

In the effort to preserve and maintain the fragile ecology of our planet, these recently selected abstracts are presented to help readers of *Journals of Materials Engineering and Performance* stay current on legislation and compliance with global environmental issues and regulations. They are reprinted from Metals Abstracts and Materials Business File with permission from Materials Information, a joint service of ASM International®, Materials Park, Ohio, and the Institute of Materials, London, England.

Guidance on the Optimum Use of Filtration Systems for Fume Exhausts From Hot Dip Galvanizing Plants. In hot dip galvanizing, steel parts are pretreated (as a rule by degreasing, pickling, rinsing, and fluxing) and then immersed in molten zinc. During this dipping process, the flux evaporates under the effect of heat; in consequence, there is emission of a relatively large proportion of the ammonium, chlorine, and Zn compounds contained in the flux. The present work reports current aspects of the operation of collection and filtration systems: it takes account of conditions in West Germany. The work does not examine all the principles of collecting systems and filtration plants (which should be generally known), but confines itself essentially to more recent findings and practical experience. J. Marberg. Conference Proceedings: Intergalva 91: 16th International Galvanizing Conference, Barcelona, Spain, 2-7 June 1991. [in English]. PHOTOCOPY ORDER NUMBER: 199305-58-0634.

Criteria for Composition of Emissions in Painting. Original Title: Criteri per il Contenimento Emissioni Nella Verniciatura. A synthesis of norms and regulations on polluting emissions from volatile organic compounds and powders is covered along with threshold limits in Italy and particularly in Lombardy. A list of the related norms is included, determining the criteria for evaluation. Concentration limits are quoted. Methods to control the emanations are outlined covering the use of water soluble paints or paints with medium to high solid content, the use of up-to-date technological systems and installations and, eventually, methods like post-burning or catalytic burning of organic volatile compounds. Automobile painting is discussed.

S. Tammaro. Cited: *Trattamenti & Finiture*, 32, (1), Jan.-Feb. 1992, 44, 46-48. [in Italian]. ISSN: 0041-1833. PHOTOCOPY ORDER NUMBER: 199305-57-0578.

Controlling Welding Fume: a Design Approach. Welding fumes cause health problems and plant and equipment maintenance problems. OSHA regulations were established in 1989 with overall permissible exposure limits of 5 mg/m³ and much lower limits on many individual components of the welding fume. These limits have been successfully challenged in a federal appeals court but OSHA is expected to take other action. The regulations required that controls be exercised through administrative controls (limiting the exposure time of workers), personnel controls (respirators and helmets), and engineering controls (fans and/or fume collection systems). Engineering controls which must be complied with are discussed. L. Reding. Cited: *Welding Journal*, 71, (9), Sept. 1992, 61-64. [in English]. ISSN: 0043-2296. PHOTOCOPY ORDER NUMBER: 199305-55-0906

Risk, Uncertainty in Risk, and the EPA Release Limits for Radioactive Waste Disposal. A conceptual model for the organization and execution of a performance assessment of a radioactive waste disposal site, including uncertainty and sensitivity analysis, is described. This model is based on a formal definition of risk as a collection of ordered triples, where the first element in each triple is a set of similar occurrences (i.e. a scenario), the second element is the probability or frequency of the first element, and the third element is a vector of consequences associated with the first element. This division of risk into its three constituent parts provides a useful model for the structure of a performance assessment for several reasons. First, it provides a clear distinction between the major parts of a performance assessment, which include: determining what can happen, determining how likely things are to happen, and determining what the consequences of specific events are. Second, it provides a way to distin-

guish between different types of uncertainty, including completeness, aggregation, model selection, imprecisely known variables, and stochastic variation. Third, it leads naturally to the representation of stochastic variation with a complementary cumulative distribution function (CCDF) and the representation of state of knowledge uncertainty with a family or distribution of CCDFs. Fourth, it provides a context in which the US Environmental Protection Agency limits for radioactive releases to the accessible environment can be represented and calculated. Fifth, it facilitates relating the development of scenarios and their probabilities to the concepts used in formal probability theory. The preceding ideas are illustrated with results obtained in a preliminary performance assessment for the Waste Isolation Pilot Plant in southeastern New Mexico.

J.C. Helton. Cited: *Nuclear Technology*, 101, (1), Jan. 1993, 18-39. [in English]. ISSN: 0029-5450. PHOTOCOPY ORDER NUMBER: 199304-16-0160.

Coke Makers' Air Reg Hotline Set Up by D&L. D&L, Pittsburgh, Pennsylvania, USA, has established a hotline for coke makers in need of assistance meeting the new EPA Clean Air Act regulations by 15 November 1993. The hotline is a source of advice on gathering and submitting the required documentation to the EPA, and working with Title III regulations, D&L's area of expertise. The hotline number is (205) 786-0934.

Cited: *American Metal Market*, 101, (60), 30 Mar. 1993, 5. [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199305-S4-0046.

EPA Releases Great Lakes Guidelines. The US Environmental Protection Agency has completed overdue guidelines for limiting pollution discharges into the Great Lakes by industries and municipalities. The EPA opens a five-month public comment period on the pollution limits, to be followed by the release of final rules. The eight Great Lakes states will have two years to adopt them. The steel industry has much at stake in the new Guidance document and in the ongoing effort to clean up the Great Lakes environment.

Cited: *American Metal Market*, 101, (65), 6 Apr. 1993, 4. [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199305-S4-0041.

Storm Water/Wastewater Issues for the Steel Industry. States are imposing new water quality limitations as existing National Pollutant Discharge Elimination System (NPDES) permits are renewed and new NPDES permits are issued. Of particular importance to industrial dischargers are the very low limitations being imposed on toxic pollutants. Most US states and territories have adopted increasingly restrictive water quality standards to protect receiving streams. Standards that specifically affect industrial facilities include acute and chronic toxicity limitations for fish and aquatic life, and limitations based on human health criteria for both short-term and long-term exposure.

C.D. Blumenschein. Cited: *Iron and Steelmaker*, 20, (4), Apr. 1993, 39-40. [in English]. ISSN: 0097-8388. PHOTOCOPY ORDER NUMBER: 199305-S4-0037.

OSHA Case Goes Unchallenged. The US federal government decided 23 March that it will not challenge a July court ruling that struck down 1989 work-place air-exposure limits on styrene, a PVC precursor and over 400 other chemicals. The 11th Circuit Court of Appeals in Atlanta overturned in July the Occupational Safety and Health Administration rules. The court argued that the agency should have backed up each exposure limit with scientific evidence, instead of setting broad limits for all of the chemicals. The OSHA rules would have lowered the permissible work-

place air exposure limit on ethylene dichloride, a PVC precursor, from 50 parts/million to one part/million every 8 h day. Maximum styrene exposure would have been lowered from 100 parts/million to 50 parts/million. The administration's decision not to challenge the ruling means that the OSHA rules now will revert to the higher exposure limits. However, those OSHA rules may return in the form of labor-reform laws.

Cited: *Plastics News (Detroit)*, 5, (5), 29 Mar. 1993, 7, [in English]. ISSN: 1042-802X. PHOTOCOPY ORDER NUMBER: 199305-P4-0023.

Update on Plastics and the Environment: Progress and Trends.

This article provides an update on recent actions taken by both the public and the industry that have helped advance plastics recycling and related technologies. It gives an overview of: (a) current legislation and solid waste issues affecting plastics, (b) current recycling practices and programs that involve items made with plastics, and (c) related developing technologies. The material presented focuses primarily on activities in the US and, to a lesser extent, Europe, and it encompasses the period between 1990-1992. It is not intended to be exhaustive, but rather to give the reader an idea of the type and extent of activities being pursued.

M.M. Nir, J. Miltz, A. Ram. Cited: *Plastics Engineering*, 49, (3), Mar. 1993, 75-93. ISSN: 0091-9578. PHOTOCOPY ORDER NUMBER: 199305-P1-0095.

Steelmakers Tackle Environmental Tasks. The regulatory sticks at work in the American manufacturing industry are driving a substantial amount of environmental progress, particularly in steelmaking. However, the standards that are imposed are fraught with ambiguity. Terms such as "reasonably available control technology" and "maximum achievable control technology" in the Clean Air Act ensure that steel companies will be chasing a moving target for the foreseeable future. In an industry starved for capital, this potentially expensive uncertainty is at best a considerable challenge, and at worst a threat to survival.

R. McLaughlin. Cited: *American Metal Market*, 101, (37), 25 Feb. 1993, 8, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199304-S4-0030.

Coke Ovens Will Dwindle Under Emission Regs. Costly new Environmental Protection Agency rules governing coke oven emissions likely will prompt producers to close some coke oven batteries. And this combined with other market-related factors probably will lead to further declines in the use of coke. The new EPA rules, which affect 86 batteries at 30 facilities, are intended to cut toxic emissions at coke ovens by 66-90% over the next three decades. They were mandated by the Clean Air Act Amendments of 1990 and agreed to during fall 1992, by representatives from the steel industry, labor unions, government and environmental groups.

D. Connaughton. Cited: *American Metal Market*, 101, (37), 25 Feb. 1993, 7, 10, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199304-S4-0029.

Bill Would Boost OSHA, Limit PVC Precursor. A bill designed to strengthen the US Occupational Safety and Health Administration includes air-contamination exposure limits on a PVC precursor that a federal court

rejected last year. The Comprehensive Occupational Safety and Health Reform Act, which was to be introduced on 9 March by Rep. William Ford, D-Michigan, also would require processors to establish health and safety programs. It would make management responsible for violations that cause death or serious injury, which could subject plant managers to criminal penalties. Ford, Chairman of the House Education and Labor Committee, sponsored similar OSHA reform legislation in the last session of Congress, but the bill fizzled from lack of widespread support. The latest bill adds a section that revives 1989 OSHA permissible air-exposure regulations on >400 chemicals, including the PVC precursor ethylene dichloride.

J. Gardner. Cited: *Plastics News (Detroit)*, 5, (3), 15 Mar. 1993, 4, [in English]. ISSN: 1042-802X. PHOTOCOPY ORDER NUMBER: 199304-P4-0019.

Zinc Execs Warned About Tougher EPA—Clinton Agency to Have Different Stand.

The Zinc industry is likely to be placed in a more defensive position in its dealings with the US Environmental Protection Agency under the Clinton administration than it has been under past governments. Negative effects are anticipated from the reauthorization of major environmental laws scheduled to come before the 103rd Congress, including the Resource Conservation and Recovery Act under which a bill attempting to restrict interstate transport of waste is likely.

O. O'Sullivan. Cited: *American Metal Market*, 101, (37), 25 Feb. 1993, 6, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199304-G4-0026.

Tasmania Curbs Obstructive Environmentalism. The Tasmanian government has adopted a package of legislation affecting the mining industry which can be considered historic. The reforms are designed to encourage and promote mining in this mineral-rich Australian state and to revitalize investor confidence in the industry. They recognize that proper environmental standards must be adhered to but at the same time remove the threat of undue interference from the preservationists. Actions taken include: creation of Strategic Prospectivity Zones in areas of high potential to guarantee access to miners; rezoning of some park areas, and limiting the depth of national parks to 50 m below the surface to promote nonobtrusive exploration; and streamlining of the licensing process.

Cited: *Engineering and Mining Journal*, 194, (2), Feb. 1993, 9, 11, [in English]. ISSN: 0095-8948. PHOTOCOPY ORDER NUMBER: 199304-G4-0022.

Excessive Environmental Regs Seen Hindering Metals' Growth.

Excessive US environmental regulations are stifling the growth of the metals industry and new international restrictions being considered could damage world trade. Excessive, expensive, and changing environmental regulations are affecting new Cu-smelters, existing ones, and the recycling of Cu. Special permits are needed for the movement of hazardous materials, treatment of waste water, and removal of particulates from the atmosphere, with licensing taking up to five years.

M.E. Goodwin. Cited: *American Metal Market*, 101, (35), 23 Feb. 1993, 9. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 199304-G4-0020.

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Furthermore...

The **U.S. National Safety Council** 1993 Congress and Exposition will be held 3-8 October in Chicago, Illinois. The event theme, "World Class Solutions" reflects the Council's *increasing focus on global safety and health*. Seminars will emphasize quality improvement, ergonomics, process safety design, and other high-profile safety, health, and environmental topics. Circle (81)

The **U.S. Environmental Protection Agency** is considering a proposal to *use field citations to settle minor violations* of the Clean Water Act, rather than lawsuits which delay enforcement actions. The proposal would enable a field citation to incorporate a complaint with the EPA's proposed settlement for the complaint.

Industry representatives have voiced the concern that the citations could be detrimental at permit time. The violations to be handled under the proposal are being characterized as minor, but some states require *all* violations as well as *employees'* environmental crime records to be considered prior to issuing a new or renewal permit. Circle (82)

A major barrier to recycling the billions of plastic soft drink bottles emptied each year has been overcome. A new process, already in full-scale commercial use at **Hoechst Celanese**, Spartanburg, South Carolina, permits *high-precision separation of plastic wastes* that are so incompatible that small amounts of one

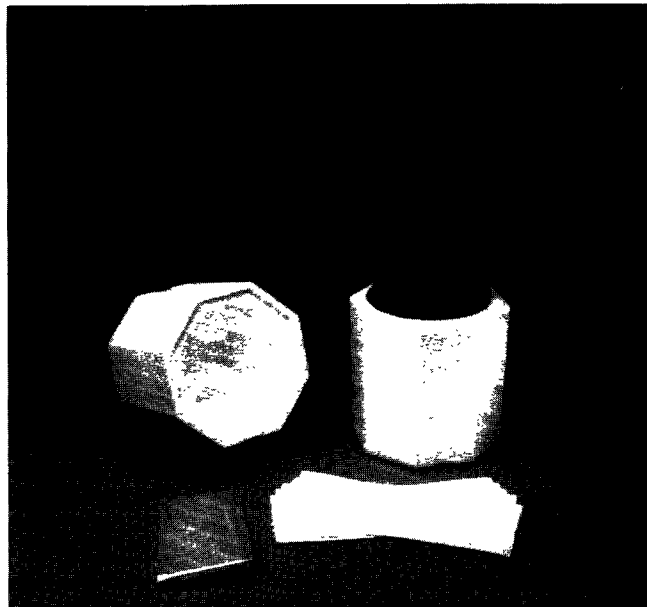
would contaminate 500 tons of the other. The new separation technology utilizes a well-established process termed "froth-floatation," wherein materials to be separated are suspended in water, and air is forced through to create a bubble-like froth that entraps one of the materials. The froth is skimmed away, leaving the desired material recovered and the remaining liquid in the process vat. The process is simple, requires no expensive chemicals, and is environmentally safe. The froth flotation reactor can separate 15 million pounds of plastic waste per year. Circle (83)

Researchers at the **Kobe Steel Biotechnology Research Laboratory**, Japan, have succeeded in *degrading nylon membranes using the lignin-degrading fungus, IZU-154*, which the laboratory isolated in 1987. In experiments with nylon membranes placed on fungus-cultivating agar for 20 days, the team found the membranes had been degraded. By controlling the nitrogen and carbon content of the culture medium, they subsequently shortened the length of the degrading time. The molecular weight of nylon 66 was reduced from 85,000 to 5,500 in three days. When degraded to such a low level, nylon could be assimilated by ordinary microbes living in soil. Circle (84)

A patented treatment chemistry offered by **Quality Environmental Systems**, Grand Ledge, Michigan, may be effective for wastewater treatment at steel mills and other metal producing facilities. The treatment process involves injecting the patented dry treatment additives into wastewater which contains a high concentration of heavy metals, prior to generation of the sludge. The sludge is then *rendered non-hazardous in a cost-effective and environmentally sound manner*. Circle (85)

The **U.S. National Science Foundation Chemistry Division**, in cooperation with the **U.S. Environmental Protection Agency's Office of Pollution Prevention and Toxics**, Washington, DC, has instituted a memorandum of understanding for joint ventures between the two agencies' existing research programs on *designing ways of chemical synthesis that are environmentally benign*. The aim is to foster basic research on limiting the production of unwanted by-products and pollution by industries that use and produce chemicals. Collaboration is anticipated in such areas as the use of recyclable catalysts to cut down on metal contaminants, among others. Circle (86)

Polyfoam Packers Corp., Wheeling, Illinois, now offers five, new UN/DOT-certified *bottle shippers for transport of dangerous goods* (Packing Group I). All five shipping systems for glass



Polyfoam Packers Corp.

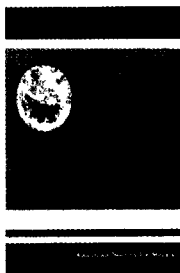
bottles have been tested and approved for solvents, corrosives, and other poisonous and flammable liquids, in conformance with United Nations recommendations (Chapter 9.4G) and U.S. Dept. of Transportation repetitive shock vibration requirements (DOT 49-178.608). Each of the shippers comes with all the components necessary to ship dangerous liquids, including plastic-coated glass bottles with screw caps, absorbent material, polybags with wire twist ties, expanded polystyrene foam cushion packaging, 200-lb. test corrugated outer shipping cartons (with UN markings), and detailed packing instructions. Circle (87)

Environmental Protection Technology 1993, published by **World Business Publications, Ltd.**, London, England, provides a readily accessible *overview of significant advances in pollution abatement and related technologies* developed during the course of 1992 in Europe, North America, Japan, and the remainder of the developed world. It consists of approximately 700 reports and 1,000 patent titles. Each report has full contact details. Circle (88)

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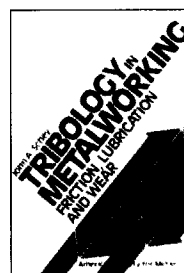
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