

Fabrication Techniques for Mems-based Sensors: Clinical Perspective
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Lecture – 37
Gowning Procedure for using Biological Lab Setup

Welcome, this is another module where we are introducing the various components of a microfabrication lab. In the previous modules we have seen how the gowning process is to be done, the importance of an air curtain at the entrance of a lab and the particulate count that needs to be different particle counts that are maintained in a lab. So, as we have seen this lab we are maintaining it as a class 10000 clean room so that means, 10000 represents a number of particulate matter, the limit of the number of particulate matter that can be there within the clean room.

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So, there cannot be more than 10000 particulate matter above 5 microns. Main component used maintain the clean room environment as I have mentioned is HEPA filter. HEPA stands for High Efficiency Particulate Air. So, the filter has different components, it has a positive pressure module and a tower module. So, Seetharam here is standing next to a tower module. The module is used to circulate the air inside the clean room environment. As you can see we have different tower modules within the lab there is one next to Seetharam now, he is moving towards the next tower module that we have.

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Now we have another partition as you can see inside where we do biological testing with our sensors. So, before we enter that we have to wear goggles, we as we have introduced before.

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So, Seetharam will wear the goggles and go inside and show you another tower module that is kept inside the lab. So, he has worn the goggles, now he is he will enter the next section in the lab.

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And there is another tower module that is kept inside the lab. So, these tower models are used for circulating the air. Apart from this there is another positive pressure module that acts. So, Seetharam is moving towards the positive pressure module he will point you to that positive pressure module.

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You can see his gloves so, that is a positive pressure module it is like an air condition system, but in a much more grander way what the positive pressure module does is it will

suck in air from outside, clean it using a series of very complex filters and push that cleaned air into the lab at a high pressure.

So, the whole lab environment will be maintained at a slightly higher pressure compared to the outside world. This ensures that particles from the outside cannot enter the lab so easily. Once this positive pressure module pumps in clean air into the lab this air needs to be circulated. The tower modules which we saw which will again which Seetharam will again point to these tower modulus will ensure the circulation of air within the lab. So, these two systems have to work hand in hand, along with our good lab practices to maintain that particulate matter count within the lab.

Now, you might think the HEPA filter is there, the filter only will clean clear everything and fill in even if the internal particles there are more number of particles the filter will clean it up no the filter has its own limitations. So, we have seen the two components of the HEPA filter. Now, that Seetharam is outside the biological section, he and he is not doing an active work so, he will keep the goggles back into this goggle tray.

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The HEPA filter is a very core part of maintaining a clean room environment. Then you might think you can just the HEPA filter will take care of the particulate matters why we are much concerned about the a gowning procedure and cleanliness aspects of it. That is because they every device has his limitations the HEPA filter Has a series of filters, these filters are first of all very costly and they have a limit of filtering that they can do and

they have a lifetime and replacement time. If there are so, much dust particles inside our lab and outside the environment also, we are loading the HEPA filter to filter the particulate matters.

So, we have to do whatever is possible from our end to maintain a clean environment so, that the lifetime of the HEPA filter is extended. So, once again when will tell the positive pressure module, tower module four tower modules are there inside this lab as you can see, one in this section and two in the other section and the positive pressure module is in the other section.

These five components of the filter maintains the class 10000 clean room, that we are intending in this laboratory setup. For a lab that maintains much more stringent class standard like a class 10 or a class 1000 clean room, the HEPA filter system which will be much more elaborate with lot of positive pressure modules and tower modules kept at frequent intervals or distances in the lab so, that the particulate matter is kept under very strict control. So, this is how clean room environment is maintained in the next modules we will get into the equipment that are used within the lab.

Thank you.