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Composite Cutting

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Abstract— There are very few process involved in cutting of composites that includes water jet cutting and laser cutting only but both the process have lot of disadvantage and are uneconomical at both machining and environmental level. While machining this both process are not suitable and have their own disadvantage which are really harmful for both the environment and human beings. This has to be taken into consideration that the loose of resources like water for operations like cutting will not lead to sustainable development but instead will lead to serious issues that will affect our future. For this irradiation of previous processes has to be done and new process has to be incorporated to save our resources and lead in future.

I. INTRODUCTION

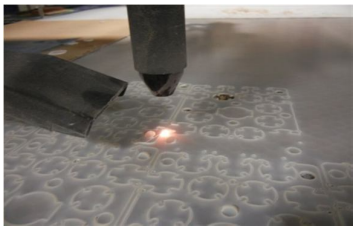
Cutting of composites is one of the major problems in production industry today. Not many processes are available to cut composites. this is due to the composite components ,the components available in it have different properties and are mainly responsible to determine the kind of cutting operation they can withstand, very often this is seen that composites cannot withstand heating , cooling operation , this is because their physical and chemical properties will alter very much , so at last the only process that is available to cut composites is only water jet cutting, which includes sending a very high velocity water at the cutting area and due to force cutting occurs frequently, the main disadvantage of this process is that excessive loss of water which is really a big problem. Even if the cutting of composites is done through it areas harm to the cutting edge ,cause laser has heating inside it and due to heat the bending of edges of cutting surface occurs which results in further finishing operation thus wastage of time and clearance has to be taken which laser cutting of composites . These are the main disadvantages of the current processes used n cutting of composites. So there is an urgent need of advancement in cutting process of composites to much extent. This is very important because this will affect the rate of water that is getting wasted regularly in cutting of composites. so just seeing every aspect of proper cutting of composites include examining the proper process that can be incorporated to cut composites that is suitable for cutting any composites regardless of theur properties . composites will revel the main properties that are specially hardness and strong composition which is mainly difficluit to cut them and requires a high force to cut them. Till now this is only given by high velocity of water. Without this high speed of water jet it is not at all possible to cut through composites. But due to increasing losses and waste of water, this procedure of cutting composites with water has to be removed also it is necessary to find some alternate to this process. Another very popular method of cutting composites is the use of laser but very important point here to notice is that we cannot simply cut composite because it will lead to bending of cutting edges ,which further requires the finishing operations that is again time consuming process. So this process is also not that efficient, another process that can be employed is the use of mechanical press of required shape and use of chemical which can lose the surface to required extent but not more than requirement. The operation is very simple but requires definite shaped of press. It also requires chemical that has a unique property of loosening the composite surface without affecting its chemical and physical properties. This should be kept in mind because if that chemical affects the physical and chemical properties of those composites then there is probable chance that material will fail to complete its original purpose. Every material has the proper purpose and aim to be applied in some particular area of application. Many things including the life of composite and its properties are the main things to be kept consistent. A proper machining operation is the one which does not change the physical and chemical properties but does the operation in such a manner that anything happens the properties should not get disturbed. The very important property of the operation I stated above is the disturbance in physical and chemical properties for some particular period of time.

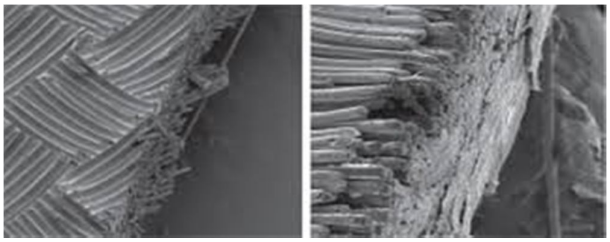
II. THE INNOVATIVE PROCESS

When the operation has to be employed the proper solution is applied on the surface of material composites which loosens the surface of composite to some particular limit such that the chemical properties remains the same but physical properties very to a certain limit without affecting the nature of operation. Its very important to note that the properties which are disturbed should be retained in order to maintain the use of material in that field for a particular period. Just consider an example that there is a composite which has to be cut in order to proceed further. Now it is dipped in some particular liquid that is having the property of lessening the surface of composites to a particular limit, after that the size and shape of which it has be cut is decided. Press having that shape is employed, composite with loss surface is kept in middle and press is employed such that it cuts the material in the required shape. Now the fluid which is used in start to put over the composite surface has to be examined and is in the

process on research. A proper research strategy involves the proper exiting the properties of material and the fluid. If proper fluid is taken in consideration this operation of cutting of composites is totally based on the kind of fluid is used so as to loosen the composite surface. The proper material and its properties are also important to examine before implying the fluid to loses its surface, once the surface is loosen then its very easy to put the material in particular shape press which will apply its operation and material will get cut into required shape. After this is age hardening is done which should be done such that it just make the top surface of material hard enough and rigid also., such that its physical properties gets retained again. This is very important that it should get back into its physical state otherwise the liquid which is used is not suitable for its use anymore on composites. The fluid which has to be used is the vast area of research in this field of cutting of composites; the major importance of this method is any shape is made out of the composite. The age hardening that is done afterwards is totally based on the kind of properties the material has and it is going to retain. Another aspect of cutting of composite by this process is by use of several shapes of press in order to provide proper shape. This is very important process because there may be a thought in the minds of manufacturers that how many different kinds of press has to be made in order to give different shapes. The important part in cutting by press is that it will hold the cutting part, the cutting part can be circular, rectangular or any shape. Bu it is really important to to have proper holding on these presses. probable thing that any person will think will be the holding press will hold different shapes till which shape, but the thing is like they will hold the shapes regardless of any typical shape also they will use cheap iron in order to use it sufficiently and when used can be send for recycling . the area and the application depends on shape and size of what kind the composite person wants. If any how the composite have the irregular shape then it becomes very necessary that the shape has to be incorporated in the form of iron sheet into press which will be used to cut the material

III. LASER CUTTING





IV. WATER JET CUTTING

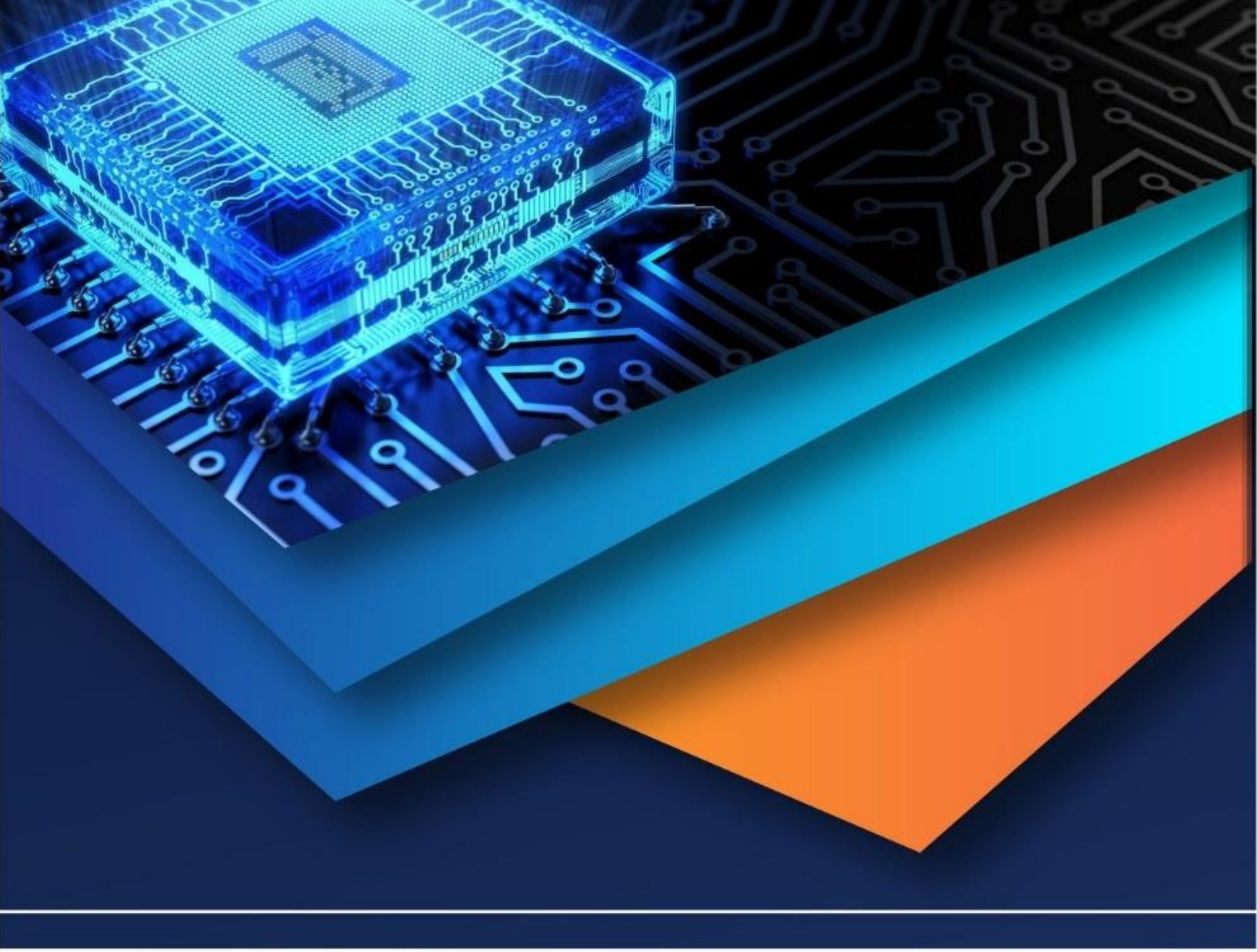
V. APPLICATION

The application part of above methods is restricted to cutting of composites only , this should be kept in mind that the several procedures used today to cut composite this methods is very important and a bit time consuming also. But on the other hand this has to be seen that even though it is time consuming this has the advantage of saving water to much extent, one must assure the positive and negative aspects of any methods that will be applied to any cutting of any kind of composites. This area that is very important because it involves the cutting without the use water and saving lot of recourse and not harming or changing the properties of composites.

Several properties of composites very with their character and composition those are very specific and particular. There are several methods that are to be kept in mind while machining composite this is very particular perspective and minute observation of workmen and the demand the person wants. The machining is very easy if done by above process this has the probability of saving water and reducing the surface finish operations that re to be applied in the previous machining operations. There are many more applications that are mainly related to the composites are under research.

VI. CONCLUSION

The most important method discussed above is the main objective of this paper. This paper mainly aims at the above procedure and its application in cutting of composites efficiently. This process if applied not only will irradiate the waste of water but also will help in consuming time in many ways. This is very efficient process that can be taken into consideration at minimal cost. If anyhow some problem persists it can be taken care of because whatever the problem is it will not cause any machining harm to the product but will only take little bit of time to get irradiate and function efficiently. All the materials used in this process especially for cutting are 100% bio degradable and can be recycled. The proper implementation of this process will lead to several new cutting methods and stresses that will probably help out the machining operations.



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