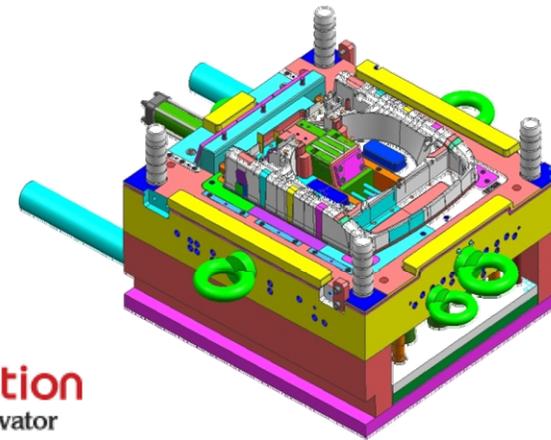


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SPACE solution
Manufacturing Innovator

Full 3D Automatic Mold Design System Based on NX Proven With Best Practices

SPACE solution Inc.

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(yclee3@spacesolution.kr) / +82-51-329-7474)
[http:// www.spacesolution.kr](http://www.spacesolution.kr)

Contents



- ▶ 1. Introduction
 - ▶ Company Overview
 - ▶ Background of Our Trials
 - ▶ Philosophy of Developments

- ▶ 2. Special Features

- ▶ 3. Success Stories
 - ▶ Achievement Summary
 - ▶ Case 1 : ASPIC (High Tech.)
 - ▶ Case 2 : NAMDO Mold (Automotive)
 - ▶ Summaries of Proven Success

- ▶ 4. Conclusions & Further Plan

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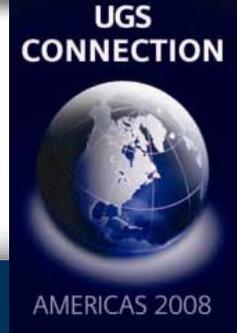
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1. Introduction

- Company Overview
- Background of Our Trials
- Philosophy of Developments

1. Introduction

- Company Overview

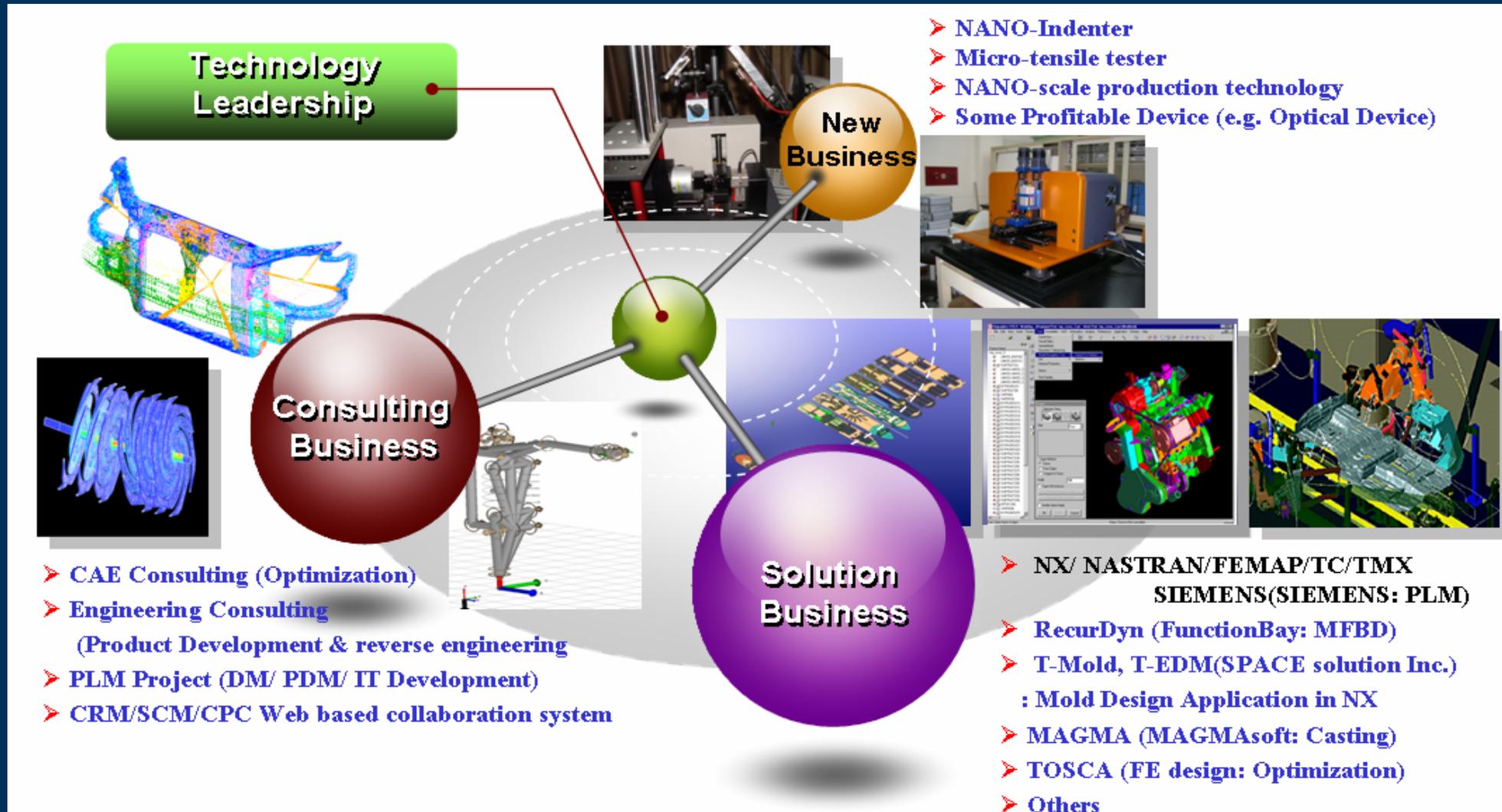


- ▶ 1. Introduction
 - ▶ SIEMENS AP Platinum Partner
 - ▶ Specialized in DM/CAE/PDM also NX
 - ▶ Four offices nationwide
 - ▶ SEL(HQ) / Kunpo / PUS / ULS
 - ▶ Competitive R&D Center
 - ▶ More than 10 biz. Partners
 - ▶ Successful supports for ME&S
 - ▶ Sincere SRs and Technical Consultants
 - ▶ Futuristic Strategy Planning & Marketing forces
- ▶ 2. Business Fields
 - ▶ Solution Business
 - ▶ CAD/ CAM/ CAE/ TC/ TMX
 - ▶ Consulting Business
 - ▶ PDM/ IT/ SI/ CAE/ DM Projects
 - ▶ New Business
 - ▶ Micro Tensile Tester / Micro Press System



1. Introduction - Company Overview

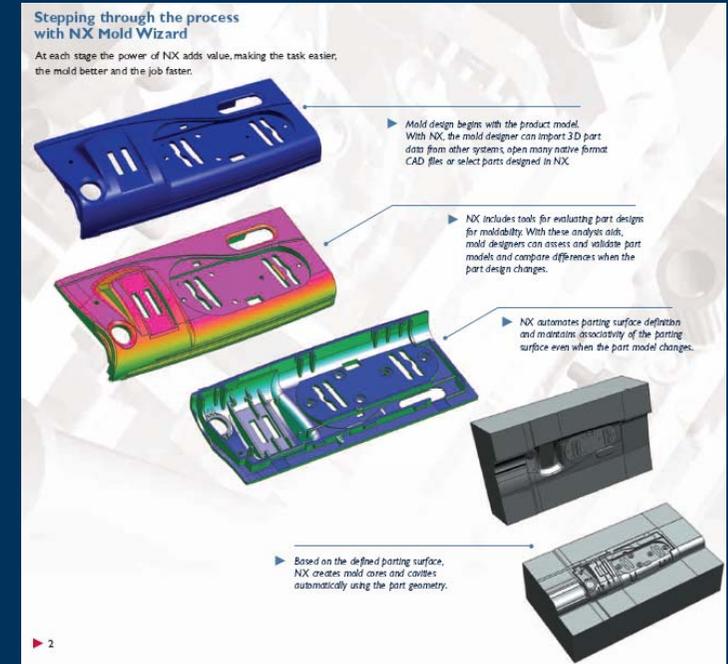
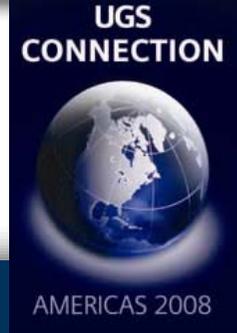
- ▶ Providing excellent solutions with outstanding consulting services, glowing with customers



1. Introduction

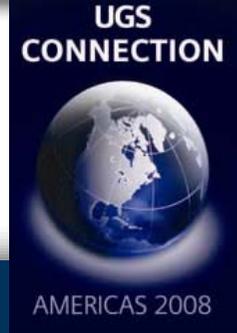
- Background of Our Trials

- ▶ NX Mold Wizard has been recognized as a good tool. However, the ASIAN market require more suitable wizard built on NX
- ▶ Customers' Common Requirements
 - ▶ Practical performance in productivity
 - ▶ Localized & effective Database system management
 - ▶ Less dependency of personal capabilities in maintaining competitive mold design qualities

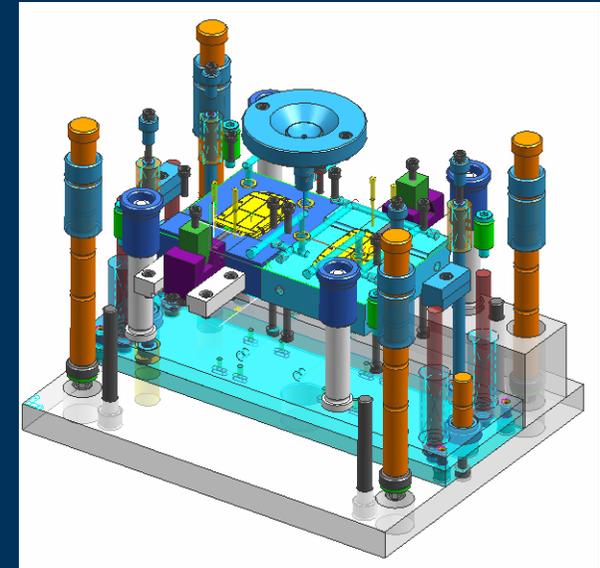


1. Introduction

- Philosophy of Developments



- ▶ Assumptions based on V.O.C
 - ▶ Hard to hire experienced technical HR
 - ▶ Strict process wizard has limits
 - ▶ System errors (sometimes, seems disasters)
 - ▶ Deep understanding of mold design process: Crucial
 - ▶ Specified design environments/ cultures
 - ▶ Getting shorter lead time strongly requested
 - ▶ Rare compensation for additional design labor due to specification changes
 - ▶ Localized Mold Base system (frequently used)
- ▶ Needs for Speedy/ Automated/ Verified/ Robust/ Full 3D system



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2. Special Features

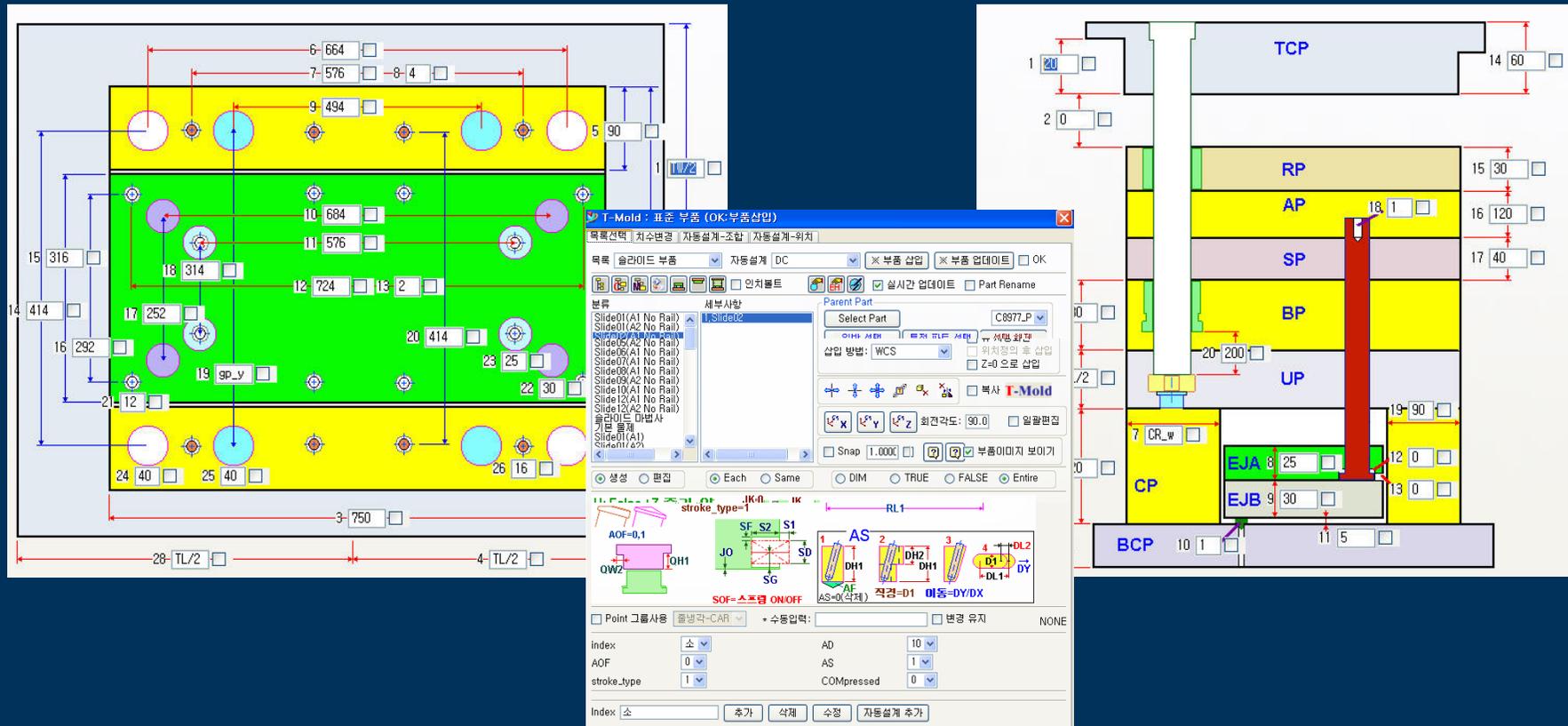
- Intuitive GUI / Command system
- Easy parting functions
- Various supporting utilities
- Library of MOLD BASE
- Library of Standard Parts
- Direct core replacement design
- High quality drafting



2. Special Features

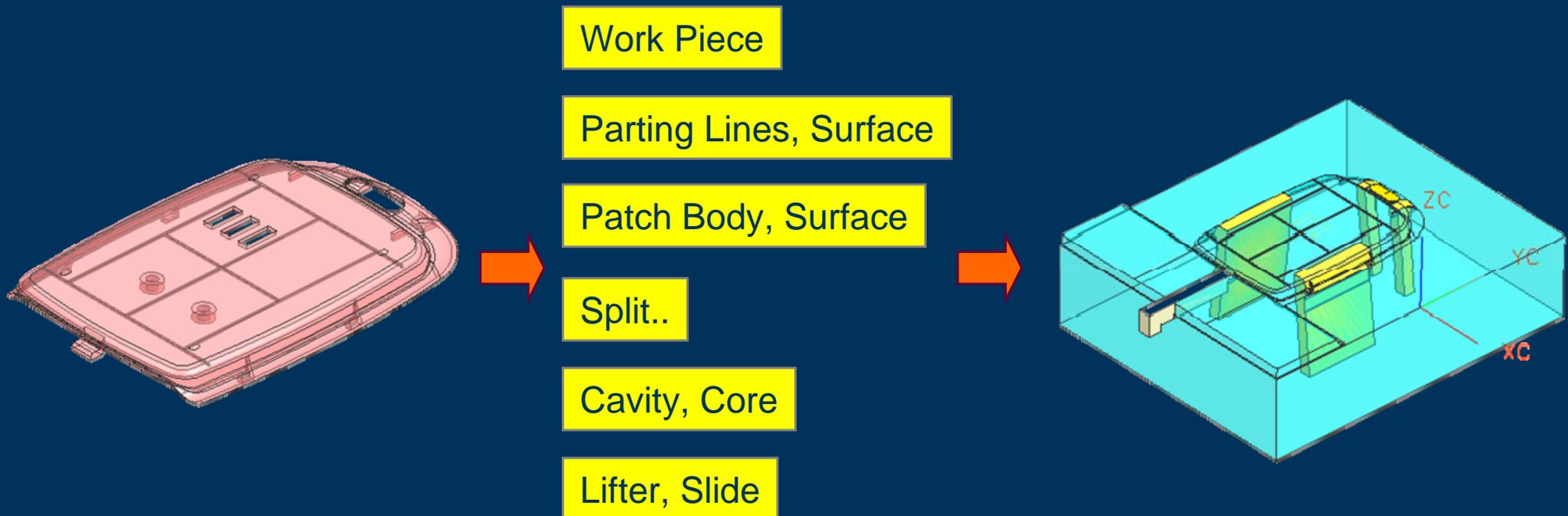
- Intuitive GUI/ Command system

- ▶ Based on mold design experiences and requests from customers, effective graphic user interface and commands are provided

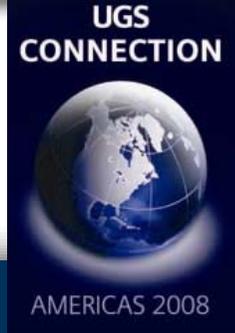


2. Special Features - Easy Parting Functions

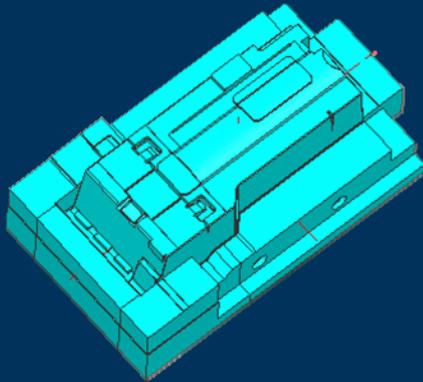
- ▶ Easy : only 2 hours training is enough
- ▶ Small data handling : not using assembly, but applying parts
- ▶ High Speed : parting with non-parametric basis (less design error)



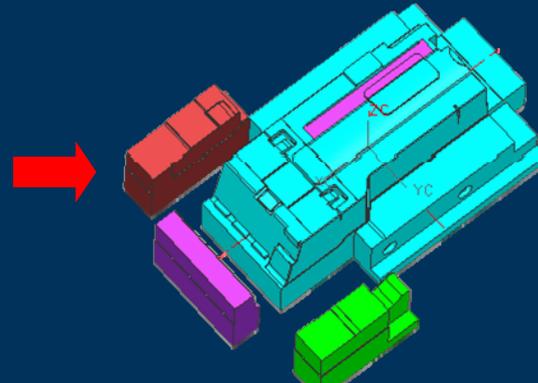
2. Special Features - Various supporting utilities



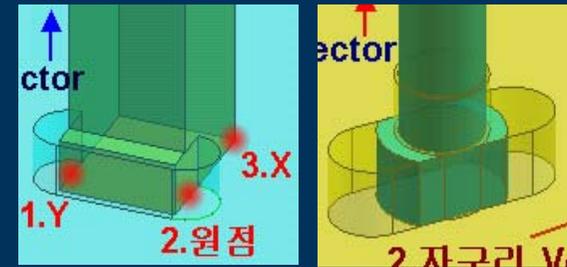
- ▶ More than 300 commands (*.dll) through whole mold design process



Main Parting in NX



Insert Core automatic separation



Insert Core Head area automatic creation

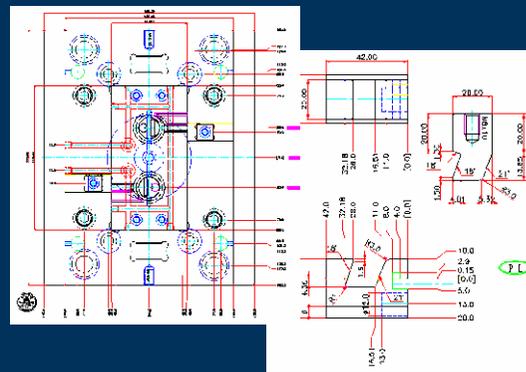
Hole CAM Data

Automatic P.O (material)

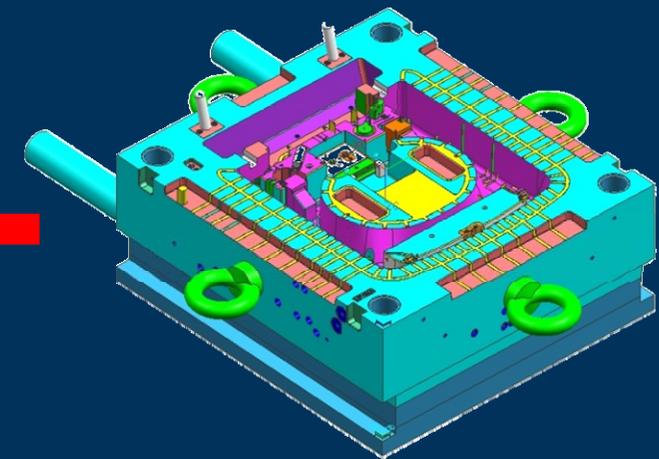
Gun Drill CAM Data

3D Measurement Data

In-house Customization



2D Drafting



Full 3D mold design

diverse CAM Data automatic generation



2. Special Features - Library of Mold Base

- ▶ Various Mold Base Type provided (include non-standards)
- ▶ Specialized mold design supported

Various size basic Mold Base

In Mold Type Mold Base

Stack Mold Type Mold Base

Large size Type Mold Base

Multi color Type Mold Base

In-Mold

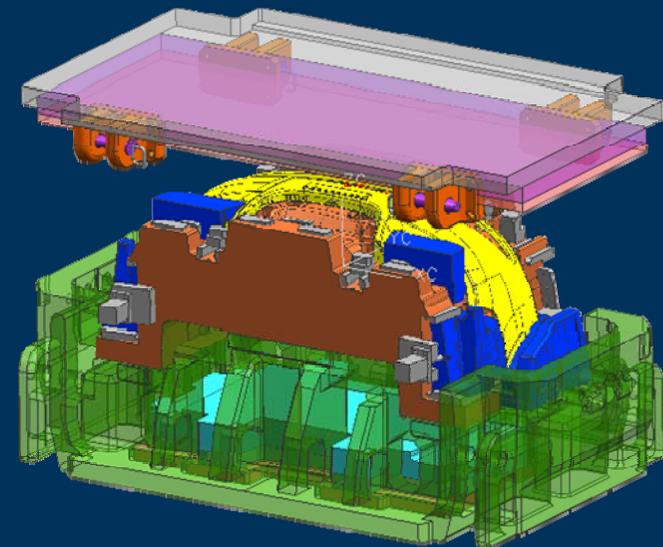
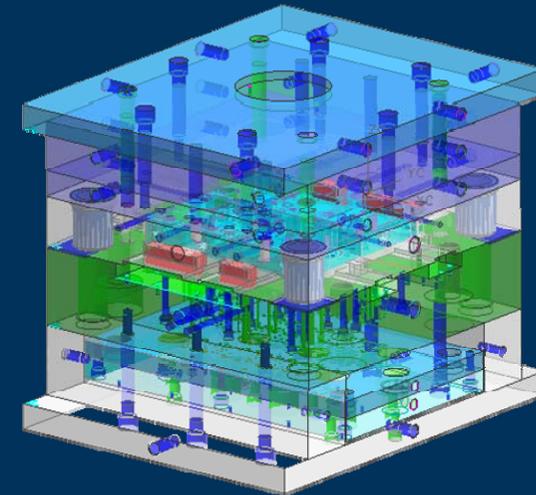
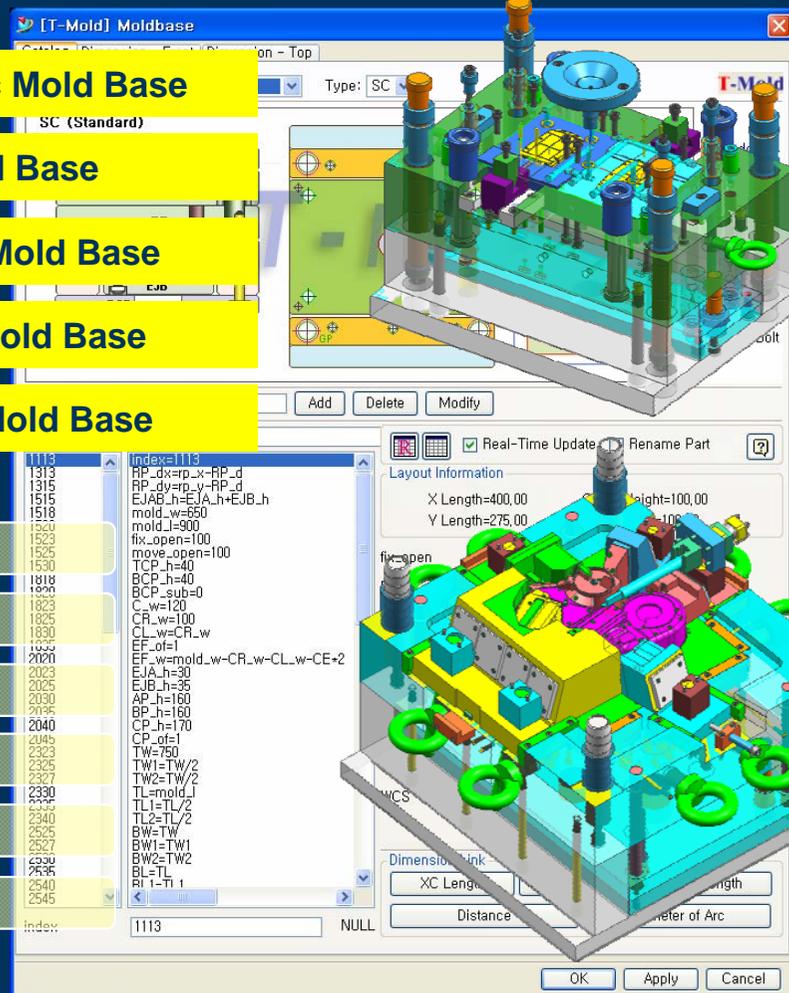
Stack Mold

Cell Phone

Electronics

Automotive

Die Casting





2. Special Features - Library of Standard Parts

- ▶ More than 900 standard parts in various size range
- ▶ Flexible standard part enrollment system

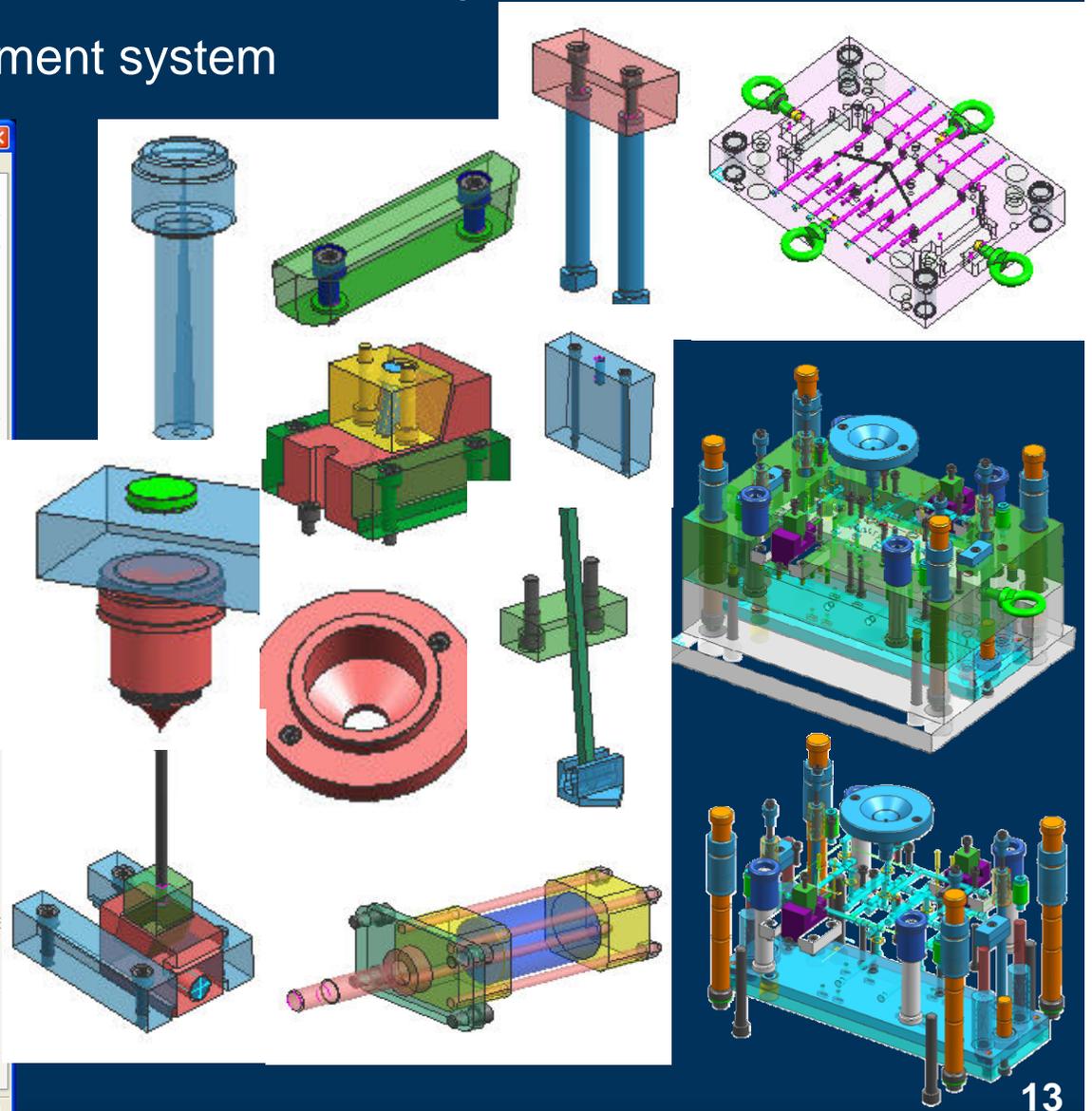
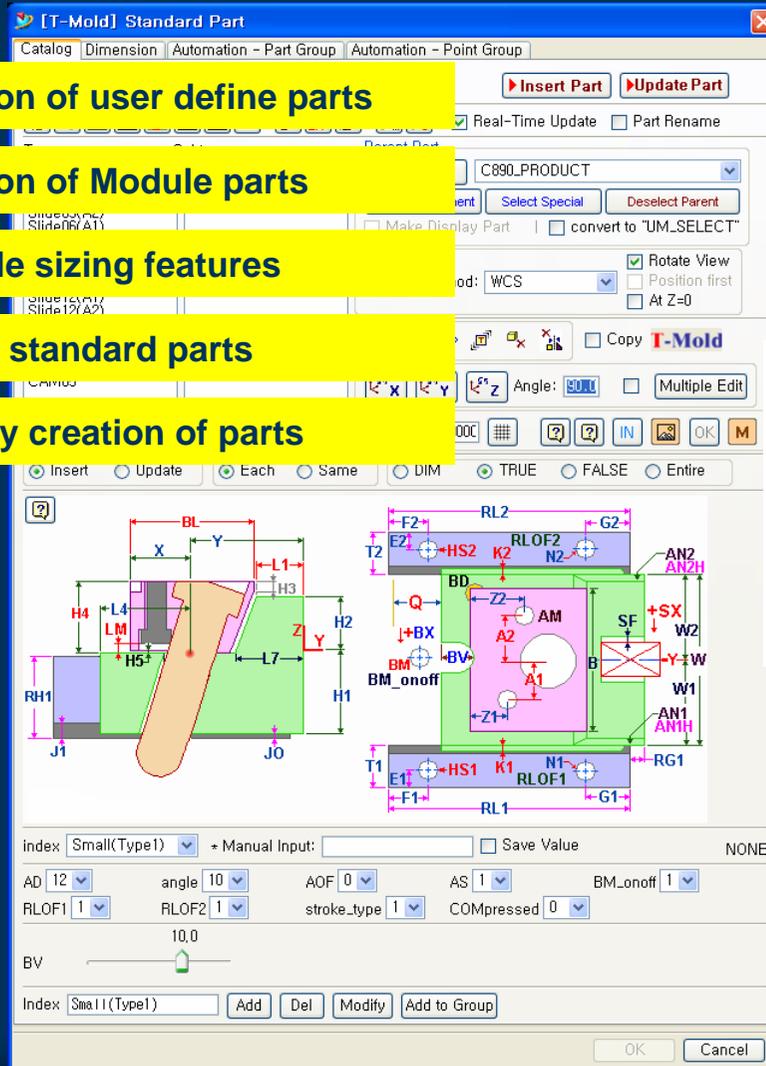
Creation of user define parts

Creation of Module parts

Flexible sizing features

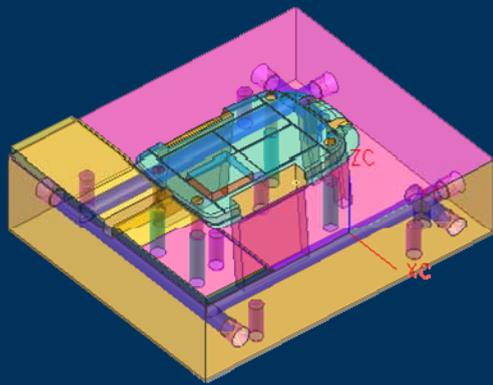
Stable standard parts

Speedy creation of parts

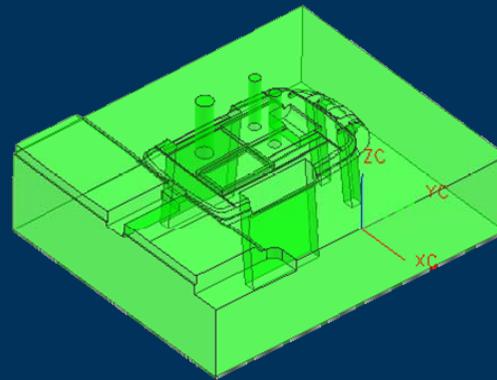


2. Special Features - Direct Core Replacement Design

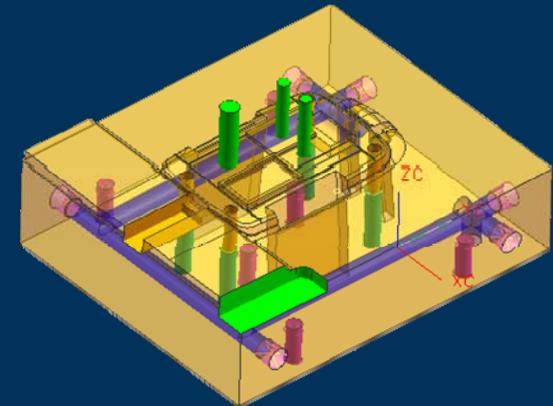
- ▶ 70~80% of time can be reduced in similar product design
- ▶ Applicable product : Mobile phone / Monitor / TV sets / etc.



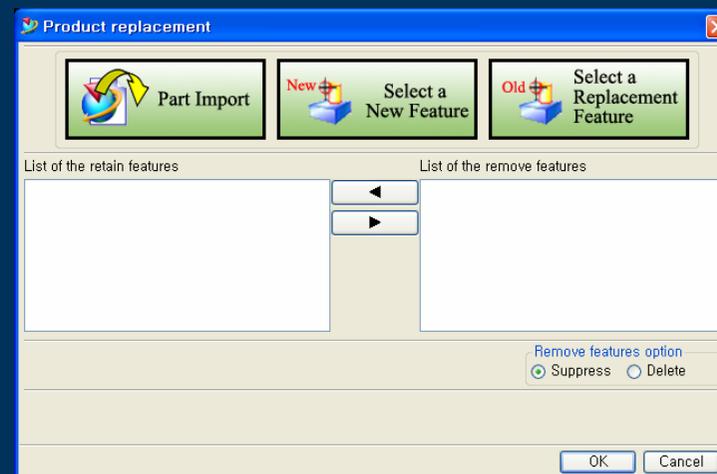
Mold with previous Core



Replacement with new core



Updated with new product

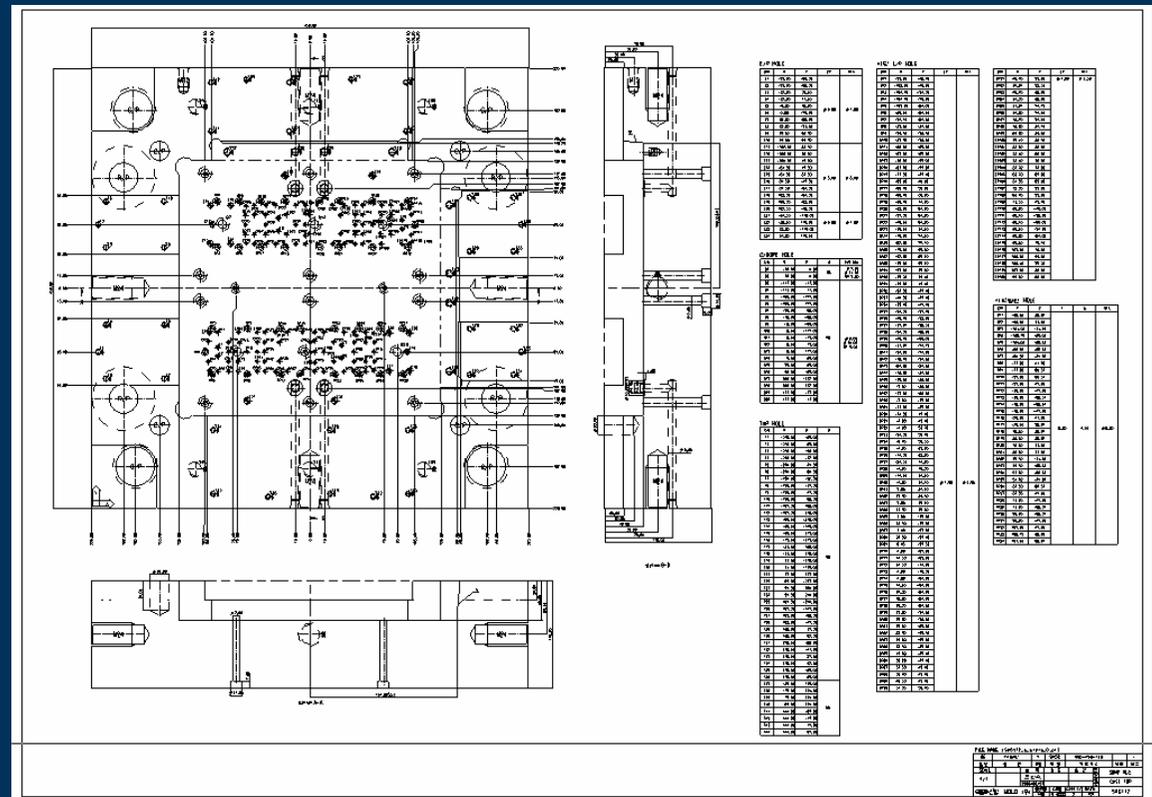
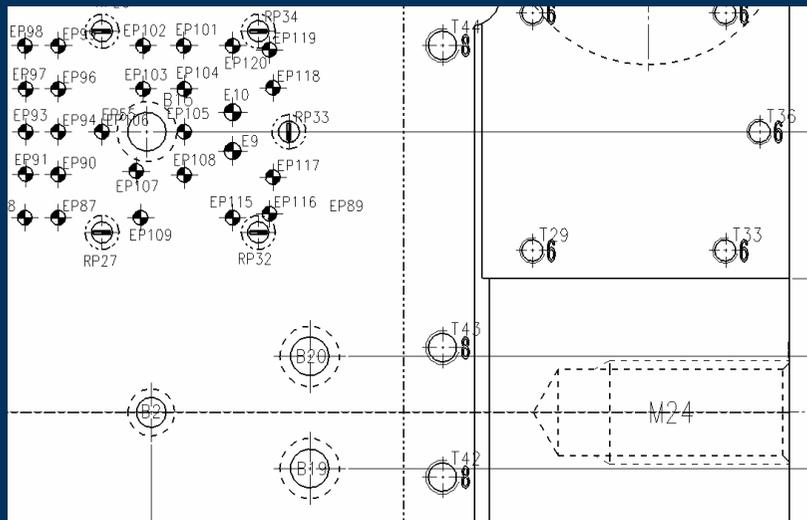




2. Special Features

- High quality drafting

- ▶ Strong requirements from ACAD users
- ▶ 100% compatibility with ACAD including frequently used characters



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3. Success Stories

- Achievement Summary
- CASE 1 : ASPIC
- CASE 2 : NAMDO MOLD
- Summaries of Proven Success

3. Success Stories - Full 3D Mold Design Project

- ▶ Minimum project required within 3 Months including specialized consulting service and training to ensure a success

◆ Previous Environment

	Prepare	M+1	M+2	M+3	M+4	M+5	~	M+12	
Parting Divide	Parting								
Library		User Customization: Mold Base & Standard Parts Library creation							
Programming (Customize)		User Customization (Design/ Manufacturing/ ETC.)				Debugging- Difficult !!!			

Full 3D Start (at M+4) Success???

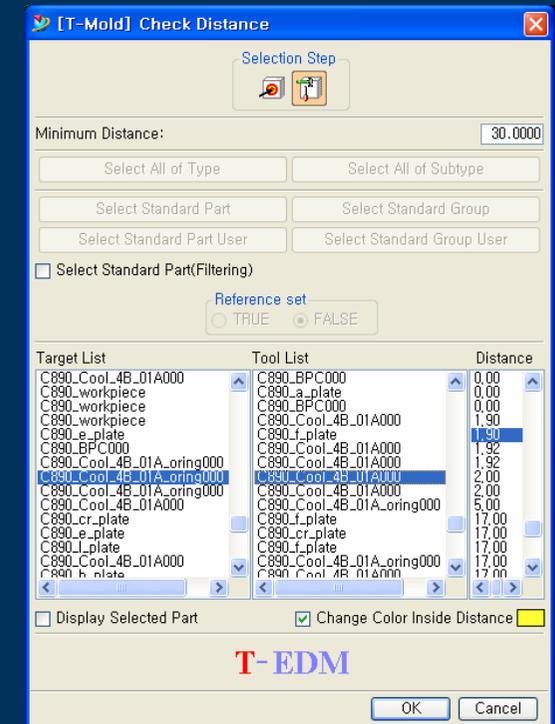
◆ T-MOLD

	Prepare	M+1	M+2	M+3	M+4	M+5	~	M+12
Parting Divide	Parting							
Library	Library	Library						
Programming (Customize)	Program	Customize	Debugging					

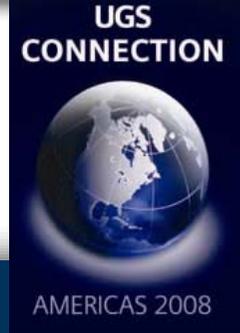
Full 3D Start (at M+1) Success! (at M+3)

3. Success stories - Achievement summary

- ▶ Prompt adoption & application after consulting and training
- ▶ Average mold design time reduction : 30~50% in six months
- ▶ 99% reduction in design errors
- ▶ Speedy skill-up in six months
- ▶ 70~90% time reduction in core replacement method
- ▶ 100% proved success even in customers having previous unsuccessful experiences



3. Success Stories - CASE1 : ASPIC



- ▶ Successful project completion in FY2007 with strategic support of high levels.



Project Background

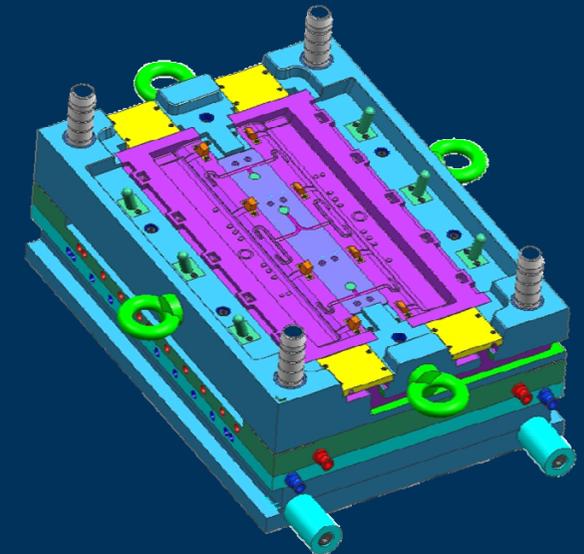
Lots of repetitive tasks
Work environment reformation
Minimize meaningless errors
Reduce design lead time

T-Mold

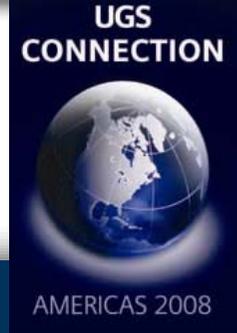
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Project Goals

Unification of Design Tool : NX
Paperless in Workshop
Zero Design Error
Part Standardization



3. Success Stories - CASE1 : ASPIC



▶ Project schedules & detail tasks performed

AS-IS / TO-BE Analysis
[2007. May ~ 2007. June]

Usage Training(2Wks.)
- NX & Core Parting

T-Mold Training (2 Wks.)
- Based on Full 3D Design
Process

On-site Consulting Step 1
[2007. June~ 2007. July]

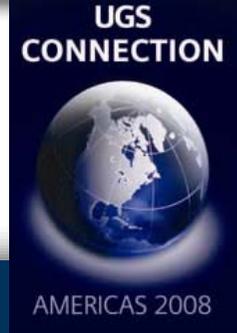
Core Parting
Full 3D Mold Design
Paperless Machining System
2D Drafting after Full 3D
Concept Design Applied
from out-sourced drawing
Minimize the essential
information on 2D drawing

On-site Consulting Step 2
[2007. July ~ 2007. August]

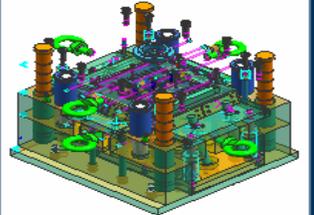
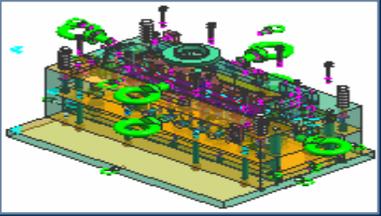
Full 3D Mold Design for
New Product
Part Standardization Process
T-Mold Customization
(Upgrade for ASPIC)
Set-up Paperless system
for 2nd Tier
Training for machining
departments for 3D system

- ▶ Project Period : 2007/5/21 ~ 2007/8/31 (3.3 Months)
- ▶ Consultants : PM (1) / Senior Consultant (3) / Code developer (1)

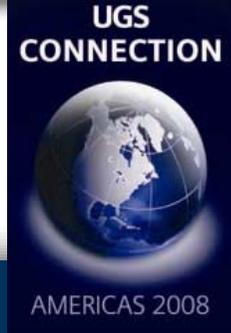
3. Success Stories - CASE1 : ASPIC



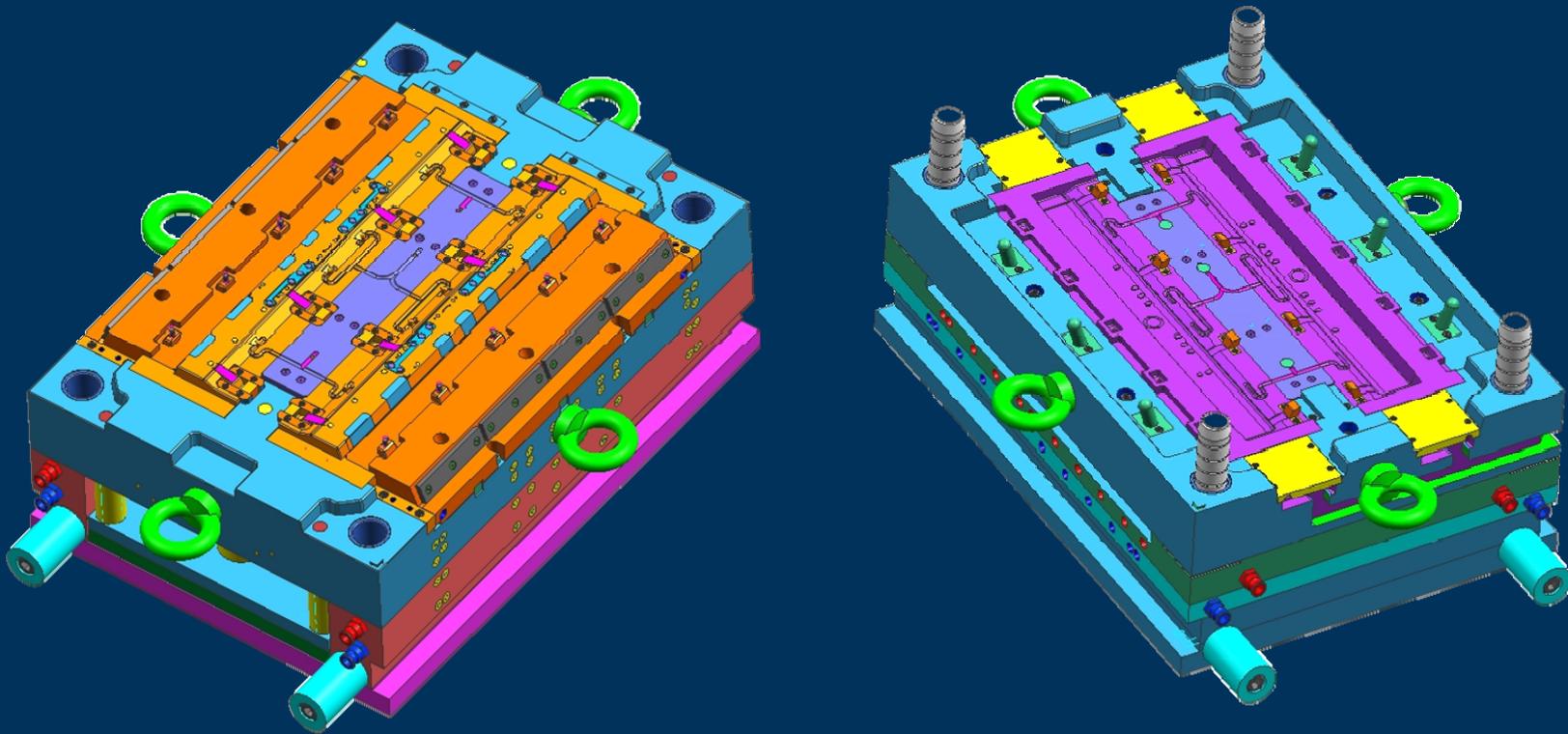
► Better performance with new approach

NO	Product Name	Customer	Designer (Experience)	Item #	Design Method	Error #	Man Day	Relative images
1	Utility Pocket	SHARP	Outside	7201	2D Outsourcing	4	12	
			ASPIC 1 (1 Years)		Full 3D	-	7	
2	Cap Deco FU	LGE Ref.	Outside	7205	2D Outsourcing	5	9	
			ASPIC 2 (5 Years)		Full 3D	-	3	
3	Cap Deco FU	LGE Ref.	Outside	7206	2D Outsourcing	6	9	
			ASPIC 3 (7 Years)		Full 3D	-	4	
4	Cap Deco FL	LGE Ref.	Outside	7207	2D Outsourcing	6	8	
			ASPIC 4 (3 Years)		Full 3D	-	3	

3. Success Stories - CASE1 : ASPIC



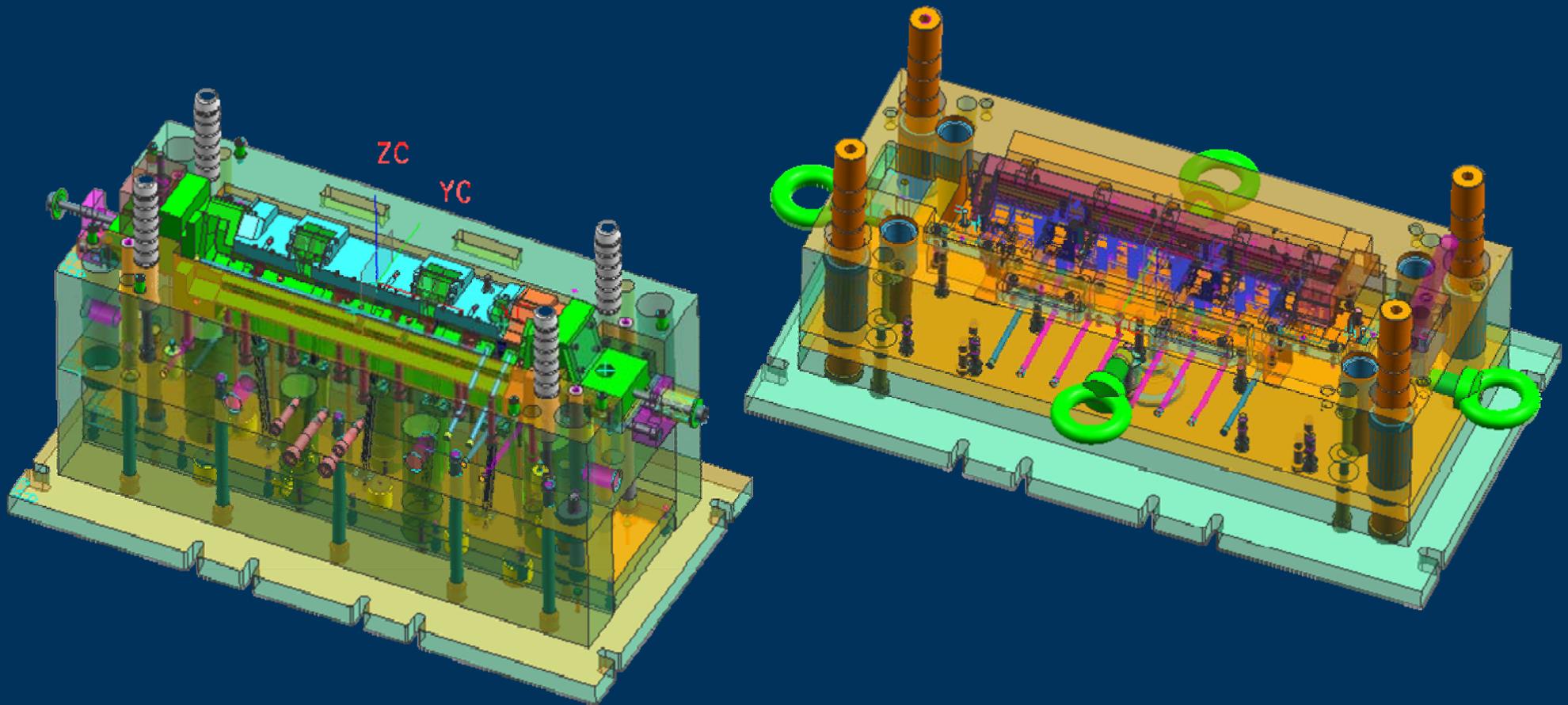
- ▶ Reduce design time : from 10 MD to 5 MD
- ▶ With zero design error





3. Success Stories - CASE1 : ASPIC

- ▶ Reduce design time : from 14 MD to 8 MD
- ▶ With zero design error



3. Success Stories - CASE 2 : NAMDO MOLD



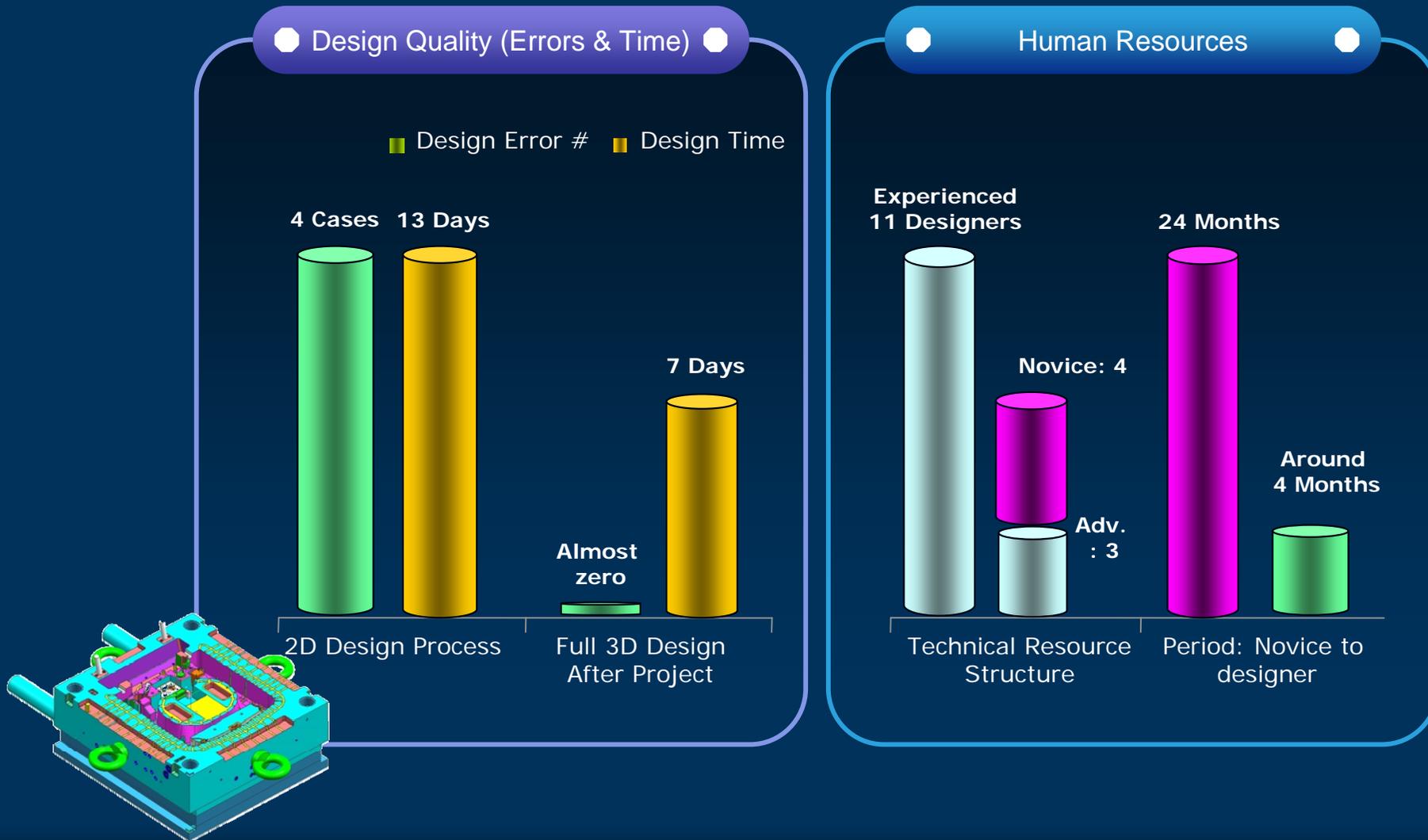
Mold Product Field	<p>High Tech/ Appliance (Refrigerator/ Washing Machine/ Vacuum/ Printer/ Etc.)</p> <p>Automotive compartments</p> <p>Stack Mold</p>
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Support Since	Legacy Design Process	Current Process	Total Support	3D Design Outcomes
FY 2006	2D Drafting (AutoCAD, partial NX)	T-MOLD Application NX Based Full 3D	20 Months	500 Pairs

Item	2D Design	After Project with 3D	Achievement
# of Design Resource	11	7	36% reduced
Design Amount/ 1 yr.	250 Pairs	300 Pairs	20% Increased
Design Errors	AVG. 5/ 1 Mold	AVG. 0~1 / 1 Mold	80~100% reduced
Averaged Design Time	13 Days	7~8 Days	35~45% reduced
Time to designer from novice	24 Months	4 Months	83% decreased

3. Success Stories - CASE 2 : NAMDO MOLD

- ▶ Superb improvements in all performance indexes

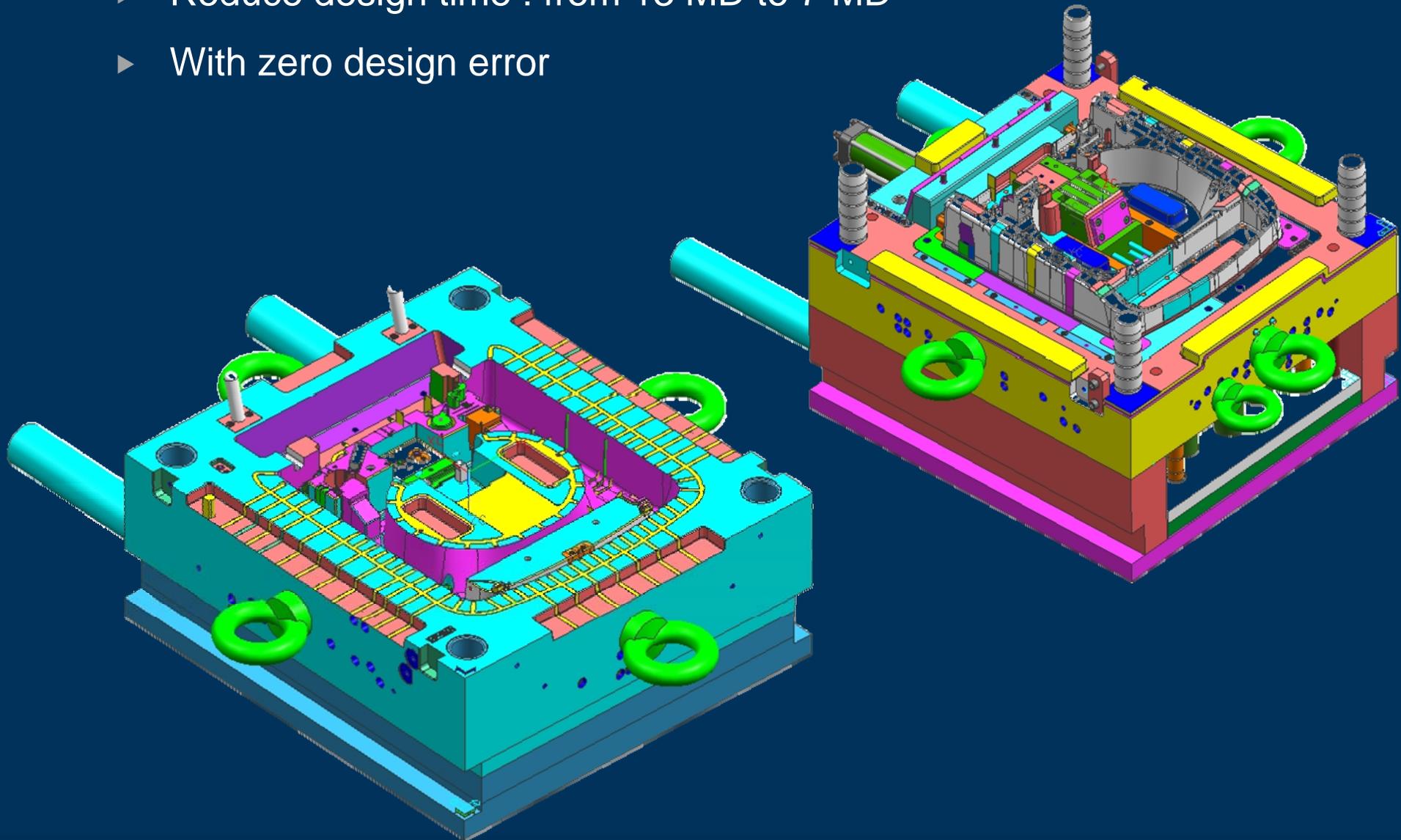


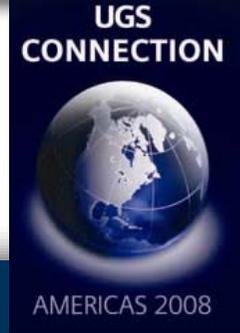


3. Success Stories

- CASE 2 : NAMDO MOLD

- ▶ Reduce design time : from 13 MD to 7 MD
- ▶ With zero design error





3. Summaries of Proven Success - Customers List

- ▶ More than 40 customers with outstanding ROI & currently more than 20 companies doing pilot projects with this system

1. Hi-Tech Suppliers

SAMSUNG/ SAMJIN LND/
KUMNUNG Precision/ ASPIC/
P&TEL / YUJIN M PLUS/
SAMWON Precision Mould
MFG./ DUCK SHIN/
YUKYUNG Precision/ Son &
Arc/ SHINIL MOLD/
EYUNSUNG Precision/
JANGWON/ KS Trading/
CHANG SUNG Precision/
JUNGANG FIT/ ETC.



2. Automotive Suppliers

Woosung Precision/
RAYGEN/ NAMDO Mold/
Jungwoo IT/ ASAN
Precision/ Jaeyoung MTS/
MIJU Precision Co./ ETC.



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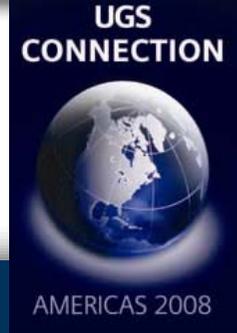


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4. Conclusion & Further Plan

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4. Conclusions & Further Plan

- ▶ Amazing successful outcomes from
 - ▶ Serious understandings of V.O.C and ourselves as users
 - ▶ Development (system implementation) skills
 - ▶ Paradigm shift or change to Selective Parametric concepts
 - ▶ Tight co-work/partnership with customers through various projects experiences
- ▶ Further considerations & plan
 - ▶ Connect current final stages of application (automatically generated P.O. table) to specialized community portal
 - ▶ Provide more customization functionalities for user's own environment to help internal KMS in mold design division