



Chapter News Letter


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EDITORIAL . . .


Rajendra M Patil

Hello Friends,

It's my immense pleasure to present the News Letter of September 2021. It will be released at the time of AGM in 1st week of September with special Focus on following topics.

MKSSS's Cummins College of Engineering for Women, Nagpur Successfully conducted an installation ceremony of its Material Advantage Student Chapter affiliated to ASM International, Pune on

13th March 2021. Pune chapter has started Globally First Women on Material Advantage chapter.

We organized 2nd ASM lecture series for polytechnic students. As part of Students' outreach, a lecture by Mr. Nitin Datar on "Metallurgy a way Ahead" was given to Polytechnic students on Ring Central Platform on 17-4-2021. Students and lecturers from Government Polytechnics of Pune, Kolhapur and Nagpur took part. 135 students attended the lecture.

ASM International Pune Chapter held a technical lecture on "Potential Business Opportunities in Metallurgy and Material Science Engineering" by Mr. Lalit Kumar Pahwa on Ring Central platform on the 8th May 2021.

Women are the largest untapped reservoir of talent in the world.

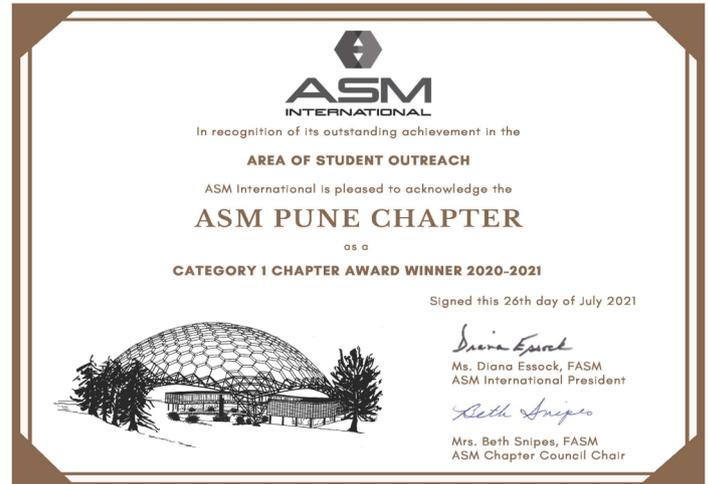
On Saturday, 6th March 2021, to celebrate this talent and to salute women in Materials field, a special program was arranged by ASM International Pune Chapter, under the guidance of Chairman Mr. Udayan Pathak (GM, ERC Tata Motors Ltd, Pune).

Lady Metallurgists have contributed immensely for development of Metallurgy in India. We have organized above women's day program which was appreciated globally by ASM & has got wide coverage in AM & P. We have formed a task group for higher women participation.

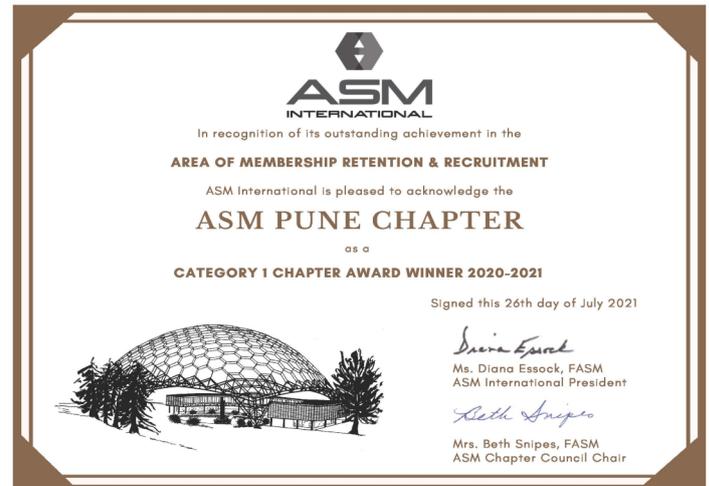
ASM International, Pune Chapter has done outstanding achievement in following area in the guidance of Chairman, Mr. Udayan Pathak & Awarded as follows.

- 1) AREA OF STUDENT OUTREACH- Category 1 Chapter award winner 2020-2021.
- 2) AREA OF MEMBERSHIP- Category 1 Chapter award winner 2020-2021.
- 3) AREA OF INNOVATIVE PROGRAMS- Category 1 Chapter award winner 2020-2021.

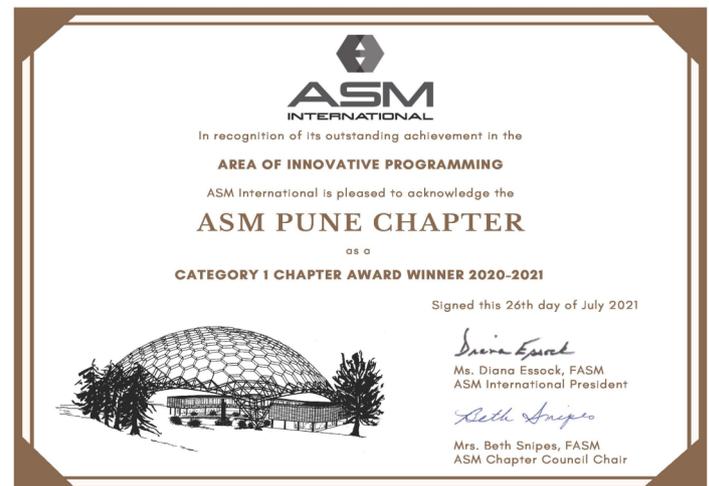
Regards,
Rajendra M Patil
 Editor



STUDENT OUTREACH AWARD



MEMBERSHIP RETENTION & RECRUITMENT AWARD



INNOVATION PROGRAMMING AWARD

From Chairman's Desk:

Dear ASM Colleagues,

Greetings!

I am sure you all, your family members and fellow colleagues are safe during Covid – 19 pandemic. It's nice to get connected with you through this newsletter, after almost 8 months. I am sure we will be meeting more regularly and frequently in days to come.

It's matter of pride for all of us, that, our chapter bagged **Three Chapter Recognition Awards** of ASM International. They are in the areas of **Students Outreach, Member Recruitment & Retention and Innovative Programming**. You will be happier to know that ASM Pune Chapter is **Globally the ONLY Chapter**, to get three Awards this year. These awards is an Executive Committee on focus areas Diversity, Students Outreach, Sharing.

We adopted New Normal quickly and We have organised more than fifty only one or two programs, others were @ Materials Team lead by Jaswandi Materials Engineers. They celebrated appreciated. The program even on some unique program to enhance Activities, please wait for details.



Udayan Pathak, FASM

You might have noticed, that, we are three months in advance. This will be programs. Our Students outreach Technical Topics students need support

soft skills. Additionally, with an outbreak of Covid-19 Pandemic, need also emerged out for Counselling the students, to address the challenges arising out of Covid -19 Pandemic. The team has identified new speakers & resource persons to address this need. Deepak Kulkarni, Retd. Principal, Govt. Polytechnic Nagpur, Mohini Limaye, Blogger and Akola, Dr Aparna Rajhans, Hyderabad, Mrs Aruna Deo – Zalte from Pee Vee Textile, Jam Dist. Nagpur are few names out of these resources.

One of the biggest challenges faced by our Chapter is retaining and increasing our membership. While team lead by L D Deshpande is working meticulously, we need your active support. I appeal all of you, to bring at least one New Member this year in our Chapter.

You may be aware, Special India Task Force was formed at global Level to enhance ASM activities in India. Dr Ravi Ravindran, Dr S Sudarshan, Navin Manjooran are actively driving this forum. You might have noticed as an outcome of this Task Forces Efforts, we at India are getting special annual membership rate of US \$ 52 (against standard annual membership fees US \$ 100). One of the major challenges faced by us is due to courier issues, our Chapter Sustaining Members were not getting hard copy of ASM Magazine AM&P, regularly. We started special arrangements to ensure the delivery of hardcopy of AM&P from Oct 2021 to all sustaining members.

Our Awards committee is focussing on streamlining process of Chapter Awards. They are also studying criteria for various awards of ASM International and they will guide our members for applying for these awards.

You might have noticed, that names of dedicated executive committee team members are almost same for years. We are looking for young volunteers and new faces to take lead roles in chapter management. I on behalf of Executive Committee, request all young members to take lead in chapter management, senior members will be happy to guide you for taking chapter to new heights with fresh ideas.

Looking forward for your more vigorous support from all of you.

Udayan Pathak, FASM.



Technical Article - LASER HEAT TREATING

LASER HEAT TREATING :

Laser hardening, is a process in which a laser beam illuminates the surface of a metal part for the purpose of heating it to a desired temperature, typically above the metallurgical transition temperature, for both the metal's surface and its heat affected zone (HAZ). When the laser heat source is removed, the thermal mass of the metal rapidly quenches the heated area by conduction, with the result that the treated part of the metal has the desired hardness.

The details of the laser beam's operation can be finetuned to exercise precise control over all aspect of the hardening process, delivering energy with great precision, and allowing for rapid quenching. Importantly, depending on geometry, laser heat treating also allows treatment via line-of-sight for areas that are difficult to reach by other means.

LASER--Light Amplification by Stimulated Emission of Radiation -A device produces a coherent beam of optical radiation by stimulating electronic, ionic, or molecular transitions to higher energy levels.

Laser hardening

The diagram illustrates the laser hardening process. A red laser beam is directed from a 'laser' source onto a metal surface. The beam is labeled 'laser beam'. An arrow indicates the 'processing direction' moving to the right. The area directly under the beam is labeled 'zone of intensive heat (austenitic structure)'. The area immediately behind the beam is labeled 'hardened zone (martensitic structure)'. Below the surface, arrows point downwards, labeled 'intensive cooling'.

Laser hardening is a heat treatment process or surface hardening process in which a laser beam is used to heat the surface of a metal part and then let it quickly cool down in air.

This process is used on ferrous materials suitable for hardening,

Incandescent lamp

- 1) Many wavelengths
- 2) Multidirectional
- 3) Incoherent

Vs

Laser Light

- 1) Monochromatic
- 2) Directional
- 3) Coherent

Because of these properties the laser stores or concentrates the energy like heat at very small place in sub microns

LASER HEAT TREATABLE MATERIAL-Any steel with greater than 0.2% carbon content is treatable by laser heat treatment. The LHT treated dies are generally as hard, or harder than, conventionally Treated dies. For example- EN19, S7 Tool Steel ,S7140 Alloyed Steel ,M2 Tool Steel ,G2500 Grey Cast Iron ,,G25HP Grey Cast Iron ,A2 Tool Steel ,410 Stainless Steel ,G3500 Grey Iron ,D2 Tool Steel & 420 Stainless Steel.

RESULTS

Martensite is a body-centered tetragonal form of iron in which some carbon is dissolved.

Martensite forms during quenching, when the face/body centered cubic lattice of austenite is distorted into the body centered tetragonal **structure** without the loss of its contained carbon atoms into cementite and ferrite

The large increase in volume that results creates a highly stressed structure. This is why **Martensite** has a higher hardness than Austenite for the exact same chemistry

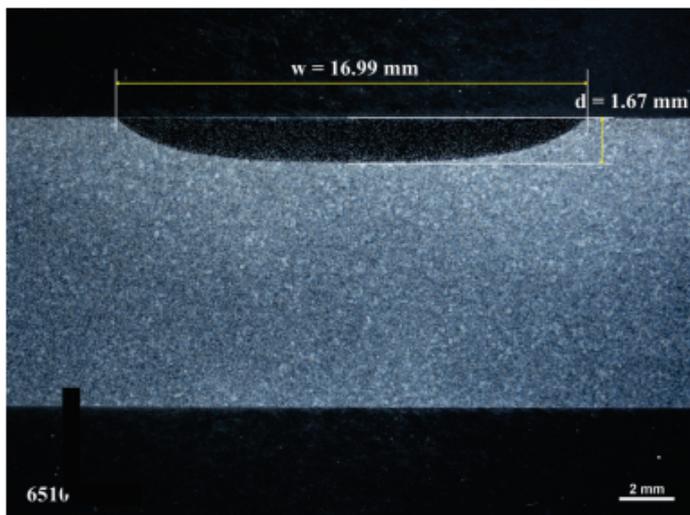
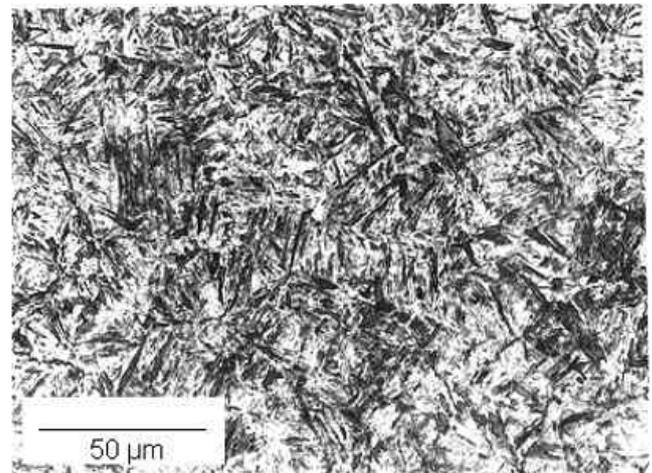


Fig. 2 – Metallurgical cross-section of laser heat treated D6510 die material.

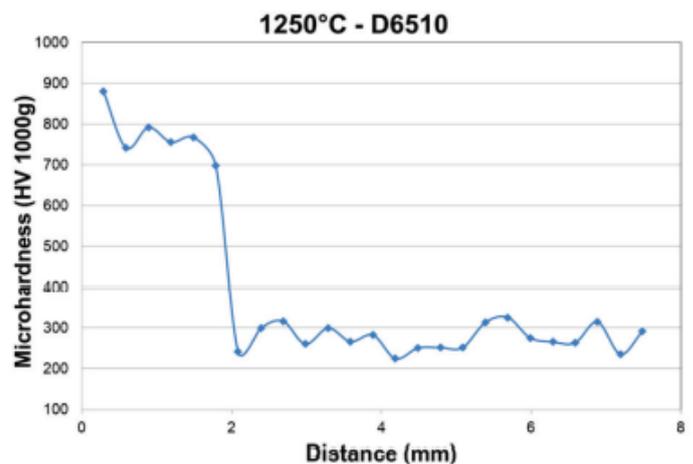


Fig. 3 – Hardness profile of laser heat treated D6510 across the depth. Average hardness of 760 HV (62.5 HRC) was recorded on the D6510 test sample shown in Fig. 2.

BENEFITS OF LASER HEAT TREATING

Compared to conventional heat treatment techniques, such as induction, furnace, and flame heat treatment, LHT's benefits include:

Compared to conventional heat treatment techniques, such as induction, furnace, and flame heat treatment, LHT's benefits include:

- Consistent hardness depth. By allowing precise, millisecond-level feedback control of the delivery of energy to the metal itself, LHT can produce a HAZ with exacting specifications, including consistent hardness depth.
- Minimal to zero distortion. Laser heat treatment automatically delivers the smallest possible total energy to the die under treatment for any size HAZ. This intrinsic feature of LHT automatically results in minimal to zero distortion in most large sizes of automotive dies.
- Laser heat treatment reduced the yearly cost by 28.4%.
- Precise application of beam energy to work spot. Flames or coils need not be in close proximity to the work area, resulting in the heat being applied only to the intended area, with minimal to zero heating of adjoining areas.



- Base material characteristics are maintained.
- Short cycle times.
- Temperature controlled process.
- No contamination of the part surface.
- Delivery time dropped from 17 to 13 days, a net speedup of 23.5%
- Total energy reduction was significant, although not computed here. This may result in savings if carbon credits become monetized.
- No hard milling is required on large automotive dies. Because of LHT's low-to-zero-dimensional distortion, post treatment material removal is limited to tiny amounts, which can be removed by polishing and abrasion, with no hard milling required on most automotive stamping dies.

Laser heat treating in the fabrication and maintenance of automotive dies usually results in cost savings, primarily from the complete elimination of the post hardening dimensional restoration processes.

CONCLUSIONS

Laser heat treatment is a process that is likely to expand in the automotive and other metal part manufacturing sectors. LHT faces no significant barriers to adoption, aside from the ones that are common to any emerging technology. These include lack of familiarity, lack of hard data, and a shortage of existing suppliers. The savings, measured by cost, schedule, quality, and energy reduction, are significant and are well supported.



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- Various avenues to Contribute in Building Nation

Contact : ASM Pune Chapter asm.pune@gmail.com;

L. D. Deshpande, Chairman, Membership Development Committee l.d.deshpande@gmail.com

WOMEN'S DAY CELEBRATION BY ASM INTERNATIONAL

Women are the largest untapped reservoir of talent in the world.

On Saturday, 6th March 2021, to celebrate this talent and to salute women in Materials field, a special program was arranged by ASM International Pune Chapter, under the guidance of Chairman Mr. Udayan Pathak (GM, ERC Tata Motors Ltd, Pune).

On this occasion Vice president of ASM International (2020-2021), Department Head, P. B. Breneman Chair, and Professor of Engineering Science and Mechanics at Penn State University, Prof. Dr Judith Todd addressed the participants about ASM International initiatives for Diversity and Inclusion and gave insight of Equality and Equity. Ms. Anuradha Das, Head of Human Resources, Engineering & Research Centre (ERC), Tata Motors Ltd

shared her experience on increasing the participation of women on shop floor. She spoke about efforts in creating the brigade of WOMEN IN BLUE by sourcing, training and skilling of rural and urban girls. Ms. Mukta Kulkarni, managing director, Industrial Enterprisers also shared her experience which motivated many women participants to learn finances along with formal technical education.

Important event of program was panel discussion on 'Diversity and Inclusion' in which panellist Ms Anuradha Das, Dr. Judith Todd, Dr.Kanyakumari Datta-Proprietor Data Metallurgical Company ,Dr.Sarika Verma - Principal Scientist and Associate Professor at AMPRI, Mr. Mangesh Shetye- Sr. General Manager Carraro India expressed their valuable thoughts on importance of Diversity and Inclusion and how to bring in inclusive culture at work place. The session was moderated by Ms. Jaswandi Gotmare and concluded by Ms Debbie Aliya.



Volunteer yourself for your Chapter!

For more efficient working & expanding network of your ASM International Chapter, please support your chapter by offering your time. Lot of avenues to choose areas of your liking. Options are - Membership Development, Education Programs, Students Outreach, Member Service, Website, News Letter, Technical Program and Social Events. Contact ASM International Pune Chapter asm.pune@gmail.com



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UPCOMING TECHNICAL LECTURES

SN	Month	Topic	Speaker	Venue	Date
1	Sept'21	Latest Development in Dew point Analyser	Naval Patel	Ring Central	23-09-2021
2	Oct'21	Metalurgical characterization	Prof. Abhinandan Admuthe	Ring Central	21-10-2021
3	Nov'21	Failure Analysis & Problem Solving	Ruta Barve	Ring Central	18-11-2021



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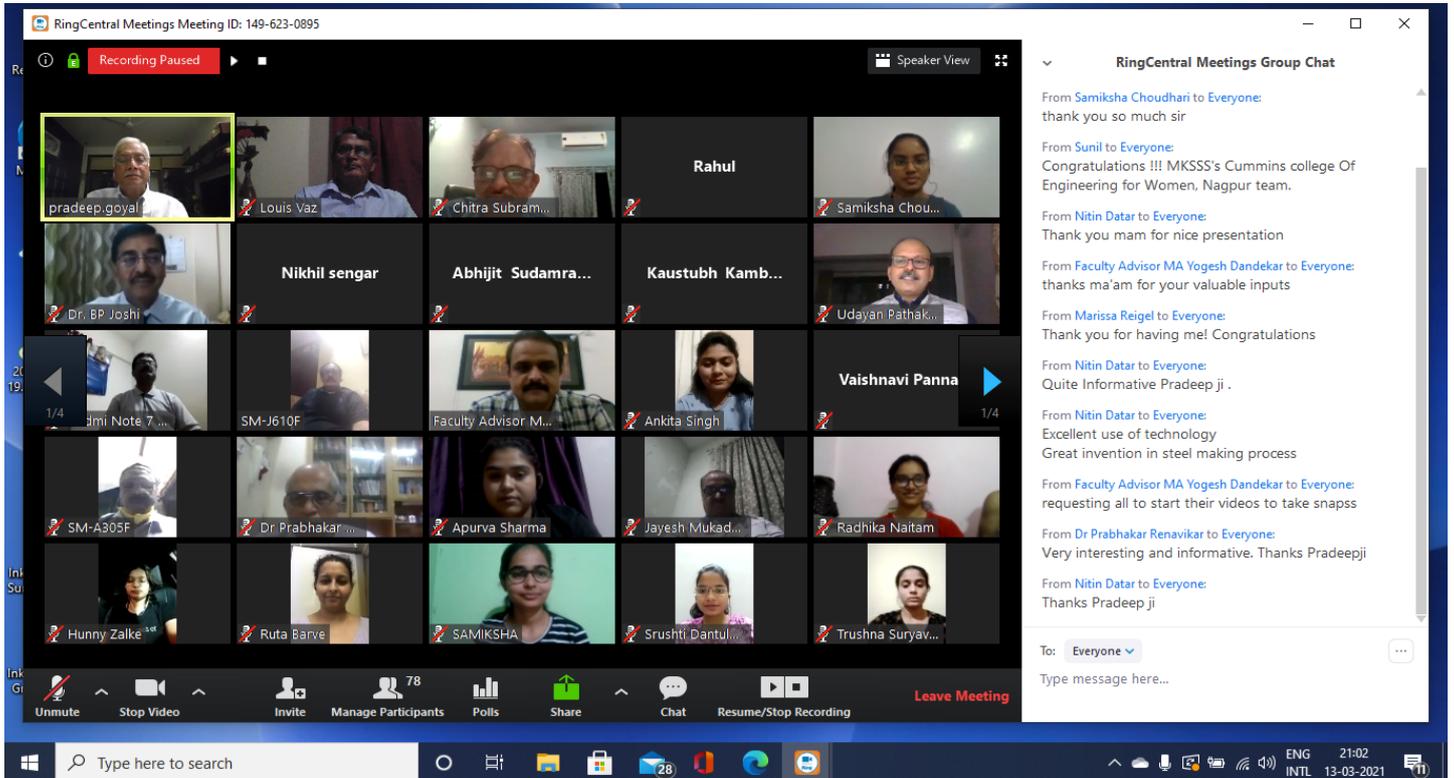
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INSTALLATION OF MATERIAL ADVANTAGE STUDENT CHAPTER AT MKSS'S CUMMINS COLLEGE OF ENGINEERING FOR WOMEN, NAGPUR



MKSS's Cummins College of Engineering for Women, Nagpur conducted an installation ceremony of its Material Advantage Student Chapter affiliated to ASM International, Pune on 13th March 2021.

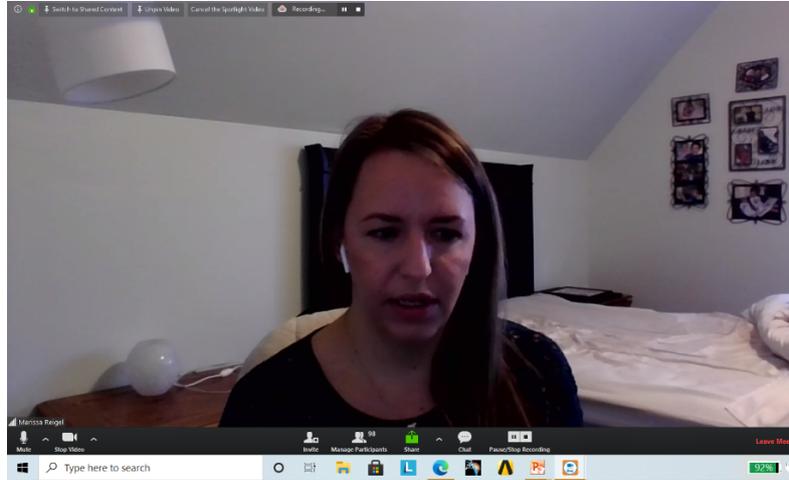
Happy to share that it is the 1st in Nagpur and amongst the 3rd chapter in Maharashtra and probably the first ever only women chapter of Material Advantage program. Chapter is affiliated to American Society of Materials (ASM), American Ceramic Society (ACerS), The Mineral Metal and Materials Society (TMS) and Association of Iron and Steel Technology (AIST).

Dr. Marissa Reigel, Chairman (Inclusion, Diversity, Equity and Awareness) IDEA committee of ASM International and R&D Execution Manager at Savannah River National Laboratory, South Carolina, USA was the Chief Guest of the program. She briefed about IDEA committee activities and also enlightened the audience about contribution of women in material science field.





Speaker for the Technical Talk was Mr. Pradeep Goyal, FASM, Past Trustee, ASM International and Member of India National Council of ASM, Chairman & MD, Pradeep Metals Ltd. He delivered a talk on Microwave Heating and shared his experience in the field.



Pradeep Goyal

- Founder, Chairman and **Managing Director** at Pradeep Metals Limited
- Mr. Pradeep Goyal is a qualified engineer having completed his **B. Tech (Metallurgy)** from Indian Institute of Technology, Kanpur .
- He obtained his **M.S. (Materials Science and Engineering)** from the world renowned **Massachusetts Institute of Technology**, Cambridge, USA, .
- He has been a Trustee of **ASM International, USA (2005-2008)**, A **Fellow of ASM International (FASM)**.
- He also worked at **Air Products and Chemicals Inc.** Allentown, PA, USA for 3 years at various positions before he joined as Whole Time Director of Pradeep Metals Limited .
- He was promoted as **Chairman and Managing Director** of the Company .
- He is also currently on the Board of **Directors of Munak Engineers Private Limited, UPL Limited, Uniphos Enterprises Ltd, Hind Rectifiers Limited and S. V. Shah Construction Services Private Limited. Ltd.**
- He is also a Member of **Indo- German Chamber of Commerce, Indian Merchants Chamber** and **Thane Belapur Industries Association.**
- He is also the Chairman of **Ekal Vidyalaya Foundation** of India, an NGO which operates over 50000 tribal schools in India.

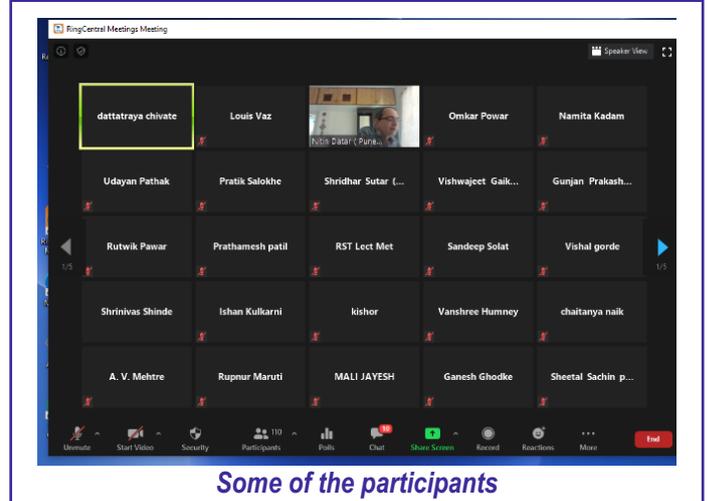


The chapter conducted competition on New Logo Designing and Ms. Shruti Dhole's logo was finalized and bagged 1st position. She was given a book named "From Frog-lapping to Pole-vaulting" written and signed by Padma Vibhushan Dr. Raghunath Mashelkar.

The event was attended by students, faculties of MKSSS's

“Metallurgy a way Ahead”

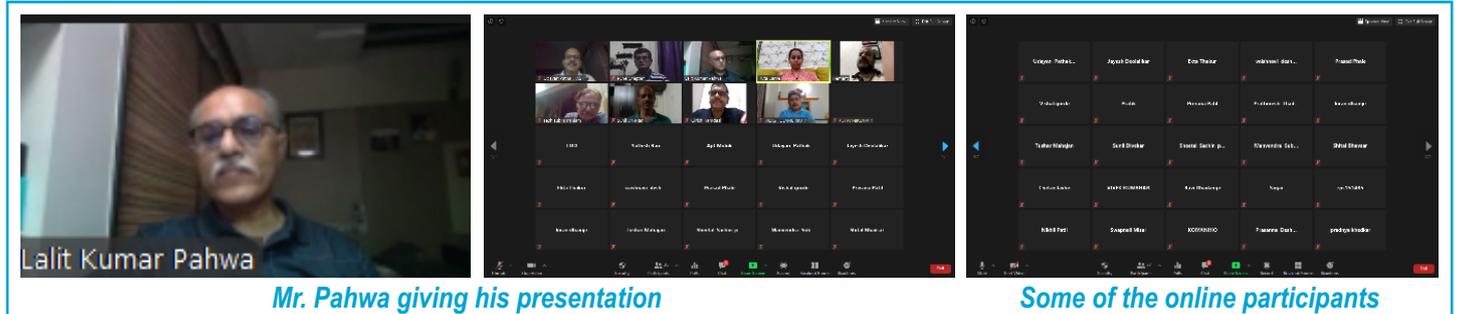
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Mr. Datar shared the future opportunities in material science and metallurgical engineering. He explained that earlier there was very limited scope for metallurgical engineers but now a days metallurgical engineers are in great demand. To name a few he gave examples where metallurgical engineers are in demand like welding engineer, plant metallurgist, ballistic engineers, vendor development, chemical, physical metallurgy, purchase, R&D, design, finance and IT. He also gave a list of well-known companies which require metallurgists. BHEL, ISRO, DRDO, NTPC, Indalco, Finolex, Tata group of companies, TCS, etc. were some of the companies he named. He also showed a clip on steel making, etc. The students gave a lot of importance to his lecture as could be seen from the question and answer session. The question and answer session went on for more than half an hour and Mr. Datar gave satisfactory answers to each and every students' queries.

“Potential Business Opportunities in Metallurgy and Material Science Engineering”

ASM International Pune Chapter held a technical lecture on “Potential Business Opportunities in Metallurgy and Material Science Engineering” by Mr. Lalit Kumar Pahwa on Ring Central platform on the 8th May 2021.



There were 52 participants. Mr. Pahwa explained that there are many opportunities in Metallurgy and how we should take advantage of it.

Very many a times some entrepreneur takes up this opportunity but does not know how to take it forward. He explained some basic steps to solve the problem.

1. Identify the problem
2. Solve the real problem
3. Ensure that your solution is a complete solution.

He gave practical examples of how to tackle these opportunities.

Mr. Pahwa gave the example of metal powders. Metal powders are used for 3D printing. There are hardly any metal powder manufacturers in India. Metal powders have a very large scope so it is a good business opportunity to manufacture quality metal powders. Another example he gave was that of copper. Copper has very good anti-bacterial properties so the application of copper is also a potential business opportunity. The question answer session was very interesting.

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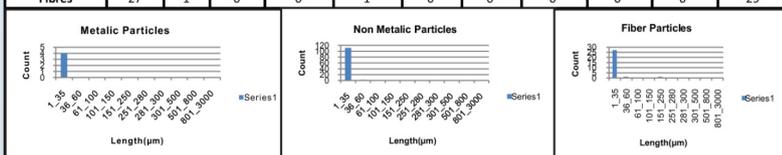
PARTICLE TEST REPORT.

Customer	ABC		
Part No:	A124N	Recd Date:	04-Jun-18
Report No.:	1672	Department :	QA Lab
Sample ID:	ABC	Test Date:	05-Jun-18
Analysis:	Particle	Standard Specification:	As per ISO 16232
Magnification	100X	Filter paper Size:	47 mm
No. of Fields :	5	Scanning Area	30 mm



Particle Size Analysis

Size ranges(µm)	1_35	36_60	61_100	101_150	151_250	251_280	281_300	301_500	501_800	801_3000	Total Count
Metallic	4	0	0	0	0	0	0	0	0	0	4
Non Metallic	111	3	0	0	1	0	0	0	0	0	115
Fibres	27	1	0	0	1	0	0	0	0	0	29



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