Rekayasa microneedle pada proses biomachining dengan menggunakan bakteri acidithiobacillus ferroxidans NBRC14262 = Microneedle engineering based on biomachining process with acidithiobacillus ferroxidans NBRC14262 bacteria

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Abstrak

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Engineering merupakan ilmu yang mempelajari proses merekayasa pembuatan suatu produk sehingga mempunyai fungsi yang bermanfaat sesuai dengan desain yang dirancang. Dalam pembuatan suatu produk pasti menemukan kendala ? kendala tertentu sehingga harus dilakukan analisa kembali dalam menemukan jalan keluar untuk menyelesaikan kendala ? kendala yang ditemui. Salah satu kendala yang sering ditemui dalam proses pembuatan suatu produk adalah adanya efek secara fisik kepada benda kerja yang dilakukan proses permesinan seperti panas maupun tegangan yang dapat mengakibatkan kerusakan pada benda kerja. Peneliti ? peneliti sebelumnya telah melakukan riset jangka panjang dan menemukan salah satu cara yang dapat dijadikan solusi dalam proses permesinan. Alternatif yang ditemukan adalah penggunaan bakteri yang digunakan sebagai cutting tool dalam proses permesinan. Beberapa keunggulan yang dimiliki oleh proses biomachining adalah ramah lingkungan, tidak terjadi thermal damage pada permukaan benda kerja serta hemat energi. Dalam peneltian sebelumnya telah dilakukan proses kareakterisasi terhadap material nickel dimana terdapat pertambahan kedalaman permesinan seiring dengan bertambahnya waktu proses biomachining, sehingga pada penelitian kali ini peneliti akan melakukan variasi waktu yang lebih lama dan optimalisasi kondisi temperatur lingkungan proses biomachining pada suhu 330C, selain itu bentuk pola yang akan digunakan pada proses biomachining berbentuk lingkaran dengan tujuan untuk melakukan rekayasa dari bentuk microneedle, microneedle merupakakan jarum dalam bentuk micro yang biasa digunakan sebagai alat uji kesehatan dan proses pemberian vaksinasi pada manusia . Proses rekayasa microneedle bermula dari pembuatan pola lingkaran dengan ukuran 3mm hingga kecil 400μm dimana akan dilakukan perbandingan kontur dan sufrace roughness dari setiap hasil lingkaran yang terbentuk pada proses biomachining.
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<i>ABSTRACT
;Engineering is a knowledge that studies about makings a product which has usefull function according to design . In makings a product must find some problem that has to be reviewed back by re-analysis to find a way out or find the solution. One of constraint which often been found when creating product is physicall effect when processing engineering machinery that create hot condition and also tension who can damage the object. Previous researcher have research in long time and they found several ways which can be the solution in engineering process. One of the famous alternative is biomachining which used bacteria that is utilized as cutting tool in machinery process. Some reason which had by biomachining process are environmentally-friendly, there were not happening thermal damage on object surface and energy saving. In previous the researcher did characterisation process to significant nickel characteristic where the result was the depth of material is increased proporsional to increased condition of biomachining time , so this time the

researcher will increased time variation and optimalize the condition of temperature in biomachining process which is 33 0 C, on the other side researcher will make a new pattern form that will be used on biomachining process, that new form is a circle that will be used as a microneedle mask, microneedle is several needle which shaped in micro that is different to the ordinary one, microneedle was being utilized as tool for vaccination application on human .Microneedle enineering started from making several pattern with size 3mm until 400μm, until then researcher will do contour and surface roughness comparison of each model which is the result from biomachining process., Engineering is a knowledge that studies about makings a product which has usefull function according to design . In makings a product must find some problem that has to be reviewed back by re-analysis to find a way out or find the solution. One of constraint which often been found when creating product is physicall effect when processing engineering machinery that create hot condition and also tension who can damage the object. Previous researcher have research in long time and they found several ways which can be the solution in engineering process. One of the famous alternative is biomachining which used bacteria that is utilized as cutting tool in machinery process. Some reason which had by biomachining process are environmentally-friendly, there were not happening thermal damage on object surface and energy saving. In previous the researcher did characterisation process to significant nickel characteristic where the result was the depth of material is increased proporsional to increased condition of biomachining time , so this time the researcher will increased time variation and optimalize the condition of temperature in biomachining process which is 33 0 C, on the other side researcher will make a new pattern form that will be used on biomachining process, that new form is a circle that will be used as a microneedle mask, microneedle is several needle which shaped in micro that is different to the ordinary one, microneedle was being utilized as tool for vaccination application on human .Microneedle enineering started from making several pattern with size 3mm until 400μm, until then researcher will do contour and surface roughness comparison of each model which is the result from biomachining process.]