MIHA
Malaysian Industrial Hygiene Association

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UPDATE ON MIHA'S ACTIVITIES (NOV 2003 TO NOV 2004)

MIHA is growing fast thanks to the support and promotion by its members. Currently MIHA's membership stands at 65 Full members, 40 Associate members and 3 organizational members. It is MIHA's aim to continue to provide useful information to its members via its activities.

Since its conception, MIHA has put together several activities for the benefit of its members. These activities include:

- 1st Technical Industrial Hygiene Forum on 31st March, 2004
- Participated in DOSH OYK/OYB Dialogue—paper presented by MIHA President
- Co-organized 2nd National occupational Health Seminar with Society of Environmental Medicine at Manipal Medical College, Melaka—3 papers were presented by MIHA
- Established IT infrastructure to enhance communication and networking among members : MIHA Committee@yahoogroups.com— a single email contact for MIHA; MIHAMember@yahoogroups.com—to facilitate dissemination of Occupational Environmental Health and Safety news and networking among MIHA members only and MIHAGroup@yahoogroups.com) a free email listing service to disseminate OEHS news to members and non members)
- MIHA president attended the International Occupational Health Association Board of Directors meeting in Australia upon invitation and sponsorship by the IOHA.
- Application of funding from SOCSO for various activities.
- Participated in the American Industrial Hygiene conference and Exposition in Atlanta, Georgia, USA in May 2004—Marina Zainal presented a paper entitled "Industrial Hygiene in Malaysia: Now and Future" on behalf of MIHA/Petronas (co-author with Zainal Mubarik and Wan Sabrina)
- COSH 2004 Concurrent Session organizer—MIHA Members were invited to submit Industrial Hygiene related topics for presentation at the conference organized by the National Institute of Occupational Safety and Health on 20th July, 2004.
- Comprehensive Industrial Hygiene Course from 9th to 13th August, 2004, by Associate Professor Park Do Yoong of Hansung University, Korea.
- Certified Industrial Hygienist Examination by the American Board of Industrial Hygiene on September 11th, at NIOSH Bangi.

LASER GENERATED AIRBORNE CONTAMINANTS SYSTEMS……PART 1

By JOHN YOUNG of PUREX INTERNATIONAL

Laser Generated Airborne Contaminants (LGACs) is a term used for dust and smoke which is generated when a material is processed with a laser.

Lasers are increasingly used to mark, etch, cut and weld a wide variety of materials in automotive plants, packaging lines, medical procedures, aerospace manufacture and many others. They offer an alternative to traditional processing methods and coupled with the right fume extraction system, deliver excellent results in terms of precision, machining time, flexibility and performance. To comply with International Health & Safety Regulations, fume extraction is required for most laser operations in order to protect personnel and to enhance the performance of the laser system itself. It is, therefore, of paramount importance that the correct fume extraction system is specified.

What happens when laser processing?

When a laser beam is applied to the surface of a material, several conditions can occur. High temperatures that are generated cause the air near to the contact point to expand, generally back in the direction of the lens. The laser beam causes incineration, vaporization, melting and softening of the material depending upon the distance from the contact point. Rapidly expanding gases pick up and carry the removable particles and droplets at relatively high velocities away from the product material. The contaminants released consist of a wide variety of gases, in some cases noxious i.e., benzene, phosgene. They also consist of the products of complete and partial combustion including possible oxides of the base material. Stainless steel, for example, releases Chromium and Nickel, which can cause chronic toxicological effects such as liver/kidney disease and cancer.

Production problems caused by LGACs

During laser processing, gases, vapors and particulate matter are released as airborne contaminants, which in most cases can be classified as harmful if inhaled. Airborne particles also cause problems for the laser if they are allowed to be deposited on the lens or remain in the processing area, causing beam attenuation and, therefore, reject rates to increase.

Deposition of particulates within the laser enclosure can result in contamination of the product and also the need for regular cleaning of associated operating equipment. The only practical method of overcoming the above problems is to remove these airborne contaminants as quickly and completely as possible by the provision of a fume extraction and purification system.

The range of materials that are processed with lasers is wide and varied so any purification system must be flexible enough to cope with different volumes and type of contaminants.

Purification system design

Airflow rates of between 80 and 5000 m3/hr will ensure the correct level of extraction from most laser processes. The correct rate required depends on many interacting factors and should, therefore, only be specified by experienced professionals to prevent the provision of an inadequate extraction system. The position and design of the extraction nozzle or enclosure is also a prime consideration if effective extraction is to be achieved, oval or round nozzles should generally be used in preference to thin, slot varieties.

One of the major cost benefits of using lasers instead of conventional methods to process materials is that there are few or no consumables such as drills, milling cutters, saws, etc. Therefore, it is important that any purification system does not nullify this benefit by incurring excessive filter costs upon the user. One method of prolonging the life of a main filter is to use a pre-filter to remove larger particles (=1um) from the air stream before they enter the main filter. These are supplied in different forms, ranging from pads to bags to a patented concertina design that, as filter life is proportional to the area of media employed, offers around 10 times the life of a normal pre-filter. Pre-filters are made from a variety of filter media, and it is vitally important that the correct type is specified by the supplier - otherwise the life of the main filter will be significantly reduced. This is especially true if the material that is processed releases oily or sticky particles.

Many purification systems work on the outdated principle of "top down" filtration which has been proven not to offer the best filter life and may cause filters to split. A filter for laser processes generally contains HEPA (High Efficiency Particle Arrestor) media to filter out harmful particles (99.997% at =0.3 um and 95% at =0.01um) plus a chemical layer to filter gases. In low pressure, "top down" purification systems, the contaminated air enters the machine at the top and takes the least line of resistance at a high velocity through the filter. This means that only part of the HEPA and chemical filter media is used and that the air is allowed to pass through the media at much more than the most effective dwell time. Both of these factors reduce filter life and, therefore, increase consumable costs for the user. Particles can also collect in the pleats of the HEPA media due to gravity and can cause it to split (especially when the particles are moist), releasing hazardous material into the workplace without the operator's knowledge.

MIHA'S ADVISOR

DIRECTOR GENERAL OF THE MALAYSIAN DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH, IR. HAJI ABU BAKAR CHE MAN HAS ACCEPTED MIHA'S INVITATION TO BECOME THE ORGANISATION'S HONOURARY ADVISOR.

HIS ROLE WILL INCLUDE ASSISTING MIHA IN ACHIEVING ITS GOALS, PROVIDING DIRECTION AND ADVISE ON THE RUNNING OF MIHA.

COMPREHENSIVE INDUSTRIAL HYGIENE REVIEW COURSE

MIHA received excellent reviews from participants of the above mentioned course co-oganised with Perkeso. The course was held from August 9th to 13th at Subang Sheraton Hotel, Subang Jaya.

Looks like we must bring Professor Park to Malaysia to conduct this course again!! Those who would like MIHA to repeat this course please register your interest by emailing MIHACommittee@Yahoogroups.com.

LOOK OUT FOR

NEW REGULATIONS

BASED ON THE CHEMICAL WEAPONS

CONVENTION ACT, 2000

IN MIHA ' S NEXT

ISSUE

Continued from previous page……

The solution to the aforementioned problems is found in the "Reverse Airflow Principle". This causes the contaminated air to slow and turn through 90 degrees when entering the purification machine. This action causes larger particles to drop out of the air stream, thus preventing premature filter blockage and particles can no longer collect in and cause the pleats of HEPA media to split because the air is traveling upwards. Air equalization plates containing holes with a cross sectional area which correspond mathematically with that of the pump air inlet should also be used. These, in conjunction with the reverse airflow system, cause the air to slow to the speed at which the filter media is most effective and ensure that the full area of filter media is used. They also increase the rigidity and security of the filter themselves. Some materials release corrosive vapor when processed with a laser; for example, PVC produces Hydrochloric Acid vapor which coalesces inside the purification machine. In "top down" systems, the liquid HCl can travel through the filters and collect on the electrical wiring and the motor below causing corrosion and a possible fire risk. Reverse airflow systems, on the other hand, allow the acid to drip onto an absorbent pad where it can be safely dealt with.

Another method of greatly increasing filter life is to utilize high-pressure pumps that are able to overcome the resistance in a filter as it becomes blocked for far longer than a low-pressure system is able. The high pressures that are generated necessitate the use of reinforcing that should be employed between the pleats of HEPA media to prevent them from splitting.

PART 2 of this article will be continued in the next newsletter. Part 2 will look at Health and Safety and Environmental issues with regards to laser usage.

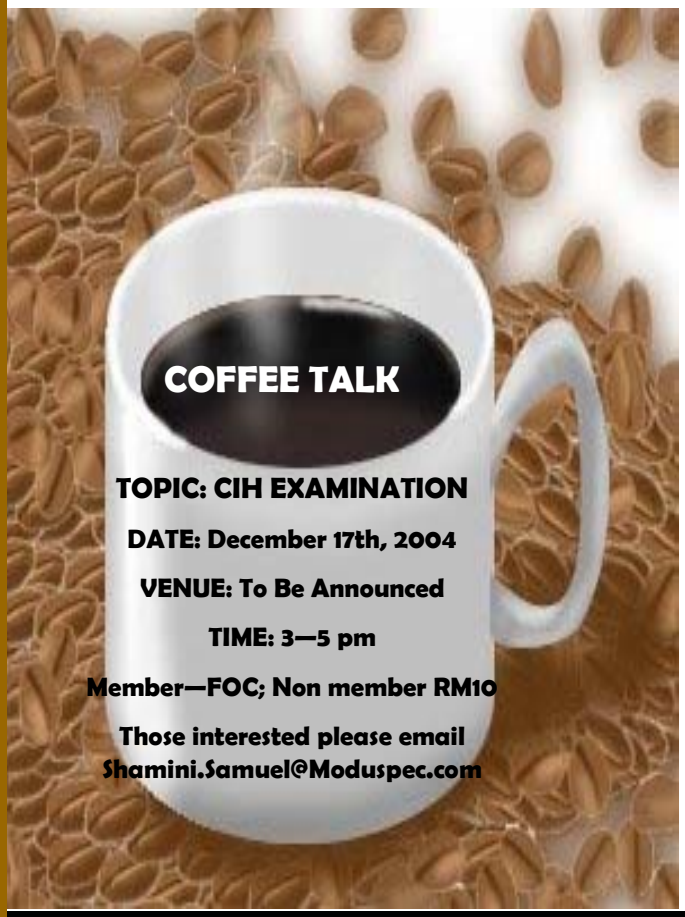
Source: Industrial Hygiene News, January 2004
Contributor: Ms Chan Kah Yin

EVENTS TO PLAN FOR….SEE YOU THERE

MIHA'S SECOND INDUSTRIAL HYGIENE FORUM:
A TWO DAY ADVANCED PRACTICAL WORKSHOP ON
LOCAL EXHAUST VENTILATION SYSTEM ASSESSMENT

Organized by MIHA
in Collaboration with

At NIOSH's Lecture and
Laboratory Facilities in Bangi, Selangor
1ST Course : Monday and Tuesday 29th & 30th November, 2004
2nd Course : Wednesday and Thursday 1st & 2nd December, 2004
See next page for LEV Workshop Registration Form



REPLY SLIP

COURSE DATE

☐ 29 & 30 th November, 2004
☐ 1 & 2 nd December, 2004

MIHA Member ☐ RM 750.00
Non-Member ☐ RM 900.00

REGISTRATION (One form per participant)

Name :_____
Designation :_____
Company :_____
Address :_____
_____
Contact No :_____
Fax :_____
Email :_____
Date :_____
Signature :_____

PAYMENT DETAILS

(Please indicate where applicable)

I hereby enclose a cheque made payable to MIHA for the amount of RM 750 / 900

Cheque Number: _____

OR

Please invoice my company, attention to _____
_____
_____
Fax number:
_____

Mailing address: _____
_____
_____

PLEASE NOTE

Enrollment is limited to 15 participants per course and thereby advanced registration with payment is required and accepted in the order received.

Cancellation must be in writing. Refunds, less a cancellation fee of RM150, will be issued up to five working days prior to the start of the course; all cancellation received thereafter is nonrefundable. MIHA reserves the right to cancel/make changes to its courses as necessary. If the course is cancelled for any reason, MIHA assumes the liability limited to a refund of the course fee only.

Please send your duly completed registration form with payment to:

Malaysian Industrial Hygiene Association
c/o Secretary of MIHA (Wan Sabrina),
19, Jalan USJ16/2B, 47630 Subang Jaya
Selangor, MALAYSIA
Fax: +603-80244890 (accepted for registration only, confirmation of registration must be followed with payment)

Further enquiries with regards to the course, contact:
Wan Sabrina at 012-2041322 or Evelyn Kuan at 012-6880075 or
Email to MIHACommittee@yahoogroups.com