769A04 - Interaktionsdesign

HT 2021 - Modeller och mateial i papp

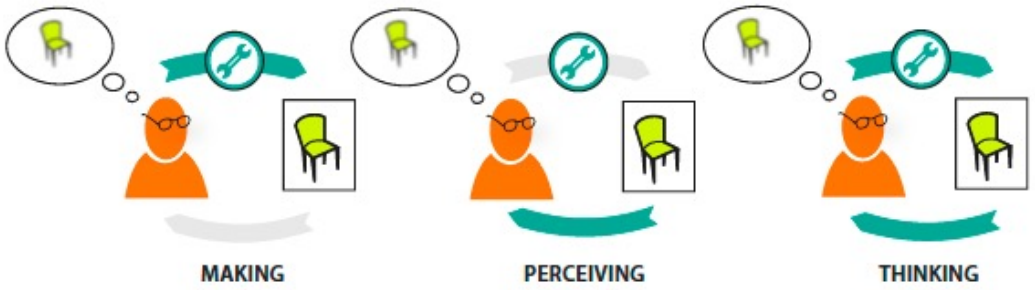
Torbjörn Andersson

LINKÖPING UNIVERSITY

Agenda

- Theory about making models
- Examples of different types of models
- Paper model building techniques
- Test paper model techniques

In the making.



MEDIA AND REPRESENTATIONS …

… PROVIDE AN EXTERNAL MEMORY SPACE.

The possibility to capture ideas and "move on" was considered essential for remembering one's thoughts clearly. Bringing together various representations in larger displays enabled monitoring not only a single idea, but also a spectrum of thoughts.

… ALLOW FOR SELECTIVE ATTENTION.

The different aspects in focus were exemplified: specific visuo-spatial properties, a specific view, or a function or a component of the product.

… FACILITATE VISUAL THINKING AND IMAGERY.

Imagining consequences of manipulations was facilitated by making a representation and using it as a resource to rely on in subsequent transformations.

… ENABLE LEARNING THROUGH HIGHLIGHTING PROBLEMS.

By posing questions, trying out an idea and eliminating its errors, making representations facilitated learning about a problem or a potential solution.

… FACILITATE INTERPRETATION, EVALUATION & VERIFICATION OF IDEAS.

Making representations was considered a "catalyst" that helped in interpreting and evaluating different aspects of ideas.

… TRIGGER EMERGENCE OF NEW IDEAS.

New and unexpected solutions emerged during externalisation activities. Sometimes they were considered to be entirely due to the specific activity and unlikely to have been reached at otherwise.

Figure 11 - Roles of media and representations, in thinking, based on the informants' reflections on their design activities.

Maral Babapour, 2015. PENSIERI - An Inquiry into Sketching and Modelling in Design

ICONICITY IN REPRESENTATIONS

SYMBOLIC RESEMBLANCE ◆ VISUO-SPATIAL ACCURACY

Some representations are accurate in showing spatial qualities, while others are precise in conveying visual properties of artefacts. Inspecting representations with visuo-spatial accuracy and resemblance to the envisioned physical reality was considered important especially when evaluating one's ideas, while the symbolic nature of sketches led to their generally being considered unreliable.

FIXEDNESS OF REPRESENTATIONS

FREE ◆ LOCKED

The possibility to rotate the representations in order to see the artefact from different points of view was considered valuable in physical and digital models.

RICHNESS AND PRECISION

VAGUE ◆ CLEAR

Digital models were considered to approximate reality due to the rich visual information they provide. This was however sometimes seen as a disadvantage when working with a preliminary idea. The vagueness and imperfection of sketches were regarded as facilitating a freed flow of idea generation.

TRACEABILITY OF PRECEDENTS

PERMANENT ◆ TRANSIENT

Some representations provide permanent and persistent traces of ideas. The ability to trace precedent ideas was however considered limited in some media. For example, in physical and digital modelling, typically the interim representations disappear if the designer does not save them while working. As a result, the digital or the physical model only represents the latest changes and traces, preventing designers from tracing the evolution of their ideas.

Figure 12 - Qualities of media derived from the informants' reflections on their design activities.

PLASTICITY OF MATERIAL

MALLEABLE ◆ RIGID

Some media provide malleability and flexibility for making different variations while others are found to be relatively rigid and stale.

IMMEDIACY OF FEEDBACK

INSTANT ◆ DELAYED

Some media provide the possibility to represent ideas in a fast and brief manner. While some offer immediate feedback on visual properties e.g. shape and size of the artefact, others provide feedback on proportion in relation to the environment and the use situation.

DIRECTNESS OF INTERACTION

DIRECT ◆ REMOTE

The directness to the representations (e.g. pen & paper sketching or physical modelling) are preferred to the indirect interaction with models in digital media, especially since they require inputting what is being drawn e.g. whether it is a point, a straight line, a curve, or a surface.

EASE OF USE

EASY ◆ DIFFICULT

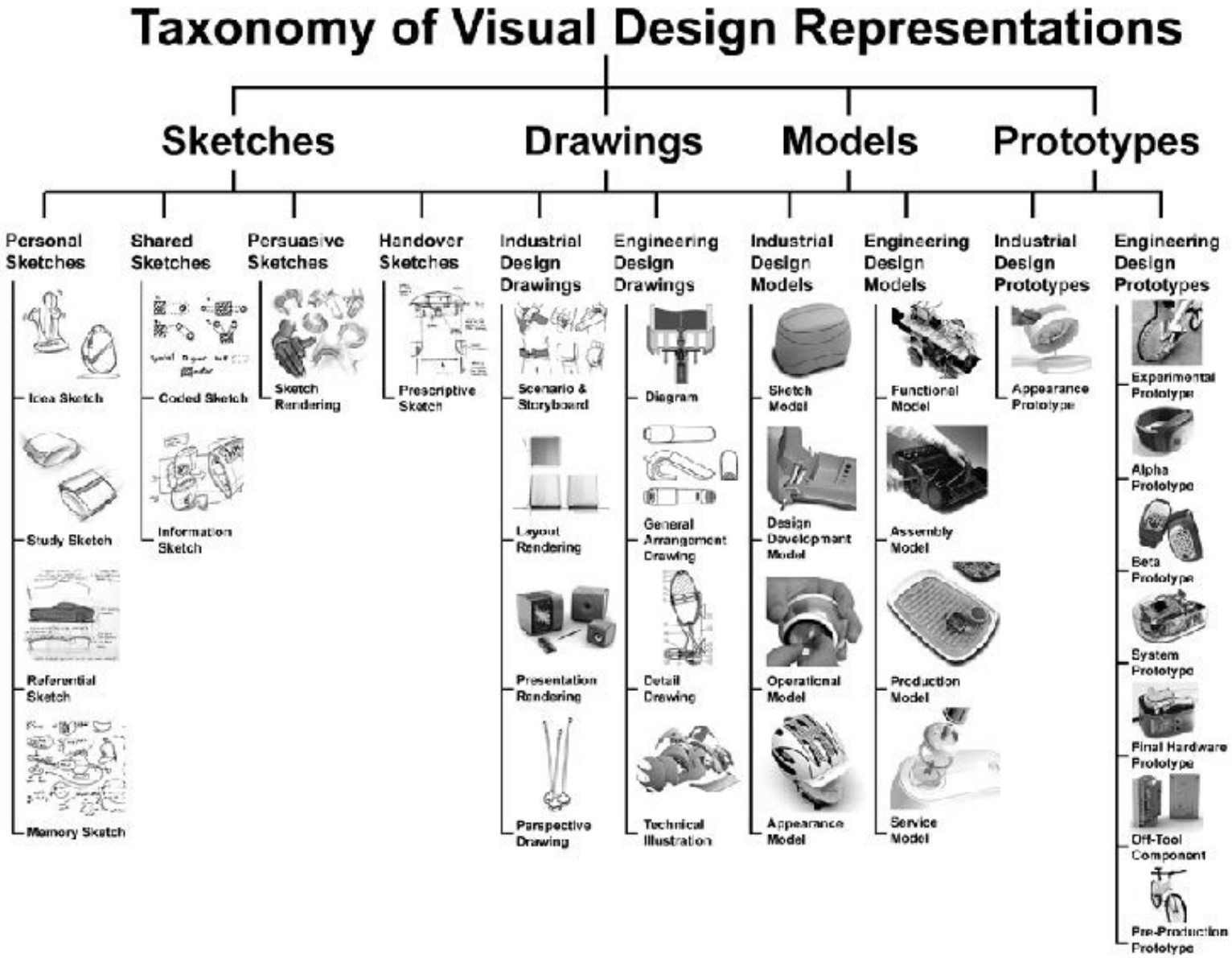
Sketching is thought to be intuitive, though difficult to use at times depending on the situation; e.g. some ideas may be easier to visualise through sketching, others through physical or digital modelling.

RESOURCE EFFICIENCY

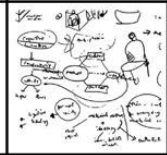
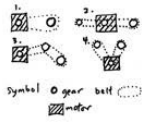
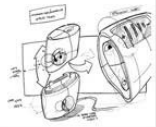
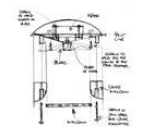
CONVENIENT ◆ INCONVENIENT

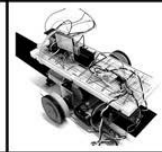
Convenience is related to time and resources required in a specific context e.g. clay modelling might be more convenient for making organic forms, digital modelling for working with patterns and repetitions.

Figure 12 - Qualities of media derived from the informants' reflections on their design activities.



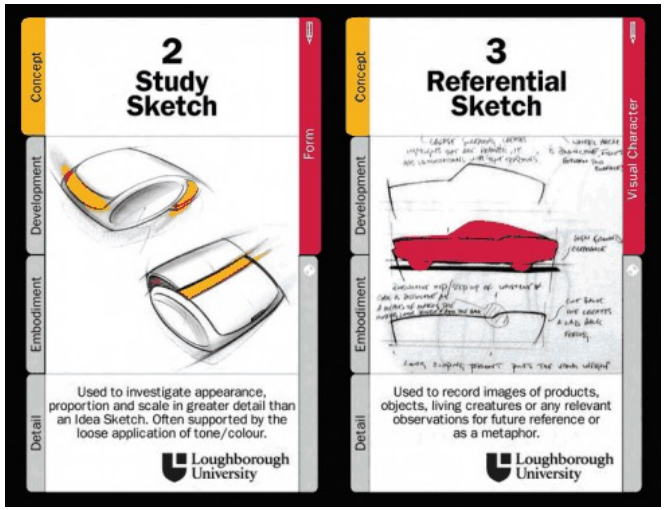
Eujin Pei, 2009. Building a Common Language of Design Representations for Industrial Designers & Engineering Designers

2D Visual Design Representations	Sub-group	Visual Design Representation	Definition	Visual Example
Sketches	Personal Sketches	Idea Sketch	Employed at a personal level to quickly externalize thoughts using simple line-work. Also known as a Thumbnail, Thinking or Napkin Sketch.	
		Study Sketch	Used to investigate appearance, proportion and scale in greater detail than an Idea Sketch. Often supported by the loose application of tone/colour.	
		Referential Sketch	Used to record images of products, objects, living creatures or any relevant observations for future reference or as a metaphor.	
		Memory Sketch	Helps expand thoughts during the design process using mind maps, notes and annotations.	
	Shared Sketches	Coded Sketch	Informal coded representation that categorizes information to demonstrate an underlying principle or scheme.	
	Persuasive Sketches	Information Sketch	Quickly and effectively communicates features through the use of annotation and supporting graphics. Also known as an Explanatory or Talking Sketch.	
		Sketch Rendering	Clearly defined proposal produced by controlled sketching and use of colour/tone to enhance detail and realism. Also known as a First Concept.	
	Handover Sketches	Prescriptive Sketch	Informal sketch for the exploration of technical details such as mechanisms, manufacturing, materials and dimensions.	

3D Visual Design Representations	Sub-group	Visual Design Representation	Definition	Visual Example
Models	Industrial Design Models	Sketch Model	Informal, relatively low definition 3D model that captures the key characteristics of form. Also known as a Foam Model or 3D Sketch.	
		Design Development Model	Simple mock-up used to explore and visualize the relationships between components, cavities, interfaces and structures. Usually produced using card.	
		Operational Model	Communicates how the product is used with the potential for ergonomic evaluation.	
		Appearance Model	Accurate physical representation of product appearance. Also known as a Block Model as it tends not to contain any working parts.	
	Engineering Design Models	Functional Model	Captures the key functional features and underlying operating principles. Has limited or no association with the product's final appearance.	
		Assembly Model	Enables the evaluation and development of the methods and tools required to assemble product components.	
		Production Model	Used to evaluate and develop the location and fit of individual components and sub-assemblies.	
		Service Model	Supports the development and demonstration of how a product is serviced and maintained.	

2D Visual Design Representations	Sub-group	Visual Design Representation	Definition	Visual Example
Prototypes	Industrial Design Prototypes	Appearance Prototype	Highly detailed representation that combines functionality with exact product appearance. Uses or simulates production materials.	
	Engineering Design Prototypes	Experimental Prototype	Refined prototype that accurately models physical components to enable the collection of performance data for further development.	
		Alpha Prototype	Brings together key elements of appearance and functionality for the first time. Uses or simulates production materials.	
		Beta Prototype	A refined evolution of an Alpha Prototype used to evaluate on-going design changes in preparation for the final specification of all components.	
		System Prototype	Integrates components specified for the production item without consideration of appearance. Used to evaluate electronic and mechanical performance.	
		Final Hardware Prototype	Developed from the System Prototype as a final representation of the product's functional elements.	
		Off-Tool Component	Produced using the tooling and materials intended for production to enable the evaluation of material properties and appearance of components.	
		Pre-Production Prototype	Final prototype produced using production components. Manufactured in small volumes for testing prior to full scale production.	

Eujin Pei, 2009. Building a Common Language of Design Representations for Industrial Designers & Engineering Designers



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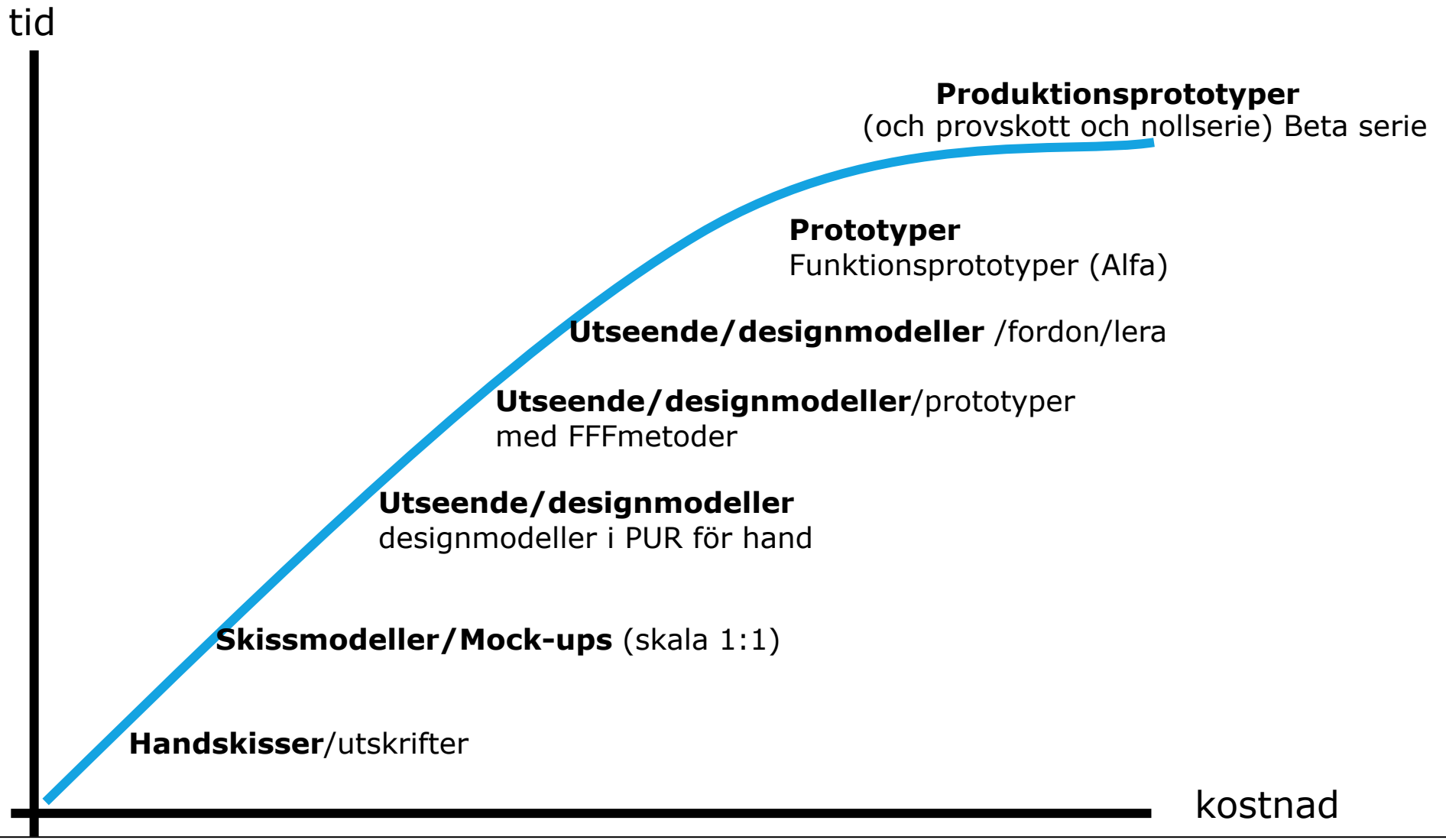
kostnader modeller/prototyper:



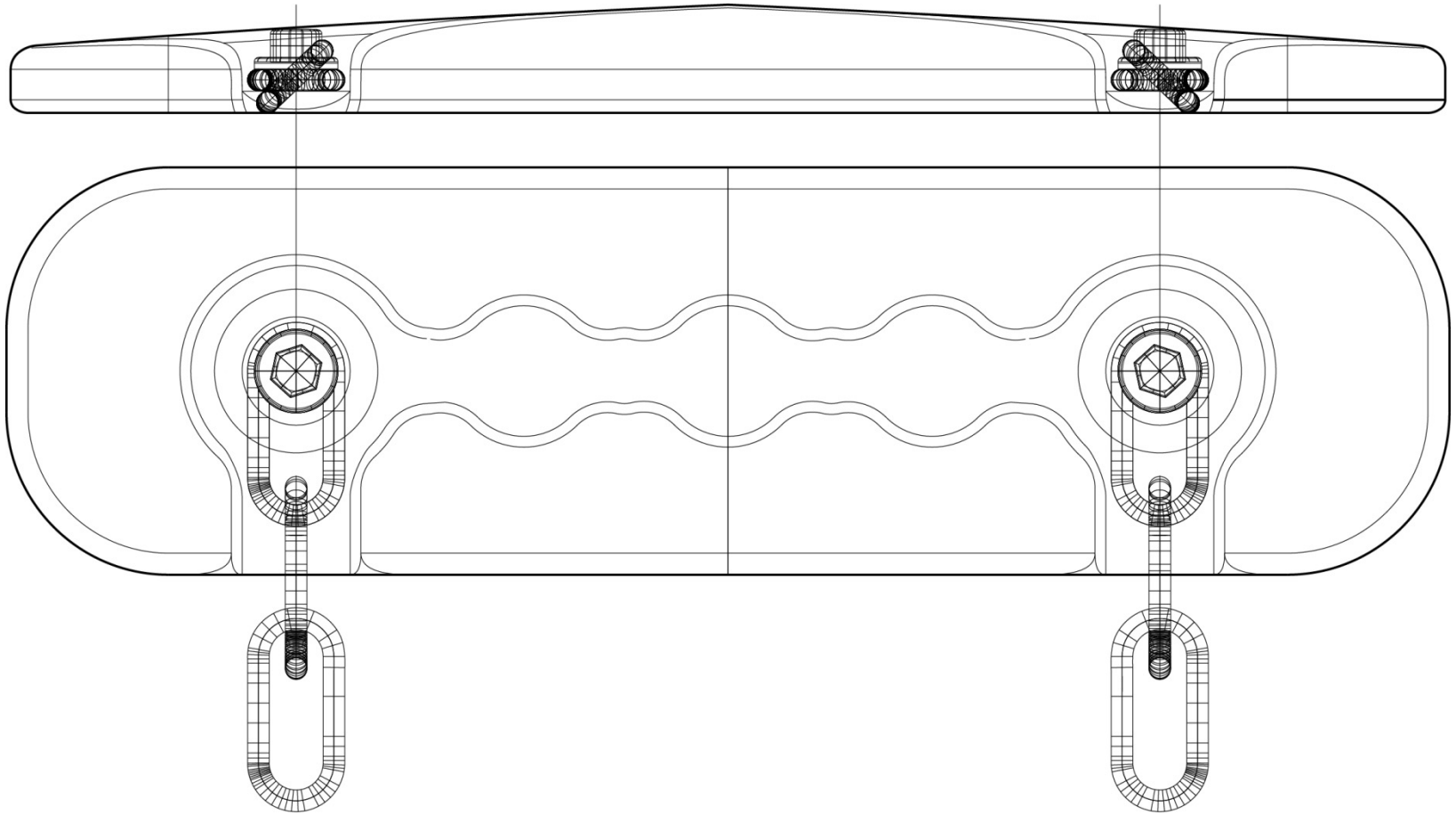
Modellbygge och ”Qick and Dirty” method

Torbjörn Andersson

LINKÖPING UNIVERSITY

Skissmodeller -exempel

- **Skisser i skala 1:1** utskrifter

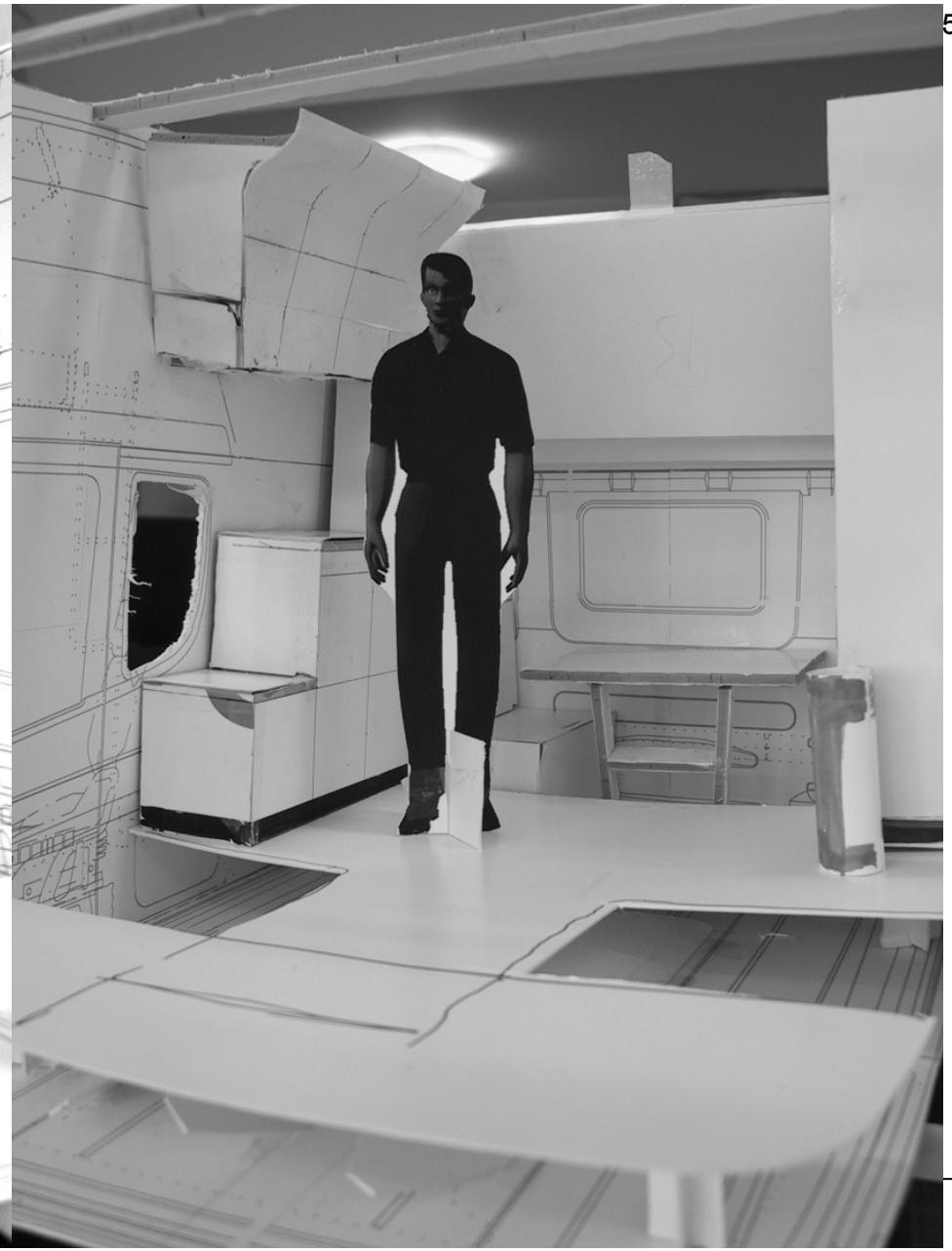


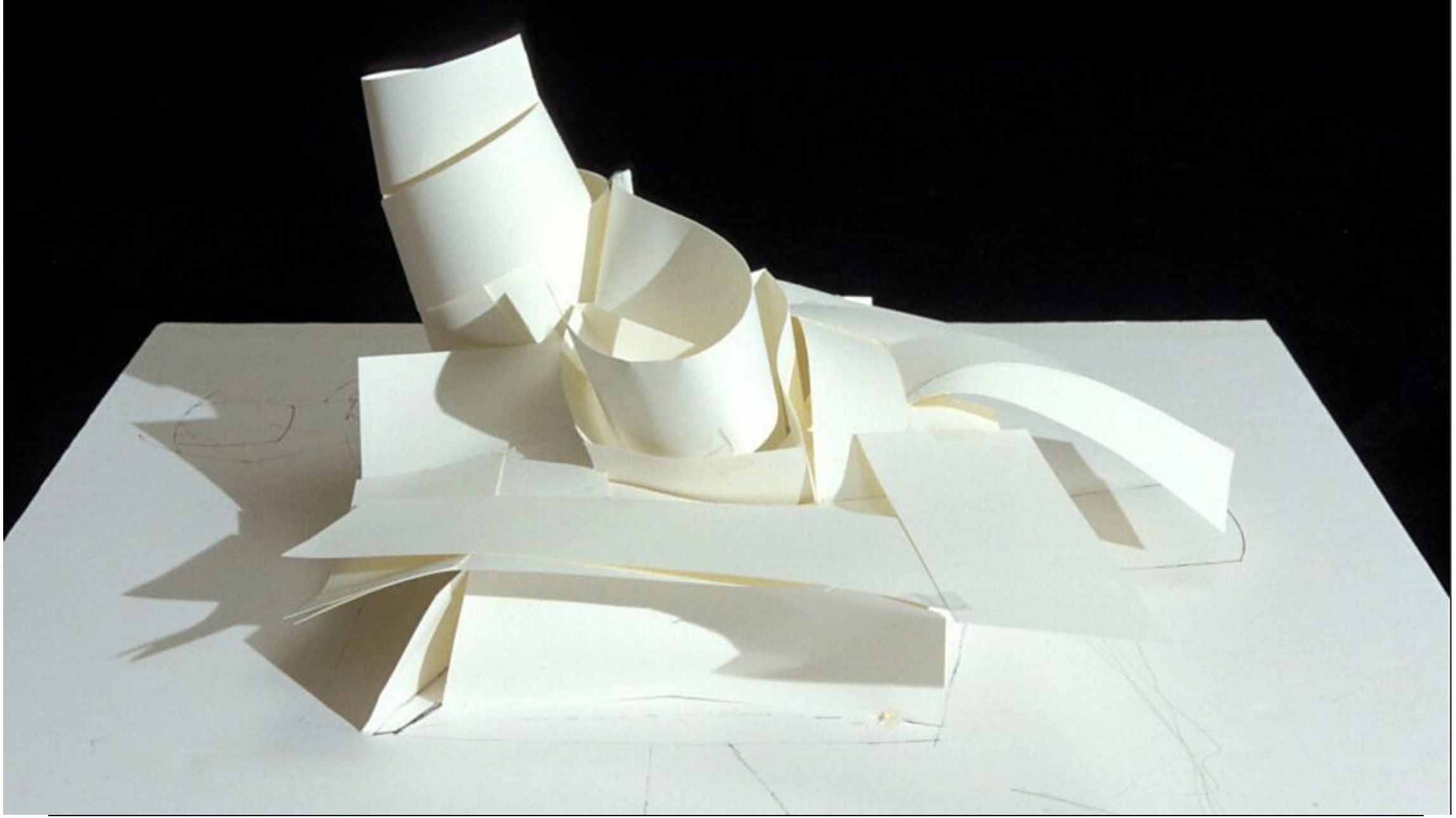
Design: Thomas Nyström

Pappmodeller - exempel



Det går att använda papp till olika sorters modeller.





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Guggenheim museum in Bilbao

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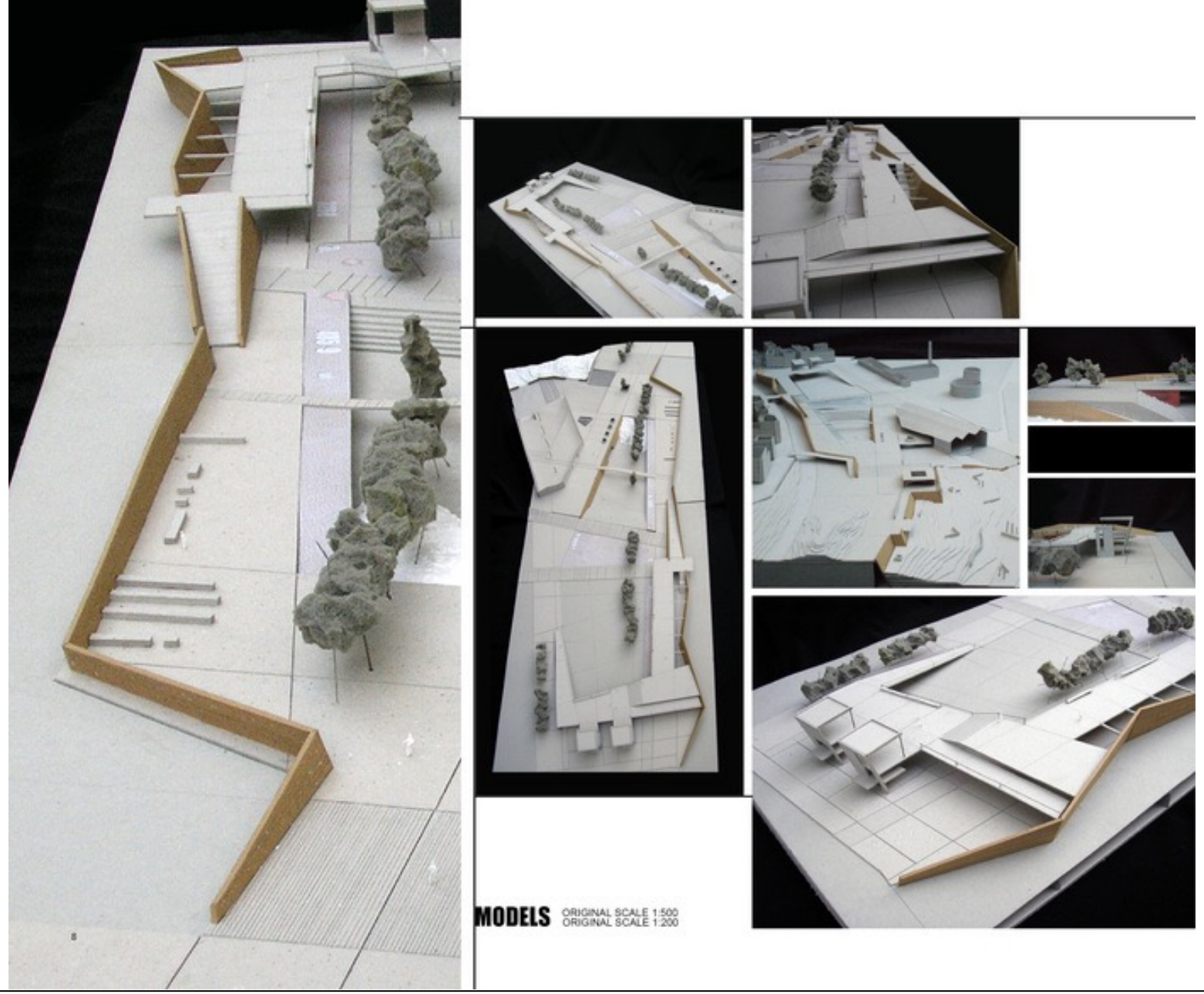
Guggenheim museum in Bilbao



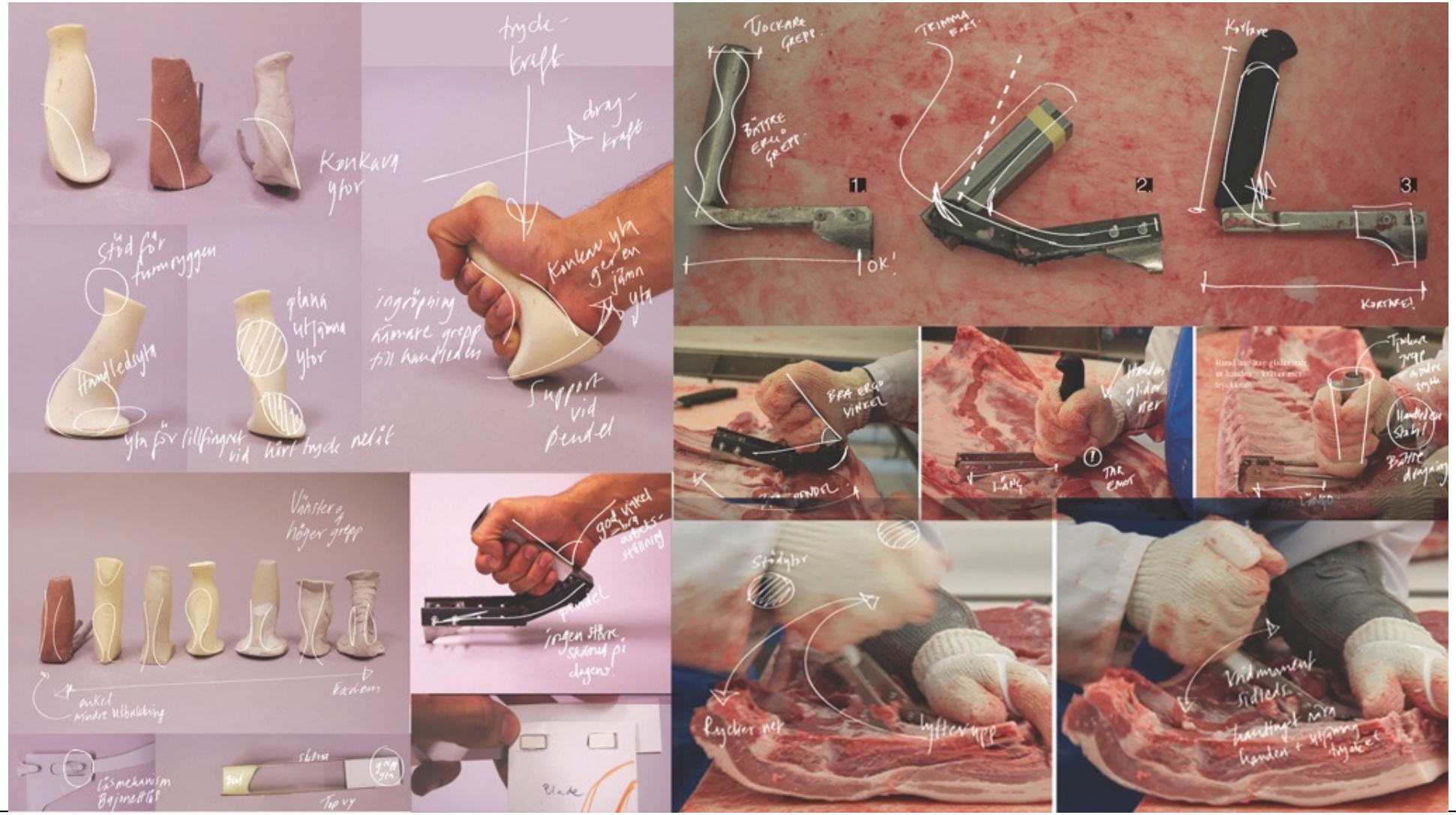
MODELS ORIGINAL SCALE 1:500
ORIGINAL SCALE 1:200

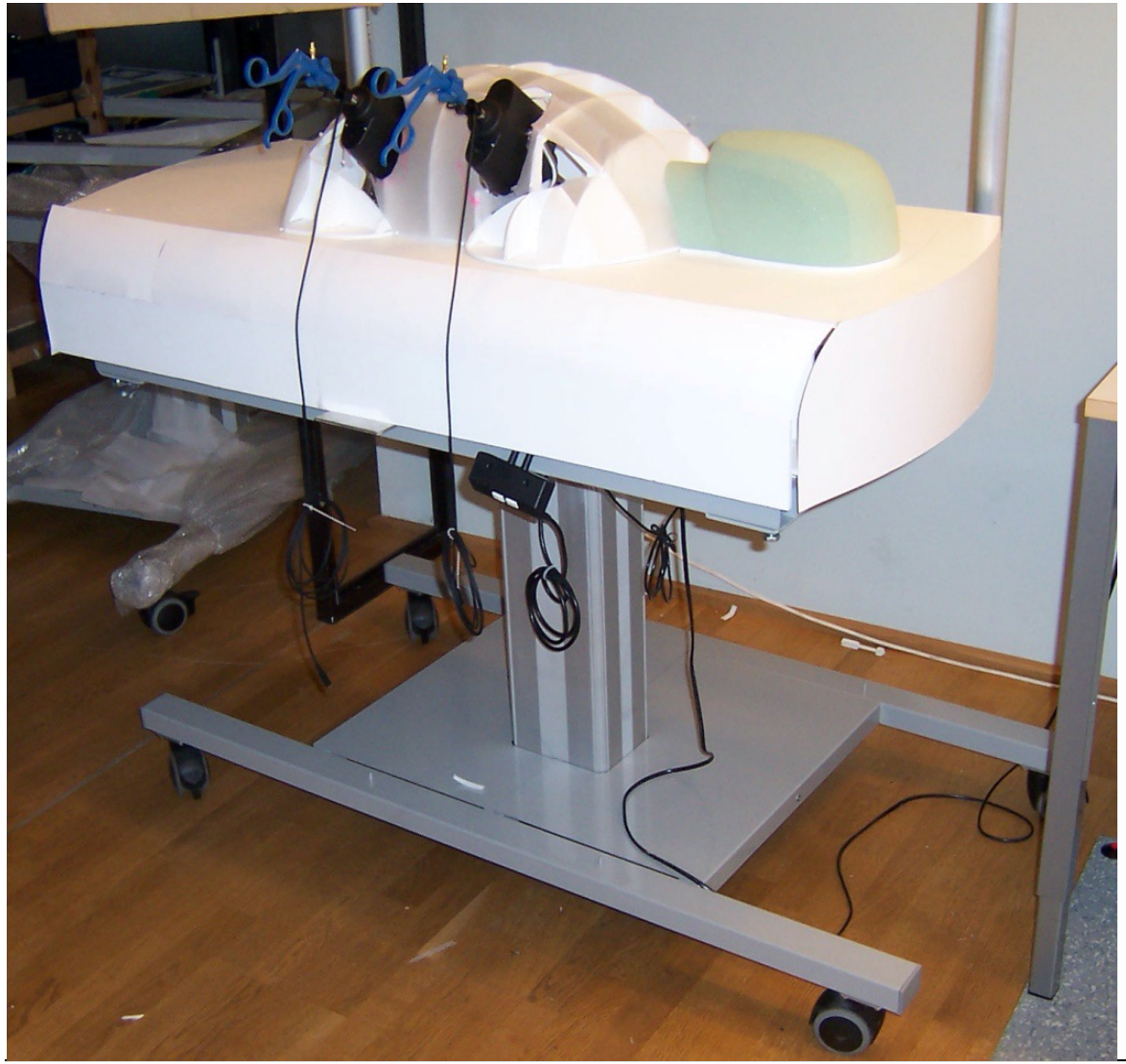
Designer: Sandra Backlund 2010

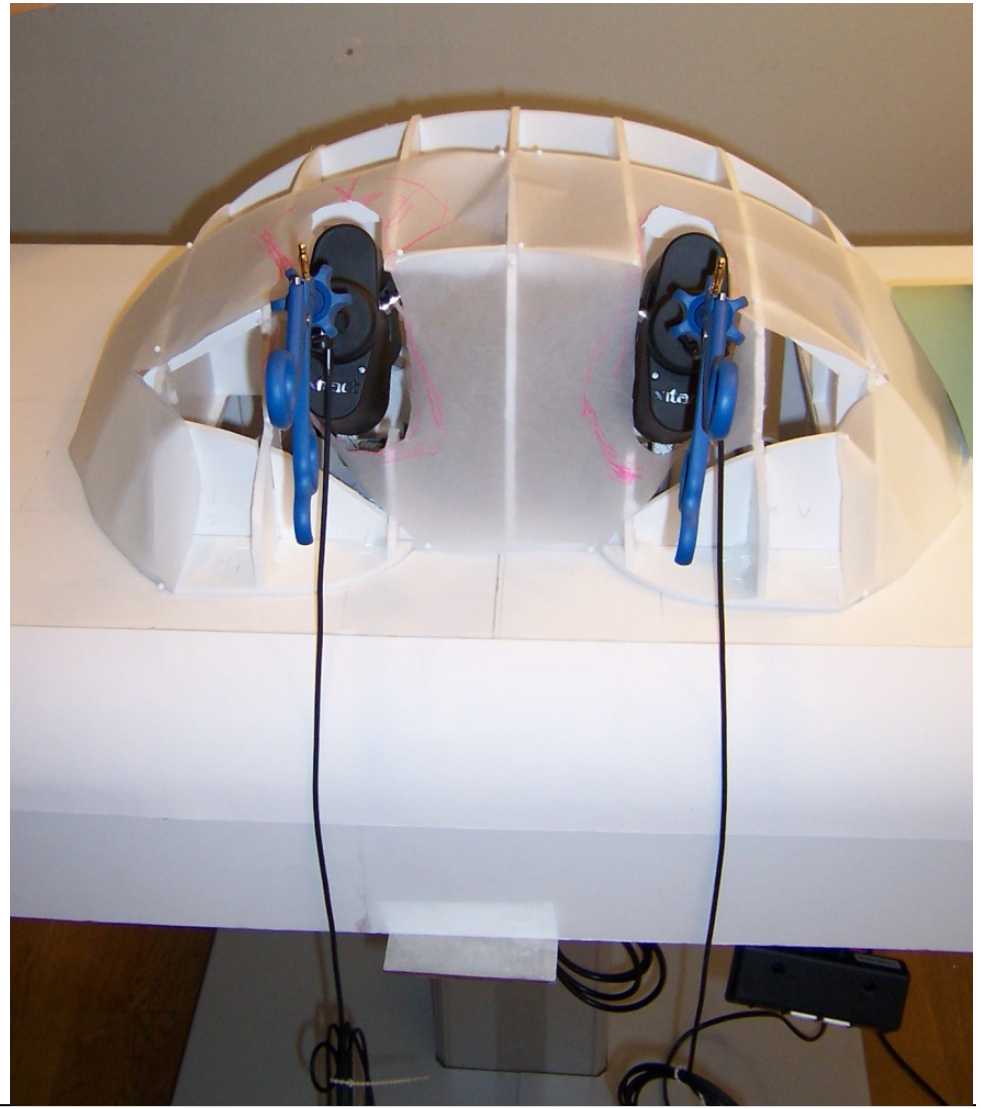

PICK YOUR
NOSE
party animals

Antropometriskstudie

Använda modeller, komfort i arbete (utförande av en uppgift)





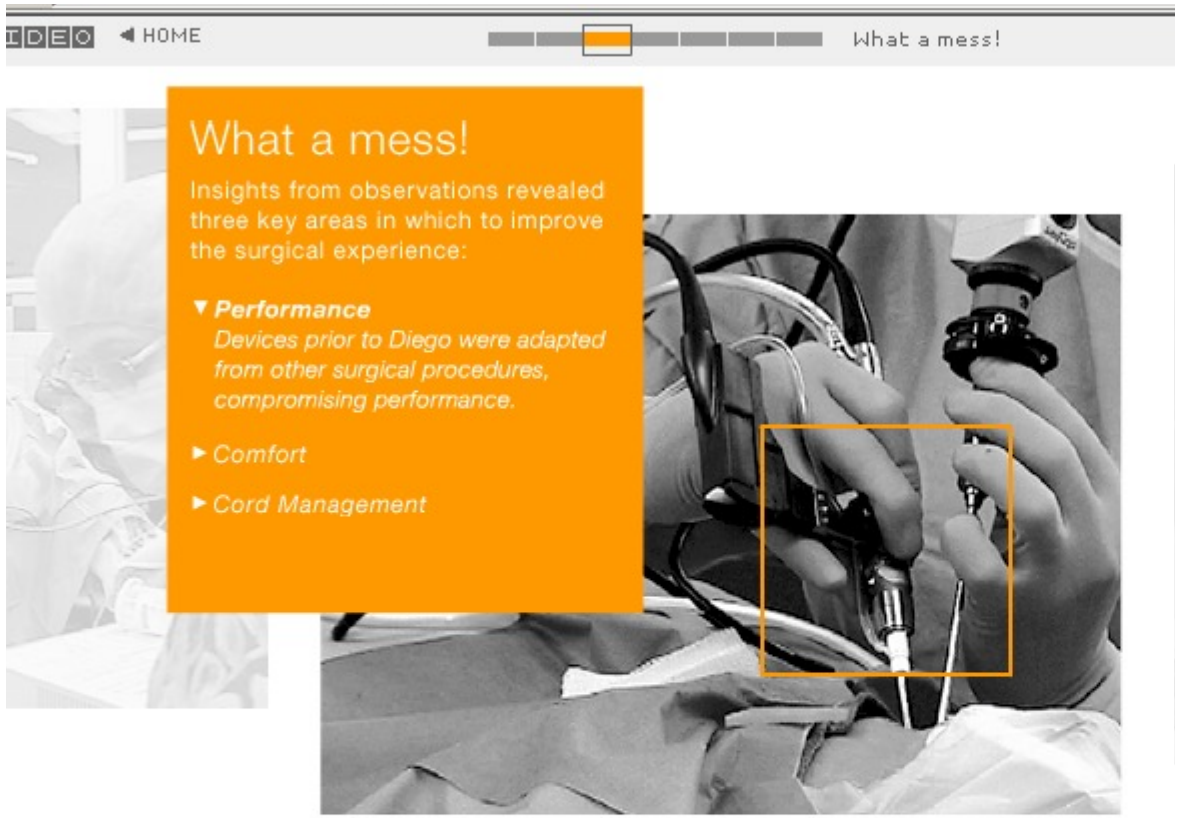


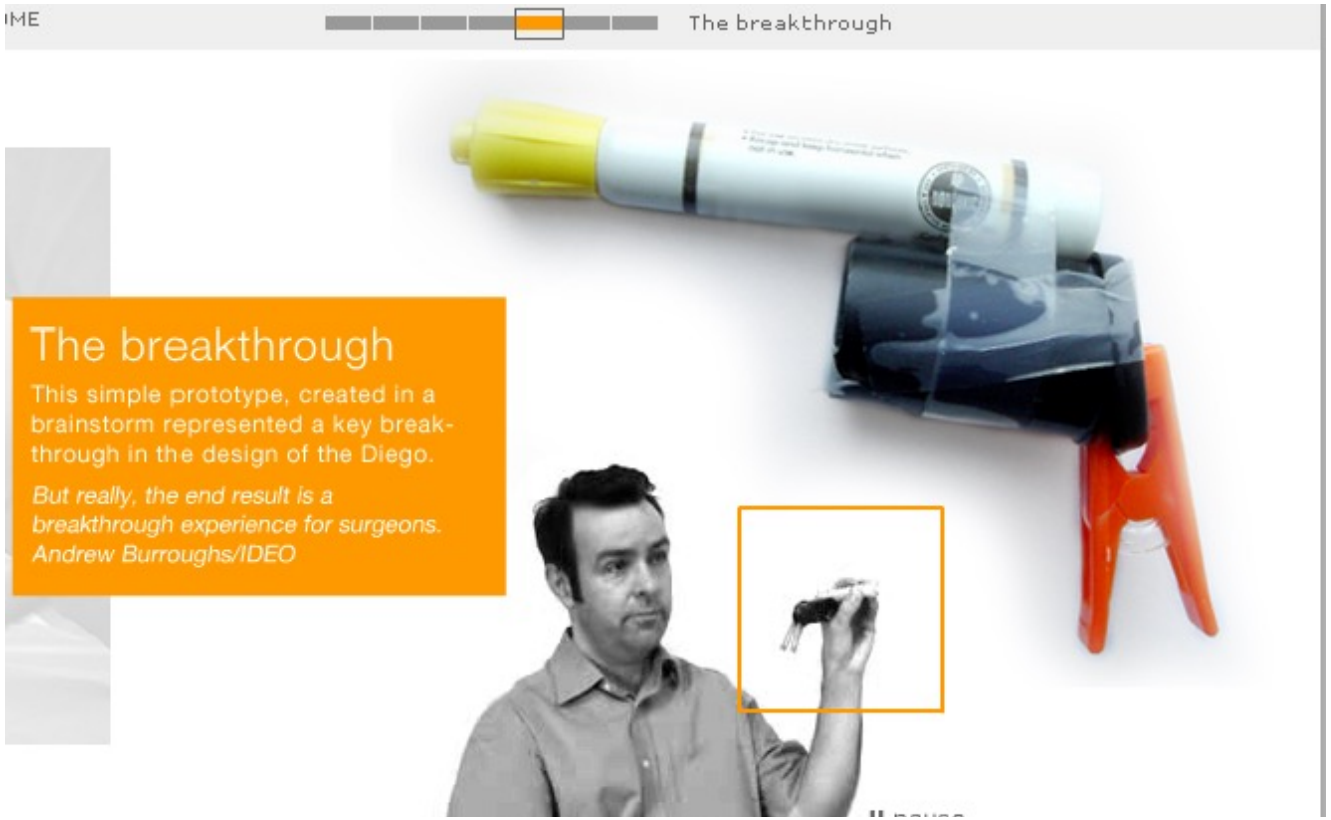
Design: Torbjörn Andersson

Skissmodeller - ”Quick and dirty”

med det som finns i närheten,

IDEO prototyping





Skissmodeller - ”Quick and Dirty”

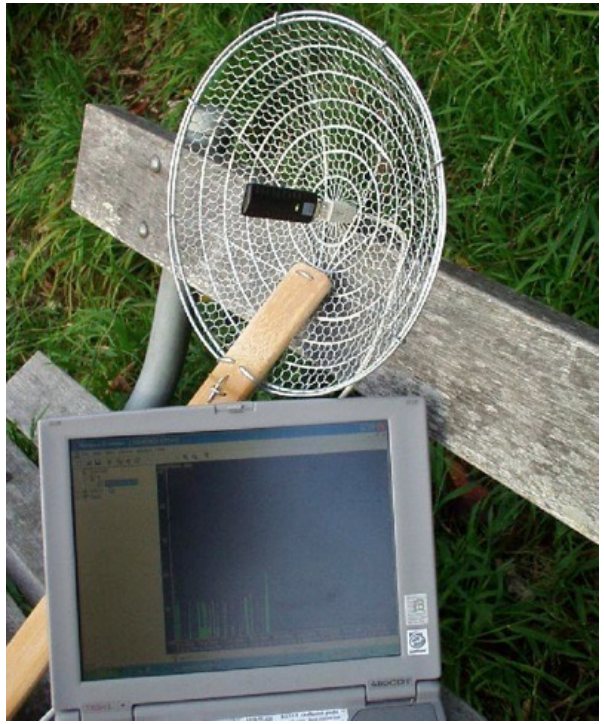
- problembild - Med det som finns i närheten.

Design: Thomas Nyström

”Quick and Dirty” alt. Fulfix…

fruktplockare

stol

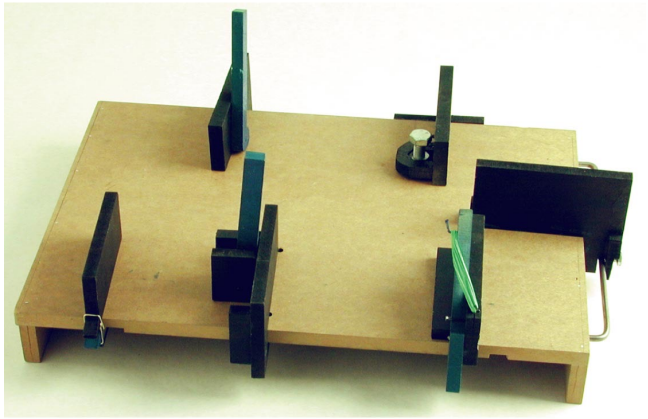


antennförstärkare

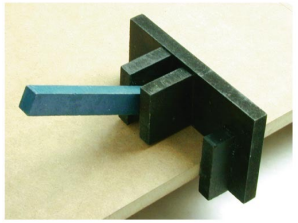
Skissmodeller - mockup

Skissmodeller - funktionsmodell

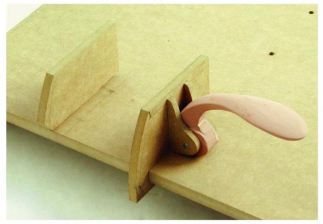
Funktionsmodeller



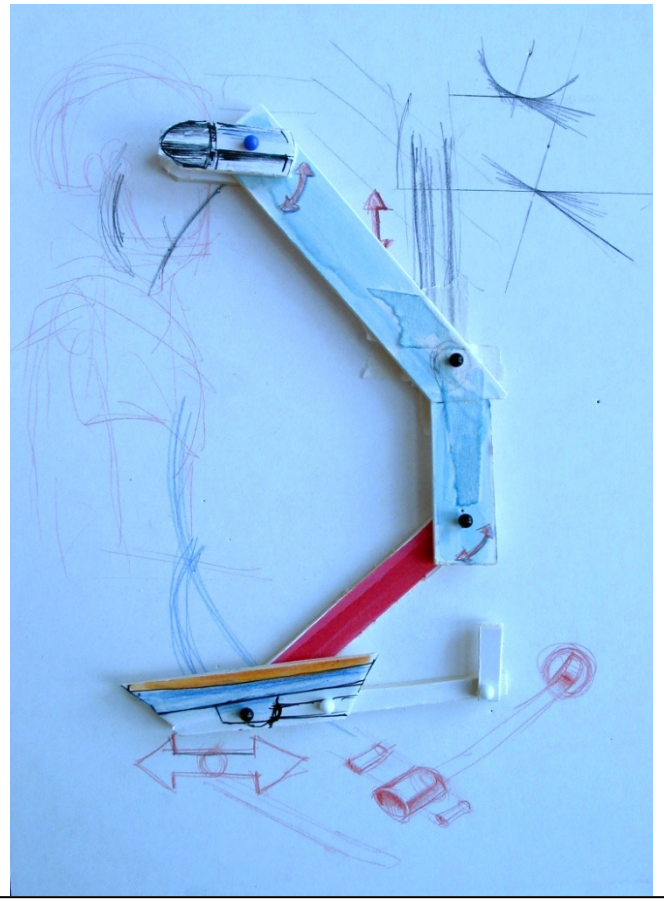
Val av koncept



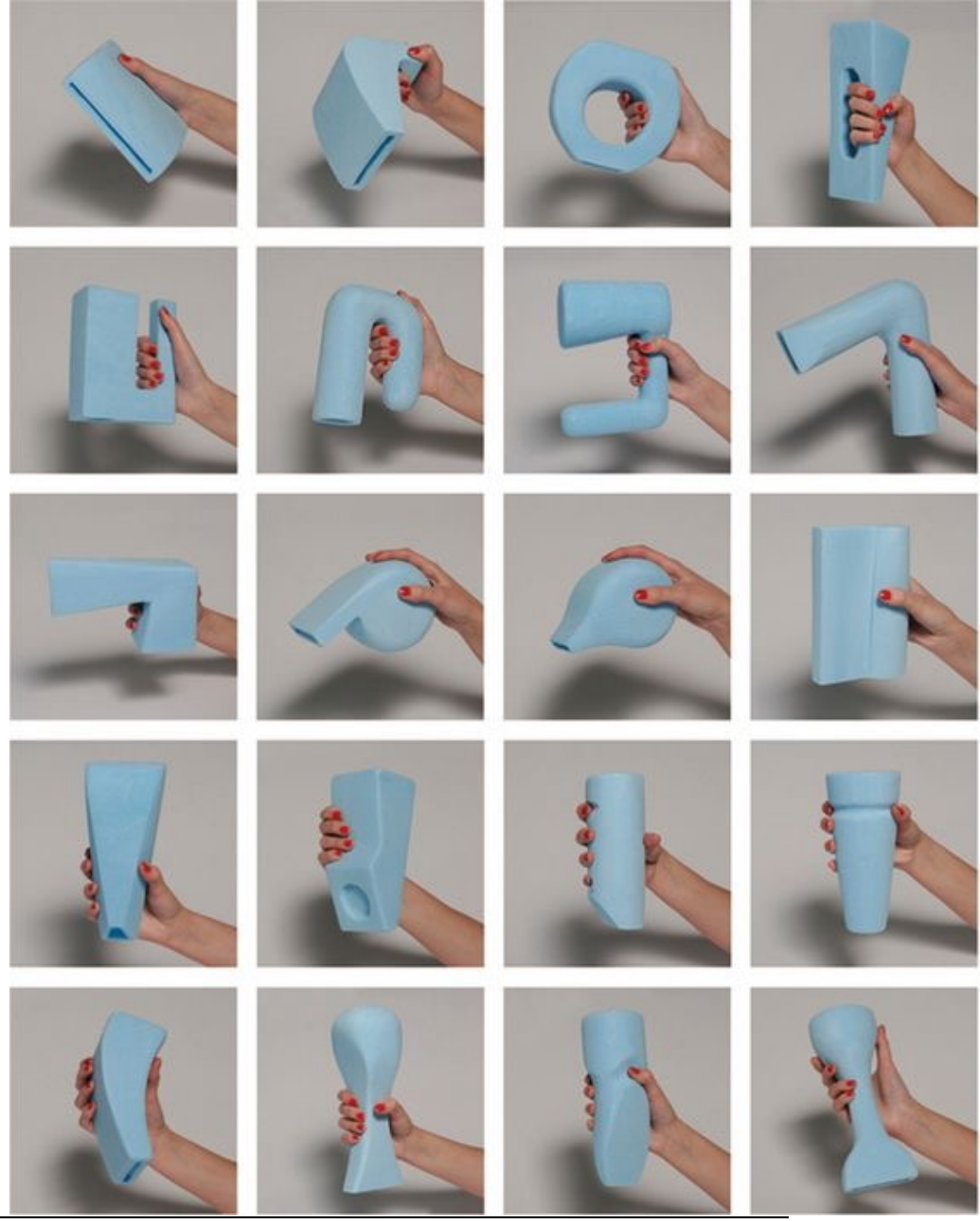
Utforming av koncept



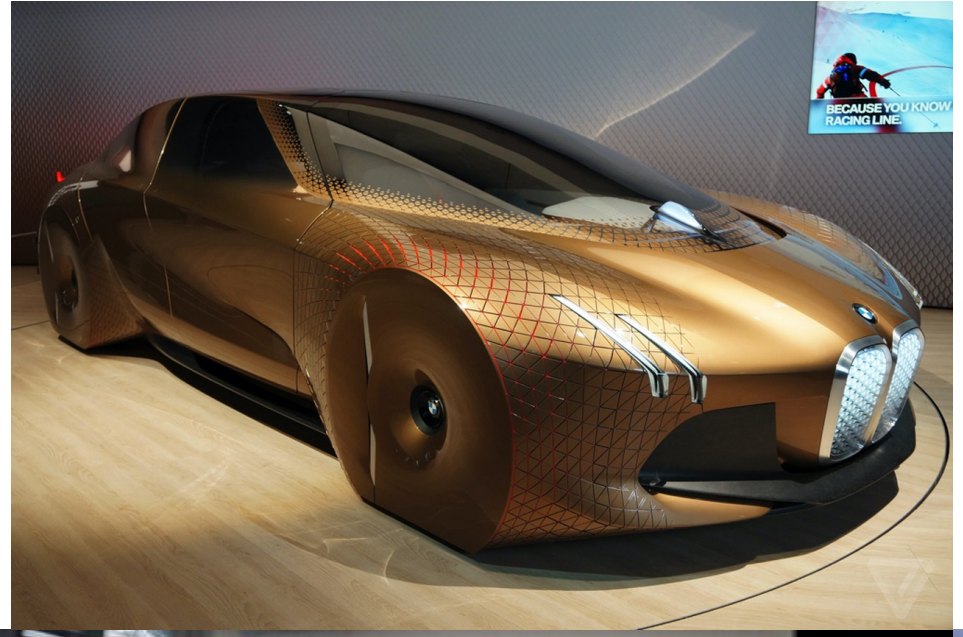
Test av koncept

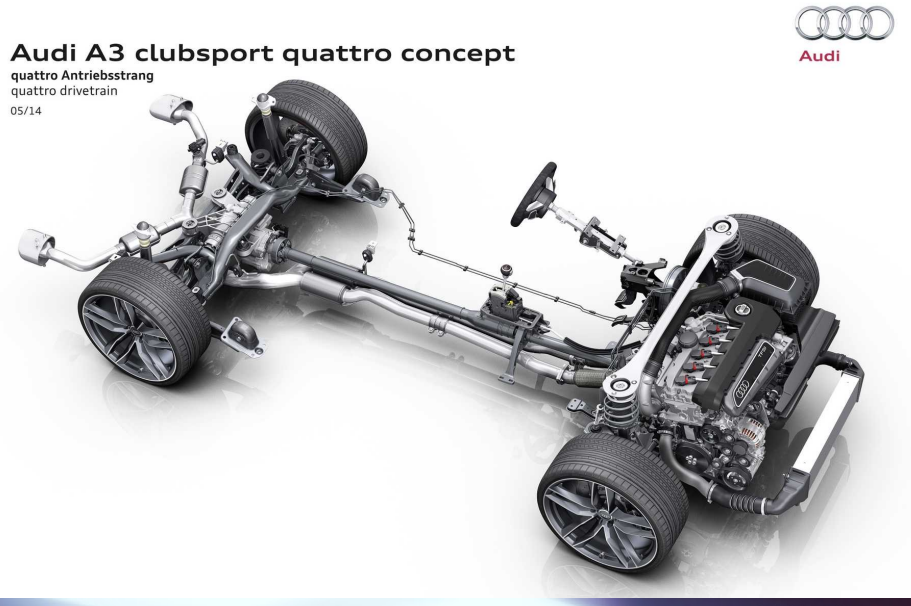


Basic form exploration



Blade One Philips - Jens Andersson





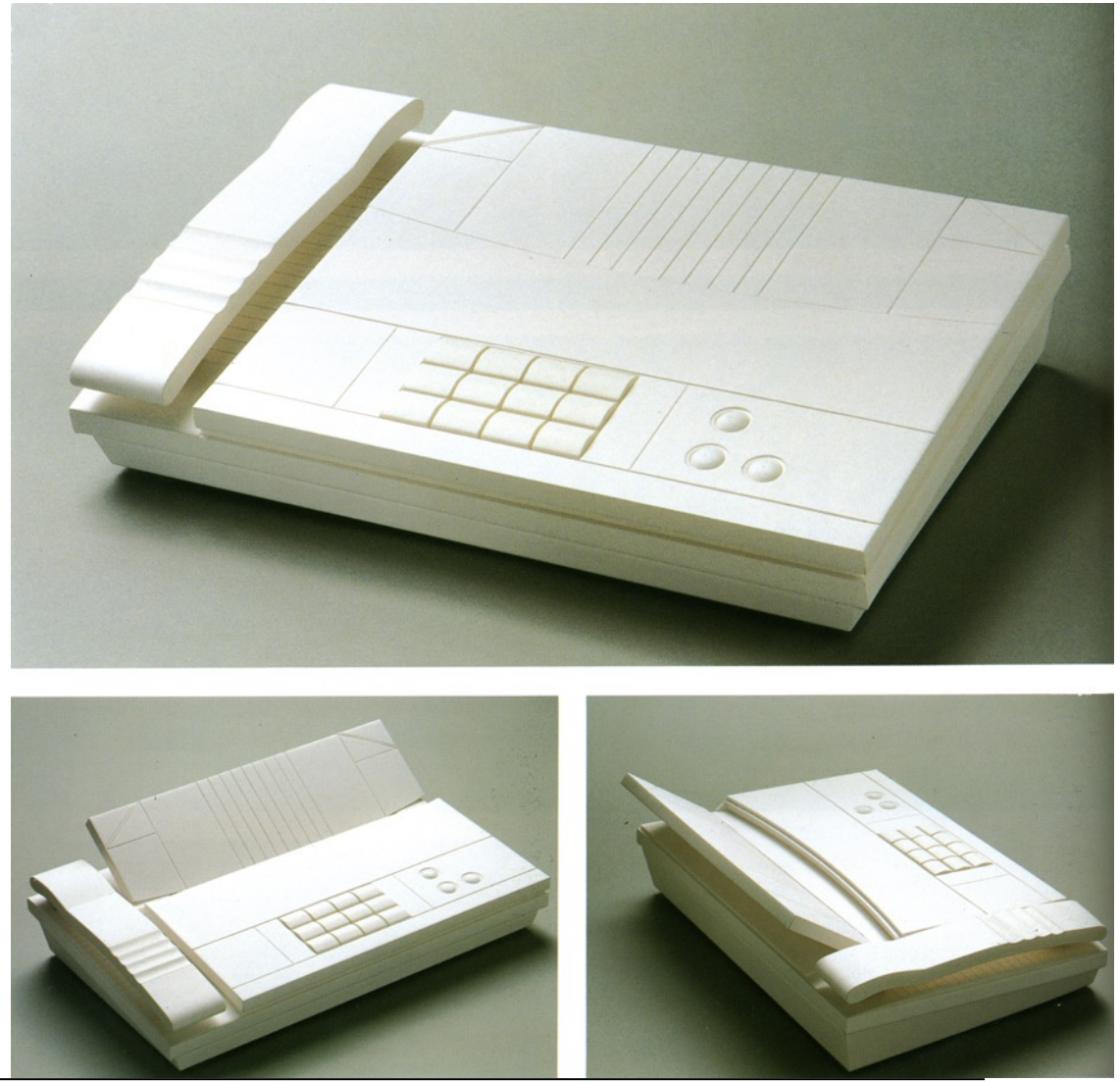
Eujin Pei, 2009. Building a Common Language of Design Representations for Industrial Designers & Engineering Designers

Skissmodeller -exempel
Skissmodeller i lera

Hur man arbetar med papp.

https://www.youtube.com/watch?v=k_9Q-KDSb90

https://www.youtube.com/watch?v=smQFsyrTWhk



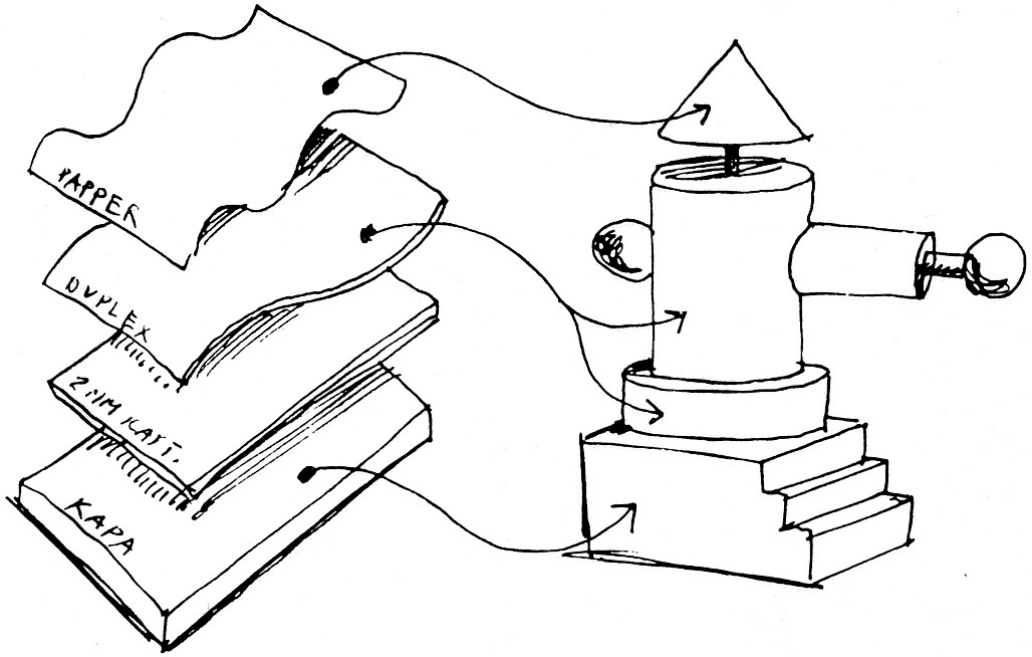
Papper

100 – 250g/m²

Blank och matt sida

1000g/m² tjocklek 2mm

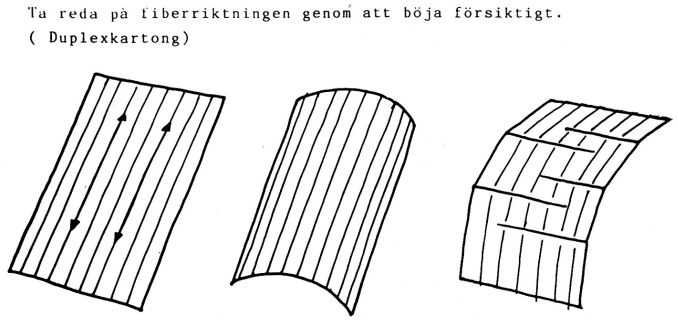
3mm – 10mm cellplastkartong

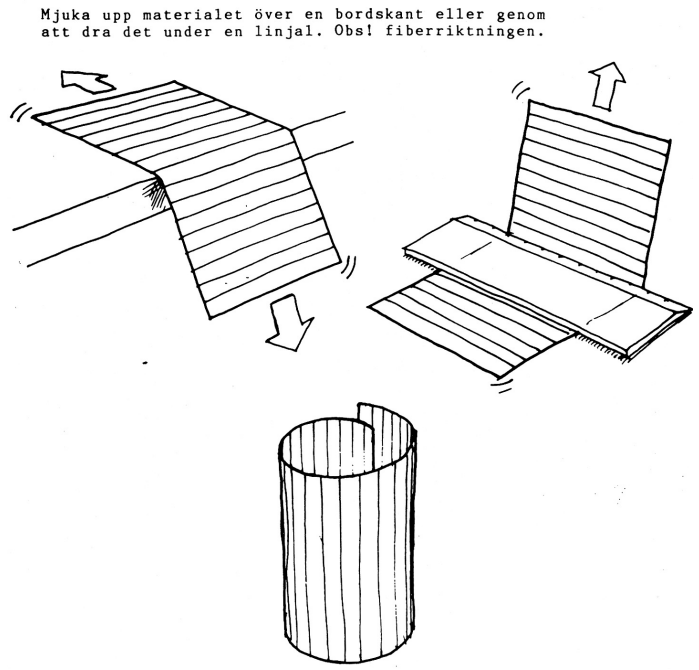


Papper - fiberriktning

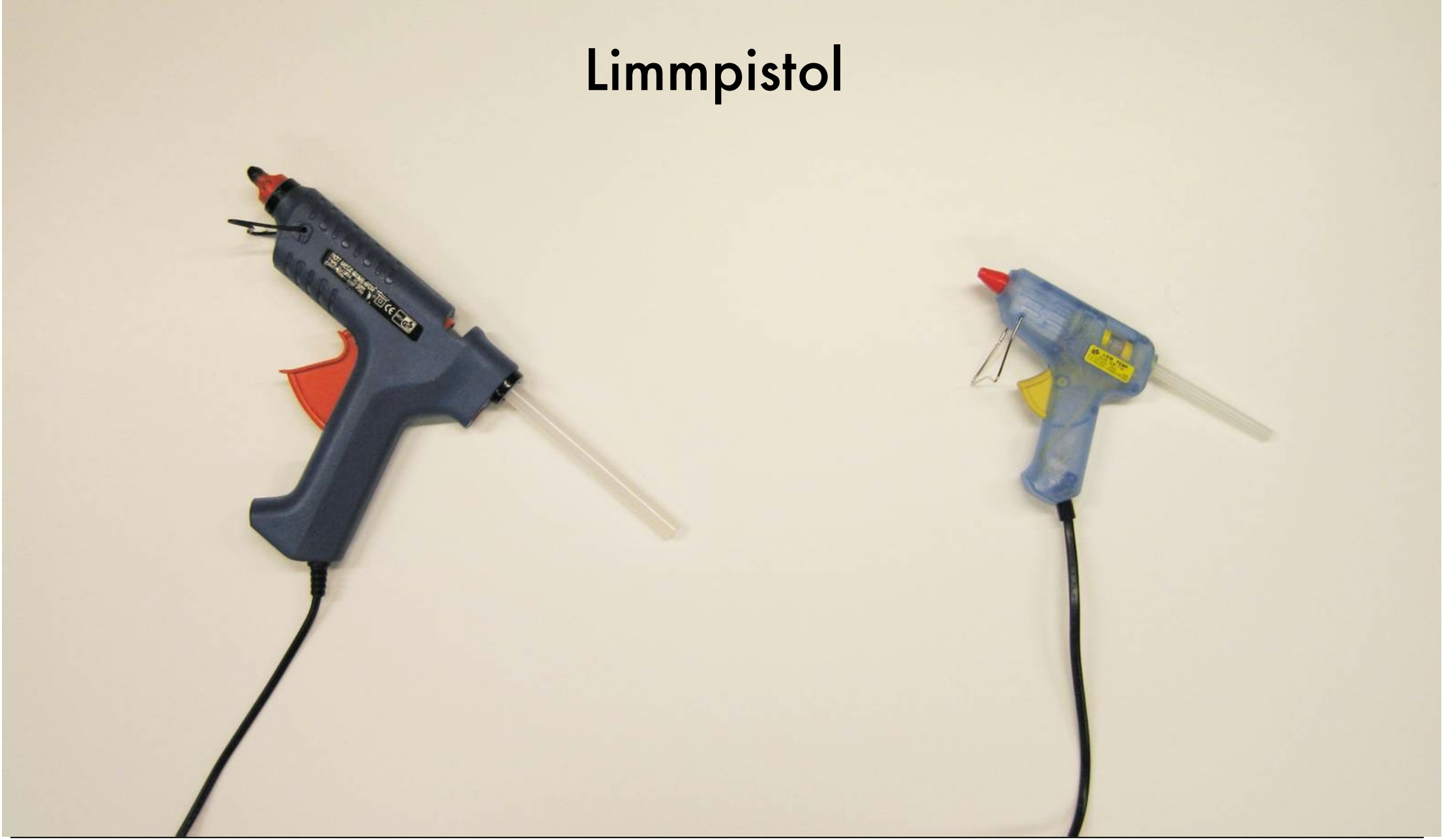
Undvika fula veck

Lättare att göra cylindrar





Limmpistol



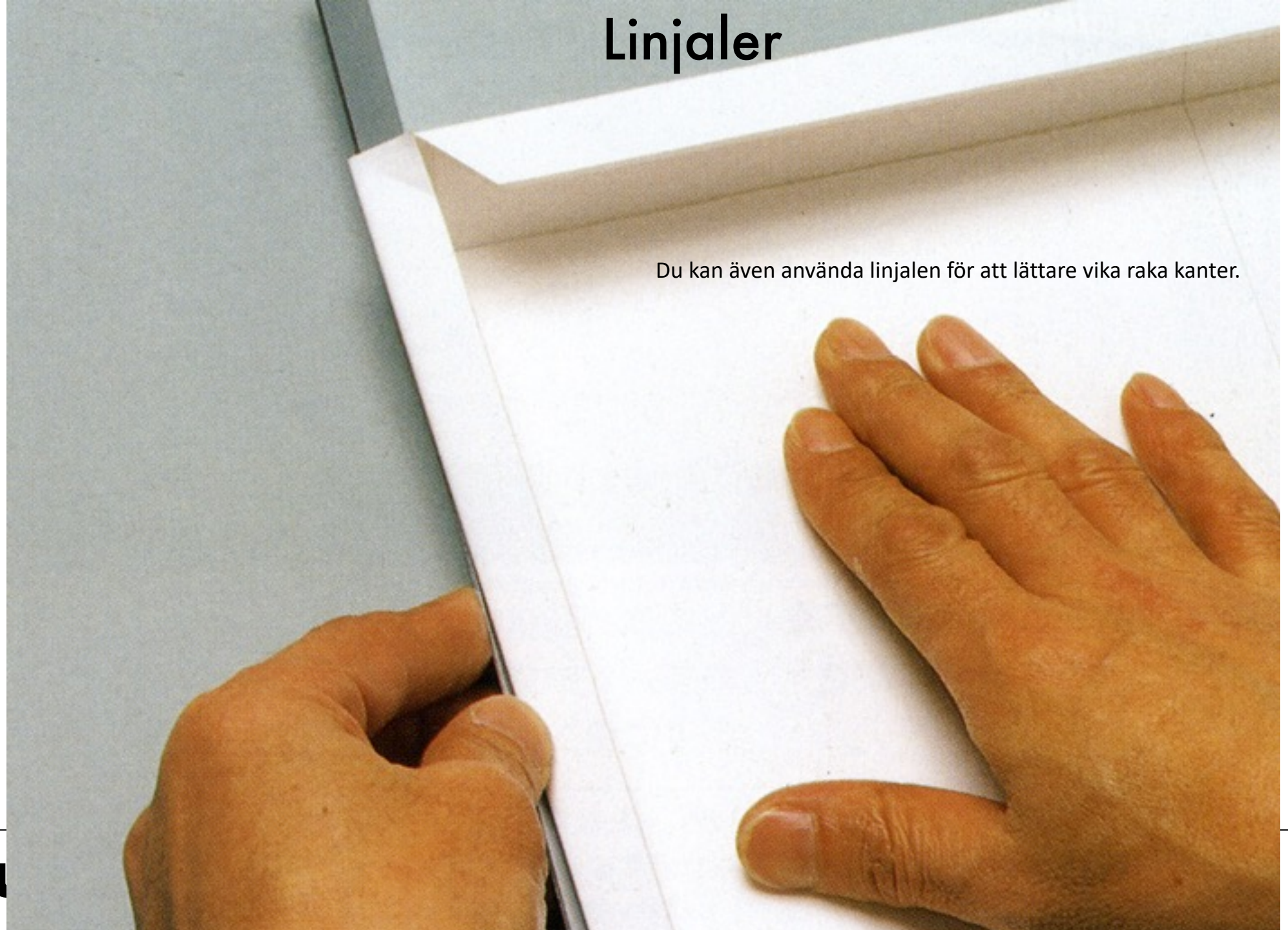
Skärknivar

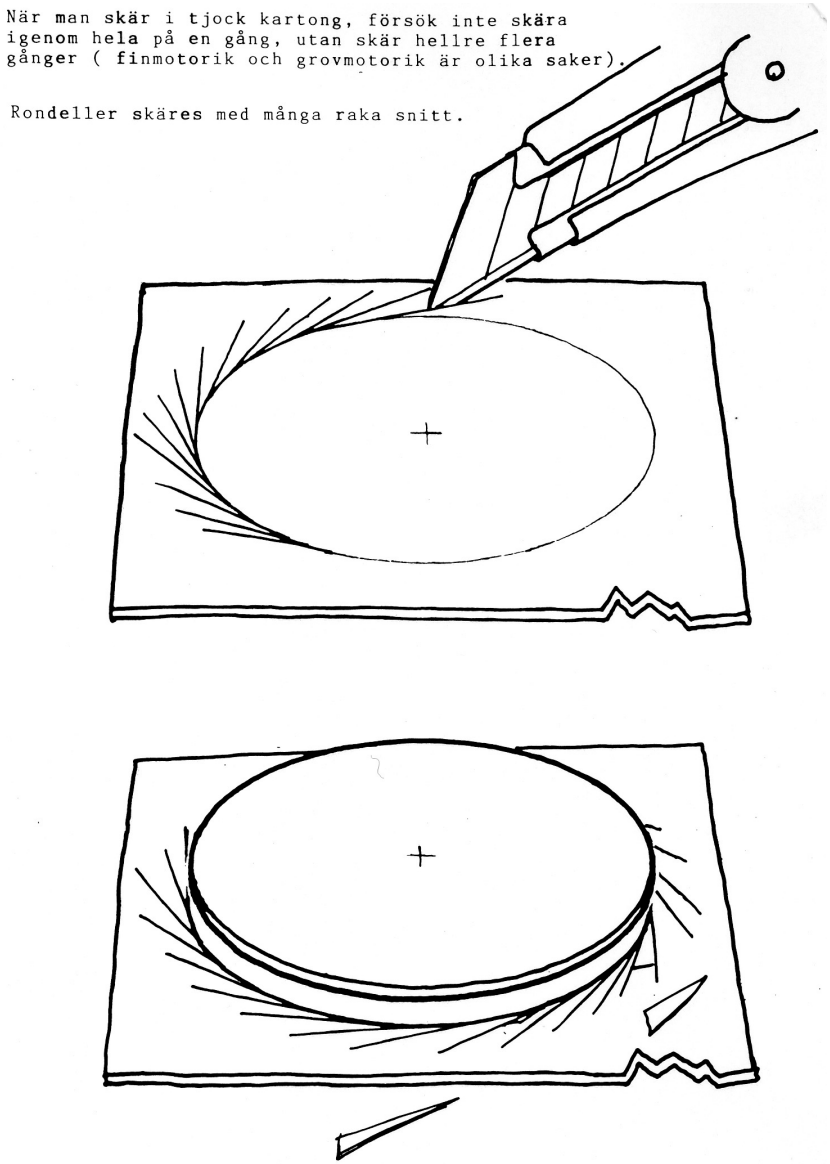
Skärteknik

Skär **alltid mot** dig!

Linjaler

Du kan även använda linjalen för att lättare vika raka kanter.

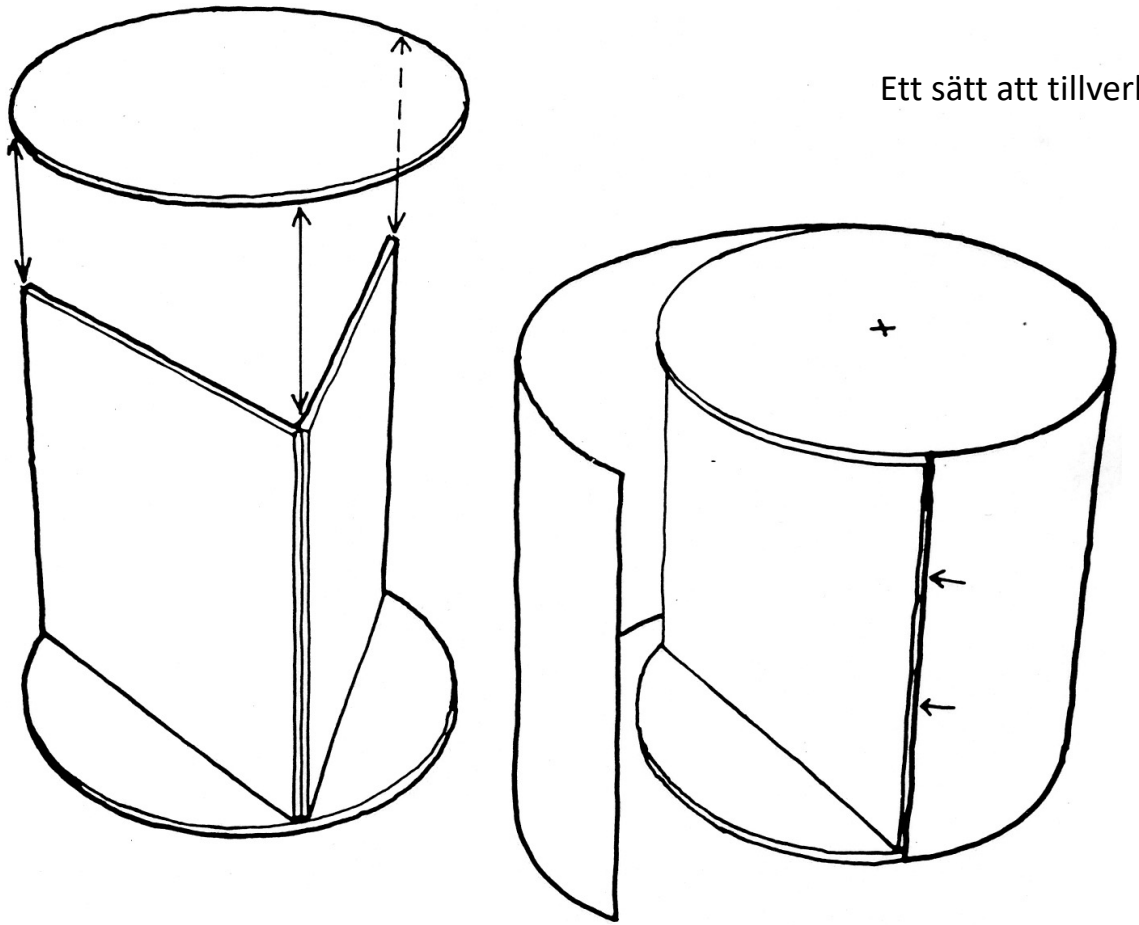




Håltagning

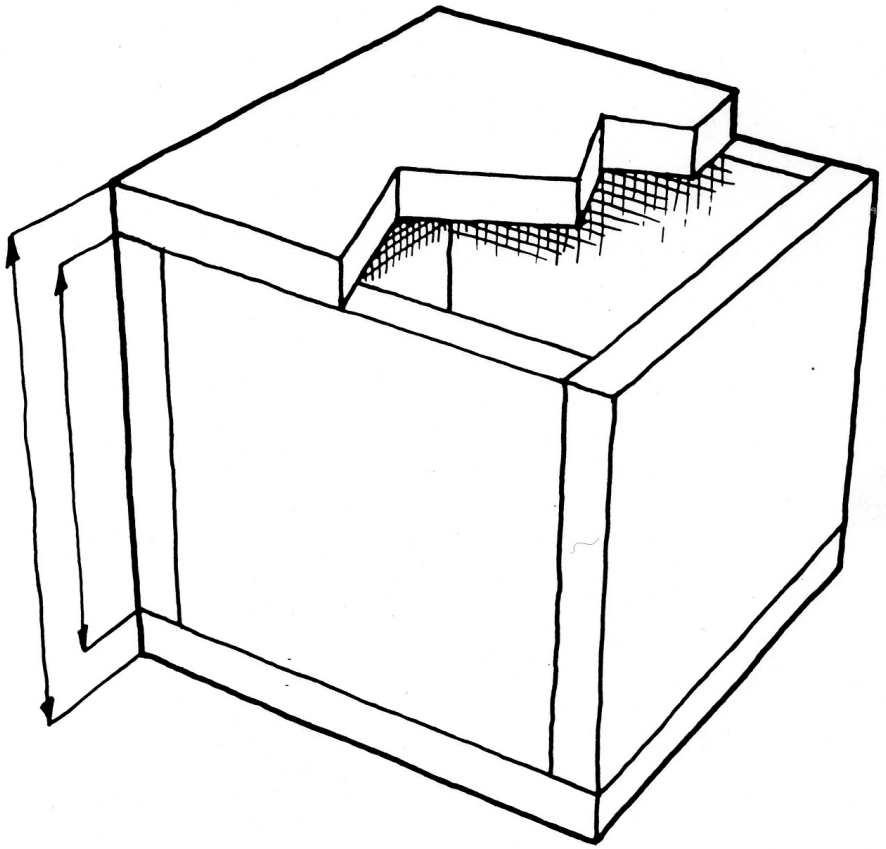
Hålpipa (slå mot stabilt underlag t.ex. träskiva på en snickarbänk.)

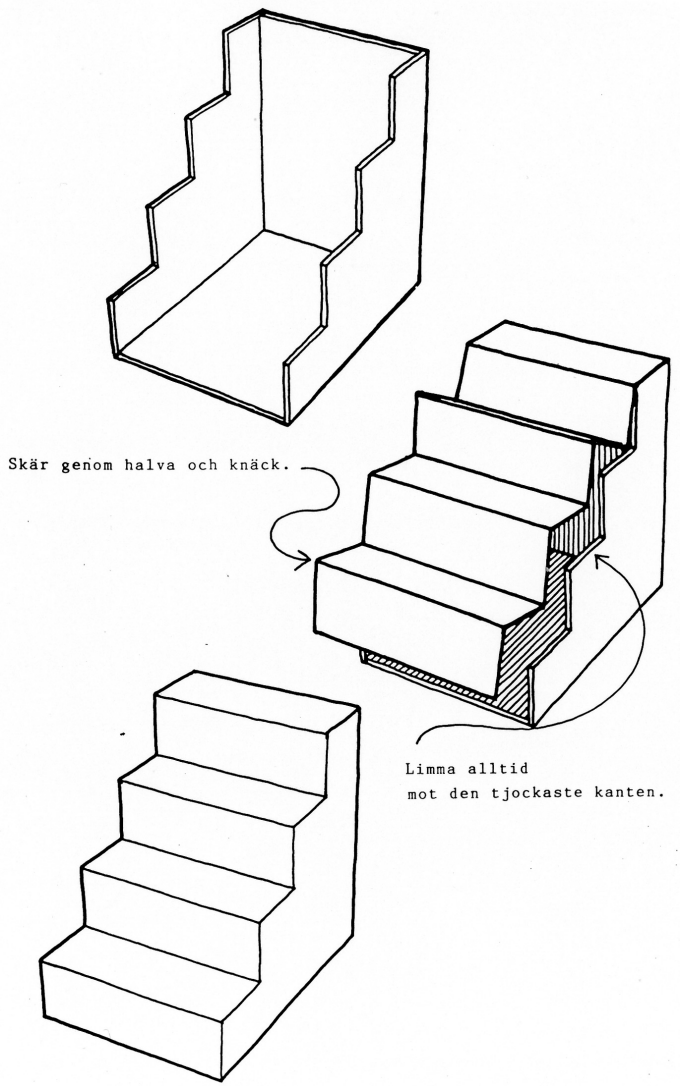
Modellteknik



Ett sätt att tillverka cylindrar.

Modellteknik





Modellteknik

Skär och dra av ena sidan.

Modellteknik

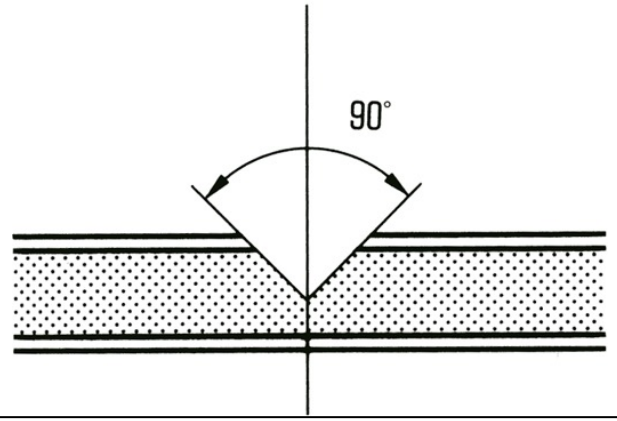
Då kan du limma ihop den så att den behåller en ny form.

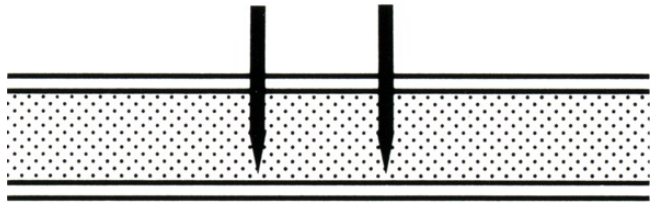
Skärteknik

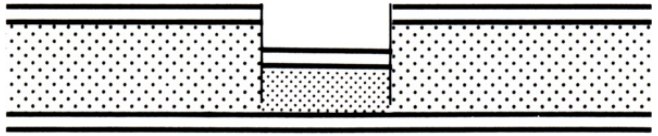
Man kan utnyttja materialens tjocklek:

- Skarpare vik kanter.

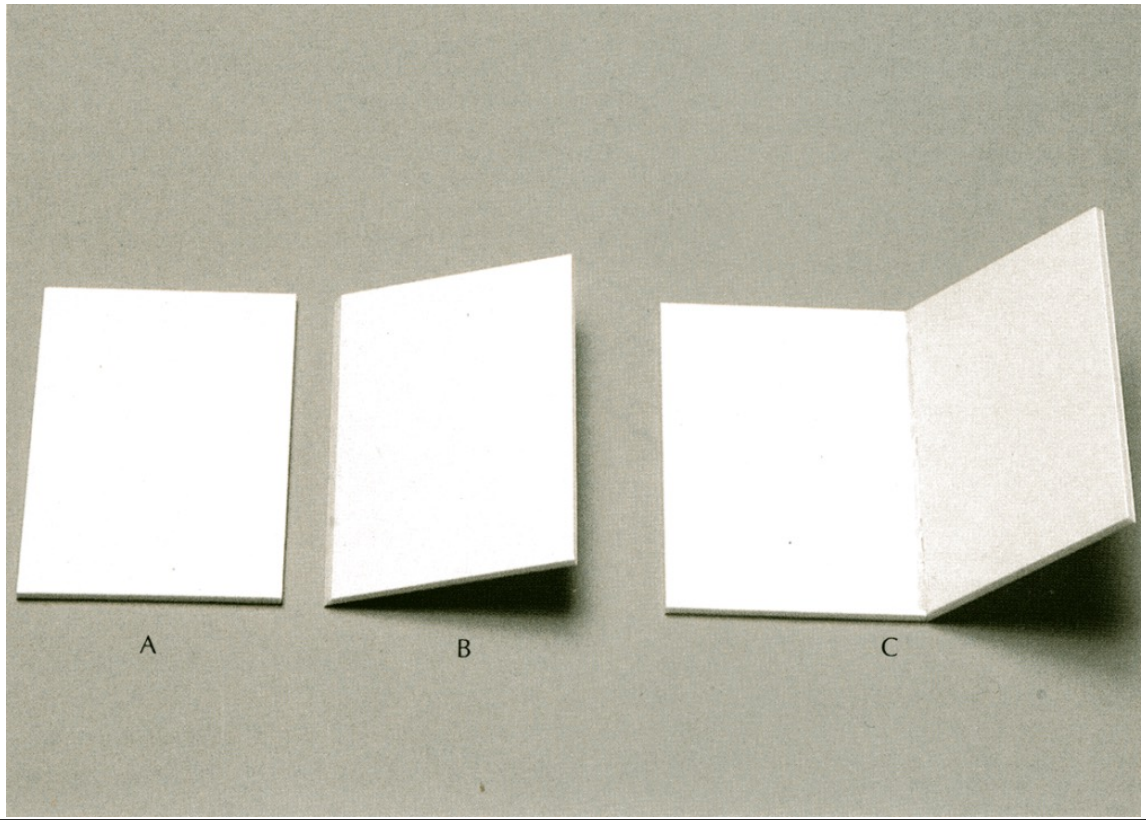
- Skapa mönster.

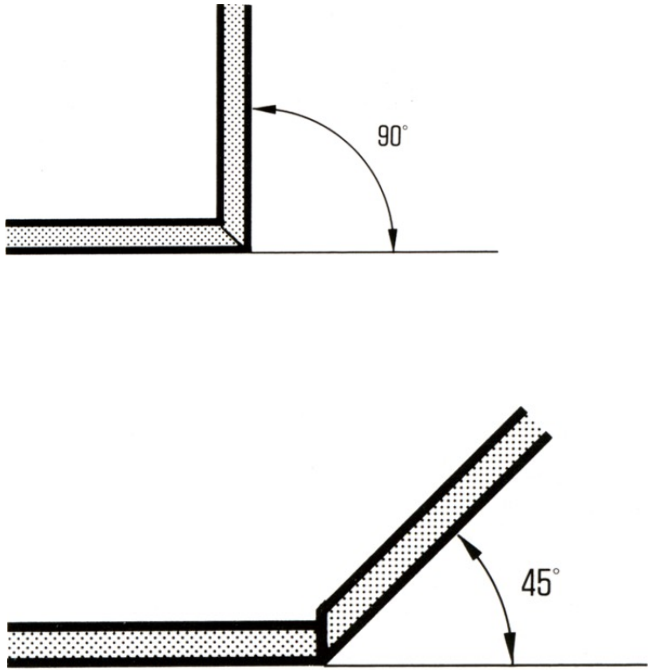




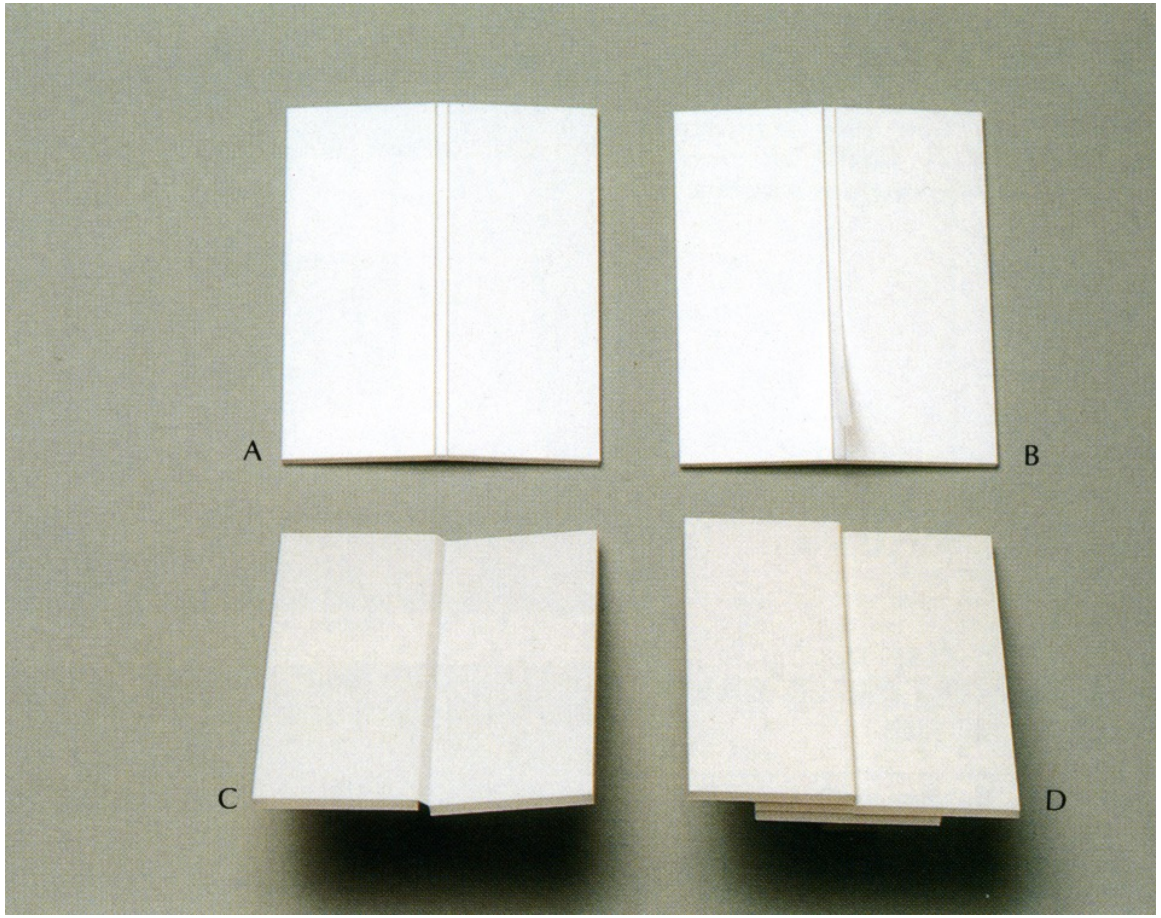


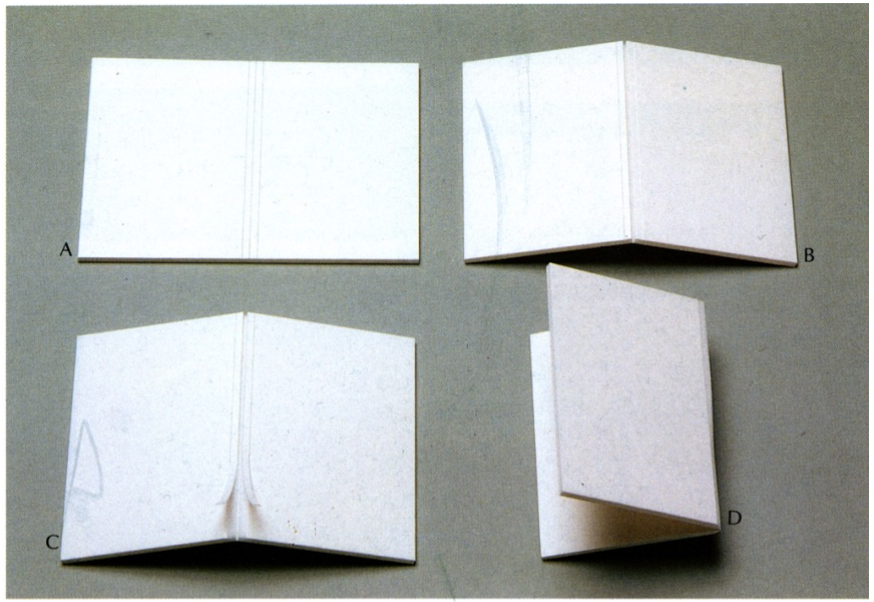
Modellteknik

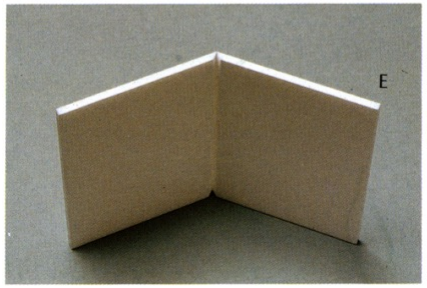




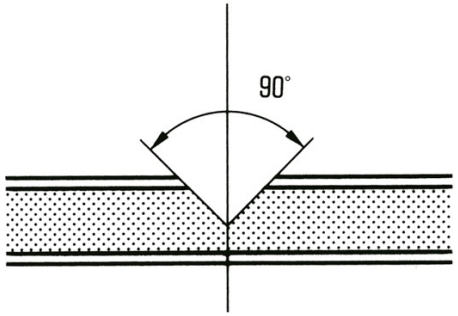
Modellteknik

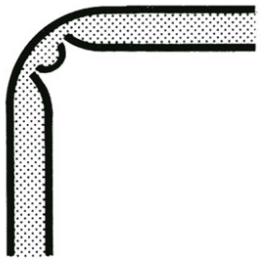


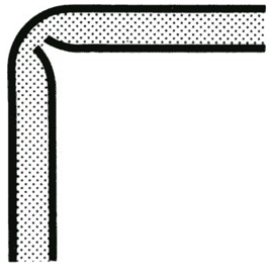


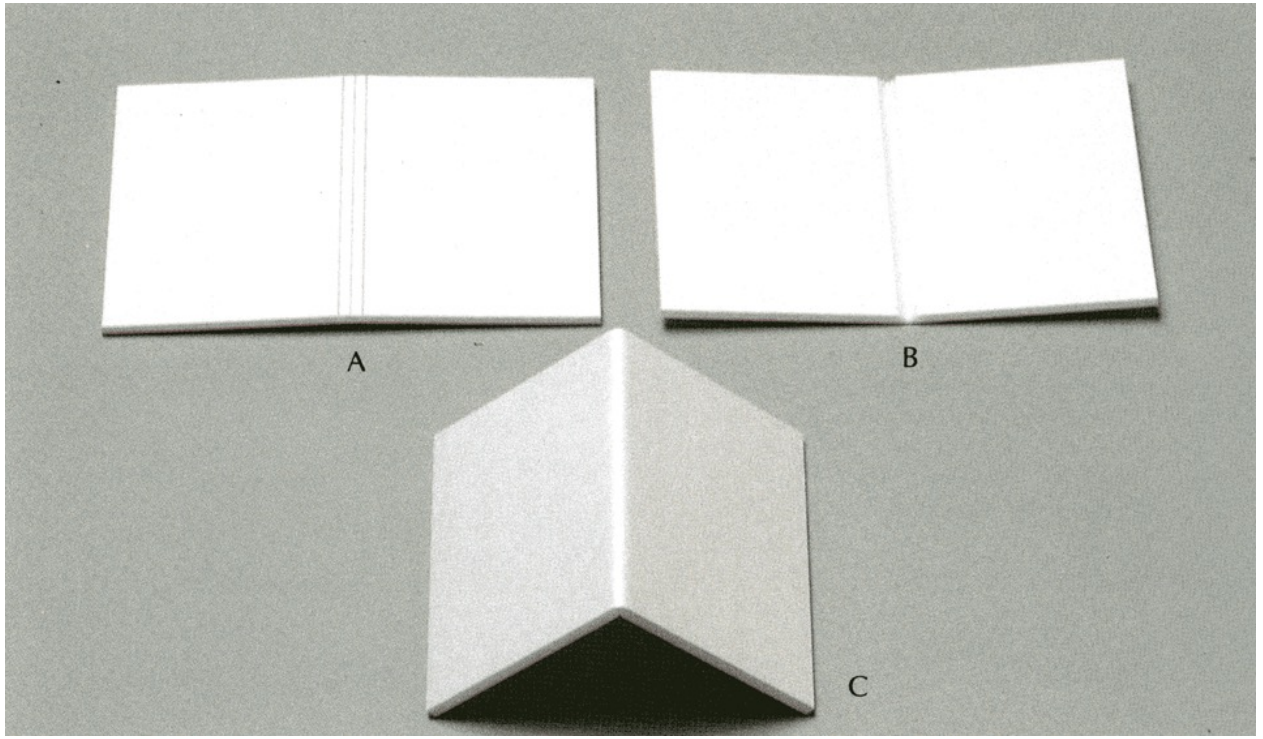


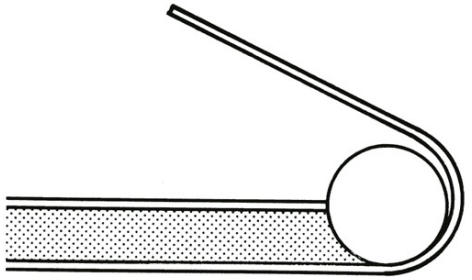
Modellteknik – rundahörn

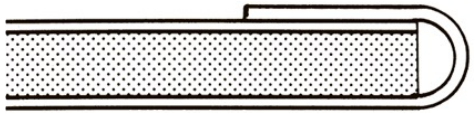




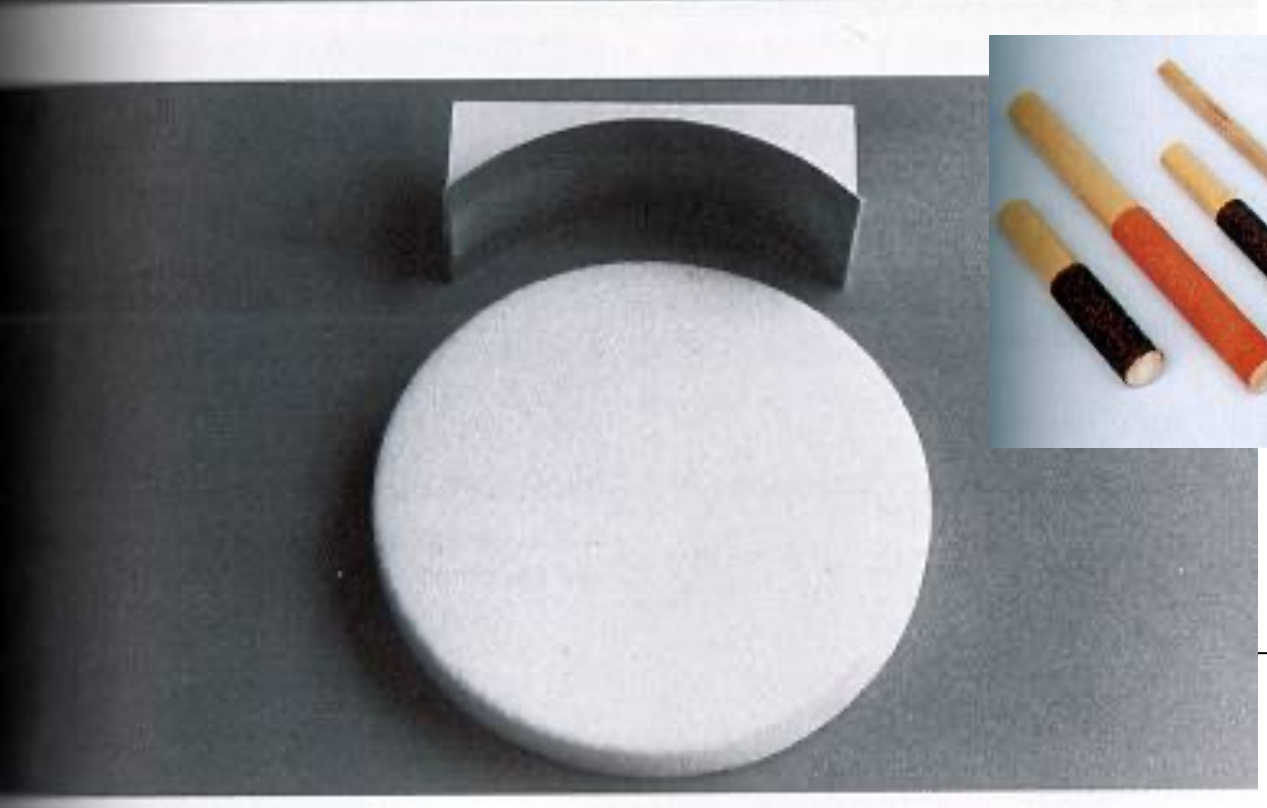




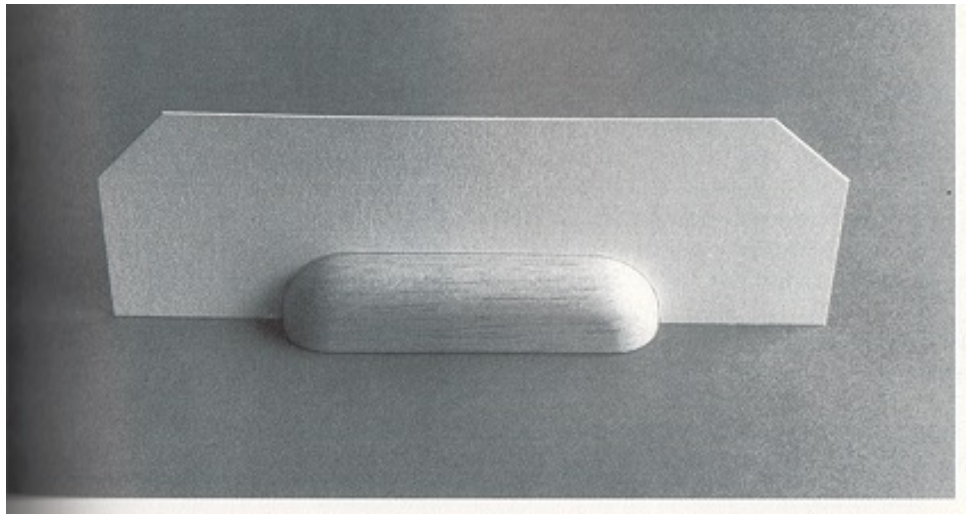


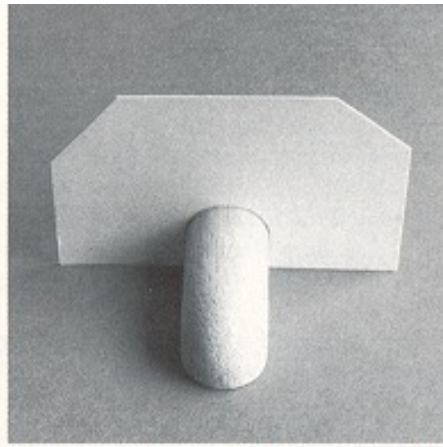


Modellteknik



Kontrollmallar





3-15 *(left)*, 3-16. Checking the shape a
radiuses with paper templates.

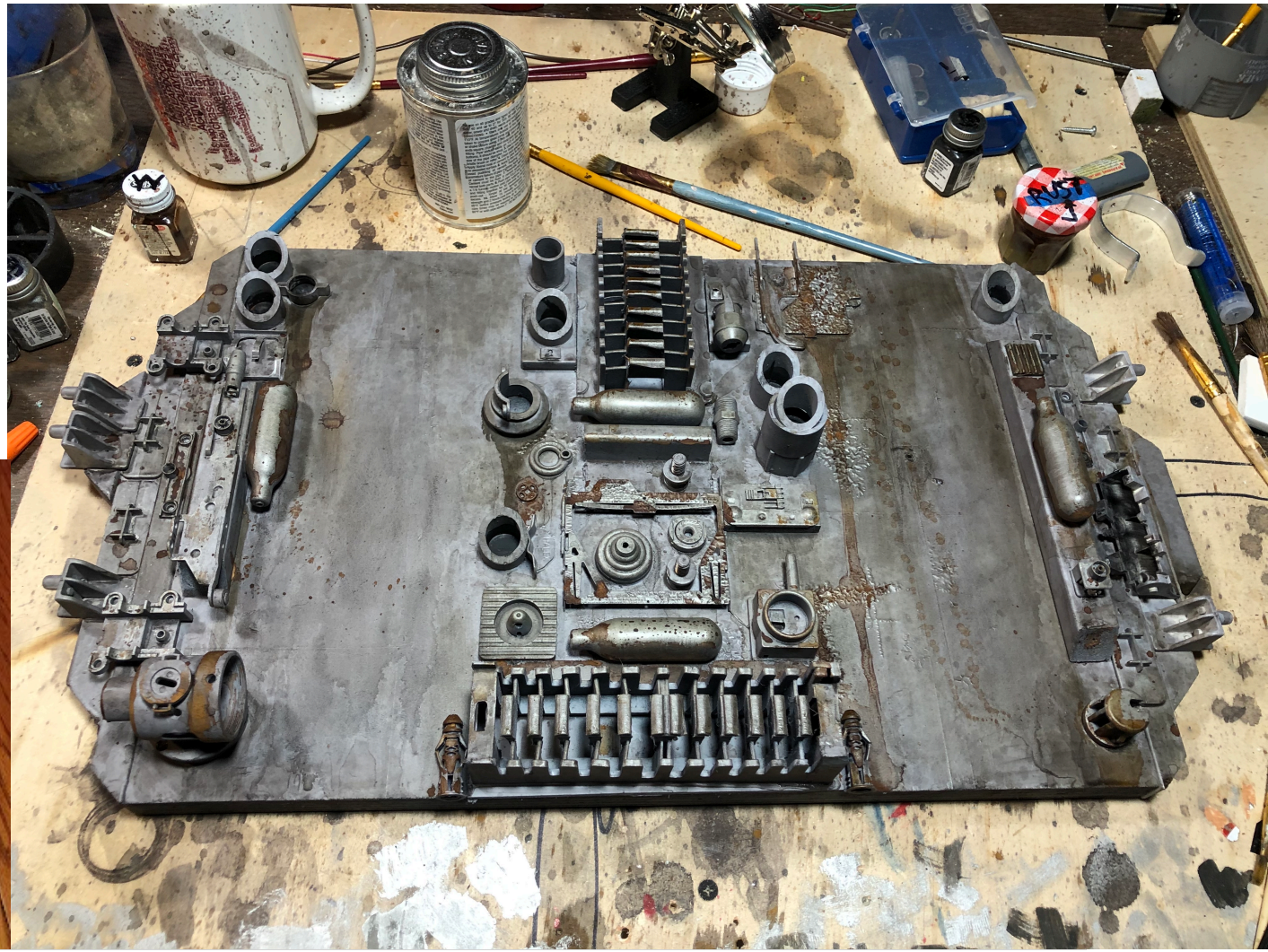
Ready-made and Kit-Bashing

Adam Savage

Greeblie! _ George Lucas

https://www.youtube.com/watch?v=ZfvtGrhYk0I

https://www.youtube.com/watch?v=smQFsyrTWhk



Uppbyggnadsexempel

Cibatool: Frästa sektioner limmade med epoxy mot mdf

Rostfridiskho: limmad i överkant

MDF 8mm

Al-plåt: rundbockad

Billack:

Alltihopa lackat flera gånger med cellulosalack +klarlack

Hur man arbetar med EPS

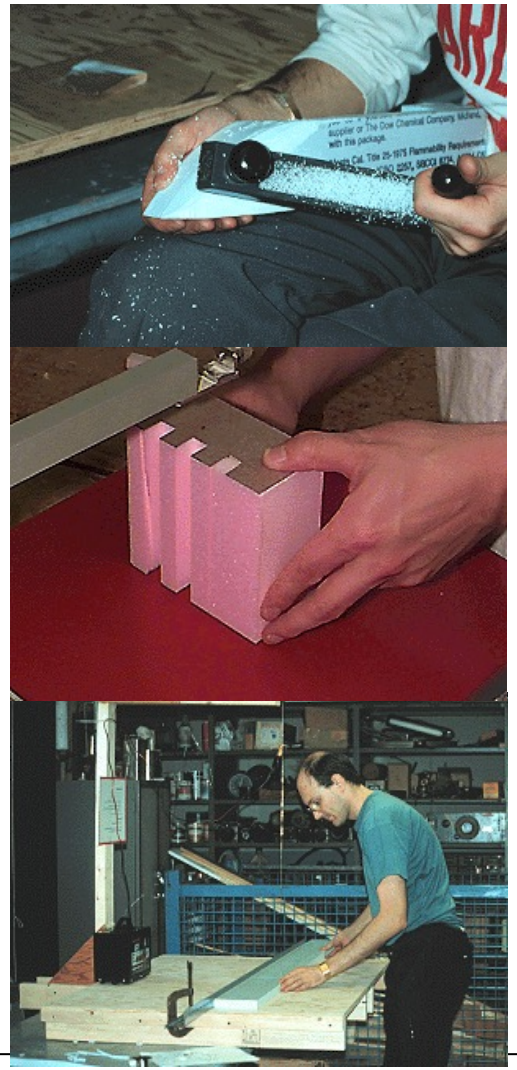
Bearbetning EPS

•EPS (extruderad polystyren)

Används som Isoleringsmaterial för byggindustrin

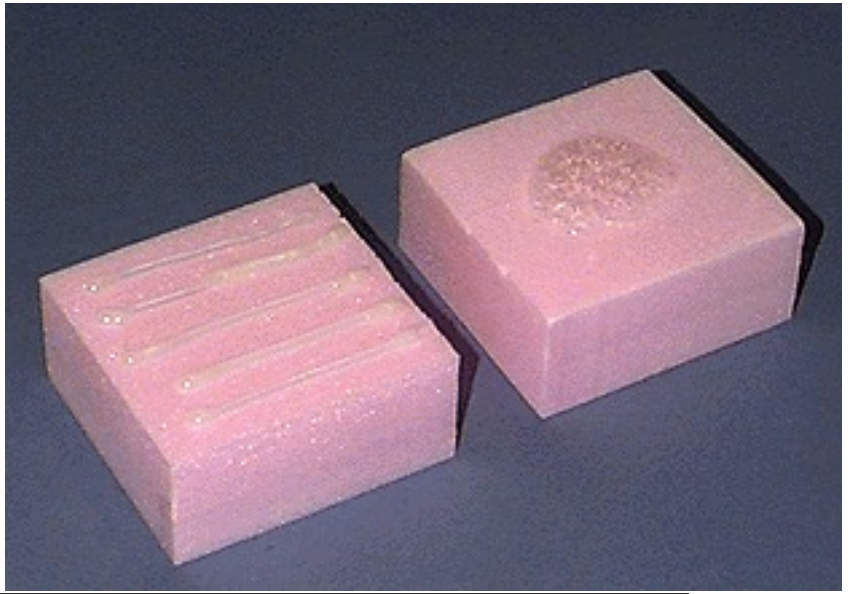
+ Billigt och enkelt att bearbeta med kniv,
  Sandpapper, rasp, såg, värmetråd, smältlim

- Smälter lätt vid fräsning, limning, lackering
  (klarar inte vissa lösningsmedel)
- Kan upplevas ha en ”fiberriktning”
- Kan ge en grov yta
- irriterande ångor vid limning
- Statiskt , dammet fastnar lätt på kläder



Fogning

- Dubbelhäftande tejp, eller ark
- Spraylim (obs absolut nödvändigt med dragskåp eller mask med kol +partikelfilter
- Limpistol (rekommenderas)
- Trälim om man har gått om tid
- Snabblim (isocyanat) fäster dåligt på porösa material typ uriol/roacell(måste fuktas först)
- 2-komponents epoxy



Ytbehandling

•Skissmodeller behöver sällan målas, då syftet är att snabbt visualisera en form, volym eller funktion.

• Om man vill måla, använd vattenbaserad latex eller akryl färg.

•(eps skum tål inte oljefärger och många lösningsmedel).

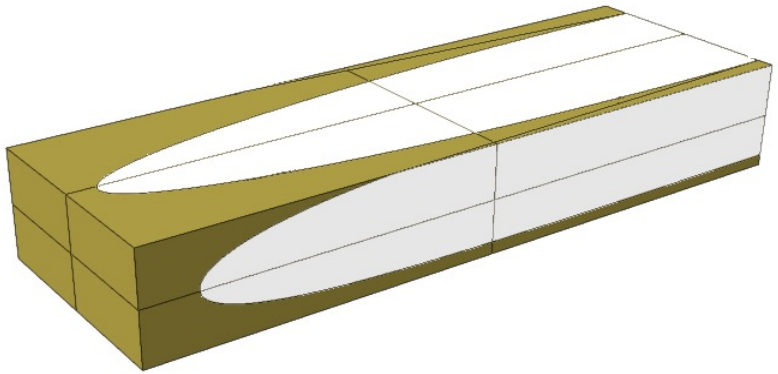
Testa PÅ SMÅ BITAR!!!

•Om limmet håller

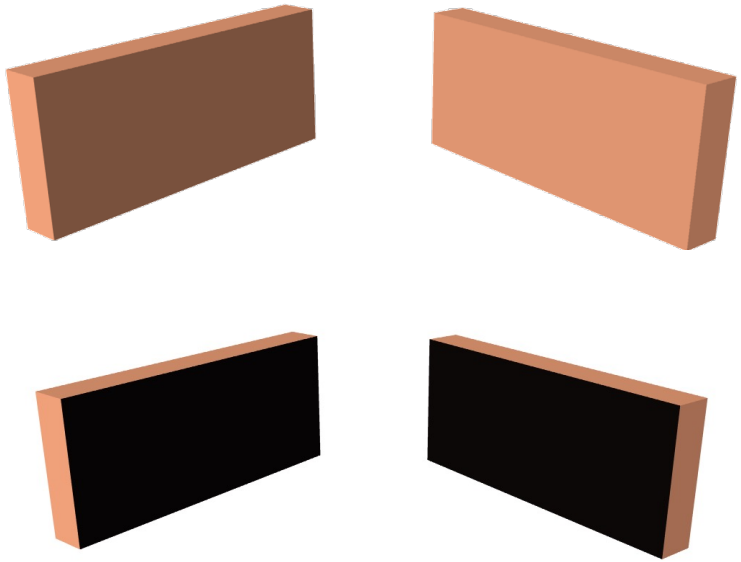
•Om materialet tål lösningsmedel

•Torktid

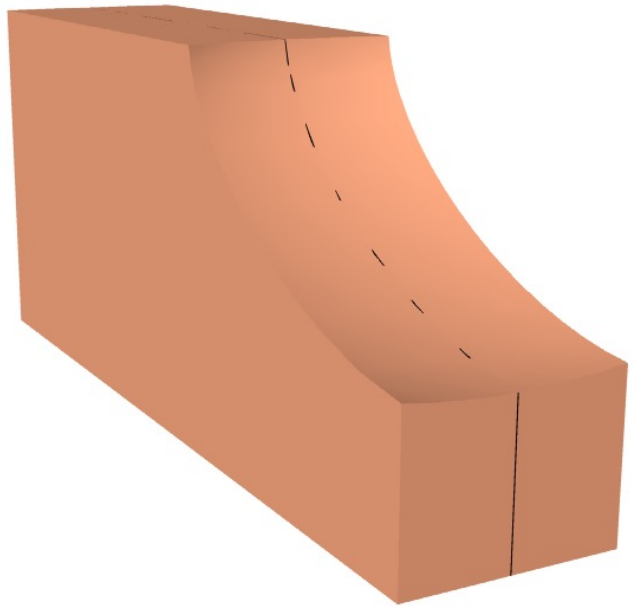
Håll koll på måtten.



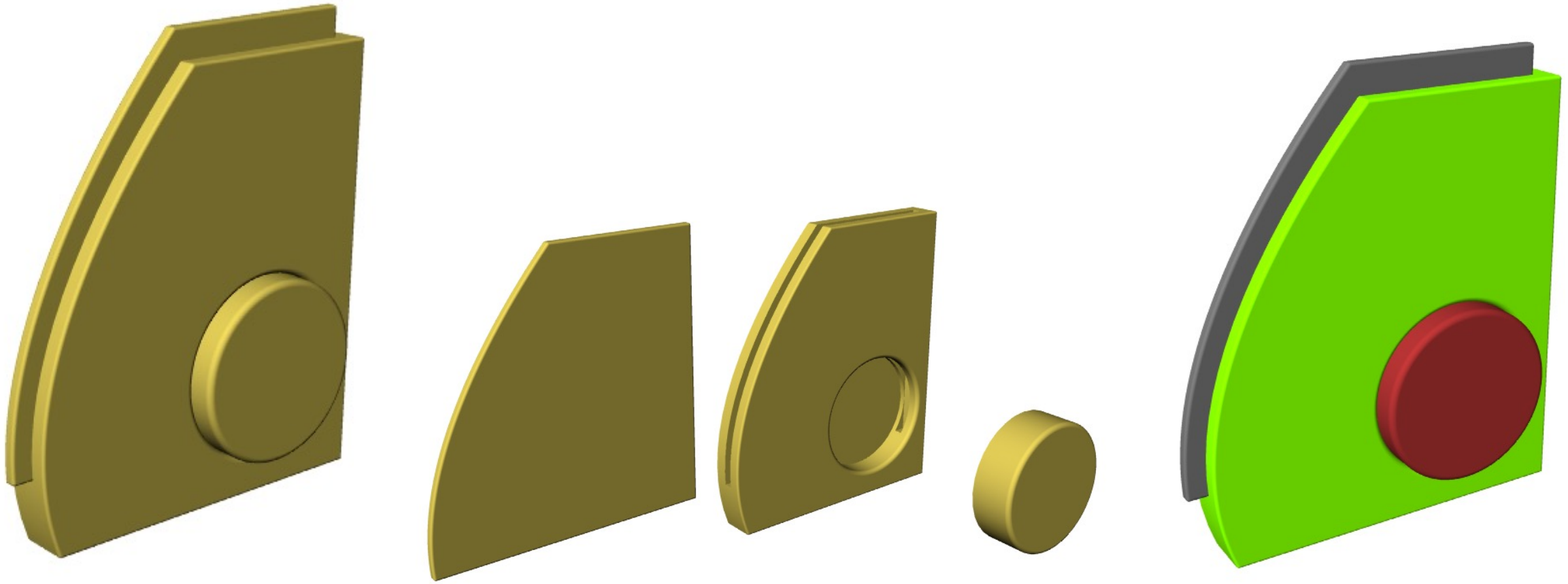
Klistra på utskrivna mallar.



Spraya med mörk färg
innan limning.



Uppbyggnad i delar



Thank you!

LINKÖPING UNIVERSITY