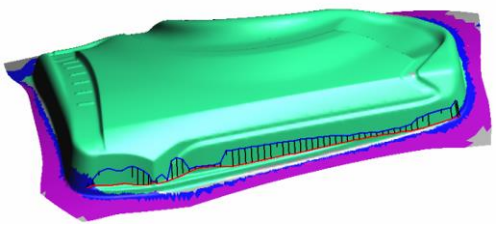
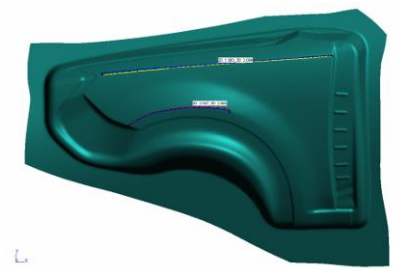
CAE analysis in all operation

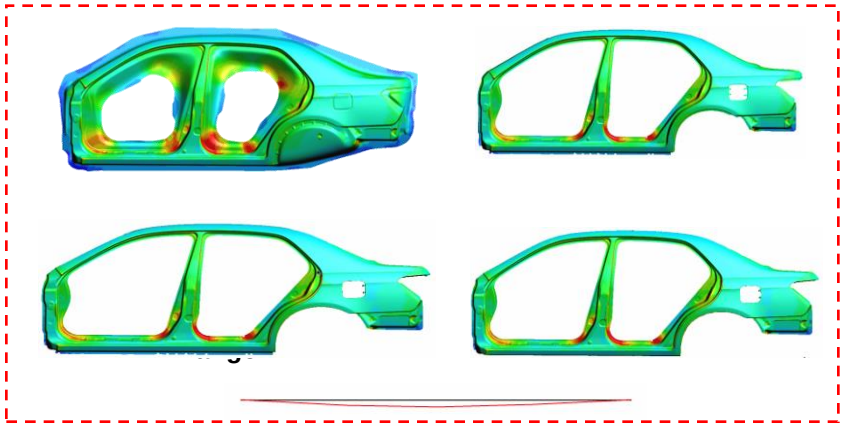
- **Actuarial analysis of draw forming ability : application of large CAE analysis server, using real bead to do analysis verification.**
- **Optimization trim line and forming analysis of flange operation**
- **Spring back analysis and compensation analysis of high strength steel panel, aluminum panel and skin panel etc.**
- **Skin panel：stroke line、slip line、feature line forming analysis.**

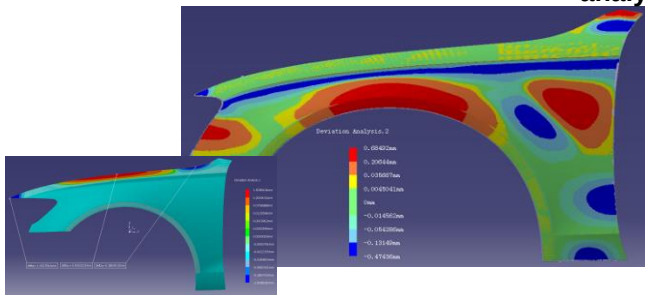


Stroke line movement analysis

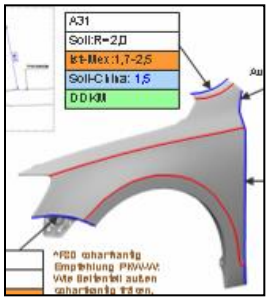


Feature line movement analysis of skin panel

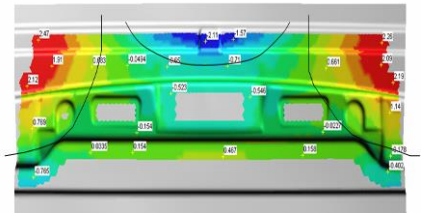




Spring back compensation of skin panels



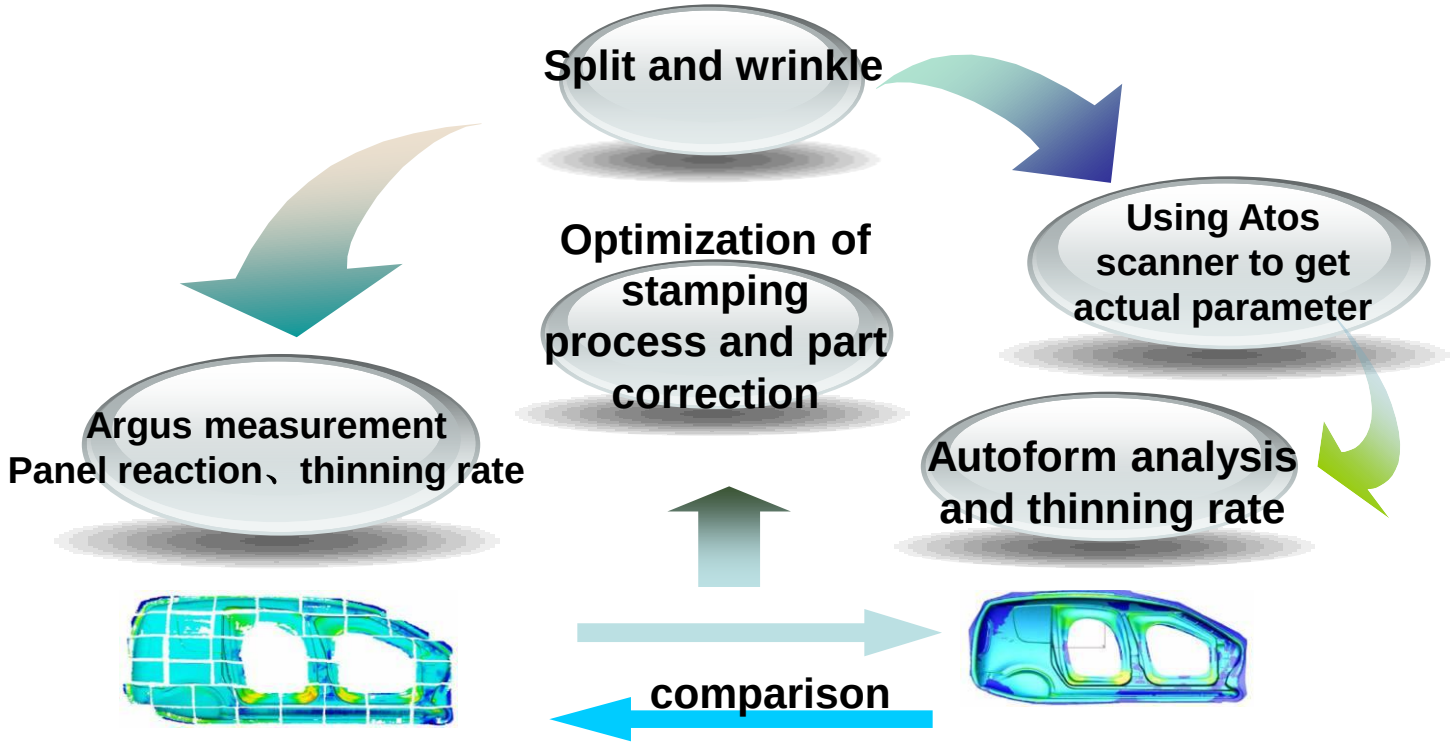
Process design of feature line



Spring back analysis and compensation of high strength steel and aluminum part

Cycle Grid Analysis-CGA closed-loop verification

➢ **Compare the CAE analysis result with cycle grid analysis to optimize the stamping process and come up with part correction.**



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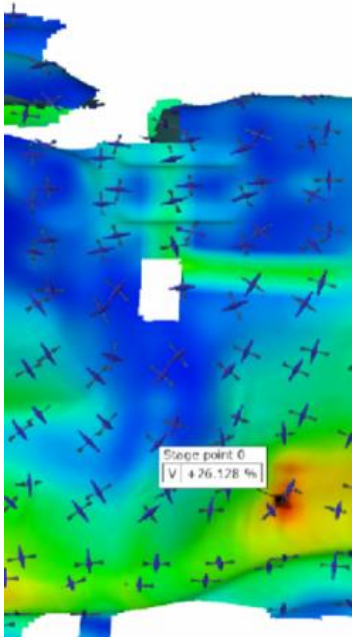
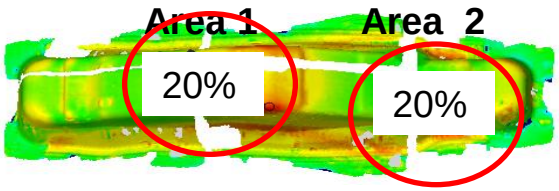
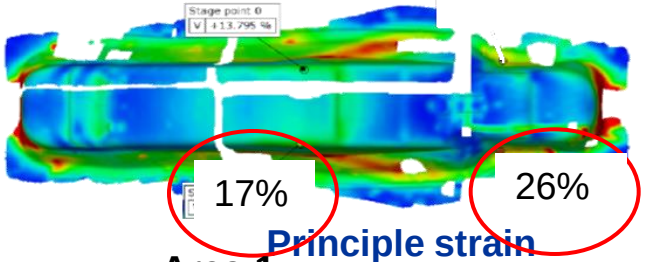
Cycle Grid Analysis-CGA



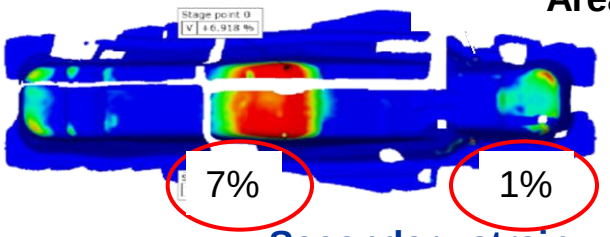
Strain direction



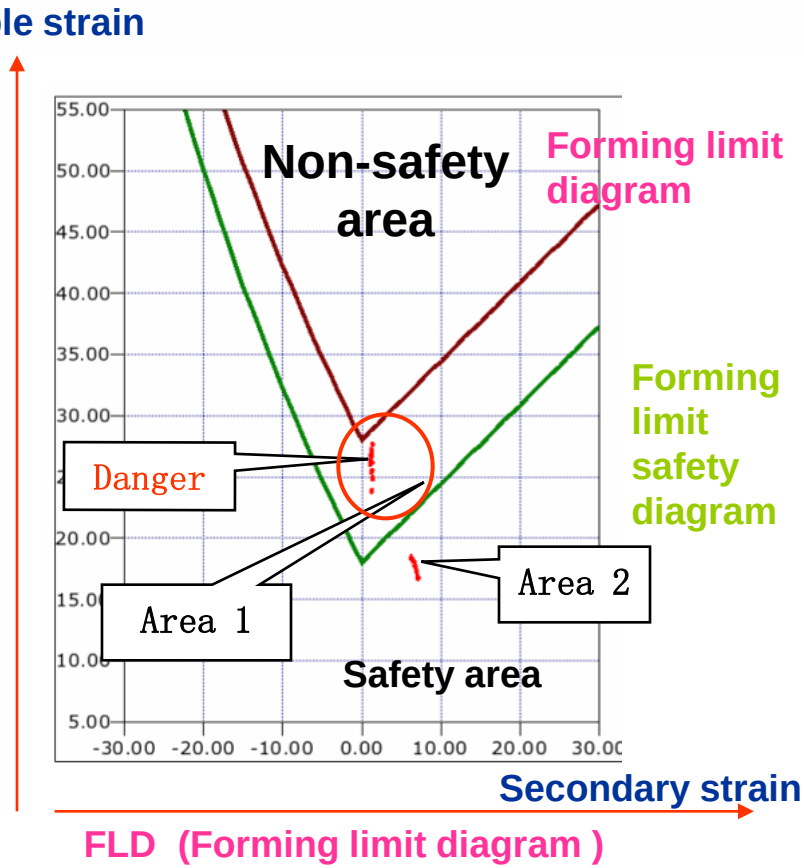
Same thinning rate



Principle strain



Secondary strain

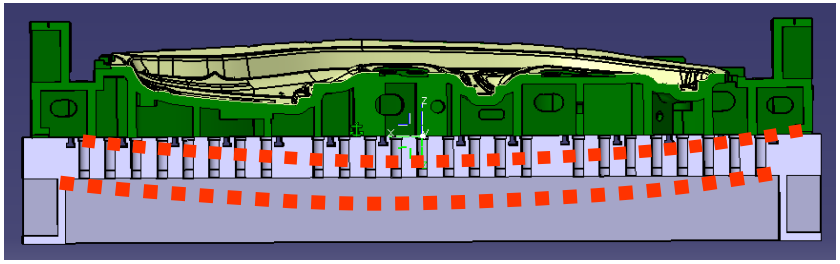


In the past the qualified production should be with good surface quality and accurate dimension.

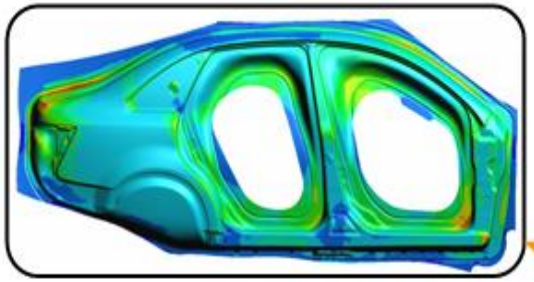
Nowadays the forming result must be safety and stabile further more.

Accurate NC surface design

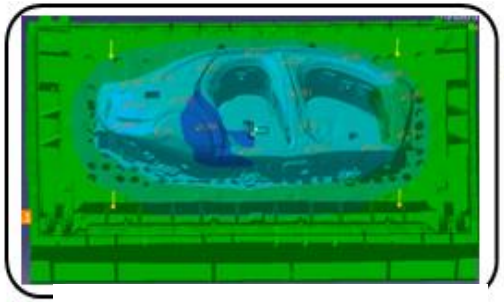
- Clearance between punch and die is even and blank material become thinner during forming, and this will lead to the uneven clearance between blank and die surface, so panel spotting is not good.
- By CAE analysis, we can get a forming force, which will act on the lower die (with the press bolster) directly and cause deformation of the die in the center.



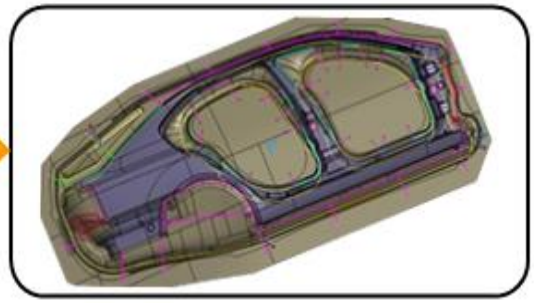
Analysis of die deformation result from the forming force



Uneven thinning result



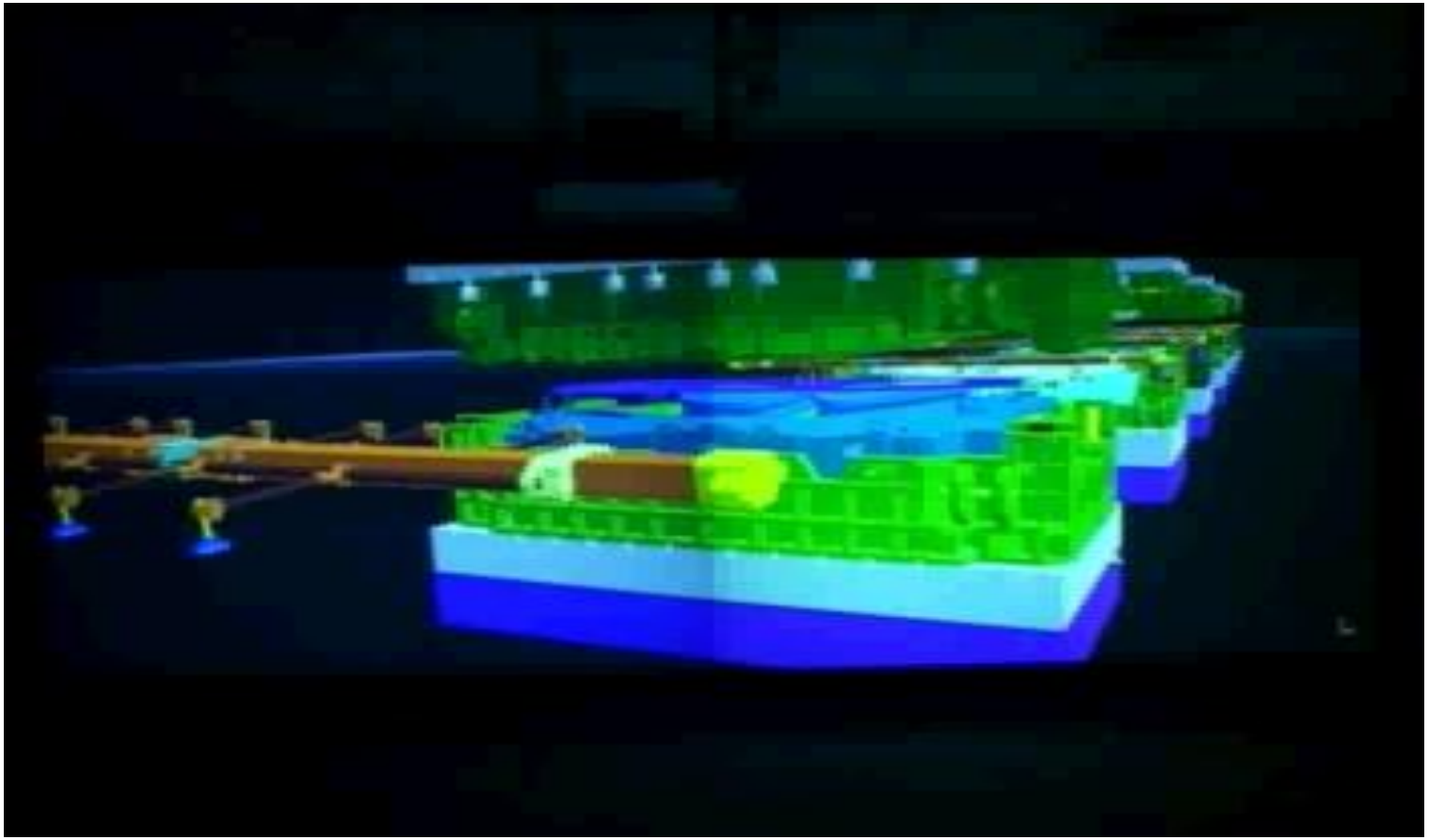
Die deformation



Form compensation

Compensation incorporated into NC surface before NC machine----reduce spotting work by hand.

VR Technique



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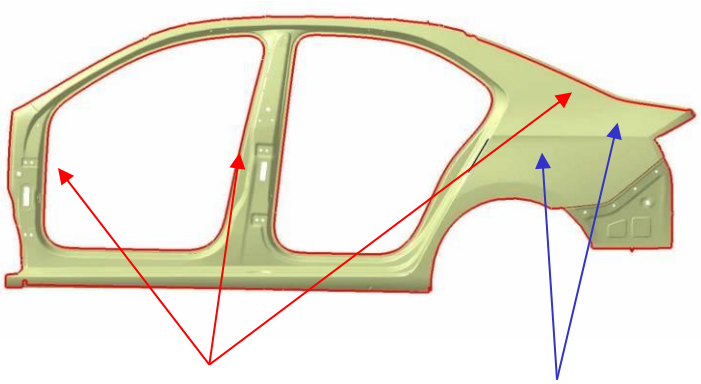
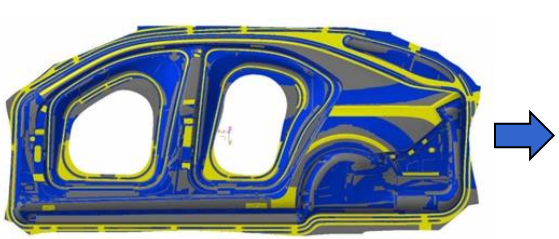
SKODA successful case



Matching surface±0.2mm

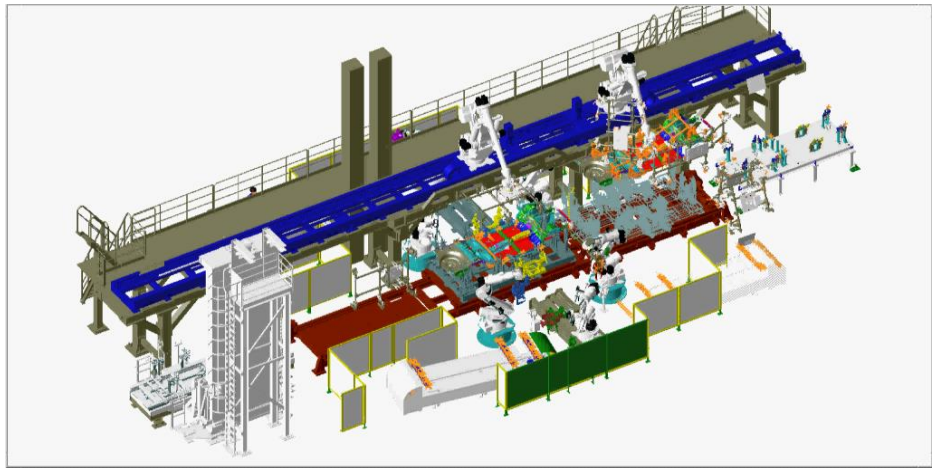
Form±0.5mm



Die and welding jig integration

Stamping pieces produced from die welded through welding jig into BIW, die and weld jig have countless ties like manufacturing based on the same math data model.

Welding line production experience

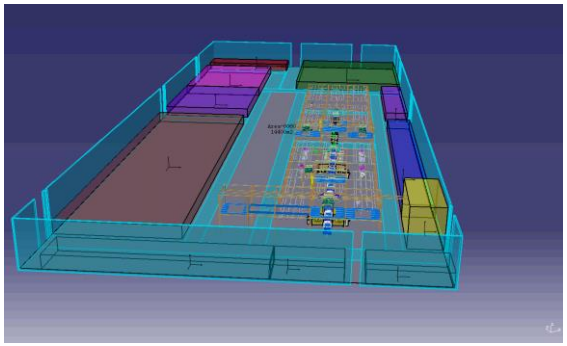


High speed flexible welding line

Overview of high speed flexible welding line

Auto body main jig

Frame welding line



Welding line plant

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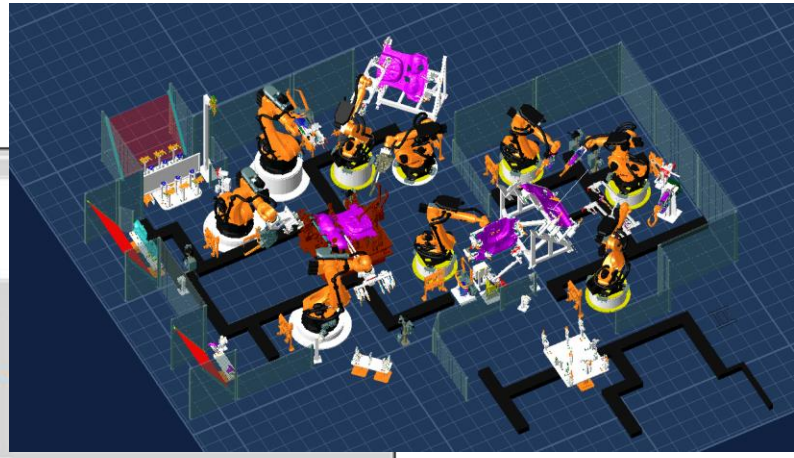
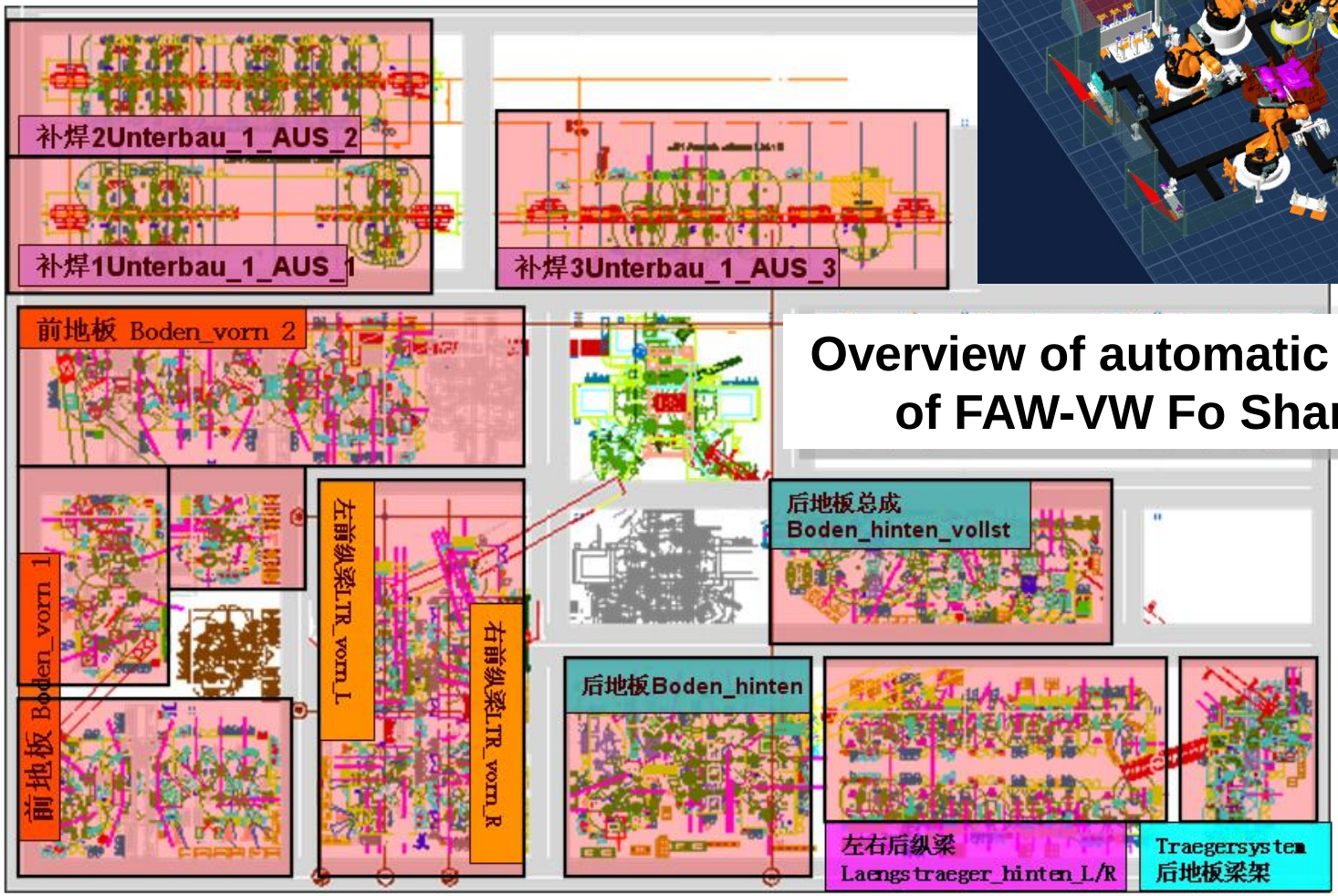
FAW-VW Fo Shan 4 plant underbody welding line





Overview of automatic welding line of FAW-VW Fo Shan project

Die and welding jig integration

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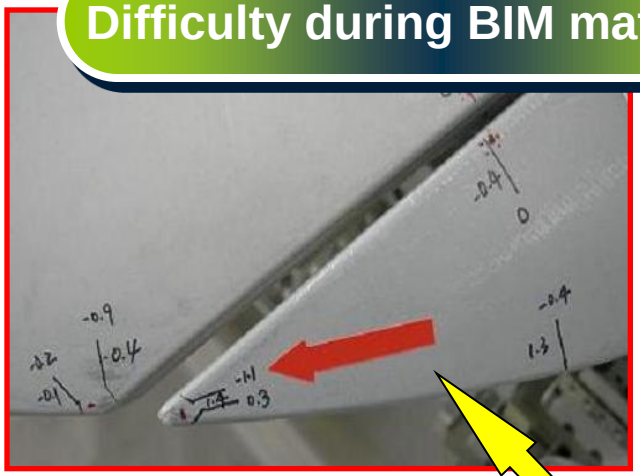
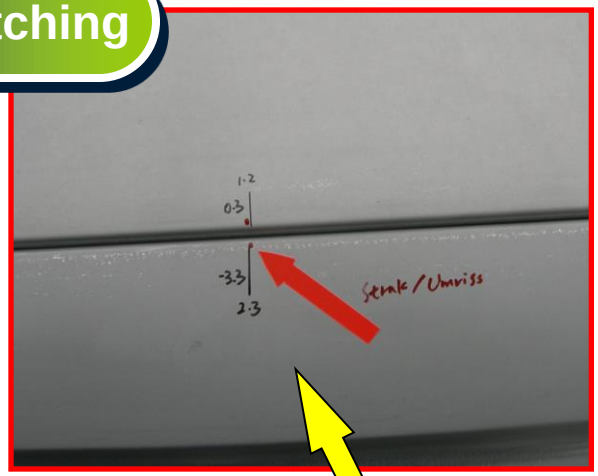
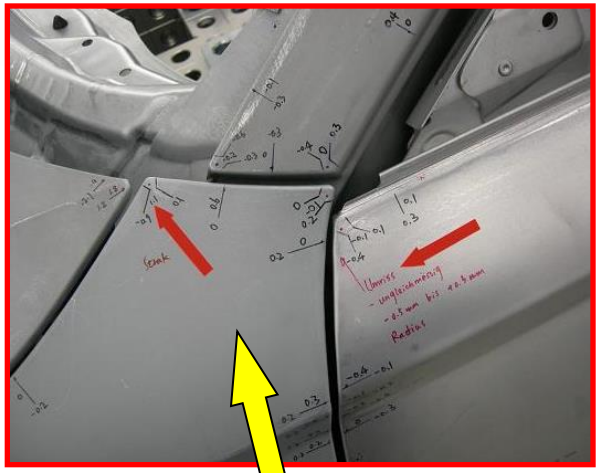
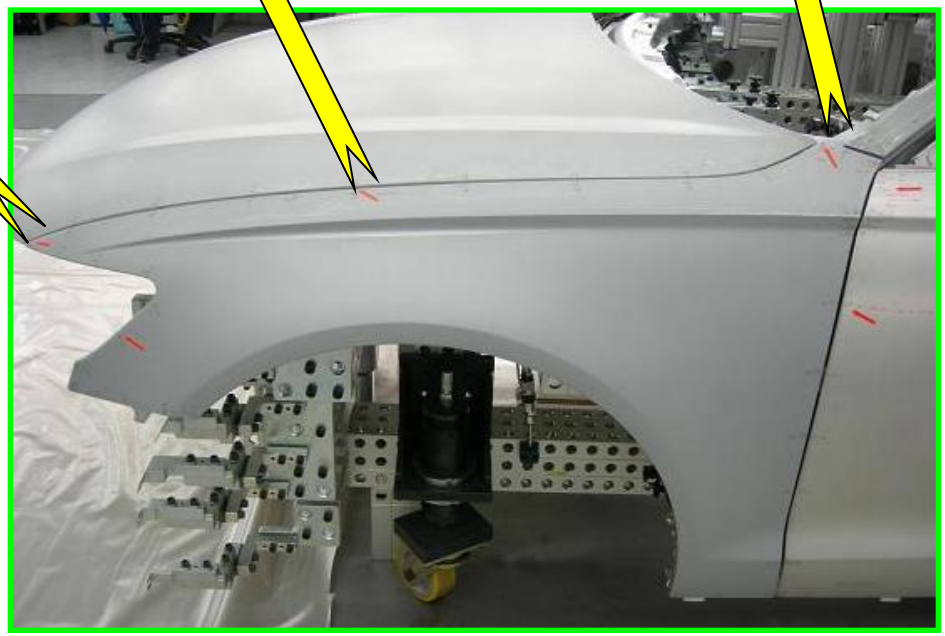
Difficulty during BIM matching









Spring back problem of some parts have led to extension of BIW matching period.

Die and welding jig integration

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- ☐Advantageous to realize white body development and tooling SE
- ☐To make precision distribution of tolerance more reasonable for stamping products and welding assembly products
- ☐ Directly to provide customers with body in white, plan a whole development cycle
- ☐ Reduce vehicle development costs, reduce user matching input

The enterprise with die and welding jig integration capability will be more competitive when they get whole body in white contract orders, he will show the project coordination ability.

Prospect of cooperation between China and America

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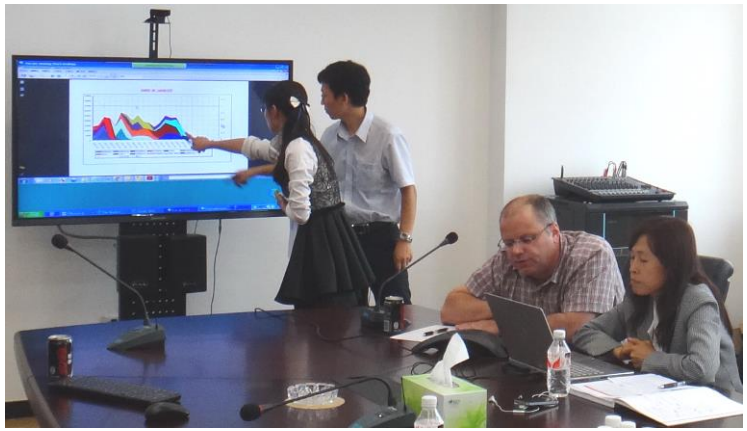
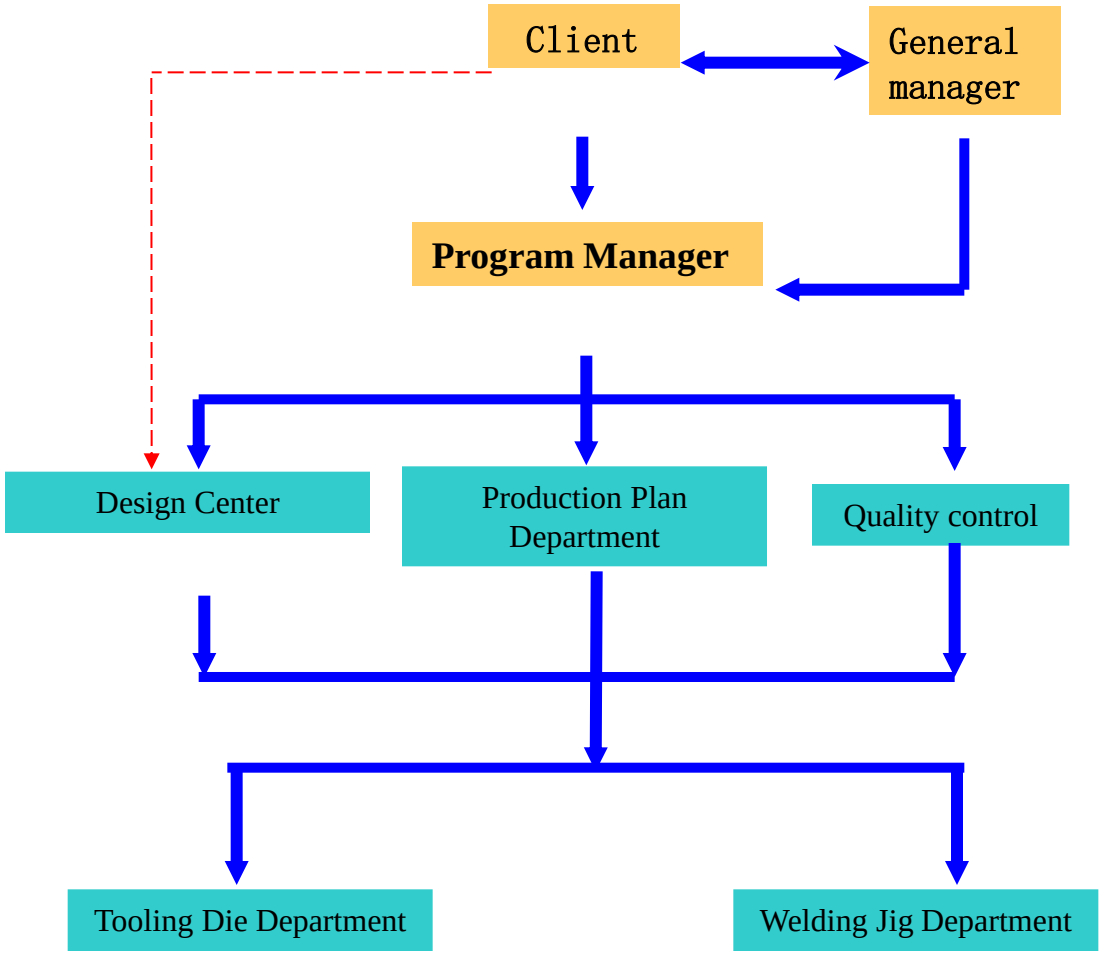
Project Management





international cooperation

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Mold enterprises in China have cooperated with many famous enterprises in the world and provided a great mount dies. We hope that we could have more cooperation with America and provide more dies with high quality and reasonable price.

2012年，模具公司同捷克斯柯达汽车公司签署模具项目。

FAWTD signed a contract for die manufacturing with Skoda of Czech in 2012.

2006年5月向美国通用公司、克莱斯勒公司提供模具。

The contract to provide GM & CHRYSLER company of USA with autobody dies was signed in May, 2006.

China ‘s development is inseparable from the world, the development of the world also needs China

The rapid growth of China’s die industry benefits from technical cooperation with the international advanced enterprise over the years, and makes the world die industry appear new vitality, and made great contribution to the world automobile industry getting rid of financial crisis and coming back development track.

In the next 5-10 years, China will remain the world's largest automobile production and sales land, the mold industry market has a very bright future, more excellent enterprises will produce quality dies for the world.

谢谢！

Thanks！