 5.1 | 4.0 | 1.2 | 719.9 | 669.0 | 50.8 |
| 1965 | 190.1 | 175.4 | 1571.4 | 1373.5 | 237.2 | 21.6 | 7.7 | 13.9 | 595.9 | 441.1 | 154.9 | 7.4 | 6.2 | 1.1 | 846.5 | 785.3 | 61.2 |
| 1966 | 216.2 | 195.0 | 1787.6 | 1568.5 | 263.8 | 23.7 | 8.6 | 15.1 | 653.2 | 483.0 | 170.3 | 10.1 | 8.7 | 1.4 | 985.8 | 918.5 | 67.2 |
| 1967 | 242.8 | 219.9 | 2030.4 | 1788.4 | 292.7 | 25.9 | 9.5 | 16.4 | 715.4 | 528.3 | 187.1 | 12.9 | 11.5 | 1.4 | 1145.2 | 1068.2 | 77.0 |
| 1968 | 267.5 | 246.5 | 2297.9 | 2034.9 | 320.4 | 28.3 | 10.6 | 17.7 | 780.0 | 577.6 | 202.4 | 16.3 | 14.6 | 1.7 | 1326.9 | 1239.1 | 87.8 |
| 1969 | 297.3 | 274.3 | 2595.1 | 2309.2 | 350.8 | 30.9 | 11.7 | 19.2 | 851.5 | 631.4 | 220.1 | 21.0 | 18.6 | 2.3 | 1530.8 | 1432.2 | 98.6 |
| 1970 | 321.1 | 299.9 | 2916.2 | 2609.1 | 380.1 | 33.7 | 12.9 | 20.8 | 929.2 | 690.2 | 239.0 | 26.0 | 23.5 | 2.5 | 1756.7 | 1647.4 | 109.2 |
| | | | | | | | | | | | | | | | 2000.3 | 1882.5 | 117.8 |

FC-12

FLUOROCARBON PRODUCTION AND RELEASE - EXPANDED DATA - REPORTING COMPANIES ONLY
 MILLION KILOGRAMS

FC-12

| YEAR | ANNUAL | | TOTAL | | | REFRIGERATION HERMETICALLY SEALED | | | REFRIGERATION NON-HERMETIC | | | BLOWING AGENTS CLOSED CELL FOAM | | | OPEN CELL+AEROSOLS+ ALL OTHER PRODUCTION | | |
|------|--------|-------|--------|--------|-------|--------------------------------------|------|-------|-------------------------------|--------|-------|------------------------------------|-------|-------|---|--------|-------|
| | PROD | REL | PROD | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | SALES | REL | UNREL | TOTAL | REL | UNREL |
| | | | | | | | | | | | | | | | | | |
| 1971 | 341.6 | 321.8 | 3257.8 | 2930.8 | 408.4 | 36.7 | 14.3 | 22.5 | 1012.1 | 754.0 | 258.1 | 31.4 | 28.7 | 2.7 | 2259.1 | 2133.9 | 125.1 |
| 1972 | 379.9 | 349.9 | 3637.7 | 3280.7 | 447.9 | 40.1 | 15.7 | 24.4 | 1105.0 | 823.3 | 281.7 | 38.6 | 35.0 | 3.6 | 2544.9 | 2406.7 | 138.2 |
| 1973 | 423.3 | 387.3 | 4061.0 | 3668.0 | 494.5 | 43.8 | 17.2 | 26.6 | 1208.8 | 898.8 | 310.0 | 47.4 | 43.0 | 4.4 | 2862.5 | 2709.0 | 153.5 |
| 1974 | 442.8 | 418.6 | 4503.8 | 4086.6 | 529.8 | 47.7 | 18.9 | 28.8 | 1315.5 | 980.7 | 334.8 | 57.2 | 52.3 | 4.9 | 3196.0 | 3034.8 | 161.2 |
| 1975 | 381.0 | 404.1 | 4884.8 | 4490.8 | 516.1 | 51.3 | 20.7 | 30.7 | 1415.4 | 1068.7 | 346.7 | 66.7 | 61.9 | 4.7 | 3473.5 | 3339.5 | 134.0 |
| 1976 | 410.7 | 390.4 | 5295.5 | 4881.2 | 546.7 | 55.8 | 22.6 | 33.2 | 1538.7 | 1163.8 | 374.9 | 73.2 | 70.0 | 3.3 | 3760.2 | 3624.8 | 135.4 |
| 1977 | 382.8 | 371.2 | 5678.3 | 5252.4 | 567.9 | 61.3 | 24.7 | 36.6 | 1689.3 | 1267.0 | 422.3 | 83.4 | 78.3 | 5.1 | 3986.3 | 3882.3 | 104.0 |
| 1978 | 372.1 | 341.3 | 6050.4 | 5593.7 | 608.0 | 66.9 | 27.0 | 39.9 | 1843.2 | 1378.6 | 464.7 | 101.5 | 92.4 | 9.0 | 4190.1 | 4095.7 | 94.5 |
| 1979 | 357.2 | 337.5 | 6407.6 | 5931.1 | 636.6 | 72.6 | 29.5 | 43.1 | 2002.3 | 1500.0 | 502.3 | 119.5 | 110.5 | 9.0 | 4373.3 | 4291.1 | 82.2 |
| 1980 | 350.2 | 332.5 | 6757.8 | 6263.6 | 663.1 | 78.3 | 32.1 | 46.2 | 2158.9 | 1631.8 | 527.0 | 143.4 | 131.5 | 11.9 | 4546.2 | 4468.2 | 78.0 |
| 1981 | 351.3 | 340.7 | 7109.1 | 6604.3 | 682.5 | 84.1 | 35.0 | 49.1 | 2320.1 | 1773.6 | 546.5 | 164.7 | 154.1 | 10.7 | 4717.9 | 4641.7 | 76.2 |

FLUOROCARBON PRODUCTION AND RELEASE SUMMARY - REPORTING COMPANIES ONLY

MILLION KILOGRAMS

| YEAR | FC-11 | | | | | FC-12 | | | | |
|------|------------|----------|------------|----------|------------|------------|----------|------------|----------|------------|
| | ANNUAL | | CUMULATIVE | | | ANNUAL | | CUMULATIVE | | |
| | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED |
| 1931 | .0 | .0 | .0 | .0 | .0 | .5 | .1 | .5 | .1 | .5 |
| 1932 | .0 | .0 | .0 | .0 | .0 | .1 | .1 | .7 | .1 | .6 |
| 1933 | .0 | .0 | .0 | .0 | .0 | .3 | .1 | 1.0 | .2 | .8 |
| 1934 | .0 | .0 | .0 | .0 | .0 | .7 | .2 | 1.7 | .4 | 1.3 |
| 1935 | .0 | .0 | .1 | .0 | .1 | 1.0 | .3 | 2.7 | .8 | 2.0 |
| 1936 | .1 | .0 | .2 | .0 | .2 | 1.7 | .5 | 4.4 | 1.3 | 3.2 |
| 1937 | .1 | .0 | .3 | .1 | .3 | 3.1 | .8 | 7.5 | 2.1 | 5.6 |
| 1938 | .1 | .1 | .4 | .1 | .3 | 2.8 | 1.2 | 10.3 | 3.3 | 7.3 |
| 1939 | .1 | .1 | .5 | .2 | .3 | 3.9 | 1.7 | 14.2 | 5.0 | 9.6 |
| 1940 | .2 | .1 | .7 | .3 | .4 | 4.5 | 2.3 | 18.8 | 7.3 | 12.0 |
| 1941 | .3 | .1 | 1.0 | .4 | .6 | 6.3 | 3.0 | 25.0 | 10.3 | 15.4 |
| 1942 | .3 | .1 | 1.3 | .5 | .8 | 5.9 | 3.7 | 31.0 | 13.9 | 17.8 |
| 1943 | .4 | .2 | 1.7 | .7 | 1.0 | 8.2 | 4.5 | 39.2 | 18.5 | 21.7 |
| 1944 | .4 | .2 | 2.0 | 1.0 | 1.1 | 16.7 | 6.1 | 55.9 | 24.6 | 32.7 |
| 1945 | .4 | .3 | 2.4 | 1.2 | 1.2 | 20.1 | 8.0 | 76.0 | 32.6 | 45.3 |
| 1946 | .7 | .6 | 3.1 | 1.9 | 1.3 | 16.6 | 13.9 | 92.7 | 46.5 | 48.5 |
| 1947 | 1.3 | 1.3 | 4.4 | 3.1 | 1.4 | 20.1 | 21.3 | 112.8 | 67.9 | 47.8 |
| 1948 | 3.0 | 2.3 | 7.4 | 5.5 | 2.1 | 24.8 | 24.8 | 137.6 | 92.6 | 48.4 |
| 1949 | 4.5 | 3.8 | 11.9 | 9.3 | 2.8 | 26.1 | 26.6 | 163.7 | 119.2 | 48.6 |
| 1950 | 6.6 | 5.5 | 18.6 | 14.8 | 4.1 | 34.6 | 29.5 | 198.3 | 148.7 | 54.5 |
| 1951 | 9.1 | 7.6 | 27.6 | 22.4 | 5.6 | 36.2 | 32.4 | 234.5 | 181.1 | 59.2 |
| 1952 | 13.6 | 11.0 | 41.2 | 33.4 | 8.4 | 37.2 | 33.7 | 271.7 | 214.8 | 63.7 |
| 1953 | 17.3 | 15.0 | 58.5 | 48.3 | 11.0 | 46.5 | 37.9 | 318.2 | 252.7 | 73.5 |
| 1954 | 20.9 | 18.6 | 79.4 | 66.9 | 13.7 | 49.1 | 42.9 | 367.4 | 295.6 | 81.0 |
| 1955 | 26.3 | 23.0 | 105.6 | 89.9 | 17.3 | 57.6 | 48.2 | 425.0 | 343.8 | 91.8 |
| 1956 | 32.5 | 28.7 | 138.1 | 118.6 | 21.5 | 68.7 | 56.1 | 493.6 | 399.9 | 106.1 |
| 1957 | 33.9 | 32.2 | 172.0 | 150.8 | 23.8 | 74.2 | 63.8 | 567.8 | 463.7 | 118.3 |
| 1958 | 29.5 | 30.2 | 201.6 | 181.0 | 23.6 | 73.4 | 66.9 | 641.2 | 530.6 | 126.6 |
| 1959 | 35.6 | 30.9 | 237.1 | 211.8 | 28.8 | 87.6 | 74.8 | 728.8 | 605.4 | 141.6 |
| 1960 | 49.7 | 40.5 | 286.9 | 252.4 | 38.8 | 99.4 | 89.1 | 828.3 | 694.5 | 154.5 |
| 1961 | 60.5 | 52.1 | 347.3 | 304.5 | 48.0 | 108.5 | 99.7 | 936.8 | 794.2 | 165.9 |
| 1962 | 78.1 | 65.4 | 425.4 | 369.9 | 61.9 | 128.1 | 114.5 | 1064.9 | 908.7 | 182.8 |
| 1963 | 93.3 | 80.0 | 518.7 | 449.9 | 76.6 | 146.4 | 133.9 | 1211.3 | 1042.7 | 198.9 |
| 1964 | 111.1 | 95.0 | 629.8 | 544.9 | 94.3 | 170.1 | 155.5 | 1381.4 | 1198.1 | 217.8 |
| 1965 | 122.8 | 108.3 | 752.6 | 653.2 | 110.7 | 190.1 | 175.4 | 1571.4 | 1373.5 | 237.2 |
| 1966 | 141.0 | 121.3 | 893.7 | 774.5 | 132.6 | 216.2 | 195.0 | 1787.6 | 1568.5 | 263.8 |
| 1967 | 159.8 | 137.6 | 1053.4 | 912.1 | 157.1 | 242.8 | 219.9 | 2030.4 | 1788.4 | 292.7 |
| 1968 | 183.1 | 156.8 | 1236.5 | 1068.9 | 186.2 | 267.5 | 246.5 | 2297.9 | 2034.9 | 320.4 |
| 1969 | 217.3 | 181.9 | 1453.8 | 1250.8 | 224.8 | 297.3 | 274.3 | 2595.1 | 2309.2 | 350.8 |
| 1970 | 238.1 | 206.6 | 1691.9 | 1457.4 | 259.9 | 321.1 | 299.9 | 2916.2 | 2609.1 | 380.1 |

FLUOROCARBON PRODUCTION AND RELEASE SUMMARY - REPORTING COMPANIES ONLY

MILLION KILOGRAMS

| YEAR | FC-11 | | | | | FC-12 | | | | |
|------|------------|----------|------------|----------|------------|------------|----------|------------|----------|------------|
| | ANNUAL | | CUMULATIVE | | | ANNUAL | | CUMULATIVE | | |
| | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED |
| 1971 | 263.2 | 226.9 | 1955.1 | 1684.3 | 300.1 | 341.6 | 321.8 | 3257.8 | 2930.8 | 408.4 |
| 1972 | 306.9 | 255.8 | 2262.0 | 1940.1 | 355.8 | 379.9 | 349.9 | 3637.7 | 3280.7 | 447.9 |
| 1973 | 349.1 | 292.4 | 2611.1 | 2232.5 | 417.7 | 423.3 | 387.3 | 4061.0 | 3668.0 | 494.5 |
| 1974 | 369.7 | 321.4 | 2980.8 | 2553.9 | 471.5 | 442.8 | 418.6 | 4503.8 | 4086.6 | 529.8 |
| 1975 | 314.1 | 310.9 | 3294.8 | 2864.9 | 479.4 | 381.0 | 404.1 | 4884.8 | 4490.8 | 516.1 |
| 1976 | 339.8 | 316.7 | 3634.7 | 3181.5 | 507.7 | 410.7 | 390.4 | 5295.5 | 4881.2 | 546.7 |
| 1977 | 320.5 | 303.9 | 3955.1 | 3485.5 | 529.0 | 382.8 | 371.2 | 5678.3 | 5252.4 | 567.9 |
| 1978 | 308.9 | 283.6 | 4264.0 | 3769.1 | 558.9 | 372.1 | 341.3 | 6050.4 | 5593.7 | 608.0 |
| 1979 | 289.5 | 263.7 | 4553.5 | 4032.7 | 589.0 | 357.2 | 337.5 | 6407.6 | 5931.1 | 636.6 |
| 1980 | 289.6 | 250.8 | 4843.1 | 4283.6 | 632.2 | 350.2 | 332.5 | 6757.8 | 6263.6 | 663.1 |
| 1981 | 286.9 | 248.2 | 5130.0 | 4531.8 | 675.2 | 351.3 | 340.7 | 7109.1 | 6604.3 | 682.5 |

FLUOROCARBON PRODUCTION AND RELEASE - USSR, EASTERN EUROPE, ARGENTINA, INDIA, AND OTHERS

MILLION KILOGRAMS

| YEAR | FC-11 | | | | | FC-12 | | | | |
|------|------------|----------|------------|----------|------------|------------|----------|------------|----------|------------|
| | ANNUAL | | CUMULATIVE | | | ANNUAL | | CUMULATIVE | | |
| | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED |
| 1931 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1932 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1933 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1934 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1935 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1936 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1937 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1938 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1939 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1940 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1941 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1942 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1943 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1944 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1945 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1946 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1947 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1948 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1949 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1950 | .1 | .0 | .1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 1951 | .1 | .1 | .2 | .1 | .1 | .5 | .2 | .5 | .2 | .4 |
| 1952 | .1 | .1 | .3 | .2 | .1 | .7 | .4 | 1.2 | .6 | .7 |
| 1953 | .1 | .1 | .5 | .4 | .1 | .8 | .5 | 2.0 | 1.0 | 1.0 |
| 1954 | .1 | .1 | .6 | .5 | .1 | .9 | .6 | 2.9 | 1.7 | 1.3 |
| 1955 | .2 | .2 | .8 | .6 | .1 | 1.1 | .8 | 4.0 | 2.4 | 1.7 |
| 1956 | .2 | .2 | 1.0 | .8 | .2 | 1.3 | 1.0 | 5.3 | 3.4 | 2.0 |
| 1957 | .3 | .2 | 1.3 | 1.1 | .2 | 1.5 | 1.1 | 6.8 | 4.5 | 2.4 |
| 1958 | .3 | .3 | 1.6 | 1.4 | .3 | 1.8 | 1.4 | 8.5 | 5.9 | 2.8 |
| 1959 | .4 | .3 | 2.0 | 1.7 | .3 | 2.1 | 1.6 | 10.7 | 7.5 | 3.4 |
| 1960 | .4 | .4 | 2.4 | 2.0 | .4 | 2.5 | 1.9 | 13.2 | 9.5 | 4.0 |
| 1961 | .5 | .4 | 2.9 | 2.5 | .4 | 2.9 | 2.4 | 16.1 | 11.8 | 4.7 |
| 1962 | .6 | .5 | 3.4 | 3.0 | .5 | 3.4 | 2.8 | 19.5 | 14.7 | 5.4 |
| 1963 | .7 | .6 | 4.2 | 3.6 | .7 | 4.1 | 3.4 | 23.6 | 18.1 | 6.1 |
| 1964 | .8 | .7 | 5.0 | 4.3 | .8 | 4.8 | 4.1 | 28.4 | 22.2 | 7.0 |
| 1965 | 1.0 | .8 | 6.0 | 5.1 | 1.0 | 5.7 | 4.9 | 34.2 | 27.1 | 7.9 |
| 1966 | 1.1 | 1.0 | 7.1 | 6.1 | 1.2 | 6.7 | 5.8 | 40.9 | 32.9 | 9.0 |
| 1967 | 1.4 | 1.1 | 8.5 | 7.2 | 1.4 | 7.9 | 6.7 | 48.8 | 39.6 | 10.5 |
| 1968 | 1.6 | 1.3 | 10.1 | 8.5 | 1.7 | 9.3 | 7.9 | 58.2 | 47.4 | 12.2 |
| 1969 | 2.6 | 1.9 | 12.7 | 10.4 | 2.5 | 11.3 | 9.4 | 69.4 | 56.9 | 14.3 |
| 1970 | 2.9 | 2.4 | 15.6 | 12.8 | 3.1 | 14.1 | 11.6 | 83.6 | 68.5 | 17.2 |
| | | | | | | 15.7 | 13.8 | 99.3 | 82.0 | 19.8 |

FLUOROCARBON PRODUCTION AND RELEASE - USSR, EASTERN EUROPE, ARGENTINA, INDIA, AND OTHERS

MILLION KILOGRAMS

| YEAR | FC-11 | | | | | FC-12 | | | | |
|------|------------|----------|------------|----------|------------|------------|----------|------------|----------|------------|
| | ANNUAL | | CUMULATIVE | | | ANNUAL | | CUMULATIVE | | |
| | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED | PRODUCTION | RELEASED | PRODUCTION | RELEASED | UNRELEASED |
| 1971 | 3.4 | 2.8 | 19.1 | 15.6 | 3.8 | 18.9 | 15.7 | 118.2 | 97.8 | 23.4 |
| 1972 | 4.3 | 3.3 | 23.3 | 18.9 | 4.8 | 21.8 | 18.4 | 140.0 | 116.2 | 27.3 |
| 1973 | 5.2 | 4.1 | 28.5 | 23.0 | 6.0 | 24.0 | 20.9 | 164.0 | 137.1 | 31.1 |
| 1974 | 7.8 | 5.6 | 36.3 | 28.5 | 8.3 | 30.7 | 24.9 | 194.7 | 161.9 | 37.6 |
| 1975 | 9.3 | 7.3 | 45.6 | 35.9 | 10.4 | 37.6 | 30.4 | 232.2 | 192.4 | 45.7 |
| 1976 | 10.8 | 8.6 | 56.5 | 44.5 | 12.8 | 44.9 | 35.5 | 277.1 | 227.9 | 56.1 |
| 1977 | 12.4 | 9.8 | 68.9 | 54.3 | 15.6 | 52.1 | 39.1 | 329.2 | 267.0 | 70.5 |
| 1978 | 14.5 | 11.0 | 83.3 | 65.3 | 19.3 | 61.1 | 43.6 | 390.3 | 310.6 | 89.5 |
| 1979 | 17.1 | 12.4 | 100.4 | 77.7 | 24.2 | 71.7 | 50.9 | 462.0 | 361.4 | 112.1 |
| 1980 | 19.7 | 13.9 | 120.1 | 91.6 | 30.2 | 83.2 | 60.0 | 545.2 | 421.5 | 137.3 |
| 1981 | 23.2 | 16.0 | 143.2 | 107.7 | 37.7 | 97.9 | 71.6 | 643.1 | 493.0 | 166.1 |