Il valore aggiunto della simulazione per l'industria

CONFINDUSTRIA UDINE

Udine, 2 luglio 2015

Real&Virtual testing di componenti, macchine e processi

ADVANTECH RUNNING ON TIME

Marco Sortino
Alessandro Armellini

ADVANTECH RUNNING ON TIME

Advantech TIME Srl is a spin-off of the University of Udine,born in the beginning of 2014, and composed by:

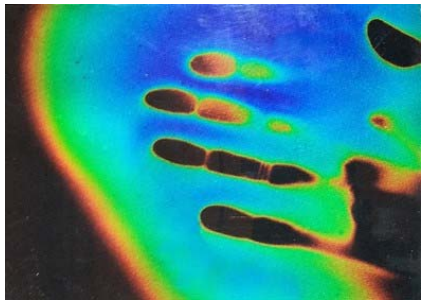
- **3 researchers from DIEG - UNIUD**
  - Prof. Ing. Luca Casarsa
  - Prof. Ing. Marco Sortino
  - Dott. Ing. Alessandro Armellini
- ADVANTECH THE WAY TO LIKE — **University of Salento Spin-off for Digital/Virtual Engineering&PLM**
- RALCitalia
- UNIVERSITÀ DEGLI STUDI DI UDINE

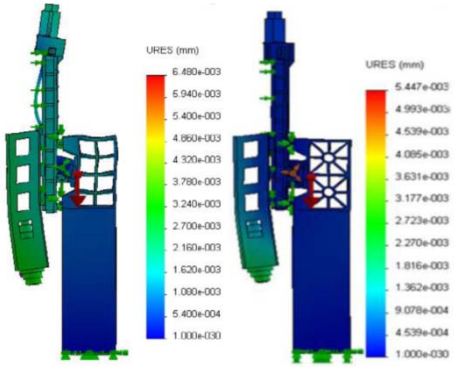
IMPRESA SUPPORTATA NELL'AMBITO DI techno seed incubatore d'impresa di Friuli Innovazione

ADVANTECH
RUNNING ON TIME

Advantech TIME Srl is divided in 2 main business units

REAL & VIRTUAL TESTING DIVISION



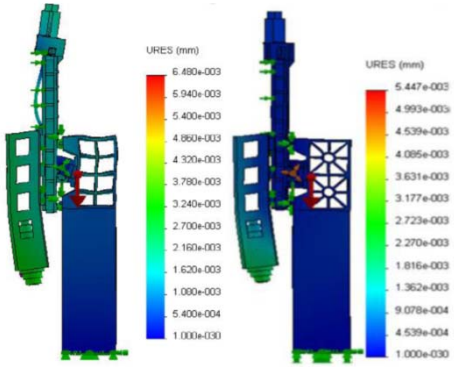


MANUFACTURING AND IT SYSTEMS DIVISIONS

ADVANTECH

RUNNING ON TIME

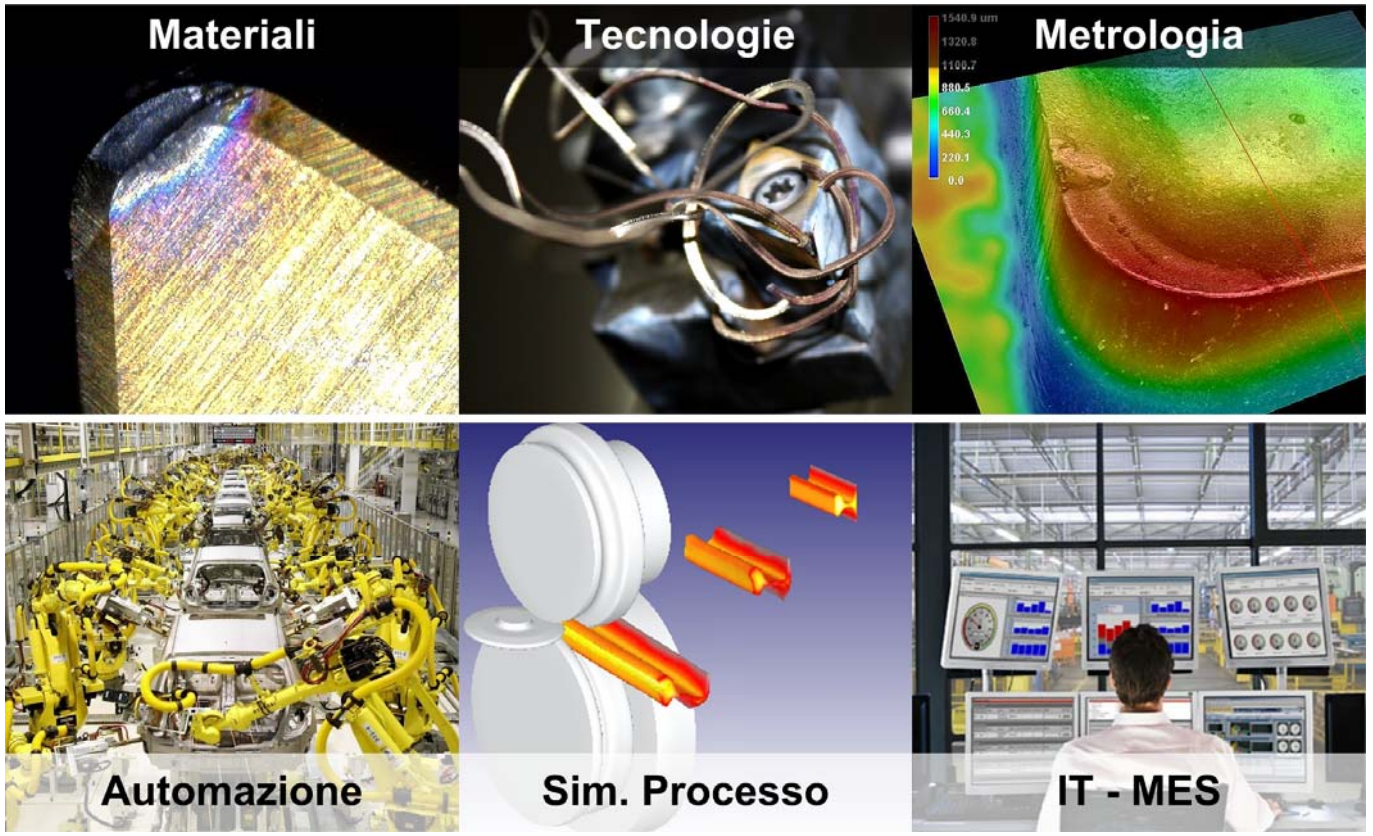
REAL & VIRTUAL TESTING DIVISION



MANUFACTURING AND IT SYSTEMS DIVISIONS

Manufacturing & IT Systems Division

E’ la divisione di Advantech TIME che offre servizi di **consulenza ingegneristica** per la **l’innovazione di processo** in **ambito manufatturiero.** Questo è possibile grazie alla **combinazione** di diverse **competenze:**



Manufacturing & IT Systems Division

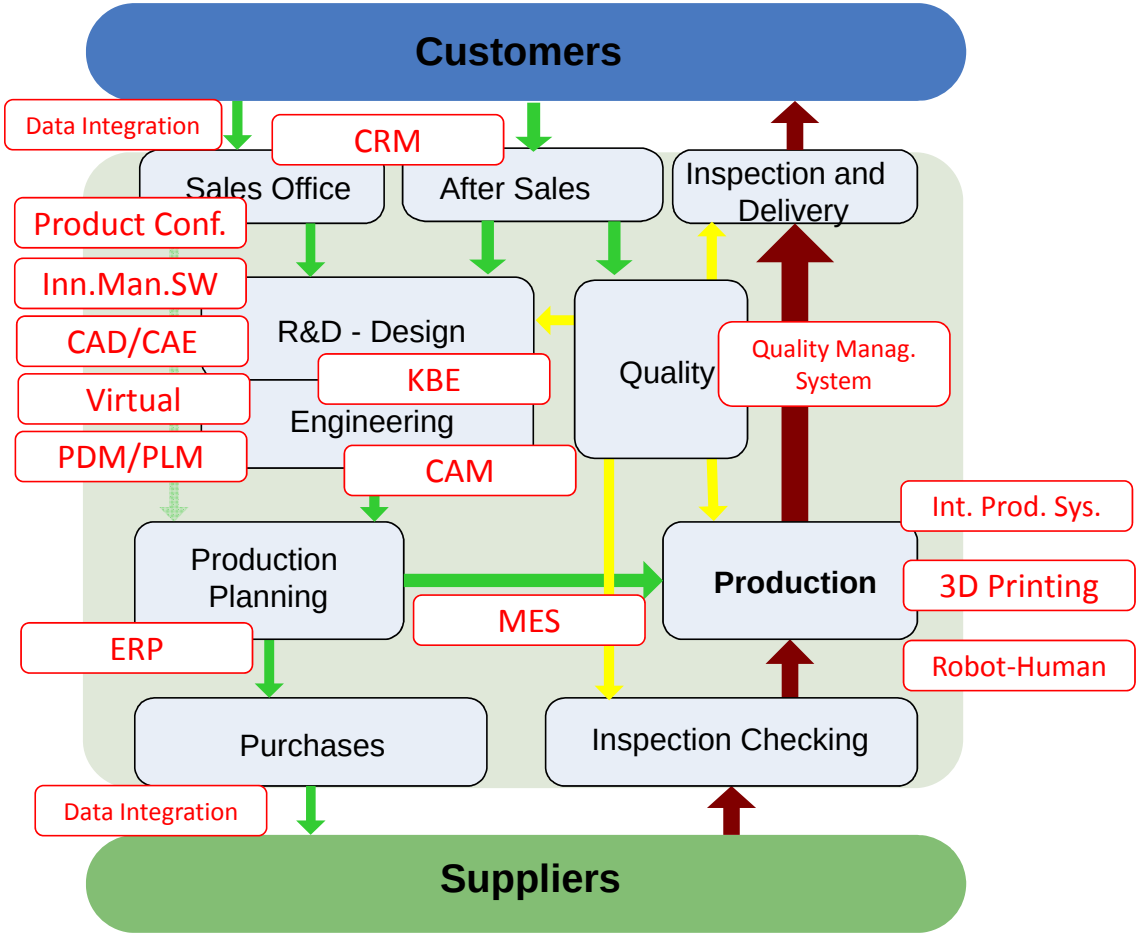
La simulazione in ambito manufatturiero è utile per:

- Analisi preliminari di fattibilità e preventivazione costi;
- Progettazione di utensili ed attrezzature;
- Supporto alla comprensione di problematiche di processo;
- Ottimizzazione preliminare di processo;
- Strategie di automazione avanzate.

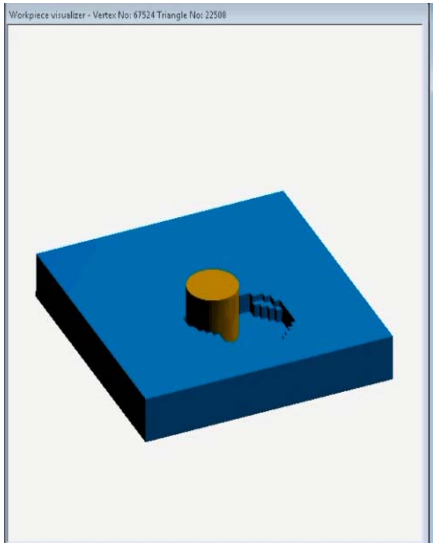
Criticità:

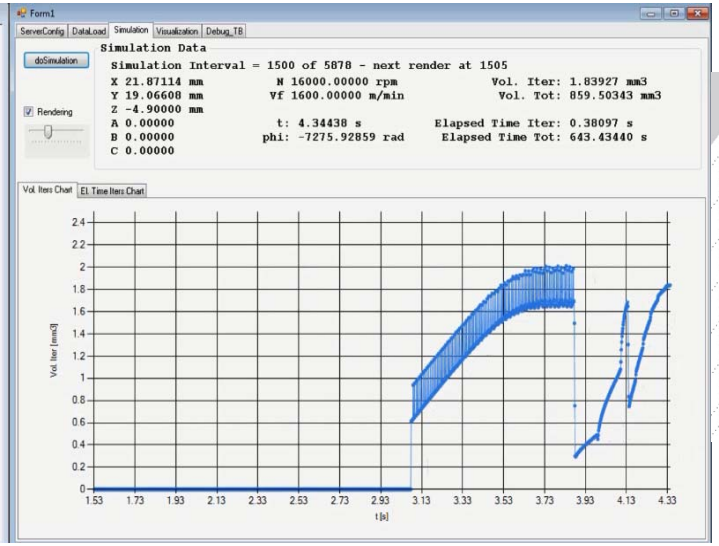
- Necessità di formazione specifica;
- Adeguatezza dei risultati;
- Tempi di calcolo;
- Costi delle licenze e delle infrastrutture informatiche.

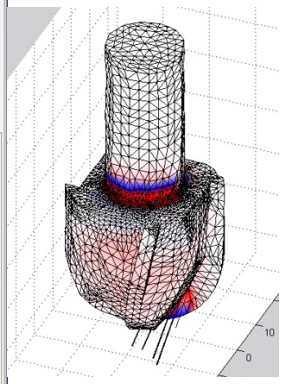
DIGITAL MANUFACTURING

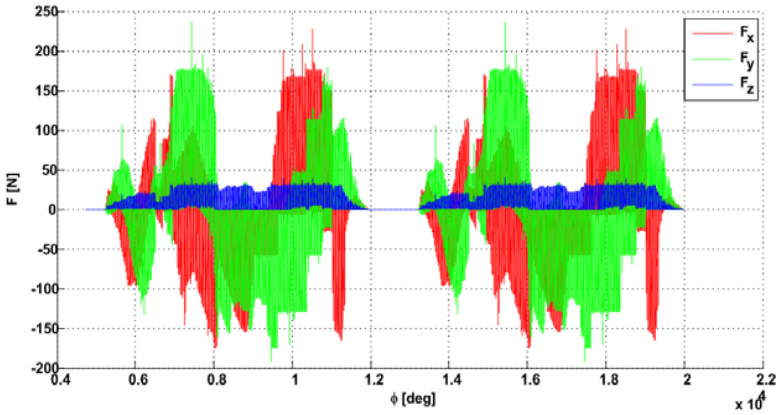


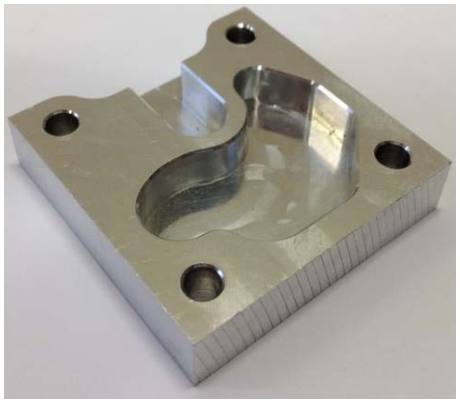
PROCESS SIMULATION - MACHINING



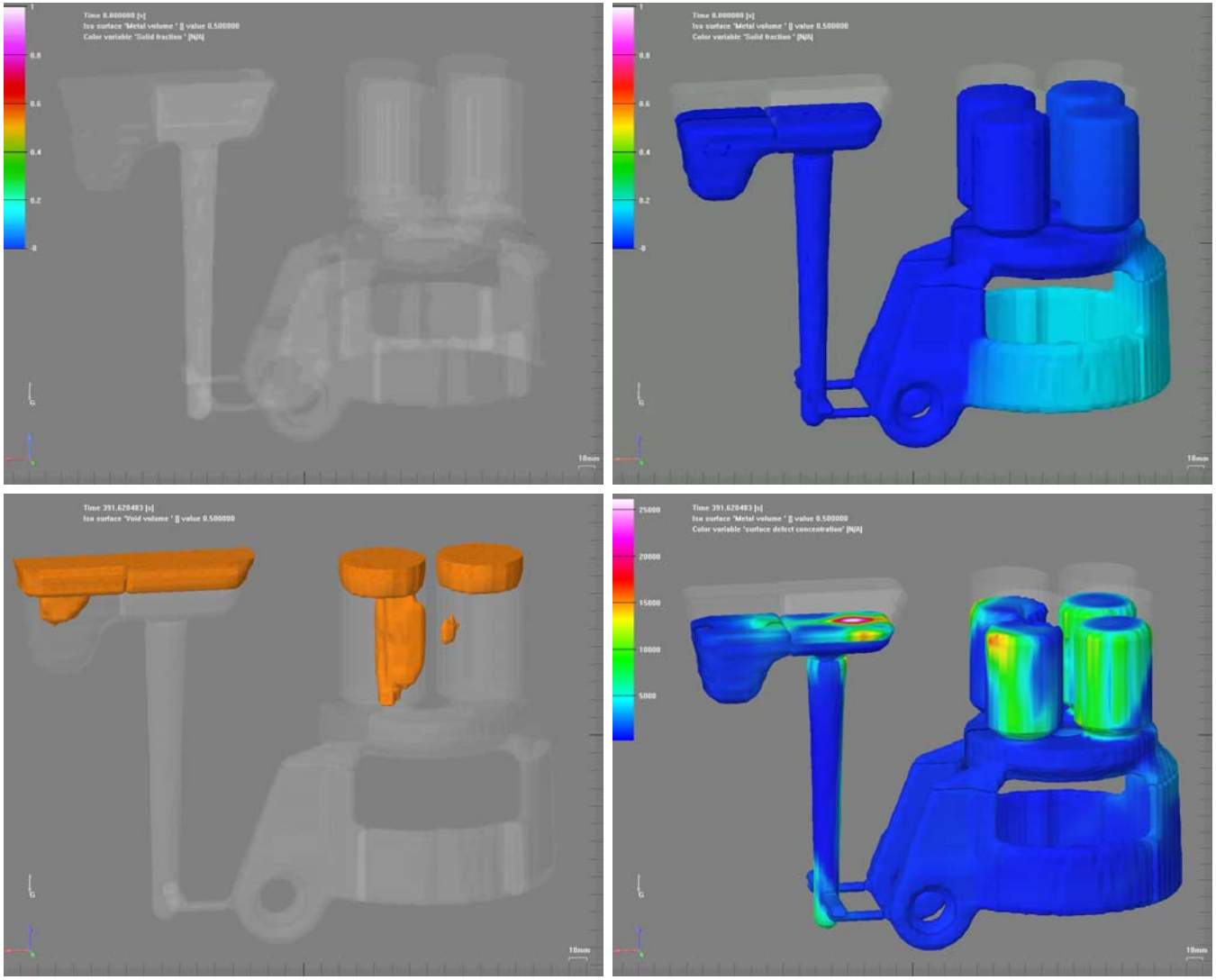




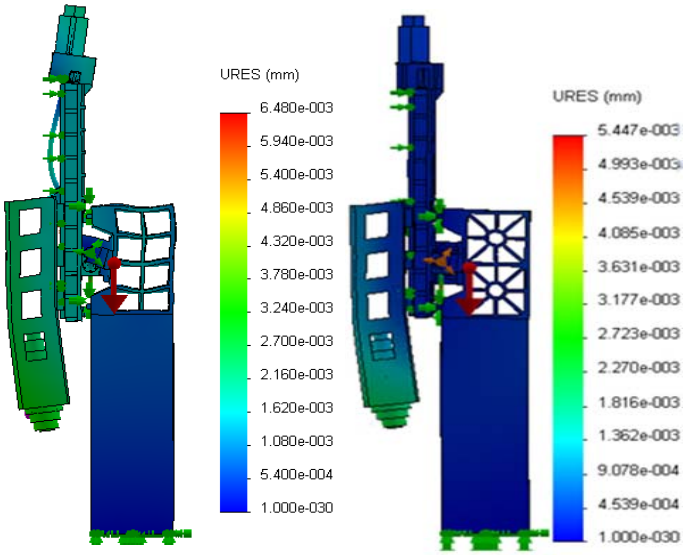




PROCESS SIMULATION - FOUNDRY



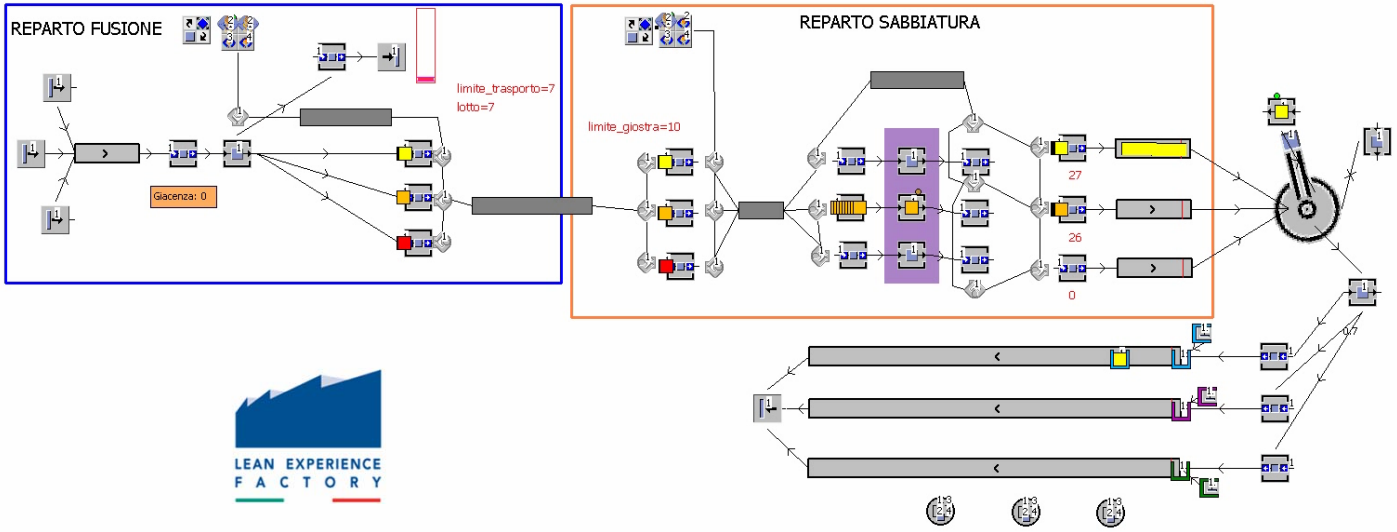
PRODUCT REENGINEERING



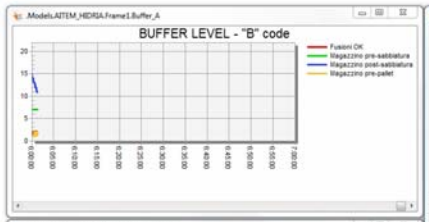
- 6% in peso!

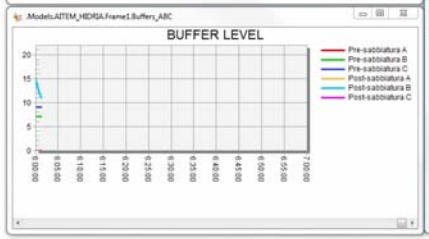
PROCESS REENGINEERING

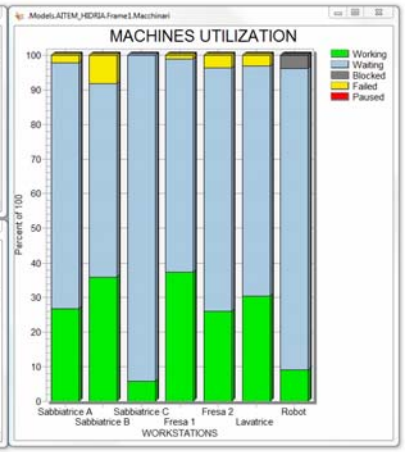
Technomatix – Process Simulate



LEAN EXPERIENCE FACTORY

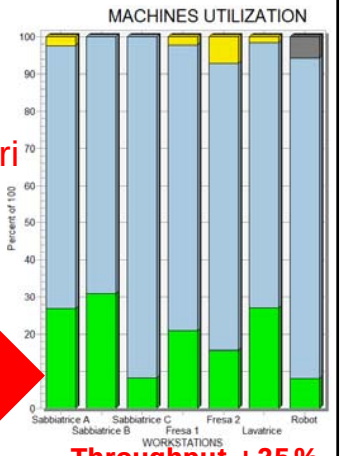






Ottimizz.:

- Parametri
- Lotti
- Flussi
- Logiche
- ...



Throughput +25%

ADVANTECH

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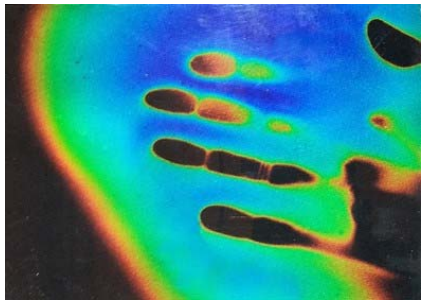
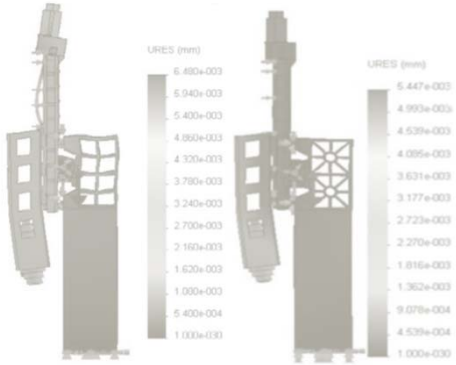
REAL & VIRTUAL TESTING DIVISION





MANUFACTURING AND IT SYSTEMS DIVISIONS

Real & Virtual Testing Division

E' la divisione di Advantech TIME che offre servizi di **consulenza ingegneristica** per la **ricerca e sviluppo prodotto** mediante testing sperimentale e virtuale in **ambito termo-fluidodinamica e macchine a fluido.**

- analisi di dettaglio su problematiche termo-fluidodinamiche in geometrie complesse con flusso turbolento 3D

Analisi sperimentale complessa e onerosa
⇨
impossibile pervenire ad una caratterizzazione completa

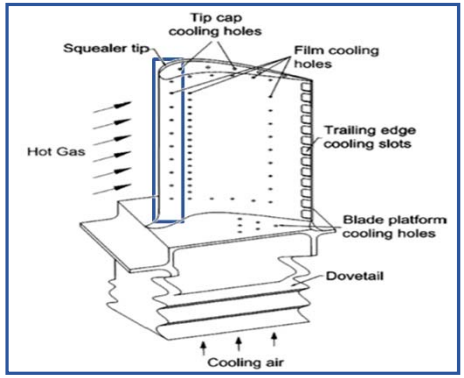
Real Testing ⇨ ***database per la validazione*** → ***3D CFD*** → ***full analysis***

- Ottimizzazione di componenti in processi multiparametrici

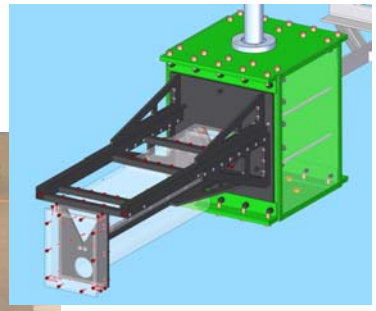
Sviluppo per via sperimentale basato su verifica funzionale di successivi prototipi
⇨
tempi e costi troppo elevati

Real Testing ⇨ ***correlazioni empiriche*** → ***Virtual Modelling*** → ***fast design***

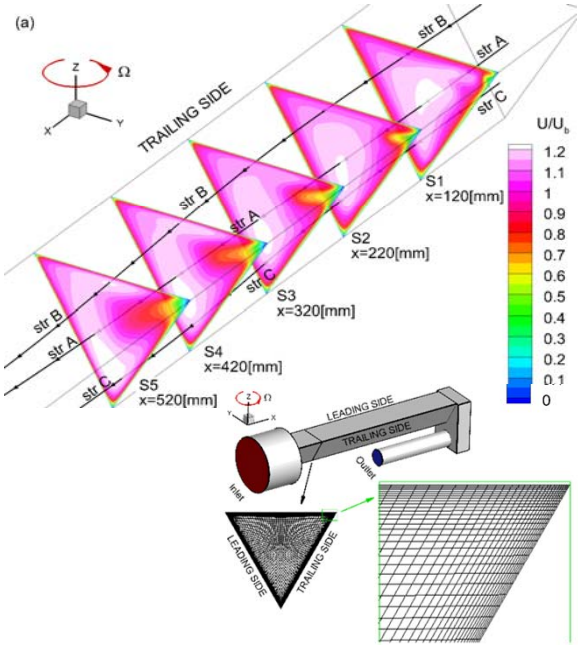
Real & Virtual Testing Division – CFD es. 1



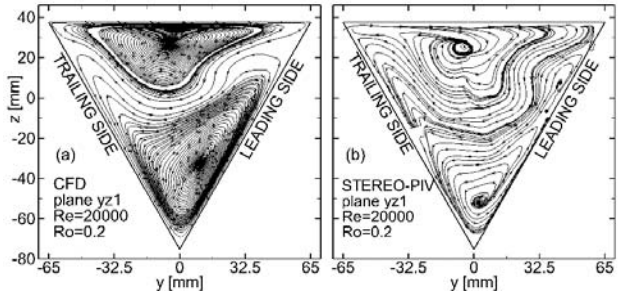
Banco Prova Sperimentale



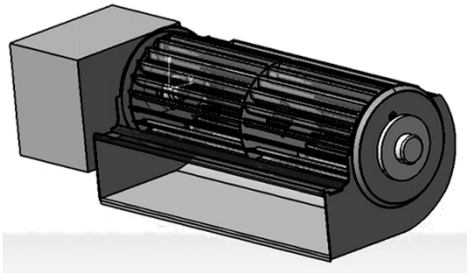
Analisi con sistema Stereo-PIV ⇨
campo di moto su una sezione piana del condotto

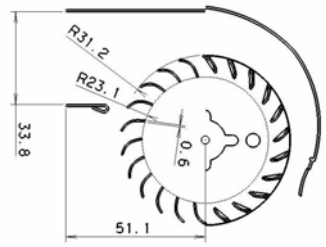


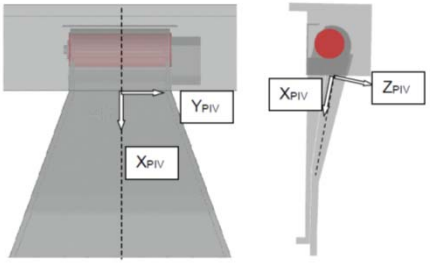
Validazione modello CFD – Steady Rans



Real & Virtual Testing Division – CFD es. 2

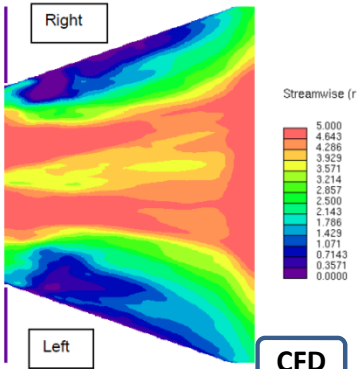




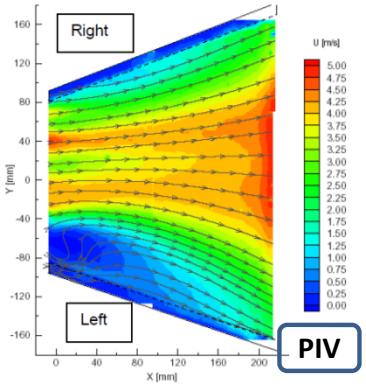


Validazione mediante PIV su sezioni piane nel condotto di scarico

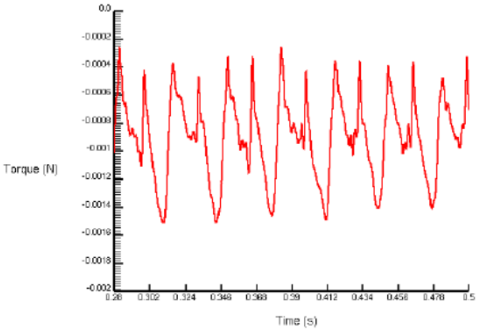
Analisi tempo-variante della coppia scambiata con le singole palette del ventilatore

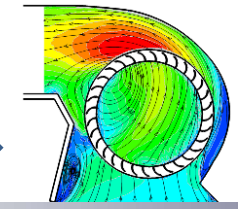


CFD



PIV

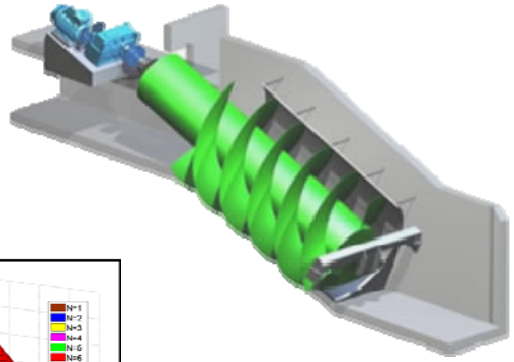




Analisi del campo di moto interno per ottimizzazione della voluta

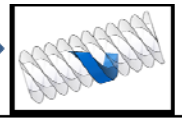
Real & Virtual Testing Division – 0D Modelling

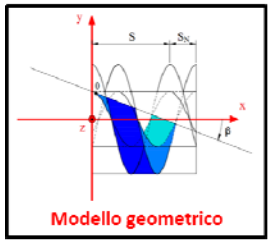
Modellizzazione 0D a parametri concentrati finalizzata **all'ottimizzazione** del **design** e della **regolazione**



Modello geometrico

- **STUDIO DEL RIEMPIMENTO MASSIMO**

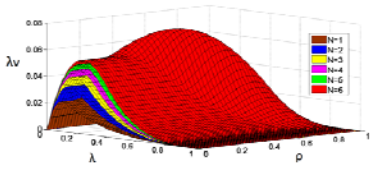




Routine Matlab

Portata in funzione di:

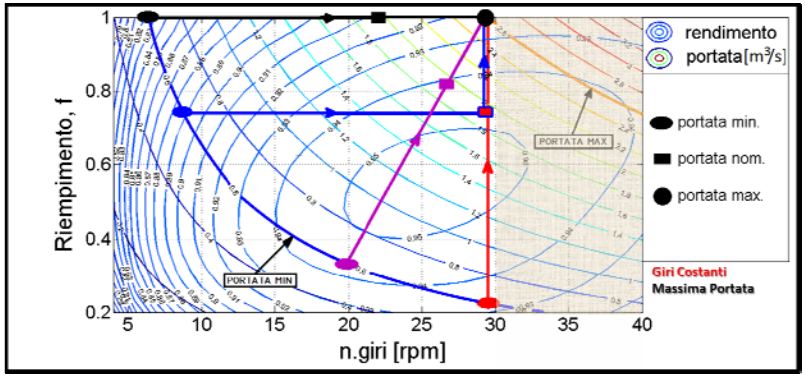
- Numero di principi
- Raggio esterno
- Raggio interno
- Passo
- Inclinazione vite



Modello Geometrico + Correlazioni empirico/teoriche per fonti di perdita

Impianto sperimentale

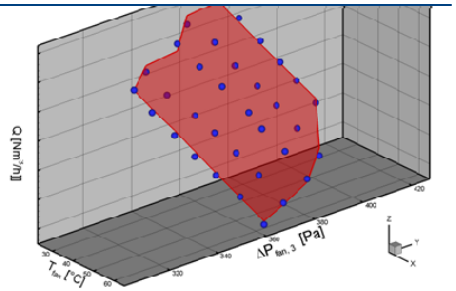
Ottimizzazione della gestione dell'impianto



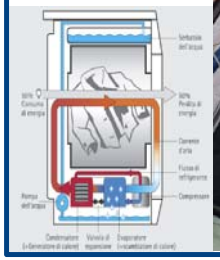
Real & Virtual Testing Division – MBD

Elettrodomestici di nuova generazione ⇨ richiesta di sempre maggior efficienza (energy label) + sistemi complessi (es. heat pump techn.)
⇨ **Virtual Modelling**: **Model Based Design**

Mass Flow Rate Assessment



Support fan & heat exchangers design

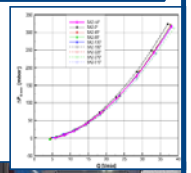


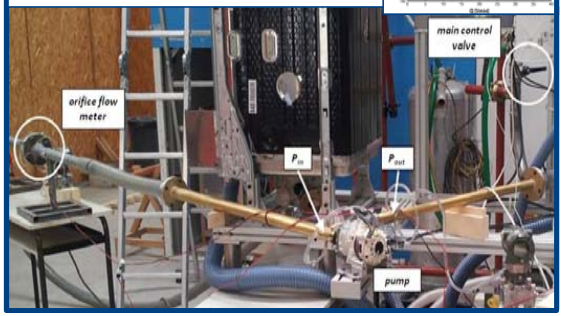
Drying Process Character. & Modeling

Performance & Efficiency Optimization

Dishwasher Hydraulic Circuit

New Virtual Design Tool





ADVANTECH

RUNNING ON TIME

Technology Innovation Mindset Engineering

Grazie per l'attenzione!

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