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Cotton Dust Standards for the Raw Cotton Industries

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ABSTRACT

In June 1978, OSHA promulgated 2 new, far more severe, standards for occupational exposure to cotton dust. The Supreme Court recently upheld the cotton dust standard for general industry. However, other court or administrative actions have invalidated the standard, or otherwise delayed its enforcement, for all sectors except textile mills and some downstream manufacturing operations. OSHA is undertaking a review of the standard. How this review affects the various segments of the cotton industry is discussed.

The cotton industry continues to put its highest priority on the problem of cotton dust. The cotton industry is highly concerned about worker health and will continue to protect the small number of workers affected by cotton dust in the most effective manner.

Court Situation

As a brief review, in June 1978, following a lengthy rulemaking procedure in which a 105,000-page hearing record was compiled, the U.S. Occupational Safety and Health Administration (OSHA) published 2 new, far more severe standards for occupational exposure to cotton dust. One was for the cotton ginning industry (29 CFR 1910.1046) and the other (the "general industry" standard, 29 CFR 1910.1043) for all other sectors where cotton is processed or handled, including textile mills, merchants' classing offices, warehouses, cottonseed oil mills, the waste processing industries, downstream industries such as knitting and elastic fabric manufacturing, and even the rail and trucking industries. In all, at least 36 different industries are apparently covered (Table I). The following permissible exposure limits (PEL) were promulgated: 0.2 mg/m^3 textiles; 0.5 mg/m^3 nontextile (including knitting); 0.75 mg/m^3 slashing and weaving; no PEL gins. Litigation was initiated immediately (for both standards). Court or administrative actions have invalidated the standard, or otherwise delayed its enforcement, for all sectors except textile mills and some downstream manufacturing operations (for which no suits were filed).

The oil mill part was struck down by the D.C. Circuit (AFL-CIO vs Marshall et al., 617 F.2d 636 [D.C. Circuit 1979]) in Oct. 1979 because OSHA had not shown the standard to be economically feasible.

The waste industry parts were severed from the rest of the general industry standard by the District of Columbia Court of Appeals at the beginning of litigation for separate consideration (1). The administrative stay was lifted on January 26, 1979 (2) but these parts were judicially stayed (with the rest of the general industry in Nov. 1978 (2) pending judicial review by the D.C. Circuit. In Dec. 1981, OSHA informed the court that they were preparing papers asking for a remand of the record so they could reexamine the standard for waste cotton industries.

The warehouse and classing office parts were remanded by the Supreme Court when OSHA (following the Supreme Court's benzene ruling) suspended enforcement and effectively acknowledged that it could not satisfy the Court that a health risk was present in these cotton industry work places (3) (Industrial Union Department, AFL-CIO vs American Petroleum Institute 448 U.S., S. Ct. 2844, 65 L. Ed. 2d 1010, 1035 [1980]). In the benzene decision, the Supreme Court ruled that OSHA, as a threshold matter, must find that the toxic substance in question poses a "significant health risk" and that a new, lower standard is "reasonably necessary or appropriate" to eliminate or lessen such risks. (See L.P. Postol and J.C. McElveen, *Occup. Health and Safety* 50:37 [1981]). In Oct. 1980, the Supreme Court remanded the case to the D.C. Court and in Feb. 1981, the standard as it affects these sectors was formally remanded to OSHA by the D.C. Circuit Court.

The gin standard was overturned by the U.S. Court of Appeals for the Fifth Circuit (Texas Independent Ginners Association et al. vs Marshall, 630 F2D 398 [5th Circuit 1980]) because OSHA had not made a threshold finding that gin workers face a significant health risk and, therefore, that a standard was reasonably necessary to provide a safe and healthful workplace.

Downstream industries did not challenge the standard's legality in the courts, but subsequently, the hosiery, fabric knitting and apparel knitting industries petitioned OSHA to suspend enforcement in these sectors on the grounds that no information exists to indicate a need for the standard.

OSHA granted a 60-day stay for the hosiery knitting industry (and in Feb. 1981, granted a 60-day extension to the stay). This stay ended in April because the hosiery industry did not submit sufficient information to show that a problem from cotton dust does not exist in the hosiery industry. The fabric and apparel knitters received a 60-day stay in March 1981. This stay was extended until Aug. 1981, and the hosiery knitters as well as all knitters were included. The stay has been extended until Jan. 31, 1982, pending the analysis of medical data collected.

The validity of the standard's application for the textile sector was upheld in a 5:3 decision by the Supreme Court in June 1981 (American Textile Manufacturers Institute, Inc., et al. vs Donovan 101 S.Ct. 2478, 49 U.S.L.W. 4720 [1981]). At issue in the High Court were important questions relating to whether OSHA is required to show that the standard's benefits bear a reasonable relationship to the cost of achieving them. The Supreme Court said OSHA "is not required" to conduct cost-benefit analysis in setting health standards.

So the textile mills and some of the downstream industries are the only sectors for which the standard is currently in effect.

Advance Notice of Proposed Rulemaking

In March 1981, OSHA issued an Advance Notice of Proposed Rulemaking (ANPR) to reevaluate and reconsider the cotton dust standard (4). Comments were due May 15. In particular, OSHA wanted to explore the usefulness of cost-benefit/cost-effectiveness analysis in setting health regulations generally. While the new rulemaking is in progress, the agency will leave the standard in effect and enforce it. (Therefore, all requirements of the standard except complete engineering controls are effective where the standard applies.)

That was before the Supreme Court ruled on cotton dust in June saying only feasibility analysis of OSHA health standards is required, not cost-benefit analysis. In light of the Supreme Court's rulings in the cotton dust and benzene cases, OSHA now feels it should apply a 4-stage rulemaking process for health standards.

First, as a threshold matter, the agency must find that the substance to be regulated poses a "significant risk" to employees; second, it must determine that the proposed standard will reduce risk; then it will consider all relevant technical, medical and economic data in setting the appropriate feasible limit (the standard set has to be economically and technologically feasible for the affected industry as a whole); and finally, after OSHA has designated the level of protection to be achieved, it must select the "most cost-efficient" way to protect employees (i.e., the standard OSHA considers to be the least expensive way of reducing health hazards to an acceptable level).

OSHA is continuing with reevaluating and revising the cotton dust standard. OSHA head Thorne Auchter has said there are technical and scientific difficulties with the standard which merit revision. Also, much new information is available that needs to be considered.

OSHA is preparing a new ANPR, which should have been published in the *Federal Register* around the end of January 1982. The purpose of the ANPR is to gather information to assist OSHA in its reevaluation. It will explain what happened to the first ANPR (March 1981) and request information so that it can (a) make changes to reduce the compliance burden without sacrificing worker safety (e.g., sampling, medical surveillance); (b) undertake a risk assessment in sectors of the industry where a risk assessment has been previously made (this includes all sectors other than textile mills); and (c) determine whether the current standard is the most cost-effective way to protect workers. Any changes should make the standard more workable, cost-effective and performance-oriented, and still protect to the same degree the workers that need protection. In addition, industry segments that should not be included because a health risk cannot be shown could be eliminated.

The comment period on the ANPR usually is 60-90 days. After the ANPR comment period ends, a proposal will be drafted. It could take at least a year to prepare. There would be a comment period and hearings (if requested) on the proposal. Thus, a final, revised standard could be 2 years away.

Now, more specific information will be given on the different sectors as well as what we think should and will happen in the new rulemaking.

TABLE I

SIC Codes of Industries Apparently Covered by the Dust Standard

SIC #	Industry description
2211	Broad woven fabric mills, cotton
2221	Broad woven fabric mills, man-made fiber and silk
2281	Yarn spinning mills; cotton, man-made and silk
2282	Yarn texturizing, throwing, twisting and winding mills; C, MM & S
2284	Thread mills
2074	Cottonseed oil mills
4221	Cotton warehouses and compresses
5152	Cotton (merchants)
0724	Cotton gins
	Other industries
0723	Crop preparation services for market, except cotton ginning (cottonseed delinting)
2241	Narrow fabrics and other small wares mills
2251	Hosiery knitting manufacturing
2252	Hosiery, except women's full length and knee length hosiery
2253	Knit outerwear mills
2254	Knit underwear mills
2257	Circular knit fabric mills (flat knits)
2258	Warp knit fabric mills (lace, netting)
2259	Knitting mills, NEC (knit gloves, bedspreads, towels)
2271	Woven carpets and rugs
2272	Tufted carpets and rugs
2279	Carpets and rugs, NEC
2292	Lace goods (lace curtains, bed sets, table covers)
2293	Paddings and upholstery fillings (apparel, batts, pillow, quilting, garnetting)
2294	Processed waste and recovered fibers and flock (mill waste, waste utilization)
2296	Tire cord and fabric
2297	Nonwoven fabrics (nonwoven textiles)
2298	Cordage and twine
2299	Textile goods, NEC (e.g., mop yarns, waste spinning)
2381	Dress and work gloves (knit gloves and glove linings)
2392	House furnishings except curtains and drapes (e.g., mops)
2515	Mattresses and bedsprings
2812	Upholstered household furniture
3842	Surgical, medical supplies (sterilized absorbent cotton – i.e., cotton balls)
4011	Rail industry
4213	Trucking industry
7399	Business services (cotton inspection service, not connected with transportation, and cotton sampler service)

Cottonseed Oil Mills

OSHA made the cotton dust standard applicable to the cottonseed processing industry despite the absence of data in the record showing any significant health impairment among the industry's workers, and despite economic impact data showing that the standard's compliance cost would shut down 62 of the 83 active plants (5).

The only medical information relevant to U.S. cottonseed oil mill workers was a study by Jones et al. (6). This

study found a "byssinosis prevalence" typical of what would be expected in an unexposed population (i.e., no abnormal byssinosis) and a chronic bronchitis prevalence even lower than would be expected in an unexposed population. The record also contains 3 foreign studies (7-9). None of the studies examined conditions similar to those in the U.S. oil mills. NIOSH condemned the foreign studies and contended that they could not be used to support a standard in the U.S. cottonseed oil mill industry (10). Yet the court upheld OSHA's finding of a risk which was inferred from data for other, unrelated industries. The remand was based on the agency's failure to satisfy the court that the standard would be economically feasible for oil mills.

It is believed that a reevaluation of the record in light of the Supreme Court's benzene ruling will show that the requisite finding of a significant risk cannot be made. So, oil mills should be excluded from the new rulemaking, and specifically exempted from the standard's coverage.

Cotton Warehouses and Cotton Classing Offices

Here, as in the cottonseed processing industry, OSHA made the standard applicable with no record support for a finding that workers in these sectors are subject to a significant health risk. Byssinosis has never been documented or diagnosed in any form among cotton warehouse workers. The only medical evidence in the record (11,12) did not find a single case of byssinosis among 70 workers studied. The record contains no reports in the published literature regarding the respiratory effects of dust in cotton classing rooms. However, on review, the Court of Appeals for the District of Columbia Circuit affirmed the standard for the warehouse industry.

OSHA subsequently acknowledged that its health risk finding for warehouses and classing offices might be flawed, and had the standard remanded to them. It is felt that these sectors also should be excluded from the new rulemaking and specifically exempted from the standard.

Cotton Waste Industries

These industries use linters from cottonseed oil mills. The only epidemiological study (13) involving waste recyclers was done in Great Britain where workers were exposed to dust levels 200 times the permissible limit (average dust concentration of 108 mg/m^3 with a personal sampler) specified in the U.S. standard. Even at those very high dust levels, only 3 out of 60 workers had minimal byssinotic symptoms (grade ½). The authors suggested that the dust in waste recycling work areas "no longer contains the causative agents of byssinosis . . . ." The authors also reported that a search of 15 years of compensation awards by the British Pneumoconiosis Medical Panel found a "remarkably low" byssinosis incidence of only 0.1%.

The record also contains very little medical information for garnetting workers (14,15). One study, a 1977 NIOSH Health Hazard Evaluation involving 54 workers, found only one worker, a garnett worker, with minimal byssinosis symptoms (grade ½) and he was a smoker (15).

One additional study was conducted in an Australian garnetting plant where 26 workers were exposed to over 10 times the dust exposure limit permitted by the U.S. standard (6-21 mg/m^3) and they experienced no decline in pulmonary function at dust levels below 6 mg/m^3 (16).

For the waste industries, therefore, OSHA cannot make a valid threshold finding of significant dust-related health risks tht will withstand scrutiny in light of the Supreme Court's benzene opinion.

Consequently, the waste recyclers, garnetters and waste cotton yarn spinners, as well as their downstream customers, should be excluded from the new rulemaking and specifically exempted from the standard.

Textile Industry

The standard's application to the various workplaces in the textile industry should be reevaluated in light of more recent, more accurate, and more extensive medical information than was available during initial rulemaking and, further, in light of the Supreme Court's benzene opinion. OSHA refers to the textile industry as yarn manufacturing (the process from bale opening through warping) and weaving (the process of slashing and weaving). By OSHA's definition, textile manufacturing apparently includes SIC codes 2211, Broadwoven Fabric Mills, Cotton; SIC 2221, Broadwoven Fabric Mills, Man-Made Fiber & Silk; SIC 2281, Yarn Spinning Mills, Cotton, Man-Made & Silk; SIC 2284, Thread Mills. Knitting is handled as a "non-textile" operation for compliance purposes (OSHA, *Fed. Regist. 43*: 27358 (June 23 [1978]). Mills now show about a 1% prevalence. Morbidity and mortality studies indicate that textile workers live longer and fewer die of respiratory disease than the general population (17-19).

A finding of significant risk would be difficult to support for certain textile work areas such as slashing and weaving. Published medical studies indicate only questionable or inconclusive prevalence at best among slashing and weaving workers and evidence indicates that the active agent(s) have been processed out and, if present at all, they are in negligible amounts in these operations. All (20-22) but Merchant (23) who have conducted studies in slashing and weaving have found a prevalence level no higher than the false positive rate (positive responses to questionnaire by unexposed workers – this level is 2 or 3% [24,25]). Even Merchant's data indicate markedly reduced symptoms from primary textile processing. Merchant's study was limited; it did not take into consideration employee transfer from yarn preparation and production into slashing and weaving, found no prevalence in slashing and did not indicate grades of byssinosis found in weaving (25,26). In addition, analysis of the dust in the atmosphere of a typical weaving room has been demonstrated to be primarily of sizing (usually starch or polyvinyl alcohol) and fiber fragments (27), in dicating the unidentified active agent(s) are processed out or are in negligible amounts in slashing and weaving operations. So, we feel that the proposed new standard should exclude slashing and weaving on the grounds that a valid threshold finding of significant risk cannot be made.

For those work places in which a significant risk is shown, consideration probably will be given to the most appropriate way to insure protection in keeping with requirements of the Occupational Safety and Health Act. A number of alternative approaches probably will be evaluated for cost and effectiveness.

Still another approach which merits consideration is a provision which allows employers to use respirators as an alternative to engineering controls.

Other Industries

Aside from the textile manufacturing, cottonseed crushing, warehousing, cotton classing and waste processing industries already discussed, at least 23 other industries are covered by the standard.

The existing record is completely void of any information on the health of workers in these industries and others which may be arbitrarily covered because of their incidental use of cotton. Not only are there no published studies in the literature regarding the respiratory effects of dust in these industries, there is no history of respiratory disease problems. In addition, the unidentified active agent(s) are most likely processed out in earlier operations and, if pres-

ent at all, they are in negligible amounts in the materials that are being processed or handled in these industries. Therefore, one would not expect the dust in these industries to cause any respiratory problem. So, there is no justification for imposing a cotton dust standard on these industries. A new standard should be proposed which excludes these industries and all other industries and/or workplaces except those (specifically identified) for which a finding of significant risk is made.

OSHA should propose a new rule excluding all industries and/or workplaces for which a significant risk cannot be shown in light of the Supreme Court's benzene opinion. Thus, the standard should not apply to cottonseed oil mills, warehouses, classing offices, waste processing industries (nor to downstream users of waste products) and some other industries. For those sectors where a finding of significant risk is made, OSHA should propose alternative standards, and the effectiveness and cost of each should be carefully evaluated toward final promulgation of the most cost-effective of the alternatives.

In closing, for the long-term solution to the problem, research is the answer and needs to be retained at least at the present level, which is over $8 million this year. Until the problem is solved, it would be shortsighted to reduce research because of the workers' compensation situation and costs associated with enforcement. Remember that disabling byssinosis is virtually indistinguishable from other disabling chronic respiratory diseases like chronic bronchitis. Some studies have found chronic respiratory disease in 20% or more of the adult population unexposed to known respiratory irritants (28) and up to 50% or more with heavy smokers (29,30). If those same people had ever worked in an industry where cotton was handled or processed, they would likely be diagnosed as having byssinosis and could receive compensation.

Cotton's textile mill customers face an open-ended liability which they expect to grow to intolerable proportions. The other industry sectors could face the same problem. So, there can be only one solution – the elimination of the byssinosis causative through research efforts.

REFERENCES

1. OSHA, Fed. Regist. 43:39087 Sept. 1 (1978).
2. Ibid. 44:5438 January 26 (1979); 43:38087 November 1 (1978).
3. Ibid. 45:50328 July 29 (1980).
4. Ibid. 46:19501 March 31 (1981).
5. Development Planning and Research Associates, The Economic Impact of Proposed Cotton Dust Standards on the Cottonseed Processing Industry, OSHA Cotton Dust (Docket no. H-052) Ex. 93i.
6. Jones, R.N., J. Carr, H. Glindmeyer, J. Diem and H. Weill, Thorax 32:281 (1977).
7. Noweir, M.H., V. El-Sadek and A.A. El-Dakhakhny, Arch. Environ. Health 19:99 (1969) (OSHA Cotton Dust [Docket no. H-052] Ex. 128k).
8. Barnes, R., and G.R. Simpson, Med. J. Aust. 1:897 (1968) (OSHA Cotton Dust [Docket no. H-052] Ex. 128m).
9. Simpson, G.R., and R. Barnes, Arch. Environ. Health 17:807 (1968) (OSHA Cotton Dust [Docket no. H-052] Ex. 6[70]).
10. NIOSH, Supporting Statement – Characterization of Byssinosis in Segments of the Cotton Industry – Mattresses and Cotton Batting, Cottonseed Oil, Waste Recycle, Cotton Warehouses and Cotton Classification Offices, OSHA Cotton Dust (Docket no. H-052) Ex. 98 and 140.
11. Barman, M.L., OSHA Cotton Dust (Docket no. H-052) Ex. 56.
12. Barman, M.L., OSHA Cotton Dust (Docket no. H-052) Ex. 95e.
13. Chinn, D.J., F.F. Cinkotai, M.G. Lockwood and S.H.M. Logan, Ann. Occup. Hyg. 19:101 (1976) (OSHA Cotton Dust [Docket no. H-052] Ex. 99f).
14. NIOSH, An Industrial Hygiene and Medical Survey of the Stearns and Foster Co., Lockland, OH 1973, OSHA Cotton Dust (Docket no. H-054) Ex. 38f.
15. NIOSH, Health Hazard Evaluation (Report no. 76-73), Stearns and Foster Mattress Factory (Lockland and Mason Plants) Cincinnati, OH, OSHA Cotton Dust (Docket no. H-052) Ex. 188x.
16. Simpson, G.R., Med. J. Aust. 1:1151 (1970) (OSHA Cotton Dust [Docket no. H-052] Ex. 6[71]).
17. Daum, S.M., H. Seidman, E. Cuyler Hammond and I.J. Selikoff, Mortality Experience of a Cohort of Cotton Textile Workers, paper presented at the XVIII Int. Congress on Occup. Health, Brighton, England, Sept. 16, 1975.
18. Merchant, J.A., and C. Ortmeyer, Chest 79:6S (1981).
19. Berry, G., and M.K.B. Molyneux, Ibid. 79:11S (1981).
20. Schrag, P.E., and A.D. Gullett, Am. Rev. Respir. Dis. 101:497 (1970). (OSHA Cotton Dust [Docket no. H-052] Ex. 6[14]).
21. Imbus, H.R., and M.W. Suh, Arch. Environ. Health 26:183 (1973) (OSHA Cotton Dust [Docket no. H-052] Ex. 6[18]).
22. Imbus, H., OSHA Cotton Dust (Docket no. H-052) Ex. 47.
23. Merchant, J.A., J.C. Lumsden, K.H. Kilburn, W.M. O'Fallon, J.R. Ujda, V.H. Germino, Jr., and J.D. Hamilton, J. Occup. Med. 15:222 (1973) (OSHA Cotton Dust [Docket no. H-052] Ex. 6[51]).
24. Weill, H., et al., Report to the Am. Textile Mfg. Inst. on a study, Assessment of Respir. Responses in Textile Workers Exposed to Low Levels of Cotton Dust, May 31, 1976, OSHA Cotton Dust (Docket no. H-052) Ex. 13A.
25. Hersh, S.P., OSHA Cotton Dust (Docket no. H-052) Ex. 58.
26. Suh, M., OSHA Cotton Dust (Docket no. H-052) Ex. 55.
27. Hatcher, J., OSHA Cotton Dust (Docket no. H-052) Ex. 59.
28. Mueller, R.E., et al., Am. Rev. Respir. Dis. 103:209 (1971).
29. Thurlbeck, W.M., Chronic Airflow Obstruction in Lung Disease, edited by W.B. Saunders, Butterworths, Philadelphia, PA, 1976, pp. 235-287.
30. Battigelli, M.C., OSHA Cotton Dust (Docket no. H-052) Ex. 48.