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## **CLARIFICATION of RULES, for STATOR LAMINATE SHAPE in BRUSHLESS MOTORS.**

During recent weeks, investigations by EFRA, BRCA and ROAR, have detected that after removing the hysol or epoxy coating from the end laminates of various Brushless Motors, it can be detected that the 'sharp edge' on the winding web of the end laminates had been removed to various amounts.

It is a sometimes difficult task to find that this procedure has been done, as the end laminates are coated with hysol or epoxy, which can be difficult to remove without affecting the metal edges. It is also clear that samples submitted for approval may not be the same as those found in production batches.

EFRA, BRCA and ROAR have been working closely together during recent weeks to ascertain the degree of deburring/chamfering that exists. Already, we have found that this procedure varies between manufacturers and also between motors of the same type. It can even be different between the multiple edges on the same stator.

Current rules of the above organisations do not allow the modification of laminates and require that all laminates in the stator have the "same overall shape", but provide no guidance on the degree to which sharp edges can be removed. However, normal engineering practices would recognise that 'removal of sharp edge' is acceptable.

In order to provide objective, measurable guidance to manufacturers; the organisations have agreed to issue a joint clarification of the rule. This makes it clear that any process to remove sharp edges must be confined to the top and bottom laminate in the stator and cannot affect the thickness of the laminate or the overall width of the wire winding web. This effectively limits the edge treatment to a thickness or depth of no more than the thickness of the end laminates.

### **As a result of what has been found by BRCA, EFRA and ROAR, we issue the following clarification :-**

*BRCA, EFRA and ROAR hereby jointly announce a clarification in the requirement that the laminations in the stator stack of brushless motors must have the "same overall shape".*

*There have been differing interpretations of this rule and confusion with respect to the degree of deburring or chamfering allowed on the end laminations where the wire is wrapped around the stator legs or webs. Recent checks of samples sent for motor approval (current and past) and motors in the field reveal varying degrees of edge treatments from gentle deburring to ground chamfers.*

*Effective immediately; the top and bottom laminate in the stator stack of brushless motors made to the rules of the respective organisations may be deburred or chamfered only on the wire winding web/leg so long as the overall thickness of these end laminates is the same as other laminates in the stack and so long as the measured width of the wire winding leg or web of these end laminates is the same as other laminates in the stack. This requirement effectively restricts any deburring or chamfering to only the top and bottom laminates in the stack.*

Regards,

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