

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

SCHEDULE 13G

**Under the Securities Exchange Act of 1934
(Amendment No. ____)***

PolyOne Corporation
(Name of Issuer)

Common stock
(Title of Class of Securities)

73179P106
(CUSIP Number)

December 31, 2004
(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
 Rule 13d-1(c)
 Rule 13d-1(d)

* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

1. Names of Reporting Persons.
I.R.S. Identification Nos. of above persons (entities only).

Barrow, Hanley, Mewhinney & Strauss, Inc.
752403190

2. Check the Appropriate Box if a Member of a Group (See Instructions)

- (a)
(b)

3. SEC Use Only

4. Citizenship or Place of Organization

A Nevada corporation

5. Sole Voting Power

2,193,700 shares

NUMBER OF
SHARES
BENEFICIALLY
OWNED BY
EACH
REPORTING
PERSON
WITH

6. Shared Voting Power

2,651,120 shares

7. Sole Dispositive Power

4,844,820 shares

8. Shared Dispositive Power

—

9. Aggregate Amount Beneficially Owned by Each Reporting Person

4,844,820 shares

10. Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions)



11. Percent of Class Represented by Amount in Row (9)

5.29%

12. Type of Reporting Person (See Instructions)

IA

Item 1. (a) Name of Issuer: **PolyOne Corporation**

(b) Address of Issuer's Principal Executive Offices

**33587 Walker Road
Avon Lake, OH 44012**

Item 2. (a) Name of Person Filing:

Barrow, Hanley, Mewhinney & Strauss, Inc.

(b) Address of Principal Business Office or, if none. Residence:

One McKinney Plaza
3232 McKinney Avenue, 15th Floor
Dallas, TX 75204-2429

(c) Citizenship:

A Nevada corporation

(d) Title of Class of Securities:

Common stock

(e) CUSIP Number: **73179P106**

Item 3. If this statement is filed pursuant to §§240.13d-1(b), or 240.13d-2(b) or (c), check whether the person filing is a:

- (a) Broker or dealer registered under section 15 of the Act (15 U.S.C. 78o).
- (b) Bank as defined in section 3(a)(6) of the Act (15 U.S.C. 78c).
- (c) Insurance company as defined in section 3(a)(19) of the Act (15 U.S.C. 78c).
- (d) Investment company registered under section 8 of the Investment Company Act of 1940 (15 U.S.C. 80a-8).
- (e) An investment adviser in accordance with §240.13d-1(b)(1)(ii)(E);
- (f) An employee benefit plan or endowment fund in accordance with §240.13d-1(b)(1)(ii)(F);
- (g) A parent holding company or control person in accordance with §240.13d-1(b)(ii)(G);
- (h) A savings association as defined in Section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813);
- (i) A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940 (15 U.S.C. 80a-3);
- (j) Group, in accordance with §240.13d-1(b)(1)(ii)(J).

Item 4. Ownership.

(a) Amount beneficially owned:

4,844,820 shares

(b) Percent of class:

5.29%

(c) Number of shares as to which the person has:

(i) Sole power to vote or to direct the vote: 2,193,700 shares

(ii) Shared power to vote or to direct the vote: 2,651,120 shares

(iii) Sole power to dispose or to direct the disposition of: 4,844,820 shares

(iv) Shared power to dispose or to direct the disposition of: —

Item 5. Ownership of Five Percent or Less of a Class.

Not applicable.

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

The right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, the common stock is held by certain clients of the reporting person, none of which has such right or power with respect to five percent or more of the common stock.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company or Control Person.

Not applicable.

Item 8. Identification and Classification of Members of the Group.

Not applicable.

Item 9. Notice of Dissolution of Group.

Not applicable.

Item 10. Certification.

By signing below the undersigned certifies that, to the best of its knowledge and belief, the securities referred to above were acquired in the ordinary course of business and were not acquired for the purpose of and do not have the effect of changing or influencing the control of the issuer of such securities and were not acquired in connection with or as a participant in any transaction having such purpose or effect.

After reasonable inquiry and to the best of its knowledge and belief, the undersigned certifies that the information set forth in this statement is true, complete and correct.

BARROW, HANLEY, MEWHINNEY & STRAUSS, INC.

By: /s/ James P. Barrow

Name: James P. Barrow

Title: President

February 8, 2005