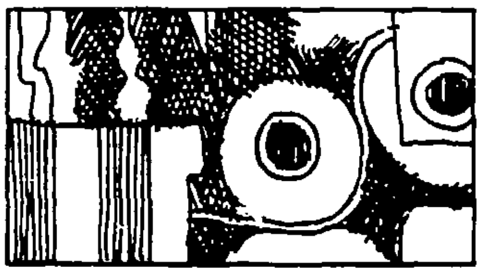
TESTING FOR BLEACHABILITY

If generic dyes in colored broke are unknown, bleachability with HTH is easily determined. Simply make up a small quantity of 3% HTH solution — 3 ounces dry granular per one gallon of hot water — and add a few handfuls of broke. Even in mixed color batches, if all color is destroyed the entire batch should bleach out satisfactorily.

THE BLEACHING PROCESS



Quantities of available chlorine required for effective bleaching depend on the dry weight of the broke to be processed. As a rule, chlorine required will be about 2% of the dry broke by weight. Example: 2500 pounds of broke will need roughly 50 pounds of available chlorine.

Since HTH contains 65% available chlorine, 50 pounds of chlorine transposes to 77 pounds of HTH (65% of 77 pounds = 50 pounds available chlorine).

Additionally, consistency of the final pulp should be in the 5-6% range. Based on 2500 pounds of dry broke, 5000 gallons of water will therefore be needed in the pulper.

Recapping, the full charge would contain:

Broke	2500 pounds, dry weight
Water	5000 gallons, U.S.
Dry HTH	77 pounds

Reducing all factors to basic benchmark proportions:

250 pounds Broke/500 gals. water/7.7 pounds dry HTH.

Ideally, the HTH should be introduced in a stock solution through a perforated pipe or sparger arrangement. Otherwise, it should be broadcast evenly with a clean stainless steel scoop. Do not handle HTH with bare hands.

Storable stock solutions prepared in volume should contain 7.7 pounds of dry HTH per 20 gallons, U.S., of water. Mixing water should be warm. Prepare and store in plastic containers.

If solution is used, reduce the raw water charge commensurately. In other words, benchmark proportions for the full charge should be adjusted as follows:

250 pounds Broke/480 gallons U.S. water/20 gal. U.S. HTH Stock Solution

Bleaching can be done in a conventional pulping unit. To prepare a bleach run, add as much water as the weight of the dry broke requires and heat to about 140° F. (If water is too cool, more HTH will be needed to get a useable result. Under 70° F no bleaching may occur at all.)

After the water is heated, broke is added and pulped. HTH either dry or in solution is introduced as quickly and evenly as possible during the beating cycle.

Proportion of HTH to dry broke weight may be reduced if colors are relatively light or weak. Experience will dictate the most economical quantity to use in each case. On that point, it is useful to log actual proportions by color so future batches of the same or similar shades can be done routinely.

Pulp should be bleached white about one hour after HTH has been added.

A final optional step in the bleaching process is to reduce the pH of the pulped mixture to 5 or 6. At the end of the beating cycle, add 0.5% sodium acid sulphate (nitre cake) or diluted sulphuric acid. Do not use alum since it tends to set extraneous foreign matter on the pulp.

PULP AFTER BLEACHING

Pulp bleached with HTH is often reused without draining or washing. However, draining reduces residual matter which may discolor the pulp. Washing after bleaching ensures an even brighter, cleaner result. One or both steps may be necessary or desirable.

No antichlors (e.g., sodium bisulphate) need be added at any point because free chlorine is almost completely consumed in the bleaching process.

HOW TO ORDER HTH

HTH dry chlorine is available either in granular or tablet form. The granular dissolves much more rapidly, however, and is therefore recommended for broke bleaching processes.

Dry granular HTH is available in package sizes ranging from 35 to 100 pounds.

For the name of your Local HTH distributor, contact the nearest Olin sales office listed below.

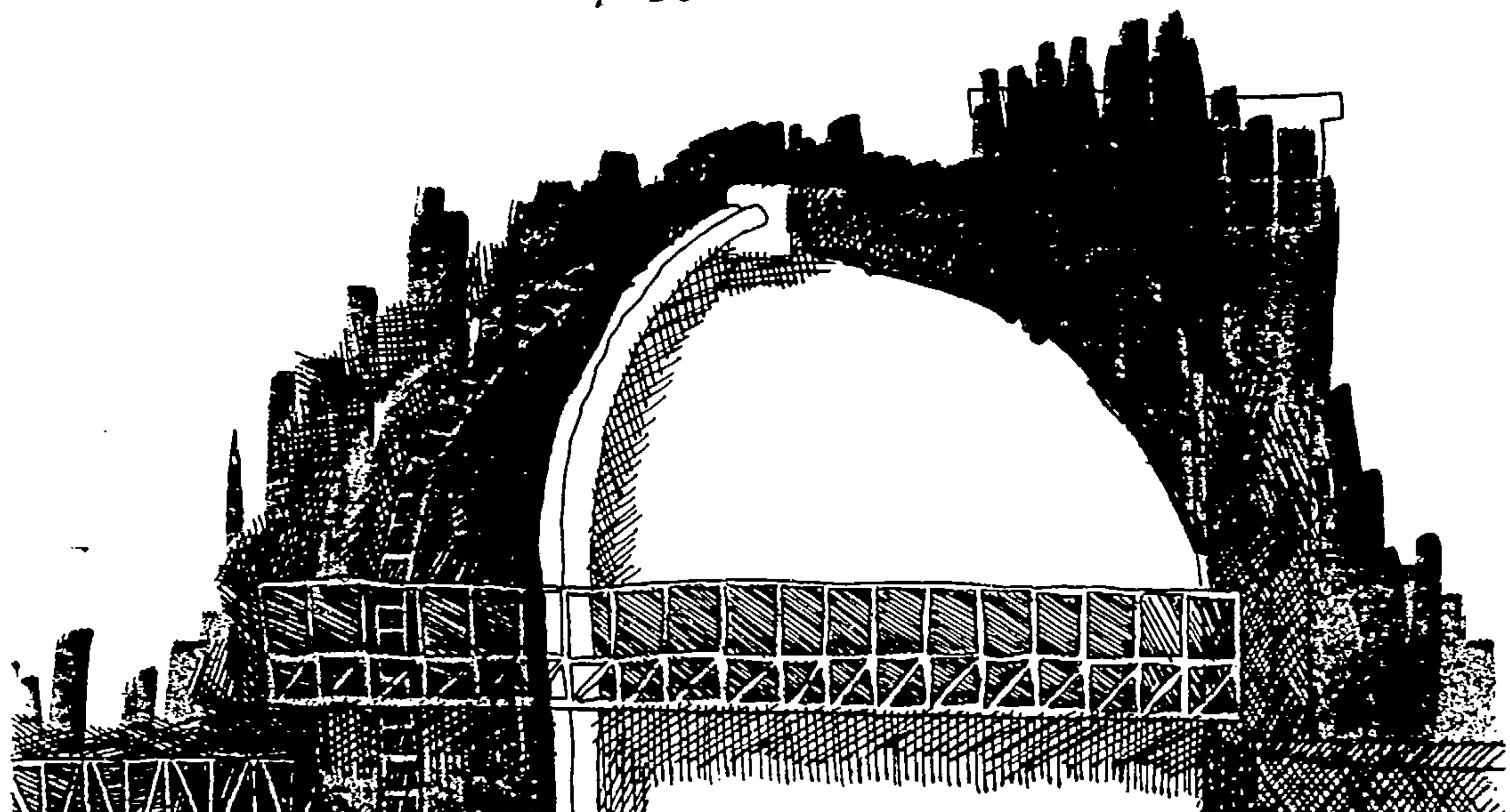
FOR TECHNICAL HELP

In general, the information and recommendations contained here for bleaching resin-free colored broke should suffice in most cases. If more help is needed, simply call the Olin district office nearest you. There is no obligation.

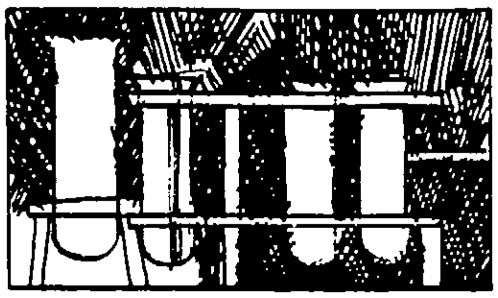
Sales Offices

Atlanta, GA 30341 — 1 Dunwoody Pk., Suite 223, (404) 394-5820
Charlotte, NC 28280 — 1 NCNB Plaza, Suite 3505, (704) 373-1681
Cleveland, OH 44122 — 29525 Chagrin Blvd., Suite 216, (216) 292-3830
Houston, TX 77006 — 3700 Buffalo Speedway, Suite 901, (713) 621-2782
Metairie, LA 70002 — 4051 Veterans Memorial Blvd., (504) 887-6500
New York, NY 10017 — 280 Park Ave., 23rd Floor West, (212) 661-7040
Oak Brook, IL 60521 — 900 Jorie Blvd., Suite 180, (312) 325-2280
Orange, CA 92668 — 500 S. Main St., Suite 411, South Tower, (714) 588-9101
Providence, RI 02903 — 637 Hospital Trust Bldg., (401) 421-2070
St. Louis, MO 63105 — 7777 Bonhomme Ave., Suite 1908, (314) 862-6705
Wayne, PA 19087 — 997 Old Eagle School Road, Suite 208, (215) 293-0990

application of hth® dry chlorinator in sewage disposal plants



I DISINFECTION OF EFFLUENTS



Problem

The disinfection of sewage effluents depends on the destruction of the disease-producing organisms in the raw or treated sewage. Disinfection is necessary to protect receiving waters which may subsequently be used for water supplies, bathing places or shell fish production beds. The proper disinfection of sewage today is recognized as necessary for the protection of public health and because of this the problems involved in treating sewage effluents is acute for many smaller communities.

Treatment

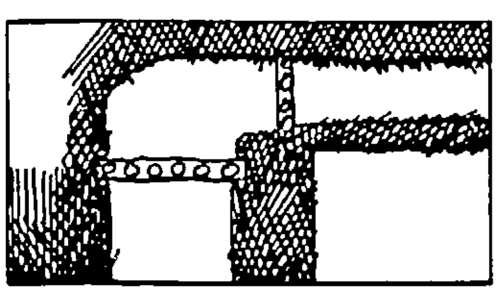
Chlorination and hypochlorination, we all know, do not act instantaneously. A suitable detention basin, therefore, must be provided to expose the sewage effluent to the effects of HTH dry chlorinator for a sufficient period of time (usually a minimum of 15 minutes). Where mechanical stirring or other agitation is not present, chlorination for disinfection should be introduced before primary or secondary sedimentation treatments, if these are used.

The amount of HTH dry chlorinator solution required will vary, depending on the concentration and conditions of the final effluent. Needless to say, sewage should be treated before it has reached a septic state. Experiments indicate that about 30% of the HTH demand of raw sewage is attributable to settled solids, 40% to suspended and colloidal solids; and 30% to dissolved solids.

Wherever possible, disinfection should be controlled by laboratory methods. Disinfection can be realized when the chlorine residual, after 15 to 30 minutes contact, lies between 0.6 and 1.0 ppm. Experience with the different types of treated sewage will generally establish a relationship between the residual chlorine content of the final effluent and the contact period necessary to insure the desired bacteriological results, after which the residual chlorine and time of contact may be made the controlling factors for operation. Occasional bacteriological checks should be practiced, of course, simply as a safeguard.

Hypochlorinators used to treat sewage in small communities should always be located near the influent of the detention basin. To conform with the requirements mentioned above, the feeding rate must be adjusted to the higher dosages usually required for sewage practices. In cases where sewage is to be temporarily disinfected before being diluted in a body of water, the following conditions will usually provide satisfactory protection against pollution of receiving waters: (a) raw sewage requires from 10-30 ppm available chlorine; (b) primary treated sewage from 5-20 ppm available chlorine, and (c) sewage which has been rendered primary and secondary treatment requires from 2-5 ppm. Bacteriological tests, however, should frequently be made.

II ODOR DESTRUCTION AND CONTROL



Problem

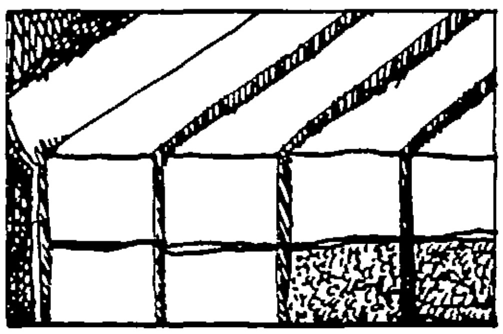
Odor troubles occur when sewage becomes septic, i.e., when its oxygen is lost through decomposition and its sulphates are reduced to hydrogen sulphide. While other sources of odors are common, hydrogen sulphide is the forerunner of all septic odors. Its control, therefore, will restrain the development of any other subsequent odors.

Treatment

Odors arising in sewage systems, particularly in sluggish collection systems or long outfalls, may be prevented by holding decomposition in check by "up sewer chlorination". This is applied by introducing HTH solutions at required points into the sewer trunk system to insure treatment of all sewage before it has reached a septic condition. Where sewage has already become septic, a higher dosage of HTH is necessary to accomplish odor control.

Up to 15 ppm chlorine dosage may normally be required to control the odor of fresh, raw sewage. Feeding points and rates of feed properly located and adjusted to give sufficient chlorination will insure against the delivery of septic sewage to the treatment plant.

III SLIME CONTROL



Problem

Slime is a major cause of trouble in the sewage treatment plants and in the sewerage system. When uncontrolled, slime may clog sewage conduits, restrict water ways, form unsightly growths and may even cause sludge bulking in the activated sludge process. Slime may also infest low rate trickling filters and cause ponding of the filters.

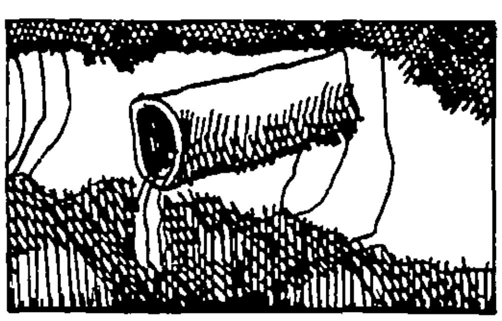
Treatment

Hypochlorination, in concentrations of .01 to 0.1% (approximately 100-1000 ppm) on the basis of the average weight of dry solids as present in the effluent at the point of infection, is recommended for the control of slime growths. It is important to remember that this treatment is to be applied at a point which will insure complete mixing of the HTH solution with the effluent. Once the organisms have been destroyed, the dosage may be reduced to 15 ppm.

When ponding of the filters is excessive, stoppage of the distributing filter nozzles is not uncommon. The continual feeding of HTH solution into the effluent at a point above the filter nozzles will clean the filter satisfactorily. Dosages depend on the amount of excess slime accumulated on the nozzles and filter stone. Extreme cases may require as high as 15 ppm. Once the desired cleaning has been obtained, the intermittent application of HTH solution to the dosing tanks just ahead of the filter is usually successful. The amount and frequency of the dosage needed to give satisfactory continuous operation of the trickling filters depends upon the severity of the microbiological problem.

In activated sludge plants where "bulking sludge" is brought about by the presence of slime which interrupts proper settling, HTH solution introduced at some point on the return sludge line will prove to be an effective control measure. Normal dosages are from 3 to 5 ppm.

IV B.O.D. REDUCTION



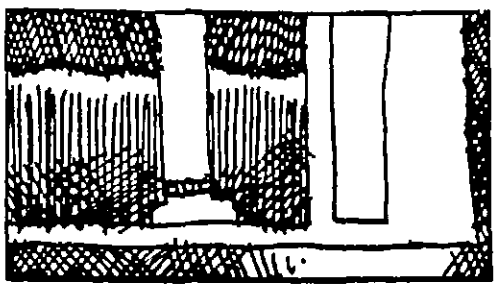
Problem

The biochemical oxygen demand (more commonly designated as B.O.D.) of sewage or industrial waste refers to the amount of oxygen (in ppm) required during the stabilization of the decomposable organic matter by oxygen-consuming bacterial action. The discharge of high B.O.D. sewage effluents into streams at rates which cause high relative dilution of the waters often creates the problem of odor nuisances, unsightly appearance plus death to aquatic life.

Treatment

This condition can usually be avoided by applying HTH solution to the effluent until a substantial residual is obtained. Application should be made at a point which will permit a 10-20 minute contact period prior to the discharge of the effluent into the stream. Minimum dosage to a residual of about 0.2 ppm after a contact time of at least 10 minutes will afford a reduction to about 1/3 of the effluent's B.O.D. Where more permanent or greater B.O.D. reductions are necessary, dosage to higher chlorine residuals is recommended.

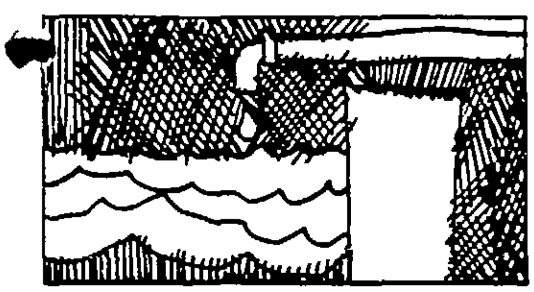
V COAGULATION AND SEDIMENTATION



Problem
A great deal of the finer divided suspended matter and most of the colloidal matter in sewage does not readily respond to plain sedimentation. The job of removing substantial portions of this kind of matter is usually accomplished either by chemical precipitation, by filtration or by the use of both processes.

Treatment
Research conducted in recent years has definitely proven that pre-hypochlorination will improve sedimentation and coagulation in sewage treatment operations.

VI MASONRY DISINTEGRATION PREVENTION



Problem
Hydrogen sulphide, which is indirectly responsible for concrete disintegration, oxidizes into sulphuric acid and attacks the masonry in the damp atmosphere above the water line. Where odors exist, but do not pose a great problem to the sewage plant operator, examination for adverse effects of hydrogen sulphide gases on the masonry should be conducted to determine if hypochlorination would not offer greater long-run economy than the cost for repair which such deterioration would necessitate.

Treatment
Where "up-sewer" hypochlorination is not considered essential for odor control, it may often be indicated for the prevention of masonry deterioration or for the improvement of both conditions.

1. Place gravity or mechanical feeders at practicable points in the sewage collection system to provide continuous treatment to every part of the system.
2. Dosing to residuals of 15 ppm may be required to inhibit the formation of hydrogen sulphide and/or control odor nuisance. Any existence of such odors will serve to indicate that additional dosage is necessary.

KEEP HTH OUT OF REACH OF CHILDREN

DANGER

SEE PRINCIPAL LABEL FOR COMPLETE PRECAUTIONARY INFORMATION AND STORAGE AND HANDLING.

application of 'hth' dry chlorine granular in bleaching broke

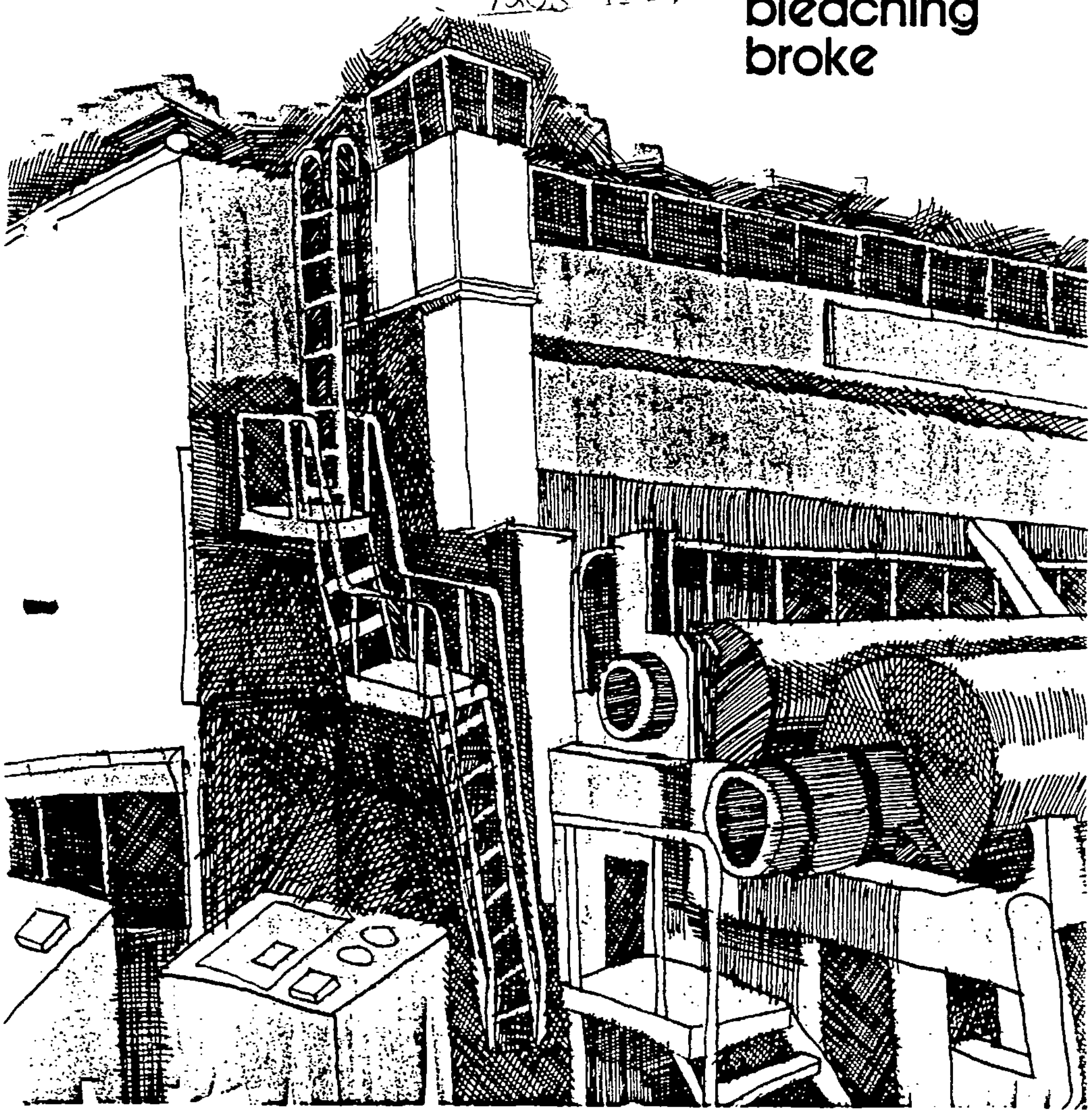


TABLE OF CONTENTS:

Colored broke left over from paper making processes can be bleached for general re-use with economical HTH.

Accumulated or purchased, resin-free trim and off-color, off-weight colored papers reduced again to whitened pulp can be used in any run, irrespective of shade. No need to bale and store until the same or similar color is rescheduled. Result: expensive baling and warehousing costs are reduced significantly. Less fresh pulp is needed for each new run.

HTH destroys colors susceptible to hypochlorite bleaching. Chemically, it is stable calcium hypochlorite ($(CA(OC1)_2)$) in dry granular form containing about 65% available chlorine. It is easy to store and apply, and is effective against all the common paper dyes.

IDENTIFYING DYES IN BLEACHABLE BROKE

In all, about 100 types of dyestuffs are used for coloring paper. However, manufacturers put their own distinctive trade names on each generic type. A world-wide directory cross-referencing generics to trade names is published by the American Association of Textile Chemists and Colorists (AATCC). Titled "Colour Index", the directory lists generics and identifies brands of every dyestuff made in the free world.

Volume I of the two-volume work lists dyes generically. A color index number appears alongside each listing. Manufacturers' trade names for each generic are then found by turning to its appointed color index number in Volume II. Hence, given a generic type, all known brands can be determined. Conversely, given a brand, the generic type can be determined.

The following chart lists some of the more common generic paper dyes which can be satisfactorily bleached with HTH. Listings appear just as they do in the AATCC Colour Index.

Generic Name	Colour Index Number
Acid red	
14	14720
88	15620
27	16185
18	16255
1	18050
73	27290
Direct red	
20	15075
28	22120
17	22150
37	22240
1	22310
2	23500
75	25380
81	28160
23	29160
Basic red	
1	45160
2	50240
Acid orange	
7	15510
8	15575
Direct orange	
8	22130

Generic Name	Colour Index Number
Basic orange	
2	11270
Acid yellow	
36	13065
3	47005
2	47010
Direct yellow	
4	24890
Basic yellow	
2	41000
Acid green	
3	42085
9	42100
Direct green	
6	30295
Basic green	
4	42000
1	42040
Acid blue	
22	42755
45	63010

Generic Name	Colour Index Number
Direct blue	
6	22610
14	23850
8	24140
1	24410
Basic blue	
26	44045
9	52015
Acid violet	
17	42650
Basic violet	
1	42535
23	42555
5	50206
Direct brown	
2	22311
1	30045
6	30140
Basic brown	
1	21000
Acid black	
1	20470
2	50420
Direct black	
38	30235