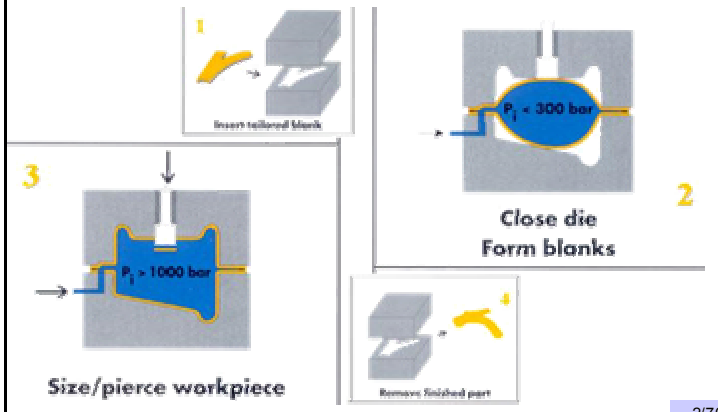
Idroformatura di lamiere (SHF)

1/70

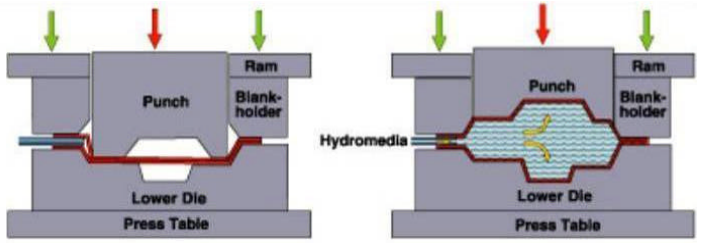
SHF a lamiere contrapposte



2/70

SHF a lamiere contrapposte

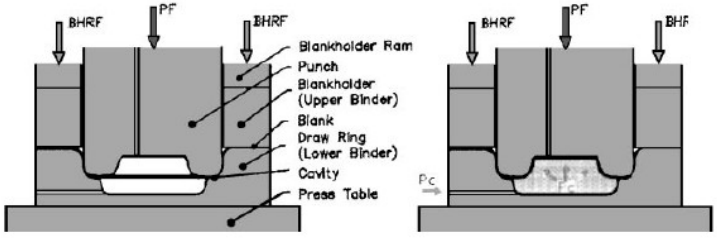
Con punzone disaccoppiato dallo stampo superiore premilamiera



3/70

SHF a lamiera singola

Con punzone solido disaccoppiato dallo stampo superiore premilamiera



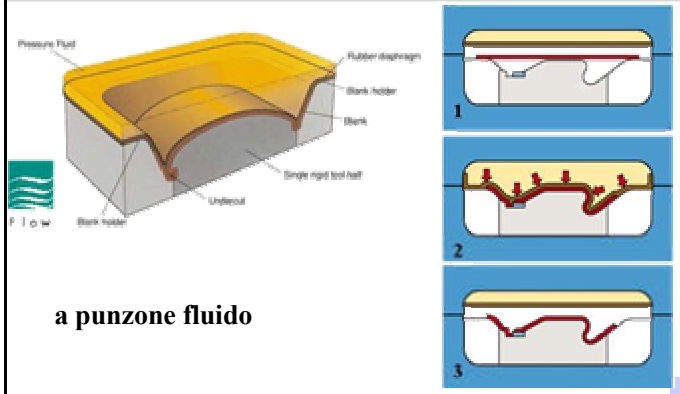
a matrice fluida

4/70

SHF a lamiera singola

5/70

Il Flexforming

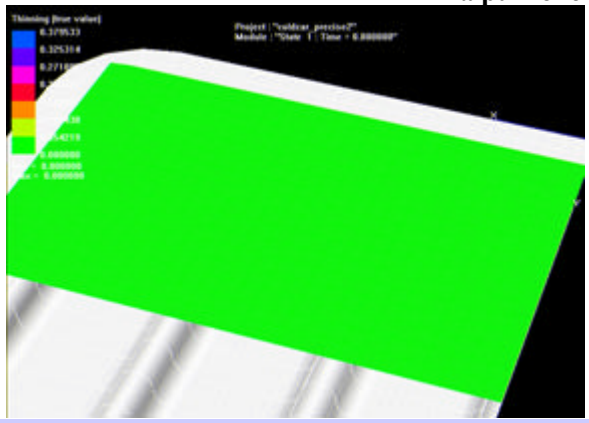


a punzone fluido

6/70

Esempio di processo flexforming

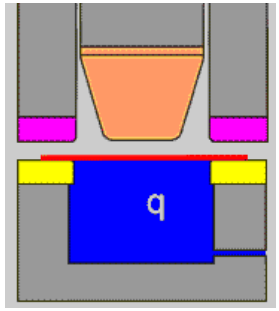
a punzone fluido

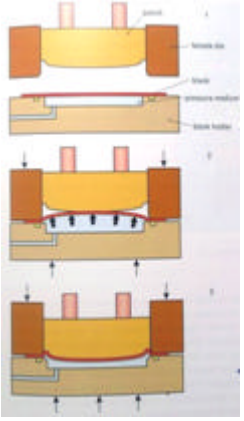


7/70

Hydromec: imbutitura idromeccanica

a matrice fluida

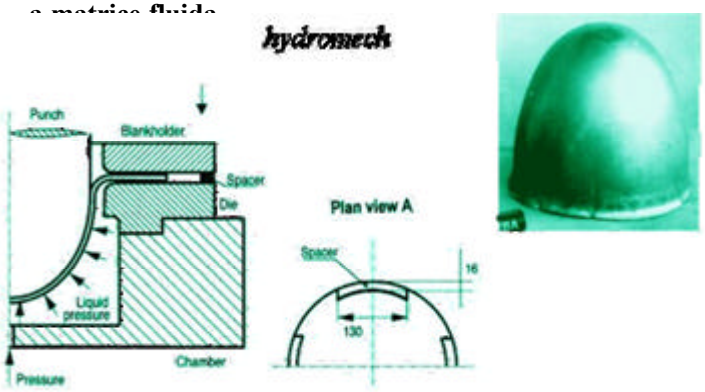




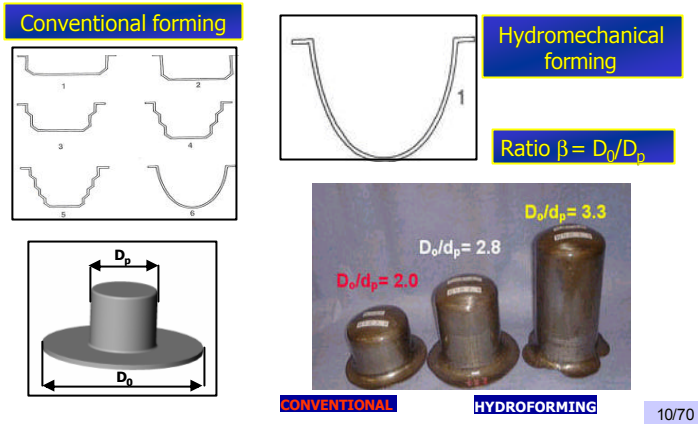
8/70

Hydromec: imbutitura idromeccanica

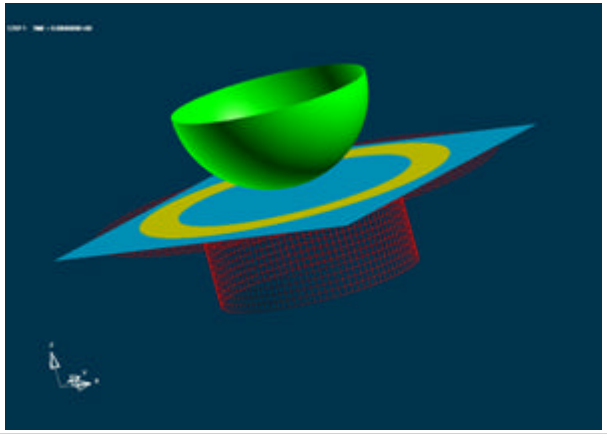
a matrice fluida



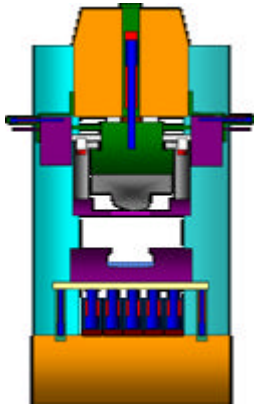
Idroformatura vs Imbutitura



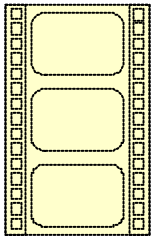
Esempio di processo Hydromec



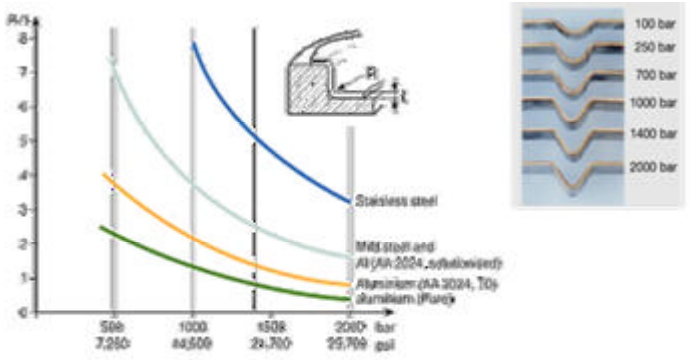
Esempio di pressa da imbutitura idromeccanica



animazione

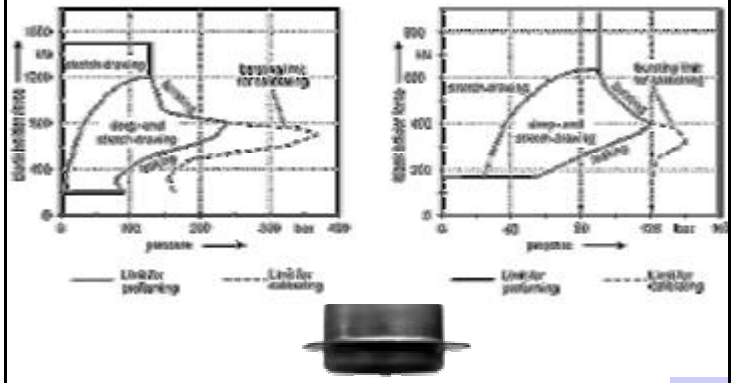


SHF: Pressione e raggi di raccordo interni



SHF: Pressione e forza premilamiera

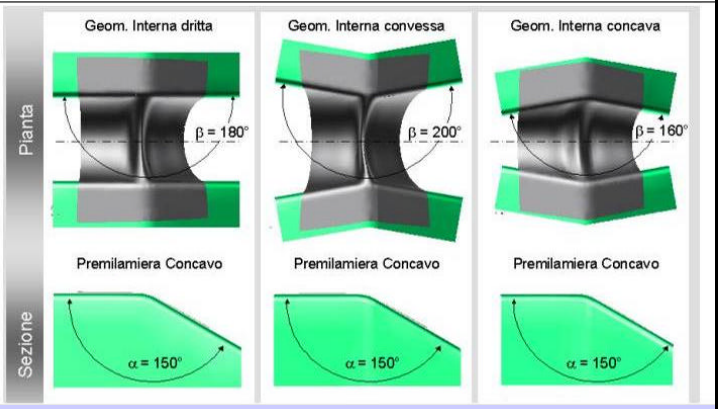
DC04 AA6016



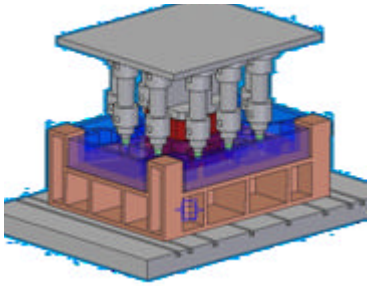
SHF: controllo del processo

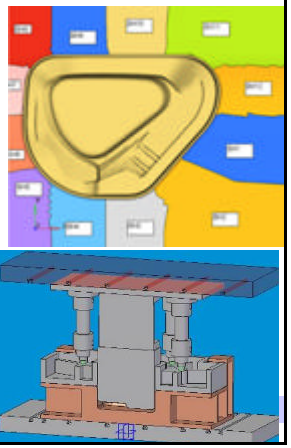
- Problema principale che ostacola la diffusione
  - Forze di chiusura degli stampi per garantire la tenuta
    - Spesso di entità molto elevata
    - L'azione di chiusura stampi e tenuta idraulica è spesso correlata o identica all'azione di premilamiera
    - Processo molto dipendente dalla geometria

Flexforming: Wrinkling e geometria dello stampo



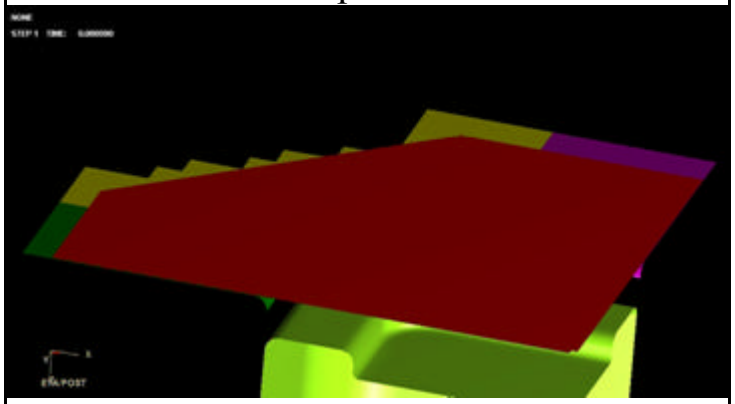
SHF: controllo del processo





Premilamiera controllato con 12 attuatori indipendenti

SHF: controllo del processo

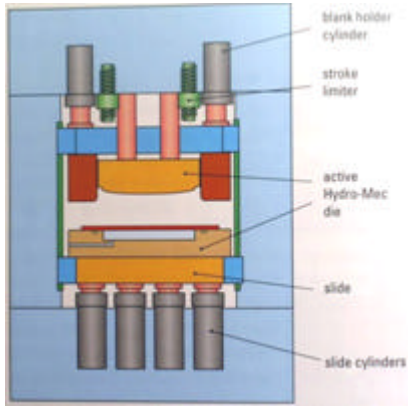


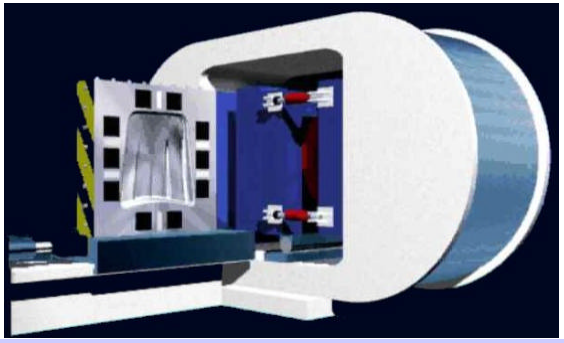
Premilamiera controllato con 12 attuatori indipendenti

Esempio di pressa da imbutitura idromeccanica

2 effetti contrapposti

Con intensificatore e punzone fluido



Esempio di pressa orizzontale da SHF

- A struttura chiusa speciale monoblocco
- A effetto singolo orizzontale con smorzamento passivo
- Con intensificatore e matrice fluida