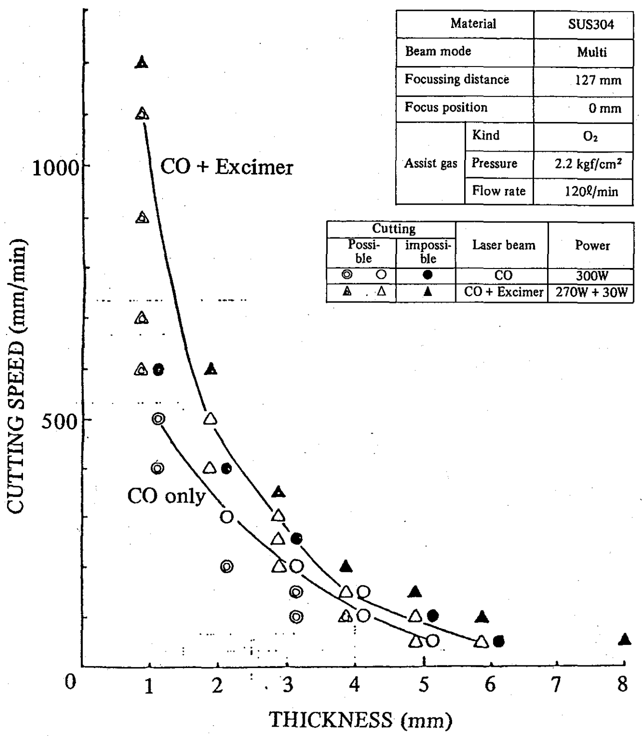
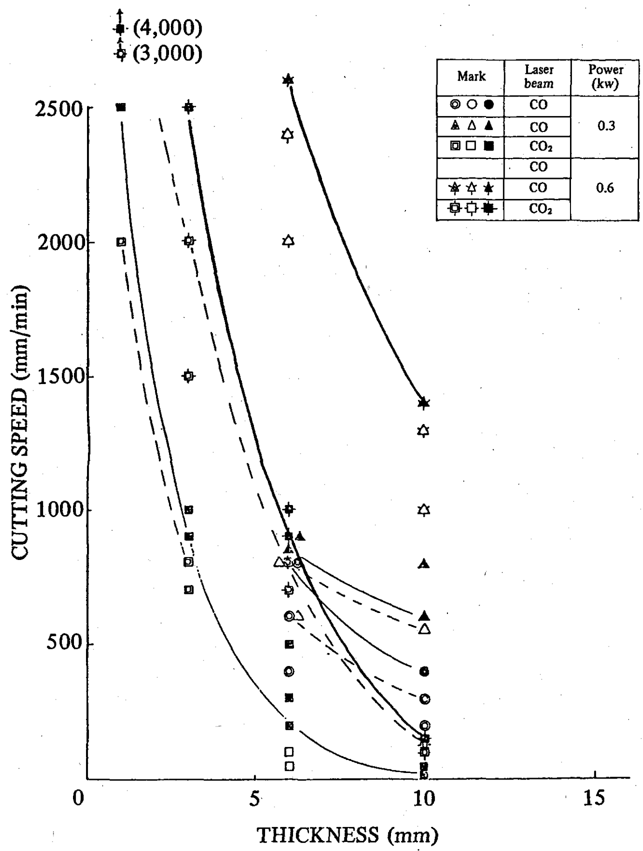
be possible but you definetely won't operate in a ragion by forming no liquid. In fact, we wrote a paper on this some years ago. For examples that I cited was in the Ospray or other droplett processes where you in fact and up operating regieme and I think the big difference is the thinckness of the coating, if you are putting down the thickness of few microns or few tens of microns, you can very easily get in regiene no liquid is formed. If you're actually putting down and much thicker layer maybe or milimeters or tens of milimeters than you'll have a liquid wall. But I'm glad you raise this and give on a chance to correct a possible misinterpretation.

"Role of Lasers in Modern Materials Processing"

Dr. E.A. Metzbower

Comment (*Dr. T. Fujioka*) :
Up to now, CO_2 laser and YAG laser have solely been used for experiments on laser material processing, such as metal cutting, welding, etc. However, it is questionable whether or not the wavelengths of these two lasers are best suited for each of the ultimate purposes of applications. Particularly, 10.6 μm, the wavelength of CO_2 laser, is considered to be too long for many areas of application. Based on above thinking, we have been conducting experiments to develop other lasers than above, and also experiments using these new lasers.
In this conference, I will review the preliminary experimental results and the states of arts on the three lasers: CO laser, I laser, and excimer laser.





Question (*Dr. Wallach*) :
The development of lasers in material processing seems to follow those of electron beams in the field of, say, joining and cutting. Now electron beam process is used extensively in the semi-conductor industry i.e., for micro technology, and lasers also already have been used for microsurgery. Even though the wavelengths of the live techniques are very different, please would you comment on the possible use of lasers for microtechnology in materials science.

Answer (*Dr. Metzbower*) :
First of all, I have never had any experience in that area, but secondly I always have a view on something whether it is right or wrong. I think the problem that we are talking about is the problem of resolutional wave length. With the small resolution, on the small wavelength you can get with the electron beam. There's a lot of very "Nano-science" that can be done with an electron beam but car not be done or accomplished with the laser. On the other hand, we haven't been able to figure out how to use an electron beam to go in and do some of the surgical aspects laser can do. I think that lot of ways we're talking about complementaly and sometimes overlapping process. And I think this is a process you described for the most

part are a sort of complementaly and they cannot be done by the laser. On the other hand, I look back the utilization of laser to change the semi-conductor industry by using the lasers as a heat source and it seems to me that, that was something pushed about seven or eight years ago, and it has never really come to the whole front. Because another competing mechanism was judged to be much more economical.

"Superlatices and their Applications"

Prof. R. Yamamoto

Question (*Prof. Shinjo*) :
Thank you, prof. Yamamoto, especially because you have included some of my results in your talk. Unfortunately the time is too short, so I will ask you to summarize again your opinion about the sample preparation technique. Because we are preparing actually many kind of multilayers but we have only used the vacuum deposition technique.
However you're using a lot of techniques not only the vacuum deposition, but also spattering and films. So, in case of metallic films to prepare the artificial superlattices with best quality.
How is you opinion? This is my first question.

Answer (*Prof. Yamamoto*) :
We're using the various techniques to compare the advantage and disadvantage of each method. I think the advantage and disadvantage depend on the superlatices themselves and depend on the problem itself. So far as to synthesize the more idealize superlatices, the molecular beam epitaxcy is much better than the radio frequency method. I suppose prof. Shinjo would like to stress that the temperature of the substrate should be lower than the room temperature, that is liquid nitrogen temperature. However, some researchers emphasize that a substrate temperature should be higher than room temperature. But I don't know exactly which is correct.

Question (*Prof. Shinjo*) :
Another small question is about your last table. I didn't see the super modulus effect. It is really, as you mentioned, one of the very interesting special property of the multilayers and actually you have shown some examples, but I don't know if it is really useful for technical or practical use.

Answer (*Prof. Yamamoto*) :
I think it's useful in future such as multilayer ceramic coating for tools fields.

Comment (*Prof. Shinjo*) :
I'd like to make a small comment. I am also making many types of multilayers and we confirm there is a lot of possibilities to make new materials, so as prof. Yamamoto said already. I think we have still good possibility to find new superconducting materials in the metallic systems.
Nowadays, oxyside superconductors have gathered too much attention but in metallic system also we have a hope to find another type of superconductors. That is my comment. Thank you very much.

Question (*Prof. Iwamoto*) :
What kind of ceramic multilayer material do you think applicable?

Answer (*Prof. Yamamoto*) :
In the near future, so many researchers will produce the many kinds of ceramic superlatices, including an oxide-oxide superlatice, oxide-nitride superlatice. And they will intend to synthesize a new oxide superconductors or ceramic sensors. Some ceramics are hetrointerfaces can be used to sensor of water concentration. So, we can use a ceramic multilayer film for many applications. So, sensors and multilayer coatings and multilayer coated electrode.

Question (*Prof. Wallach*) :
I would like to ask another question. The comprosis of strategy for innovation and in the lots of paper by Prof. Yamamoto, Prof. Shinjo said about superconductors and perhaps the lots of work could be done.
To either of the people or anybody else here have a feeling of strategy for doing this. It seems to somebody not in the field but everybody wants to work in this area and they all followed the low instinct but there isn't yet a strategy as such. So if you have any comments on or how you're interested in.

Answer (*Prof. Yamamoto*) :
Our group now synthesize oxide superlatice. Because we imagine most of the oxide superconductors are layered compound. So Yitrium case or Bismos system or the compound on the layered compound. I think if we control layering period, we can enhance the transition temperature or critical current by using the oxide superlatice. We are producing the oxide superlatice, this is a one-point.
And the second strategy is that we're also trying to synthesize the metal and organic superlatice. Third strategy is to synthesize a compound semi-conductors and the metal superlatice. This superlatice was investigated in detail by Prof. Kobayashi at Osaka University.