

Room E 1151 LINING FORMULATION PROCESSING

WET MIXING (LAST ASBESTOS MIX MAY 9, 1979)

- ASBESTOS WEIGHED BY HOOD
- MIXER COVERED TOP WHEN MIXING
- OPERATOR & OTHERS IN AREA WEAR MASKS WHEN MIXING OR WEIGHING
- FINISHED MIX HAS FIBERS WETTED (GRANULAR FORM)

DRY MIXING (LAST ASBESTOS MIX MAR 2, 1979)

- ASBESTOS WEIGHED BY HOOD
- MIXING INSIDE HOOD, WITH MIXER SEALED WHEN OPERATING
- OPERATOR & OTHERS IN AREA WEAR MASKS WHEN MIXING OR WEIGHING
- FINISHED MIX BRIQUETTED, THEN STORED IN SEALED CONTAINERS
- BRIQUETTES NOT PRESSED, PRODUCING FIBER WETTING & SEALING

GENERAL:

- ASBESTOS KEPT IN SEALED BUCKETS (PLASTIC W/SHARP LIDS)
- OPERATORS INFORMED OF PROPER LAB PRACTICE - HAVE JSA INFORMATION BOOKS IN LAB FILES
- WORK MONITORED BY M. WEINTRAUB (PH.D. CHEM. ENGR., EXPERIENCED IN LINING PROCESSING & ASBESTOS HAZARDS)
- AREA VISITED BY DRS. SELIKOFF, LANSEY, & NICHOLSON, WHO JUDGED OUR METHODS TO BE PROPER & PRUDENT.

PLAINTIFF EXHIBIT

FD 5589

\* 3M TOXIC DUST RESPIRATORS #09900 - MEETS TC-21C-17C  
\*\* MT. SINAI HOSPITAL - NY, NY. DEPT. OF ENV. HEALTH

8004 0762

PQ

Room E-1154 BRAKE DYNO (FULL BRAKE TESTING)

- BRAKE TESTING USES HIGH VOLUME EXHAUST AIR FLOW
- HARD USAGE TESTS, WHERE THE LINING WEAR RATE MAY BE HIGH USE REDUCED SUPPLY AIR FLOW TO ASSURE VAPOR & PARTICULATE EMISSIONS ARE DIRECTLY FUNNELLED TO EXHAUST DUCT
- DRUM BRAKE LINING GRINDER HAS OSHA DUST BAG & IS USED WITH FULL EXHAUST AIR, NO SUPPLY AIR FOR DYNO SO NET AIR FLOW IS FROM DOORWAY PAST GRINDER AND OUT OF BUILDING.
- WHEN LININGS FROM BRAKE TEST ARE REMOVED FOR WEAR MEASUREMENTS, THEY ARE TAPPED INSIDE THE EXHAUST DUCT TO REMOVE WEAR DUST BEFORE HANDLING. COTTON-TIPPED WOODEN STICKS (SIMILAR TO Q-TIPS) ARE USED TO REMOVE MATERIAL FROM RIVET HOLES, IF ADHERENT.

Room E-1158 SPECIMEN MEASUREMENT & THERMAL ANALYSIS

- NO SPECIMEN PREP. IN ROOM
- SPECIMENS ARE FREE OF LOOSE MATERIAL IN GENERAL. ASBESTOS, WHEN TESTED IN FREE STATE, IS IN 5 mg (0.005 gram) AMOUNTS.
- EXHAUST FROM THERMAL ANALYSIS EQUIPMENT IS VENTED THRU VACUUM LINES, TO REMOVE LOW CONCENTRATIONS OF ORGANIC DEGRADATION PRODUCTS (AIR FLOW TYPICALLY 50 mL/min ( $\approx 10^{-6} \text{ m}^3/\text{s}$ )).

## ROOM E-1160 FRICTION MATERIAL TEST LAB

- BAND SAW FOR CUTTING USES 10:1 SPEED REDUCER TO CUT LARGER PARTICLES AND TO REDUCE HEATING. VACUUM CLEANER USED FOR CLEANUP. OPERATOR WEARS MASK
- DRILL PRESS FOR SAMPLE CUTTING, MILLING, AND RIVET HOLE DRILLING USED AT LOW SPEEDS, UNDER 500RPM, TO MAXIMIZE CHIP SIZE AND MINIMIZE HEATING. VACUUM CLEANER USED FOR CLEANUP.
- SANDING APPARATUS, CONVERTED FROM METALLURGICAL EQUIPMENT, USE KEROSENE FLOW FOR DUST CONTROL WHENEVER POSSIBLE. SOME SAMPLE SANDING MUST BE DONE DRY, USUALLY WITH HAND SANDING, SO MASK IS USED. DRY SANDING DUST CLEANED UP WITH VACUUM. DRY SANDING IS WITH DUST MASK ON.
- SOME SPECIMEN CUTTING IS BY MANUAL HACK SAW AND FILES. PARTICULATES CLEANED WITH VACUUM. OPERATOR WEARS MASK.
- SPECIMEN TESTING FOR FRICTION & WEAR USES 2-3 μinch ARA (0.1 μm) metal surface roughness for low abrasive wear rate. SAMPLE IS 0.5" SQUARE X 0.14" THICKNESS. WEAR VOLUME PER TEST VARIES FROM 0.002 in<sup>3</sup> to 0.02 in<sup>3</sup> (0.03 to 0.3 cm<sup>3</sup>) WITH 99% OF ASBESTOS CONVERTED TO NON-FIBROUS FORM FROM SURFACE TEMPERATURE, BASED ON EARLIER TESTS. TOTAL WEAR VOLUME PER DAY < 0.05 in<sup>3</sup> (< 0.8 cm<sup>3</sup>)
- LABORATORY HAS ELECTROSTATIC AIR CLEANER IN CONTINUOUS USAGE TO REMOVE PARTICULATES & ORGANIC VAPORS (CHARCOAL CELL).

## OPEN ISSUES

- ROOM E1151
- NEW HOOD IN LAB HAS APPARENTLY LOW MASS FLOW OF AIR, WITH POSSIBLE RELEASE OF MATERIAL FROM OTHER TWO HOODS.
  - LAB HAS VACUUM CLEANER, BUT NOT OSHA APPROVED. CLEANUP OF SPILLED FIBER NOW REQUIRES WETTING.
  - NEED SPECIFIC DISPOSAL PROCEDURES FOR FRIABLE AND ENCAPSULATED ASBESTOS.
  - AREA SHOULD BE MARKED WITH HAZARD SIGN