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Foreword

This Handbook of Vapor Degreasing is presented as a guide to consumers who desire the essential information on the vapor degreasing process. The information contained should help to determine if the vapor degreasing process is best suited for the particular cleaning requirements. Consumers who are currently operating vapor degreasing equipment will benefit by following the procedures recommended. The benefits will be reflected in a better cleaning at lower cost and with greater safety. The manufacturers of vapor degreasing equipment and degreasing solvents maintain trained technical staffs who should be consulted for advice on specific applications and problems.

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Related
ASTM Publications

Cleaning Stainless Steel, STP 538 (1973),
$18.00, 04-538000-02

Cold Cleaning with Halogenated Solvents,
STP 403 (1966), $2.75, 04-402000-15
A Note of Appreciation to Reviewers

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Contents

Process Description 1

Applications 3
   Materials to Be Cleaned 3
   Shape, Form, and Size of Work To Be Cleaned 3
   Types and Amount of Soils To Be Removed 5
   Limitations 7
   Degree of Cleanliness Required 7
   Limitations 7
Space Requirements 8
   Adaptability to Conventional Conveying and Work-Handling Methods 8
Total Cost to Attain Desired Cleaning Results 9
Typical Uses for Vapor Degreasing 9
   Before Applying Protective Coatings 9
   Before Inspection 10
   Before Assembly 10
   Before Further Metal Work or Treatment 10
   Before and After Machining 10
   Before Packaging 10

Selection of a Vapor Degreasing Solvent 10

Vapor Degreasing Equipment 11
   Selection of Equipment 11
   Straight Vapor Degreasing 11
   Vapor-Distillate Spray-Vapor Degreasing 13
   Vapor-Immersion-Vapor Degreasing 14
   Vapor-Spray-Vapor Degreasing 14
   Ultrasonics 14
   Other Cleaning Cycles 15
   Specialized Equipment and Methods of Handling 15
   Method of Heating 16

Equipment Design Requirements 16
   Size of Equipment 16
   Width of Tank: Freeboard for Open Top Degreasers 17
   Minimum Evaporative Area 17
   Heat Input 17
      Work Heat 17
      Radiation Losses 17
      Heat for Distillate Turnover or Sprays 18
   Types of Heat Input 18
      Steam Heat 18
      Gas Heat 18
      Electric Heat 18
      Hot Water Heat 19
   Vapor Control 19
   Water Jacket 19
   Cooling Coils 19
   Moisture Removal 20
   Conveyor Systems 20
   Monorail Conveyors 20
Crossrod Conveyor
Elevator Conveyors
Operating and Safety Controls
Steam Heated Degreasers
Gas Heated Degreasers
Electrically Heated Degreasers
Safety Vapor Control Thermostat Settings
Safety Precautions
Location of Solvent Degreasing Equipment
Ventilation
Clearance
Drafts
Ovens
Open Flames: Hot Surfaces
Gas Heated Degreasers

Installation

Degreaser Operation
Operating the Degreaser
Starting the Degreaser
Proper Positioning of Work
Rate of Entry and Removal
Duration of Contact Time with Solvent Vapors
Solvent Contamination Levels
Spraying of Parts
Water Contamination
Solvent Handling
Solvent Distilling and Operation of Stills
Shutting Down the Degreaser
Cleaning and Maintenance of the Degreasing Equipment
Procedure for General Cleaning of Degreaser and Still
Routine Maintenance
Economics of Degreaser Operation
Solvent Cost
Maintenance and Direct Labor Costs
Utilities Costs

Safe Handling of Vapor Degreasing Solvents
Employee Education
Employee Selection
Preemployment
Reporting Leaks
Vapor Degreasing
Health Hazards
Inhalation
Skin Contact
Ingestion (swallowing)
Eye Contact
First Aid
Inhalation
Note to Physician
Skin Contact
Eye Contact
Ingestion (swallowing)
FIG. 3 — Liquid-liquid-vapor crossbar degreaser

FIG. 4 — Loading and unloading devices can be incorporated to automate crossbar conveyors; work can be picked up from and returned to plant conveyors

FIG. 5 — Vapor-spray-vapor monorail degreaser

FIG. 6 — Offset condenser vapor-spray-vapor degreaser

FIG. 7 — Water separator: A = solvent and water inlet, B = vent, C = water outlet, and D = solvent outlet

Tables

TABLE 1 — Physical properties of vapor degreasing solvents
TABLE 2 — Standards related to control of health hazards
TABLE 3 — Properties related to control of health hazards
TABLE 4 — Human response solvent vapors under controlled conditions (concentrations in ppm)
TABLE 5 — Flammability properties of vapor degreasing solvents
TABLE 6 — Underwriters Laboratories flammability ratings
The manufacturers of vapor degreasing equipment and degreasing solvents maintain trained technical staffs who should be consulted for advice on specific applications and problems. Existing and proposed state and federal regulations require specific operating procedures and equipment. The information in this manual is presented in good faith, but users should rely on their own legal advisors to assure compliance with these regulations. A vapor degreaser has two tanks (sumps) of solvent inside. One vapor degreasing tank boils the solvent (boil sump) which creates a vapor or mist of the solvent. The second sump (ultrasonic sump) is heated but not to the boiling point and is used as the second cleaning stage. The vapor degreaser also has bands of cooling coils inside just above the level of the sumps. These coils cause the vapor to return to a liquid state and fall back into the sump. The effect is like small "clouds" of the solvent are formed between the top of the sumps and the cooling tubes. As parts at room temperature are lowered through the cooling area into the vapor, the vapor from the boil sump condenses on the parts just like moisture in the air does on your glasses in the examples above. Why is vapor phase degreasing so important for catalyst reactors? None of the above mentioned contaminants are removed during conventional chemical cleaning during a turnaround. These materials will be removed during catalyst regeneration. While the heavy metal poisons are addressed during catalyst regeneration, distribution trays and supports are usually soiled with gums, resins and heavy oil deposits. Cleaning of these organic contaminants can be accomplished through a vapor phase degreasing and cleaning process that does not introduce water into the reactor. It is important to avoid having water in contact with the reactor catalyst. Vapor degreasing with the chlorinated solvents trichloroethylene, 1,1,1-trichloroethane, and perchloroethylene is a historically important source of environmental release and contamination. After describing how a vapor degreaser works and the solvents used, we provide a brief history of vapor degreasing in the United States, focusing on specific time periods. The practice originated in about 1930 and was quickly adopted, including by key manufacturers. Its use grew rapidly, particularly during World War II. Vapor Degreasing Questions and Answers: A Handbook for Engineers, Production Men and Students, a Dissertation on Chlorinated Hydrocarbon Solvents and Their Use in Industrial Degreasing Practice. Jan 1944. Phillips Manufacturing. Phillips Manufacturing.