

# Modelling Of Folded Curtain Airbag

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**Abstract-** Programmatic experience is assuming an undeniably significant part in the plan, advancement and utilization of airbag security frameworks. As folding designs and airbag structures become increasingly mind boggling, clients are going to recreation based folding answers for create precisely folded models in a short space of time. To fulfill this need, another product instrument called JFOLD has been created by JSOL Corporation to empower effective airbag folding utilizing LS-DYNA®. JFOLD's natural and intuitive framework directs the client through the folding steps utilizing stream diagram illustrations, intelligent apparatus situating/resizing, instrument movement control, activity review and that's just the beginning. This paper presents different folding models.

**Indexed Terms-** IC, FMVSS, JFOLD, LSDYNA, PAM

## I. INTRODUCTION

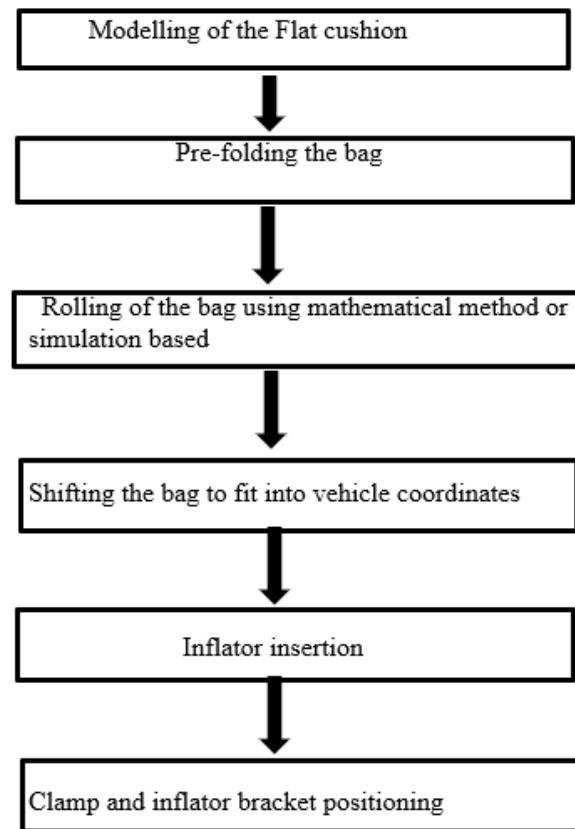
The airbag is a crucial part in the vehicle wellbeing framework to decrease inhabitant wounds during a vehicle crash. Airbags comprise of a texture sack, firmly folding to fit inside the directing wheel, instrument board, front seats, rooftop side rail, etc. The way the airbag is folded can significantly influence its sending rate and shape, and this can impact inhabitant assurance execution. Car and airbag producers progressively use programmatic experiences of airbag arrangement to plan and upgrade more perplexing folding designs. Anyway it isn't not difficult to make the PC model of the folding airbag because of the absence of CAD information for the complex folding calculation. A reenactment based folding approach needs readiness and estimation time yet can be applied to practically any sort of folding design on account of the physical, sensible nature of the folding cycle.

## II. METHADODOLOGY

The Curtain airbags are quiet long in length and width. They must cover the side part of the vehicle during the event of collision to protect the occupant.

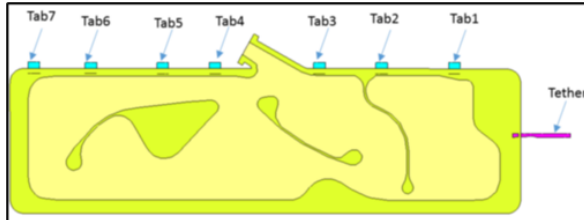
The bag has different parts like Y-sock, Tabs, strap, chamber and base. Y sock is the part where which distributes gas into the front and rear chamber during collision. The bag is inflated by the inflator which is inserted into the Y sock.

Following steps are commonly followed for any IC folding.



These steps are followed to fold the IC. The bag is outboard rolled using the mathematical approach.

The folding can be easily carried out in any of the tools like primer, Pam-safe. The bag can also be rolled by simulation approach by using tool. It's convenient to use mathematical approach to fold.



Flat cushion



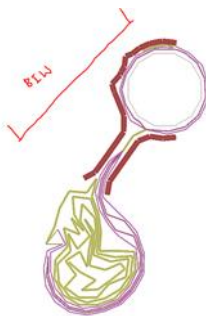
Out Board Rolled cushion



Shifted rolled model



Final model with inflator insertion and clamps in position



Cross section view of folded curtain airbag

### CHALLENGES

Fitting the folded cushion in package space is biggest hurdle. The package diameter varies from 30 to 38 mm depending on the space available in the vehicle environment. The folded elements should not be

stretched or squeezed as this has direct influence on the deployment. The tabs and straps are fixed in order to hold the cushion in place.

There are different methods to inflate the IC in LS DYNA, Constant pressure, Hybrid method and CPM. Usually, the folded bags are inflated using hybrid and CPM method. The CPM method is not completely matured. The folded bag should be from intersection and penetration as this has influence on the deployment speed. The folded IC is used for system level study as well as component level study.

### CONCLUSION

There are different bags like Knee airbag, side airbag, Far side airbag, curtain airbag, Passenger airbag and Driver airbag. We cannot use same method to perform the folding for all bags because these bags are folded in different ways. This paper mainly concentrates on curtain airbags. There are different ways of folding like zig zag fold, outboard roll, pre-fold and so on. The right tool and method has to be used in order to achieve the desired folding.

The folding approach for airbags gives a fascinating method to control its kinematics without the need of adding, deducting or changing encompassing segments or even the airbag itself. The effect of the airbag folding over its arrangement speed and energy may be helpful when there is need of a few critical thinking propositions. Also, it is a minimal expense elective as no additional parts or costly tooling are required. Along these lines, the improvement of an appropriate CAE technique that covers this cycle is absolutely critical.

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