

HOT STAMPING

Promoting Brass through Design

David Brooks Managing Director

Neil Williams Sales Manager



2004

LESLIE
GROUP

Agenda

1. The **Leslie Group**
2. The Hot Stamping Process
3. Design Considerations
4. The future

Agenda 1.0

Who's The Leslie Group ?

£3 M


2003

SME

Need to keep the competitive edge

- 65 UK associates
 - from three cultural backgrounds

MANUFACTURING EXCELLENCE IN MACHINED STAMPINGS



Manufacturers of hot brass stampings

The Leslie Group Homepage

Our Mission


To provide total customer satisfaction whilst generating profit and stable employment.

New

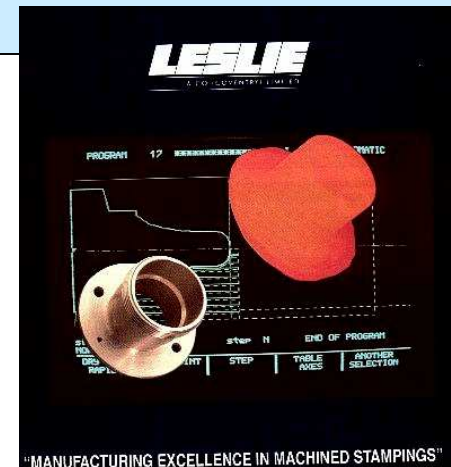
Visit our [technical page](#), which includes up to date graphs of the trends in the brass basis, and the copper LME prices.

Contact Information

Please do not hesitate to contact us. You will find all of the contact details in the [Contacts](#) page.



[News](#) [Contacts](#) [Index](#)
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Manufacturer

Bought up 2 competitors between 1996 and 1998 and lot of communication focus

UK Contraction -
3 sites to 2 1997
2 sites to 1 2003



Leslie 2003

Stamping Presses

25 on 1 acre at Yardley, Birmingham

providing up to **1,000 ton** forging
for brass, copper and aluminium
with CNC machine & design facilities
plus rotary machining & tool-room

Markets

Service - domestic and marine water fittings 2 weeks

Service - electrical high voltage connections 4 weeks

Service - industrial batch non ferrous stampings 4 weeks

+ standard oil, water, refrigeration line ex stock

catalogue products

Overseas Interests

USA

Meyer Associates Ltd.

Mike Meyer, Manager US operations

Administration office, Connecticut

www.advancesourcing.com

Markets

Service - North America OEM

6 weeks

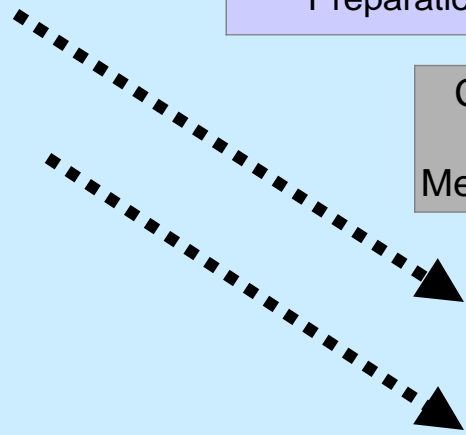
Agenda 2.0

The Hot Stamping Process

DESIGN

Billet
Dimensions

Tooling



Extruded **BRASS**
forging bar

Cut into BILLETS
Automatic SAW

Heated to 650 C
Gas Fired **FURNACE**

STAMPING DIE
Preparation

HOT STAMPING
Mechanical **PRESS**

CLIPPING DIE
Preparation

Cold CLIPPING
Mechanical **PRESS**

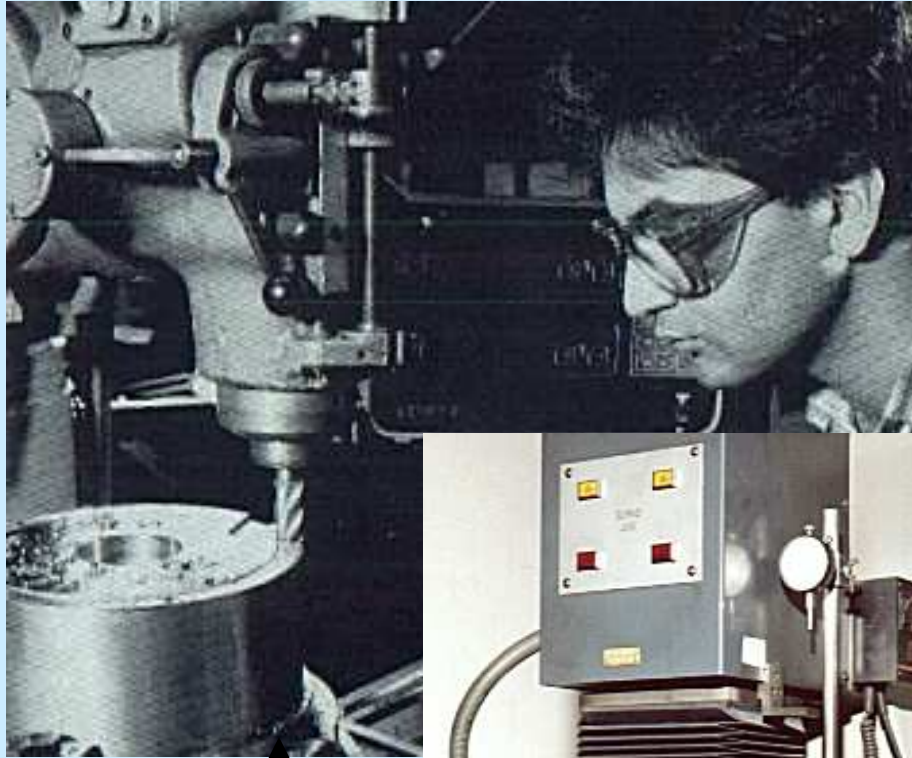
MACHINING
Traditional
CNC

ASSEMBLY



The Manufacturing Route

CUSTOMER



Milling



Spark Eroding
the Cavity



The Tool room

Manufacturing the die set

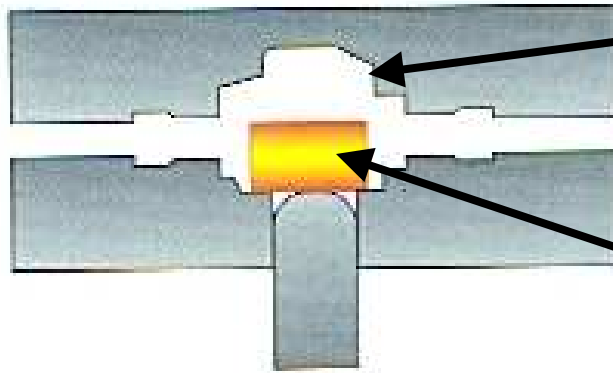
Matching die
blocks H10 / H13



Hot Stamping Tools

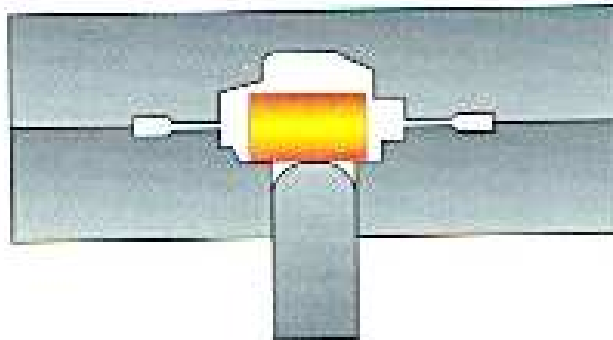
The Stamping sequence

The Stamping Die Set in a Press



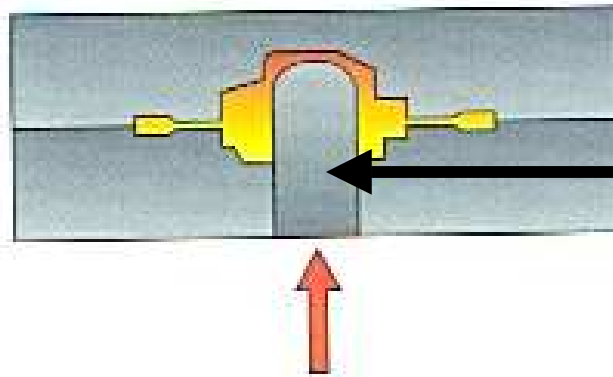
Component shape for Customer

Hot Brass Billet



Dies nearly closed

Excess brass to be removed by "clipping"



Peg moves up to squeeze brass to fill die cavity



Schematic courtesy of CDA publication 103

Types of Hot Stamping presses

- Mechanical Crank Press

- the ram is driven from a crank and is at minimum velocity approach on striking the hot billet
- this gives a rapid squeeze to extrude the brass to fill the die
- side action is possible from a bellcrank operated vice or cam operated sub press
- moving punches can then save material and machining time

- Friction Screw Press

- the ram is driven by a friction drive from a rotating flywheel
- top die is at maximum velocity on striking the hot billet

The production teams

Main Product



High volume /
Low variety



Dedicated
Machines and
Personnel

Runner Cell

General Proven
Products



Mid volume /
Medium variety



Dedicated
Machines and
Personnel

Repeater Cell

Prototypes and
“ one offs “



Low volume /
High variety



Dedicated
Machines and
Personnel

Stranger Cell



**Manual Hot
Stamping
using a
mechanical
press with an
open hearth
furnace**

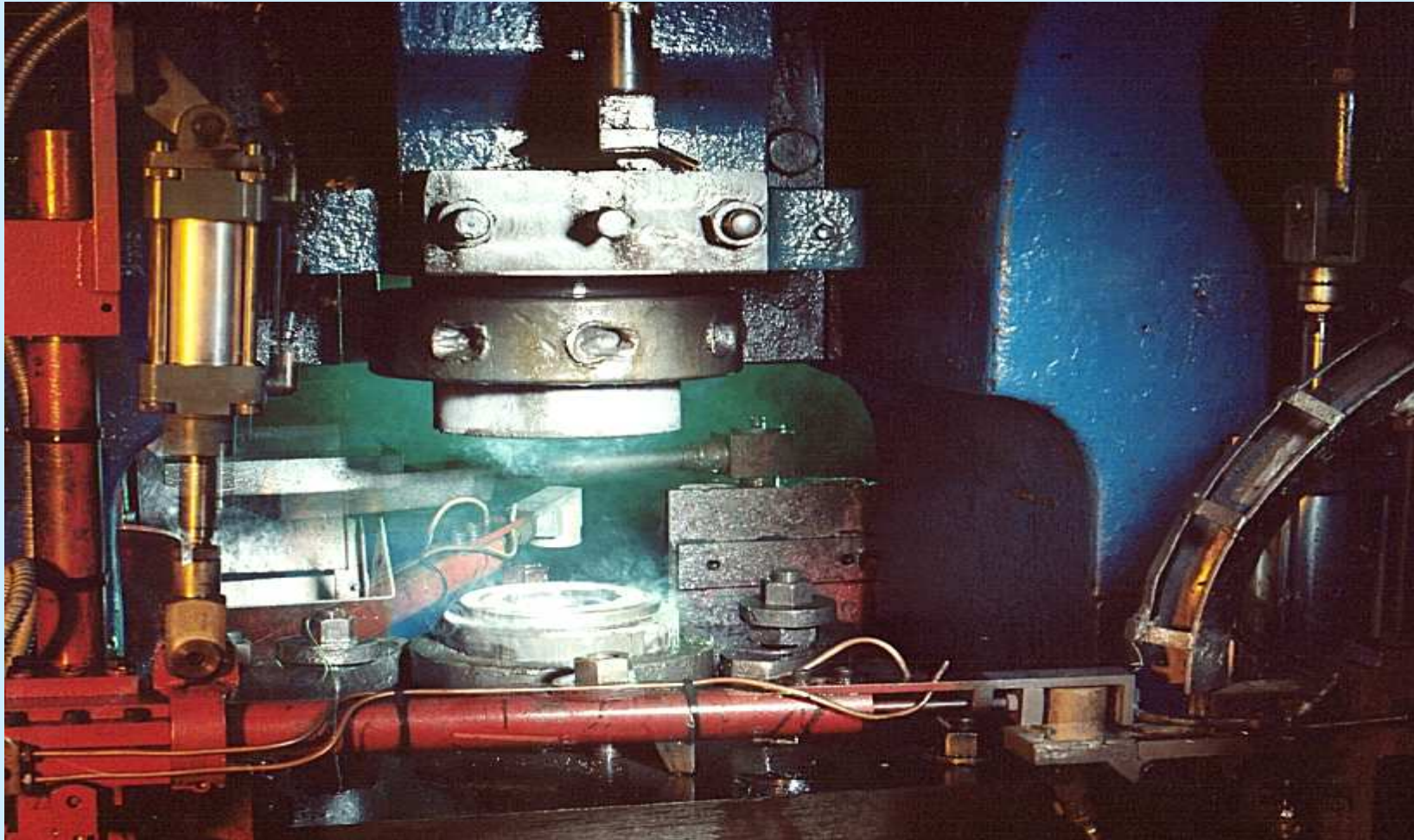
Quality Considerations

- **Demanding die set Environment**

- die deformation at the working temperature (300 C)
- mechanical & thermal shock (1,000 tonnes)
- erosion & wear by material surface flow
- heat ‘checking’ growth

- **Operator Inspection**

- geometry during the stamping manufacture
- surface definition
 - fins indicate cracks
 - surface steps indicate build up of lubrication
- variation of wall thickness in sections formed by the drive peg which wears



Automatic hot stamping using a pick and place mechanism



Hot Stamping work examples

Agenda 3.0

Design Considerations

Design Advantages of Brass Stampings

- Low Cost of component
- High volume potential
- No tooling charges in quantity
- Dimensional accuracy & complex shapes in one operation
- Near net shape components
- Good surface finish
- Good Life expectancy
- Good mechanical properties
- Good resistance to corrosion and wear
- Good electrical and thermal conductivity
- Reduces machining to a minimum
- Freedom from porosity
- Stable & environmentally friendly whole of life product

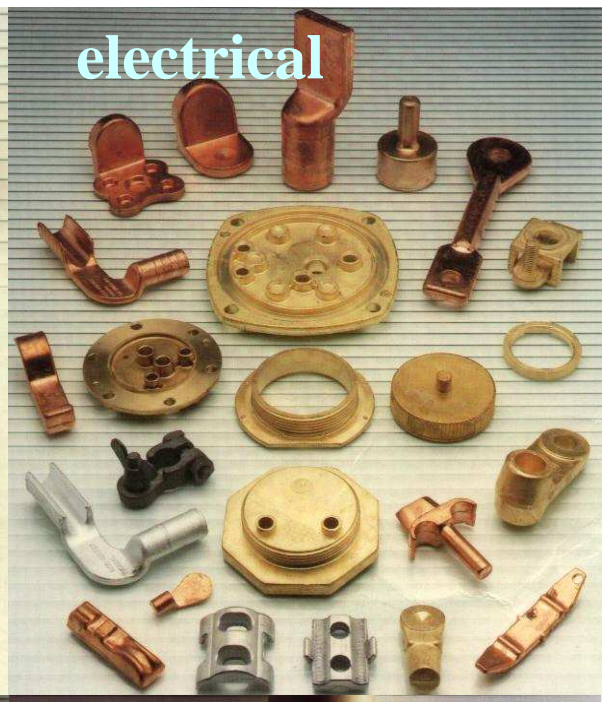
decorative



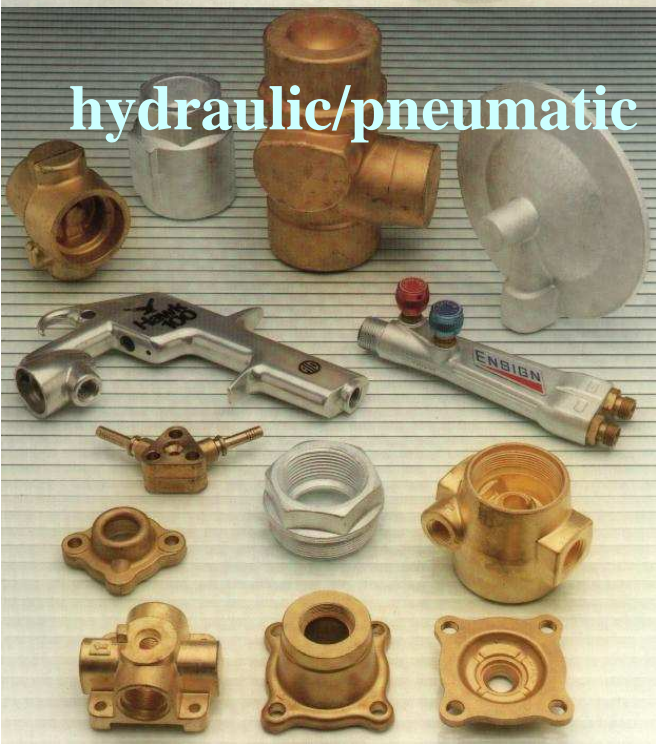
gas



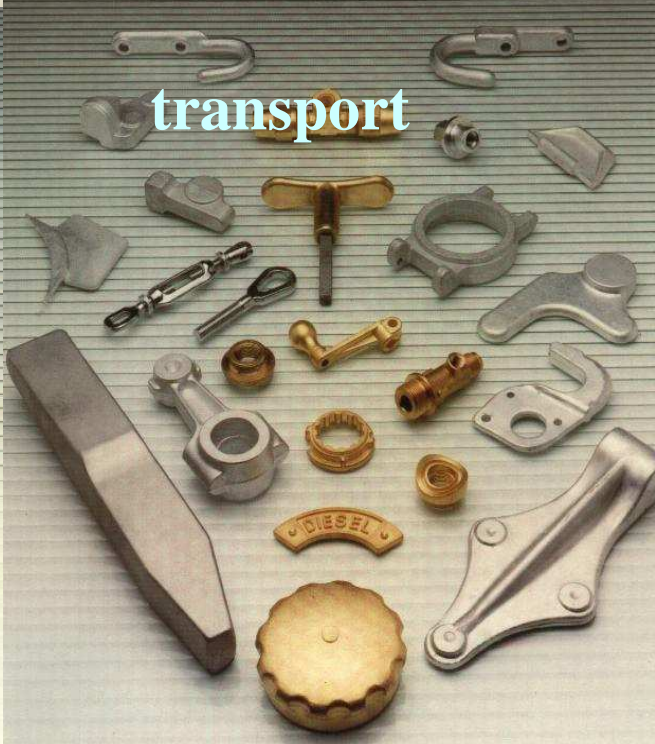
electrical



hydraulic/pneumatic



transport

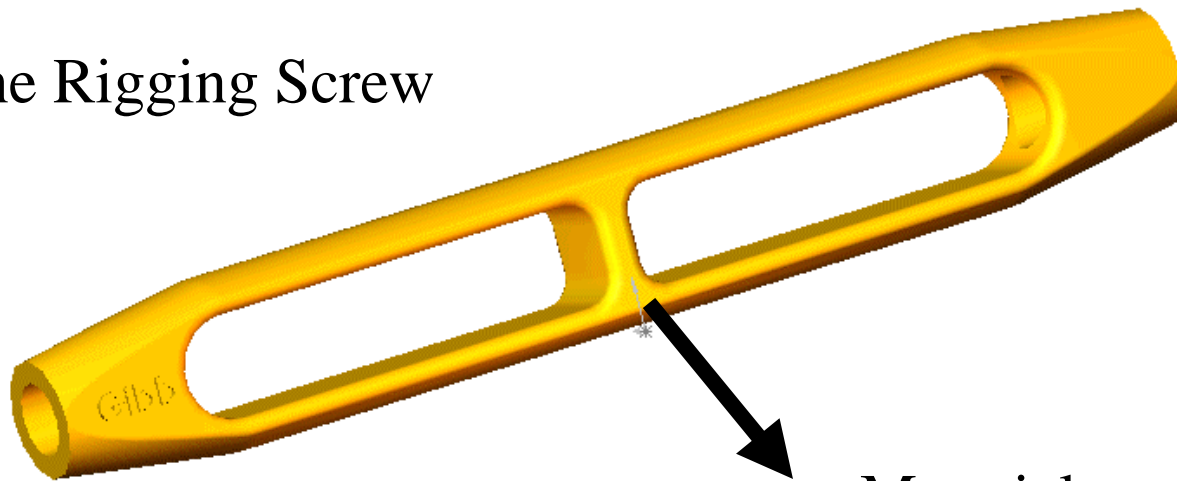


refrigeration



Optimisation of application by CAD

Marine Rigging Screw



Material saving

Net forming by design



BRASS
£2,500/tonne
variable

Extruded **BRASS**
forging bar

Cut into **BILLETS**
Automatic SAW

£/hr

The Cost elements

-£ swarf

Saw £980/tonne

Heated to 650 C
Gas Fired FURNACE

ENERGY
£

STAMPING DIE
Preparation

£/hr

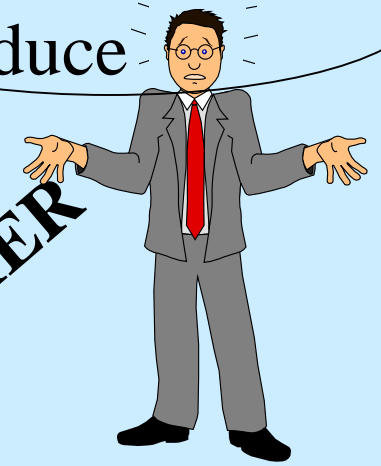
HOT STAMPING
Mechanical PRESS

£/hr

CLIPPING DIE
Preparation

£/hr

Reduce reduce reduce



CUSTOMER



-£ swarf

Solid

£1000/tonne

-£ swarf

Cold CLIPPING
Mechanical PRESS

£/hr

MACHINING
Traditional
CNC

£/hr

Fine £980/tonne

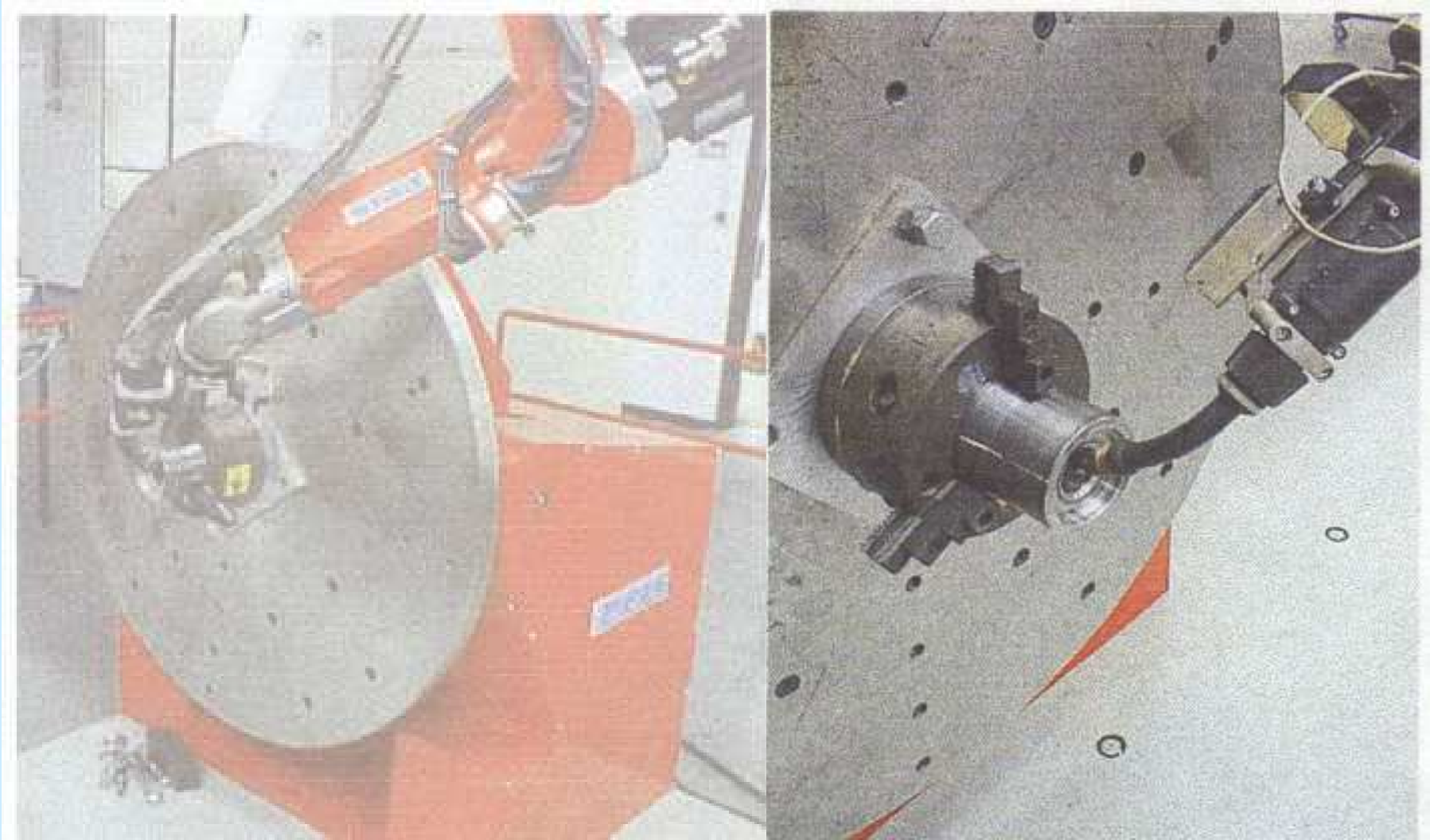
ASSEMBLY

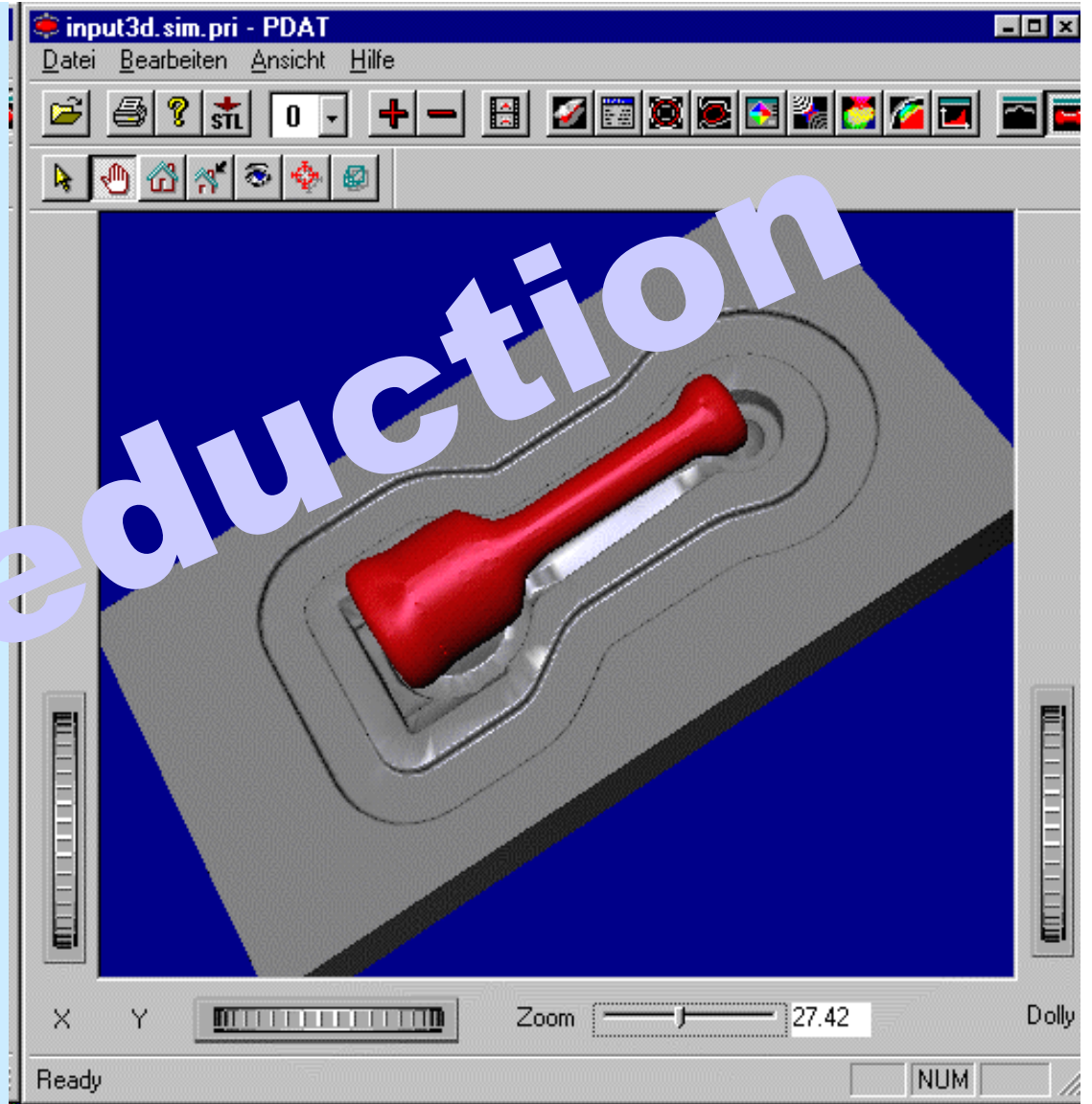
£/hr

The stamping cost estimate

- Raw material
 - Gross weight at market price less discount plus size, quality, quantity premium
 - Scrap allowance
 - Net weight for calculation
- Labour
 - Routings at team rate for machine production rate
- Energy
- Sub contract costs
- Profit

Extending the Life of Hot Stamping Dies by welding





Cost reduction

Optimisation by forge simulation

Agenda 4.0

The Future

UK Market Sector trends in Hot Stamping

- A total service
 - from simple stampings
 - to machined component
 - to factored additions
 - to sub assembled supply
 - to cost down design
 - simpler solution for customer
 - one stop shop for purchasing
 - customer focus - their market
- Market pressure to focus on added value**

R & D Project Interests

Best practice in Engineering and Manufacturing project Esprit (EP26053) 'Widebeam' Wider Dimension for best practice in Engineering and Manufacturing - **complete** **Bulgaria**
Spain

EU CRAFT - **complete**
Aluminium Forging - Innovative solutions for industrial implementation
Belgium, Germany, France

Process modeling in forging using rapid simulation - complete
University of Hannover

Company Teaching scheme - **complete**
Engineering Doctorate in Environmental Technology
Brunel University, UK

IMS-EURobust GIRD-CT-2002-0083 - **active**
'Systemisation of Quality Engineering and Development of Software for its Application'
Netherlands, Germany, Ireland, Spain

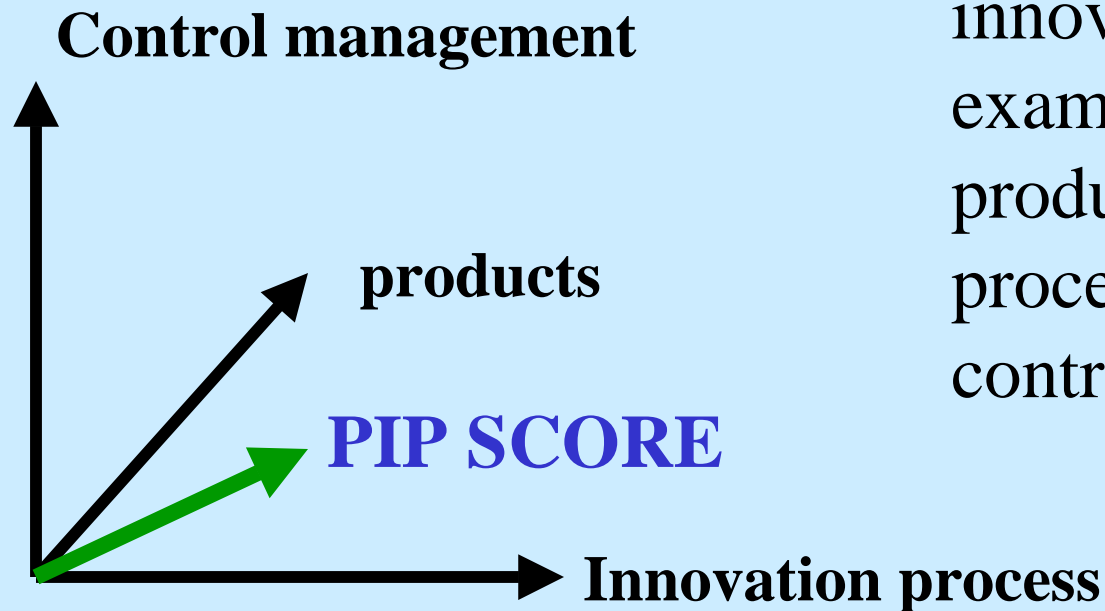
www.pip-score.org

European Project **PIPScore**

Nearing completion

Product Innovation Profiling

Aim - To position the level of product innovation maturity by examining the products developed, processes used and the control management



Greece and Germany partners

The Next Two decades

TRADING

Flexibility demanded

Electronic communication gets cheaper

Technology skill improves

External environment becomes more stable

Globalisation pressures continue to increase

Product life cycle continues to get shorter

Attitude changes

THE HOT STAMPER

Digital continuity from office to design to machine to customer

Outsourcing of non core activity becomes more attractive

Virtual offices link with production factories

Supply chain integration shares added value. Fully engineered packages made.

Prices drop

Cost down action

Prices drop

The best thrive

The End

for the moment

