
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 11-K

**ANNUAL REPORT PURSUANT TO SECTION 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934**

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2005

OR

TRANSITION REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission file number 1-16091.

A. Full title of the plan and the address of the plan, if different from that of the issuer below:

POLYONE RETIREMENT SAVINGS PLAN

B. Name of issuer of the securities held pursuant to the plan and the address of its principal executive office:

**POLYONE CORPORATION
33587 WALKER ROAD
AVON LAKE, OHIO 44012**

REQUIRED INFORMATION

The following financial statements and supplemental schedules for the PolyOne Retirement Savings Plan, prepared in accordance with the financial reporting requirements of ERISA, are being filed herewith:

| | Page No. (in this Report) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Audited Financial Statements and Supplemental Schedules, December 31, 2005 and 2004 and Year ended December 31, 2005 with Report of Independent Registered Public Accounting Firm | 1 |

The following exhibits are being filed herewith:

- 23.1 Consent of Ernst & Young LLP
 - 32.1 Certificate Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes Oxley Act of 2002, as signed by Stephen D. Newlin, President, Chief Executive Officer and Chairman of the Board
 - 32.2 Certificate Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes Oxley Act of 2002, as signed by W. David Wilson, Vice President and Chief Financial Officer
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SIGNATURES

The Plan. Pursuant to the requirements of the Securities Exchange Act of 1934, the trustees (or other persons who administer the employee benefit plan) have duly caused this annual report to be sign on its behalf by the undersigned hereunto duly authorized.

Date: June 29, 2006

POLYONE RETIREMENT SAVINGS PLAN

By: PolyOne Retirement Plan Committee

By: /s/ Michael J. Meier

Michael J. Meier
Corporate Controller
PolyOne Corporation

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AUDITED FINANCIAL STATEMENTS AND
SUPPLEMENTAL SCHEDULE

PolyOne Retirement Savings Plan

December 31, 2005 and 2004, and Year Ended December 31, 2005

With Report of Independent Registered Public Accounting Firm

PolyOne Retirement Savings Plan

Audited Financial Statements and Supplemental Schedule

December 31, 2005 and 2004, and
Year Ended December 31, 2005

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Report of Independent Registered Public Accounting Firm

The PolyOne Corporation
Retirement Plan Committee

We have audited the accompanying statements of net assets available for benefits of the PolyOne Retirement Savings Plan as of December 31, 2005 and 2004, and the related statement of changes in net assets available for benefits for the year ended December 31, 2005. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Plan's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of the Plan at December 31, 2005 and 2004, and the changes in its net assets available for benefits for the year ended December 31, 2005, in conformity with U.S. generally accepted accounting principles.

Our audits were performed for the purpose of forming an opinion on the financial statements taken as a whole. The accompanying supplemental schedule of assets (held at end of year) as of December 31, 2005, is presented for purposes of additional analysis and is not a required part of the financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. This supplemental schedule is the responsibility of the Plan's management. The supplemental schedule has been subjected to the auditing procedures applied in our audits of the financial statements and, in our opinion, is fairly stated in all material respects in relation to the financial statements taken as a whole.

/s/ Ernst & Young LLP

Cleveland, Ohio
May 24, 2006

PolyOne Retirement Savings Plan

Statements of Net Assets Available for Benefits

| | <u>December 31</u> | |
|-----------------------------------|-----------------------|-----------------------|
| | <u>2005</u> | <u>2004</u> |
| Assets | | |
| Investments, at fair value | \$ 310,968,053 | \$ 320,444,227 |
| Receivables: | | |
| Participant contributions | 462,421 | – |
| Employer contributions | 331,075 | – |
| Total receivables | 793,496 | – |
| Net assets available for benefits | \$ 311,761,549 | \$ 320,444,227 |

See accompanying notes.

PolyOne Retirement Savings Plan
Statement of Changes in Net Assets Available for Benefits
Year Ended December 31, 2005

| Additions | |
|-----------------------------------------------|-----------------------|
| Investment income: | |
| Interest | \$ 6,690,329 |
| Dividends | 3,131,634 |
| Net depreciation in fair value of investments | <u>(10,360,926)</u> |
| | (538,963) |
| Contributions: | |
| Participant | 11,194,422 |
| Employer | 10,202,754 |
| Rollovers | 421,454 |
| | <u>21,818,630</u> |
| Total additions | <u>21,279,667</u> |
| Deductions | |
| Benefits paid directly to participants | 29,677,652 |
| Administrative expenses | 284,693 |
| Total deductions | <u>29,962,345</u> |
| Net decrease | (8,682,678) |
| Net assets available for benefits: | |
| Beginning of year | <u>320,444,227</u> |
| End of year | <u>\$ 311,761,549</u> |

See accompanying notes.

PolyOne Retirement Savings Plan

Notes to Financial Statements

December 31, 2005 and 2004, and
Year Ended December 31, 2005

1. Summary Description of the Plan

The following summary description of the PolyOne Retirement Savings Plan (the Plan) is provided for general information purposes only. Participants should refer to the plan document for a more complete description of the Plan's provisions. The Plan is administered by the PolyOne Corporation Retirement Plan Committee.

General

The Plan is sponsored by PolyOne Corporation (the Company and Plan Sponsor). The Company was formed by the consolidation of The Geon Company and M.A. Hanna Company on August 31, 2000.

The Plan is an amendment and restatement of the M.A. Hanna Company 401(k) and Retirement Plan (the Hanna 401(k) Plan) and a continuation of the M.A. Hanna Capital Accumulation Plan (the Hanna CAP) and the O'Sullivan Corporation Retirement Savings Plan (the O'Sullivan 401(k) Plan). Effective June 1, 2003, as approved by the Compensation and Governance Committee on January 27, 2003, the Hanna CAP and the O'Sullivan 401(k) Plan were merged with and into the Hanna 401(k) Plan and the Hanna 401(k) Plan was amended, restated, and renamed the PolyOne Retirement Savings Plan.

Effective January 1, 2004, as approved by the Compensation and Governance Committee on November 5, 2003, the Synergistics Industries (NJ) 401(k) Savings Plan (the Synergistics 401(k) Plan) was merged with and into the Plan. Also effective January 1, 2004, as approved by the Compensation and Governance Committee on January 27, 2003, the PolyOne Retirement Savings Plan – A (formerly the Geon Retirement Savings Plan) was merged with and into the Plan.

As approved by the Compensation and Governance Committee on July 22, 2004, all account balances for employees in the Elastomers and Performance Additives business that was sold August 5, 2004, were transferred out of the Plan. The assets were transferred from the Plan's trust on August 16, 2004.

Effective December 1, 2004, as approved by the Compensation and Governance Committee on October 6, 2004, the PolyOne Retirement Savings Plan for Collective Bargaining Employees, the PolyOne Retirement Savings Plan for Collective Bargaining Employees – A and the Plast-O-Meric Thrift and Savings Plan were merged with and into the Plan.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

1. Summary Description of the Plan (continued)

The Plan is a defined contribution plan that covers all employees of the Company, other than leased employees, nonresident aliens, other employees regularly employed outside of the United States, and persons classified by the Company as anything other than employees (even if that classification is later changed). The Plan is subject to the provisions of the Employee Retirement Income Security Act of 1974 (ERISA).

Contributions

Prior to January 2004, each employee who elected to participate in the Plan could authorize a bi-weekly payroll deduction from 1% to 15% of eligible earnings. Effective January 1, 2004, participants may elect to contribute 1% to 50% of eligible earnings. The Retirement Plan Committee has the authority at its discretion to reduce the employees' bi-weekly contribution percentage in order to maintain the tax-qualified status of the Plan. Effective January 1, 2005, the employee contribution percentages were changed so that a participant who is not a highly compensated employee may elect a bi-weekly payroll deduction from 1% to 50% of eligible earnings while participants who are classified as highly compensated employees may elect a bi-weekly payroll deduction of 1% to 15% of eligible earnings.

The Plan offers participants the choice of two savings options: an after-tax savings option and a pretax savings option. Participants may elect to participate in either or both of the savings options. Under both savings options, participants may direct that contributions be invested in any eligible funds offered by the Plan. Participants may change their investment options daily.

Effective January 1, 2004, the Company provides for a matching contribution equal to 50% of the first 3% and 25% of the next 3% of the participant's eligible compensation. Effective April 1, 2005, the Company increased its matching contribution from 50% to 100% of the first 3% of the participant's eligible compensation. The matching contribution for the next 3% remained at 25% until January 1, 2006, when the Company increased its matching contribution to 50%.

For each payroll period, the Company intends to make a retirement contribution for each participant equal to 2% of eligible earnings. Both the employer matching contributions and the 2% retirement contributions follow the participant's investment elections. In addition, effective January 1, 2004, the Company will make additional contributions to certain eligible participants, as defined, equal to 1% to 4% of eligible compensation.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

1. Summary Description of the Plan (continued)

The Plan provides for the acceptance of rollover contributions from other plans qualified under the Internal Revenue Code (the Code). Rollover contributions can be made only in cash to the Plan's tax-deferred savings option.

Forfeiture accounts in the Plan total approximately \$570,000 at December 31, 2005, and are held in the NYL Insurance Anchor Account I – Stable Value Fund. The balance in these accounts will be used to fund future Company contributions and Plan administrative expenses.

Vesting

Participant contributions and Company matching and discretionary contributions are fully vested immediately. Company retirement contributions are 100% vested after three years of service except for individuals who were participants in the Hanna 401(k) Plan or the Hanna CAP as of May 31, 2003. Such participants will be 20% vested after one year of service, 40% vested after two years of service and 100% vested after three years.

Participant Loans

Participants may borrow a maximum amount equal to the lesser of 50% of their vested account balance (excluding amounts relating to discretionary profit sharing contributions) or \$50,000, subject to certain Department of Labor and Internal Revenue Service requirements. The Plan provides that loan amounts must be a minimum of \$1,000. Interest is charged to the borrower at the trustee's prime rate plus 1%. Payments on loans are made through payroll deductions and must be repaid within five years (personal loans) or five to fifteen years (primary residence loans).

Plan Withdrawals and Distributions

Active participants may make hardship withdrawals from their salary deferral and rollover account. Age-based in-service withdrawals are available from the participant's vested account balance.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

1. Summary Description of the Plan (continued)

Plan distributions are made to participants or their designated beneficiary upon normal retirement, disability, or death, in the full amounts credited to their participant account. A participant who leaves employment of the Company before normal retirement for reasons other than disability, death, or a reduction in workforce is eligible to receive all amounts credited to their account relating to participant contributions, including rollovers, and the vested portion of Company matching and discretionary contributions. Distributions are made in either a single lump sum or periodic payments. Additionally, employees of select merged plans may elect a portion in a lump sum with the remainder paid in periodic payments, a single life annuity for single participants, or a joint and 50% or 100% survivor annuity with the participant's spouse as the joint annuitant for married participants if these options were available under their previous plan.

Plan Termination

Although the Company has not expressed any intent to do so, the Company has the right under the Plan to discontinue its contributions at any time and to terminate the Plan subject to the provisions of ERISA. Upon either of these events, the accounts of each affected employee will vest immediately, and participants will receive a distribution of their total participant account balance.

Administrative Expenses

Administrative expenses of the Plan are generally paid through the forfeiture account. Participants are charged investment management fees, which are allocated to participant accounts.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

2. Summary of Significant Accounting Policies

Basis of Accounting

The financial statements of the Plan are prepared using the accrual basis of accounting.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Valuation of Investments and Income Recognition

Investments are stated at fair value. Securities traded on a national securities exchange are valued at the last reported sales price on the last business day of the Plan year. Investments for which no sale was reported on that date are valued at the average of the last reported bid and ask prices. Shares of mutual funds are valued at quoted market prices, which represent the net asset values of shares held by the Plan at year-end. Common/collective trust funds are stated at fair value, as determined by the trustee.

The New York Life Stable Value Option fund consists primarily of guaranteed investment contracts valued at contract value. Investment contracts are recorded at their contract values, which represent contributions and reinvested income, less any withdrawals plus accrued interest, because these investments have fully benefit-responsive features. For example, participants may ordinarily direct the withdrawal or transfer of all or a portion of their investment at contract value. However, withdrawals influenced by Company-initiated events, such as in connection with the sale of a business, may result in a distribution at other than contract value. There are no reserves against contract values for credit risk of contract issues or otherwise. The fair value of the investment contracts at December 31, 2005 and 2004 was \$59,025,070 and \$59,786,394, respectively. The net average yield was approximately 3.9% in 2005 and 2004. The crediting interest rate for these investment contracts is reset daily by the issuer but cannot be less than zero and was approximately 4.4% at December 31, 2005 and 2004.

Participant loans are valued at their outstanding balances, which approximate fair value. Purchases and sales of securities are reported on a trade date basis. Dividend income is recorded on the ex-dividend date and interest income is recorded on the accrual basis. Gains and losses on security transactions are determined using the average cost method.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

3. Investments

The fair value of individual investments that represent 5% or more of the Plan's net assets are as follows:

| | December 31 | |
|------------------------------------------------------|---------------------|--------------|
| | 2005 | 2004 |
| PolyOne Common Stock | \$41,383,396 | \$59,932,788 |
| NYL Insurance Anchor Account I – Stable Value Option | 59,025,070 | 59,786,394 |
| PIMCO Total Return Fund | 18,309,261 | 17,679,830 |
| Mainstay S&P500 Index Fund | 54,365,163 | 58,106,429 |
| Growth Fund of America | 32,506,543 | 28,249,223 |
| Alliance Bernstein Balanced Shares | 21,197,146 | 21,605,407 |
| Euro Pacific Growth Fund | 16,465,706 | 11,550,595 |

During 2005, the Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) depreciated in fair value as follows:

| | Net realized and unrealized appreciation (depreciation) in fair value of investments |
|----------------------|--------------------------------------------------------------------------------------|
| PolyOne Common stock | \$ (17,268,924) |
| Mutual funds | 6,907,998 |
| | \$ (10,360,926) |

4. Risks and Uncertainties

The Plan invests in various investment securities. Investment securities are exposed to various risks such as interest rate, market and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits.

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

5. Income Tax Status

The Plan has received a determination letter from the Internal Revenue Service dated March 10, 2004, stating that the Plan is qualified under Section 401(a) of the Code. As a result the related trust is exempt from taxation. Subsequent to this determination by the Internal Revenue Service, the Plan was amended. Once qualified, the Plan is required to operate in conformity with the Code to maintain its qualification. The Plan Sponsor believes the Plan is being operated in compliance with the applicable requirements of the Code, and therefore, believes that the Plan, as amended, is qualified and the related trust is tax exempt.

6. Reconciliation of Financial Statements to the Form 5500

The following is a reconciliation of net assets available for benefits per the financial statements to the Form 5500:

| | December 31 | |
|----------------------------------------------------------------|------------------------------|-----------------------|
| | 2005 | 2004 |
| Net assets available for benefits per the financial statements | \$ 311,761,549 | \$ 320,444,227 |
| Less: deemed distributions | (184,927) | (187,490) |
| Net assets available for benefits per the Form 5500 | <u>\$ 311,576,622</u> | <u>\$ 320,256,737</u> |

The following is a reconciliation of benefits paid to participants per the financial statements to the Form 5500:

| | Year Ended December 31, 2005 |
|--------------------------------------------------------------------------------------------------------------|------------------------------------|
| Benefits paid to participants per the financial statements | \$ 29,677,652 |
| Add: Amounts allocated on Form 5500 to withdrawn participants as deemed distributions at December 31, 2005. | 184,927 |
| Less: Amounts allocated on Form 5500 to withdrawn participants as deemed distributions at December 31, 2004. | (187,490) |
| Benefits paid to participants per the Form 5500 | <u>\$ 29,675,089</u> |

PolyOne Retirement Savings Plan

Notes to Financial Statements(continued)

6. Reconciliation of Financial Statements to the Form 5500 (continued)

Deemed distributions of participant loans are loans that are in default by participants of the Plan. While the U.S. Department of Labor does not recognize these loans as assets for regulatory reporting, they are included as assets (i.e. loans) in the financial statements of the Plan.

7. Subsequent Event

On February 15, 2006, the Company completed the sale of its Engineered Films business unit. As a result of the sale, all account balances for employees in the Engineered Films business have been transferred out of the Plan.

PolyOne Retirement Savings Plan

EIN #34-1730488 Plan #010

Schedule H, Line 4i – Schedule of Assets
(Held at End of Year)

December 31, 2005

| Identity of Issue, Borrower, Lessor, or Similar Party | Description of Investment | Current Value |
|----------------------------------------------------------|------------------------------------------------------------------|-----------------------|
| | PolyOne Stock Fund – | |
| Mainstay Management | Mainstay Cash Reserves Fund I | \$ 1,233,874 |
| PolyOne Corporation* | Common stock: 6,435,987 shares | 41,383,396 |
| New York Life Insurance* | Anchor Account I – Stable Value Option | 59,025,070 |
| Pacific Investment Management Company | PIMCO Total Return Fund: 1,743,739 units | 18,309,261 |
| AIM Advisors | Small Cap Growth Fund: 186,181 units | 5,121,840 |
| Capital Research & Management | American Funds – Euro Pacific Growth Fund: 400,723 units | 16,465,706 |
| | American Funds – Growth Fund of America Fund: 1,053,697 units | 32,506,543 |
| | American Funds – Washington Mutual Investors Fund: 346,020 units | 10,667,801 |
| Mainstay Management | Mainstay S&P500 Index Fund: 1,890,305 units | 54,365,163 |
| | MainStay MAP Fund: 399,424 units | 14,003,801 |
| Franklin Advisory Services | Franklin Balance Sheet Investment Fund: 208,381 units | 12,863,364 |
| Alliance Capital Management | Alliance Bernstein Balanced Shares: 1,274,633 units | 21,197,146 |
| Brokerage Account | Various investments | 13,806,210 |
| Participant loans* | At interest rates ranging from 4.0% to 10.5% | 10,018,878 |
| | | <u>\$ 310,968,053</u> |

* Indicates party-in-interest to the Plan.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement Registration Statement (Form S-8 No. 333-47796) pertaining to Post Effective Amendment No. 2 on Form S-8 to Form S-4 and PolyOne Retirement Savings Plan of our report dated May 24, 2006, with respect to the financial statements and schedule of the PolyOne Retirement Savings Plan included in this Annual Report (Form 11-K) for the year ended December 31, 2005.

/s/ ERNST & YOUNG LLP

Cleveland, Ohio

June 28, 2006

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 11-K of PolyOne Retirement Savings Plan (the "Plan") for the period ended December 31, 2005, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Stephen D. Newlin, President, Chief Executive Officer and Chairman of the Board, do hereby certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

- (1) The Report fully complies with the requirements of section 13(a) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Plan as of the dates and for the periods expressed in the Report.

/s/ Stephen D. Newlin

Stephen D. Newlin
President, Chief Executive Officer and Chairman of the
Board June 29, 2006

The foregoing certification is being furnished solely pursuant to 18 U.S.C. § 1350 and is not being filed as part of the Report or as a separate disclosure document.

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of PolyOne Retirement Savings Plan (the "Plan") for the period ended December 31, 2005, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, W. David Wilson, Vice President and Chief Financial Officer of the Company, do hereby certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

- (1) The Report fully complies with the requirements of section 13(a) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Plan as of the dates and for the periods expressed in the Report.

/s/ W. David Wilson

W. David Wilson
Vice President and Chief Financial Officer
June 29, 2006

The foregoing certification is being furnished solely pursuant to 18 U.S.C. § 1350 and is not being filed as part of the Report or as a separate disclosure document.