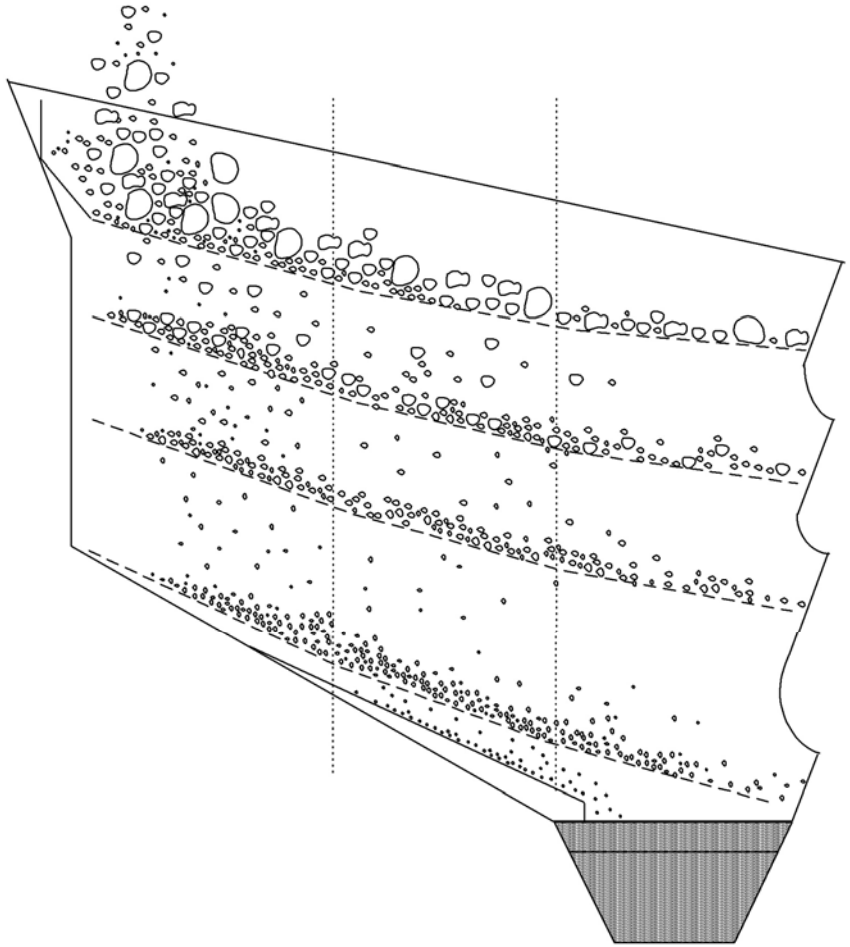
Screen Modelling

Magnus Evertsson

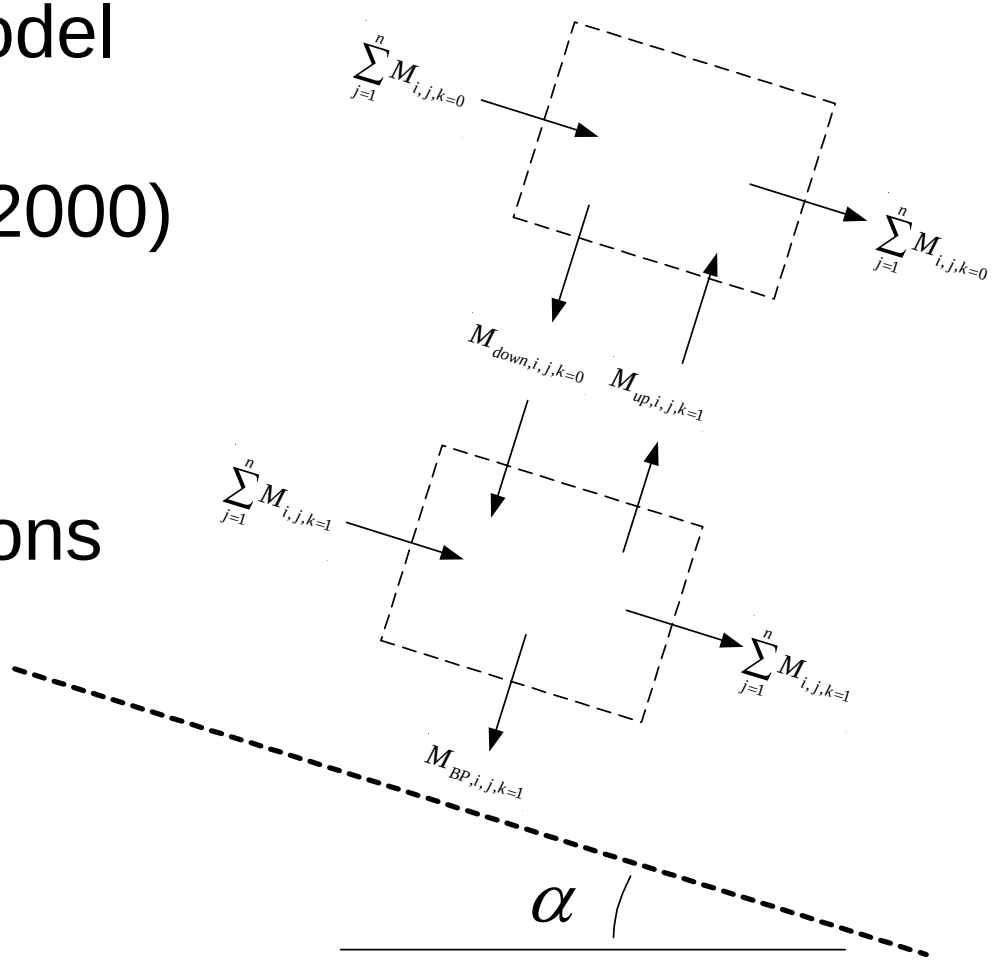
Outline

- Previous work
- Developing the flow model
- Results
- Future work



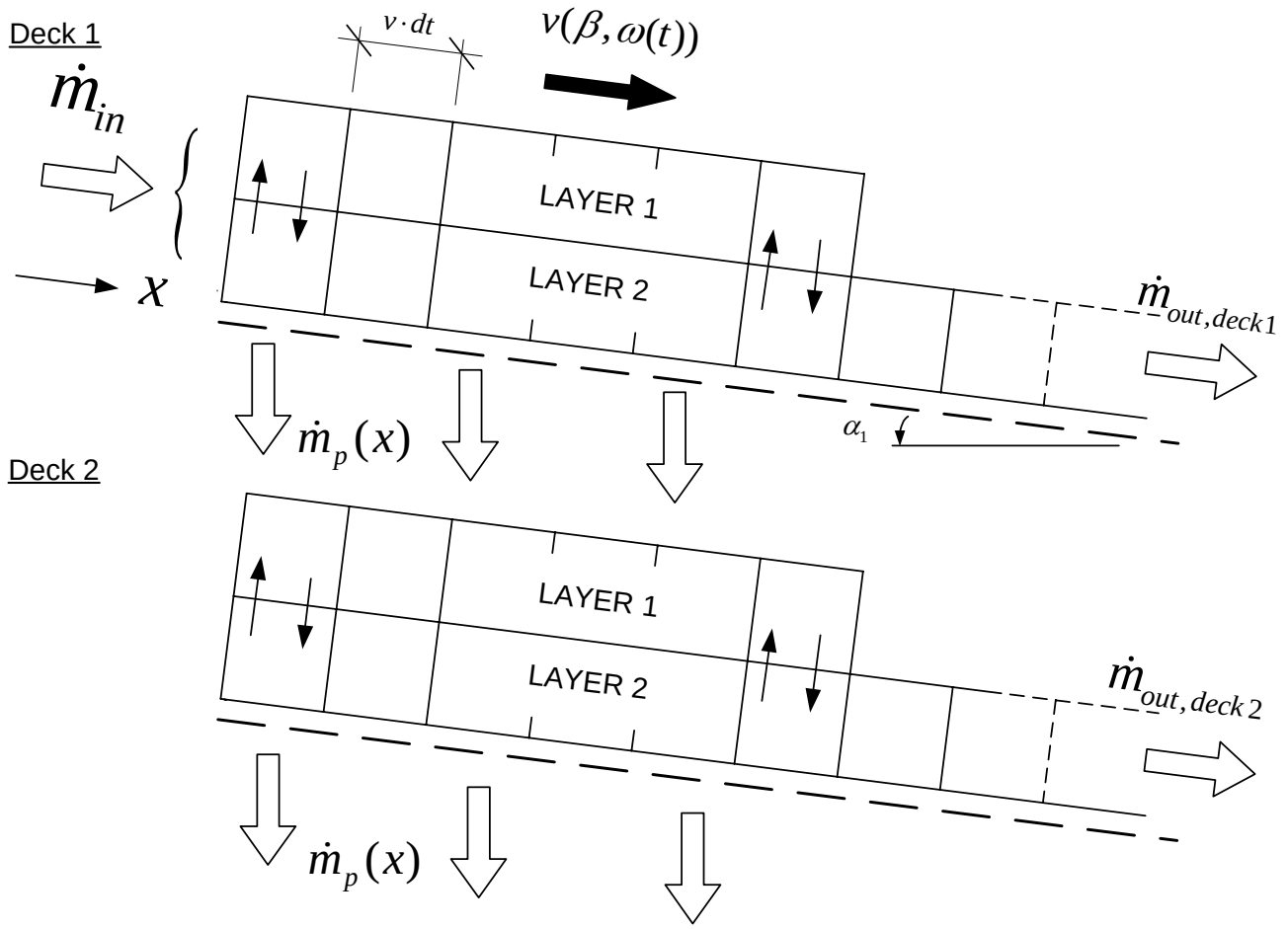
Previous work

- Basic flow model (Soldinger-Stafhammar 2000)
- Stratification
- Passage
- Some limitations



Previous work

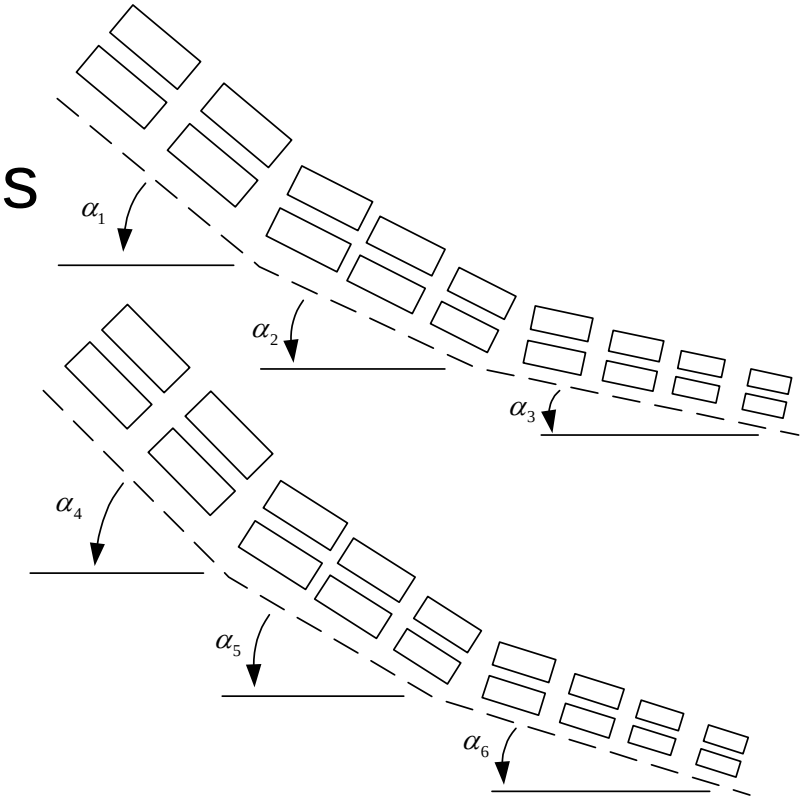
Basic flow model



Developing the flow model

General model

- Wear
- Material characteristics
- Arbitrary geometry



Developing the flow model

Goal with the development

- A generic model that can calculate how the capacity and PSD changes due to change in inclination, wear, different material and geometry in the cloth.

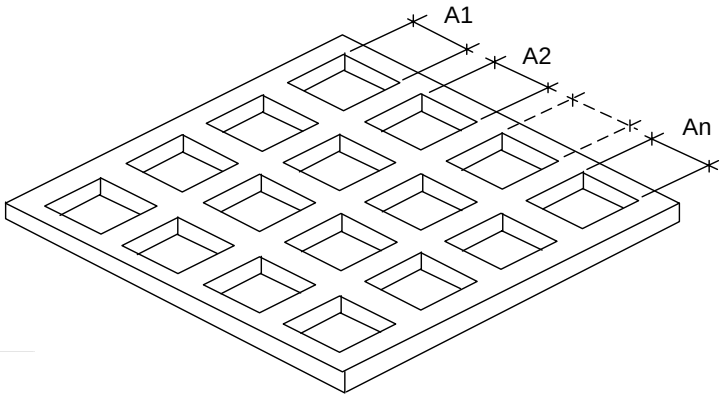
Developing the flow model

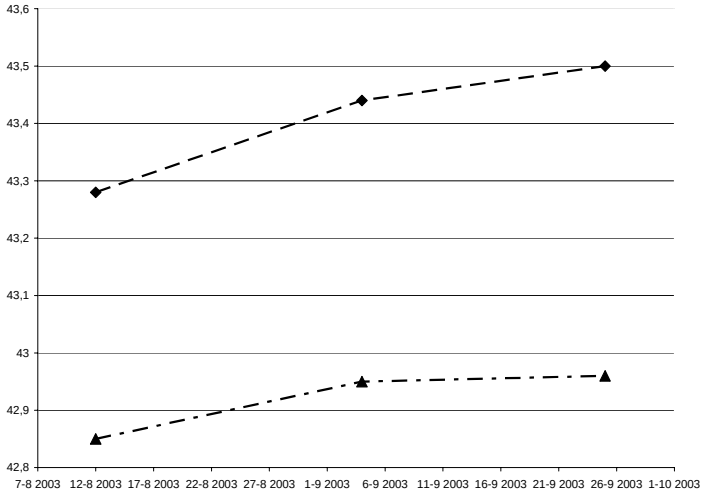
Implementation

- The model is fully implemented in Visual C++
- The influence of wear, and different materials are implemented.
- The results are presented in a user friendly graphical interface

Developing the flow model

Measuring and implementing the wear





$$w_{material} = f(A, F(t))$$

$$w_{material} : wear, material$$

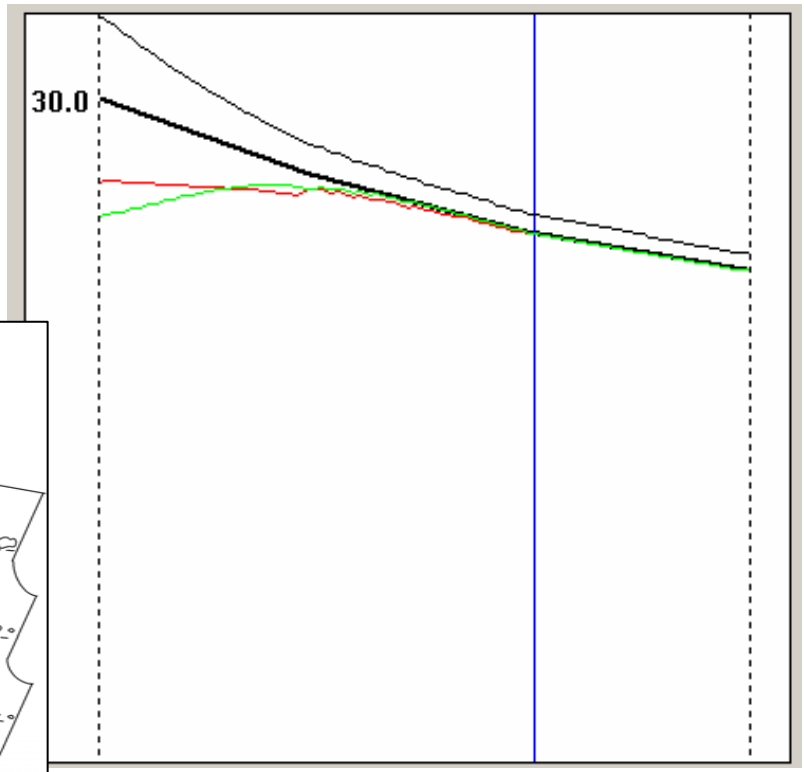
$$A : deck\ area$$

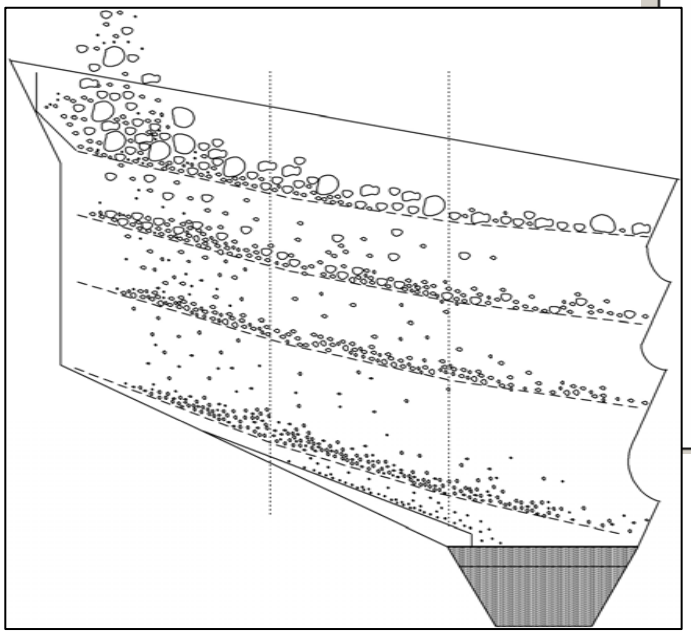
$$F : feed\ rate$$

Results

Example: Banana screen

- The model can simulate a screen with different slopes.





Results

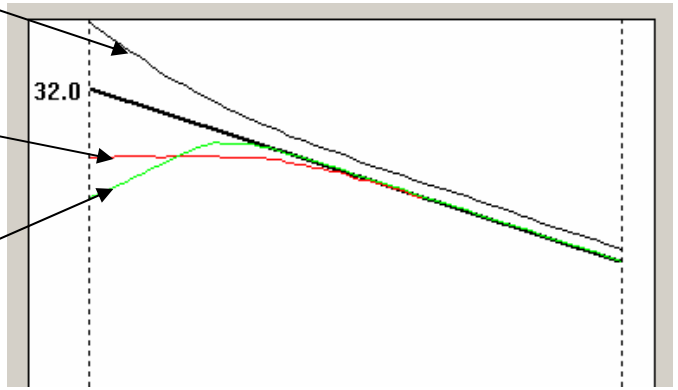
Influence of Wear

- The model calculates the mass flow along the deck.

Remaining material, New deck.

Passed material, New deck.

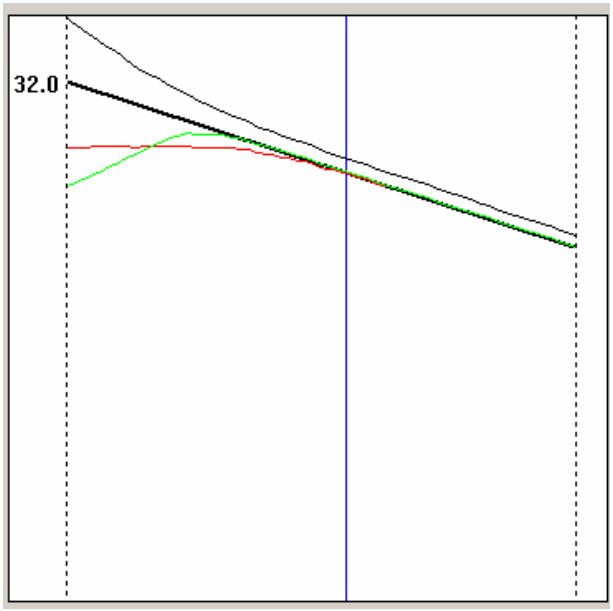
Passed material, Worn deck.

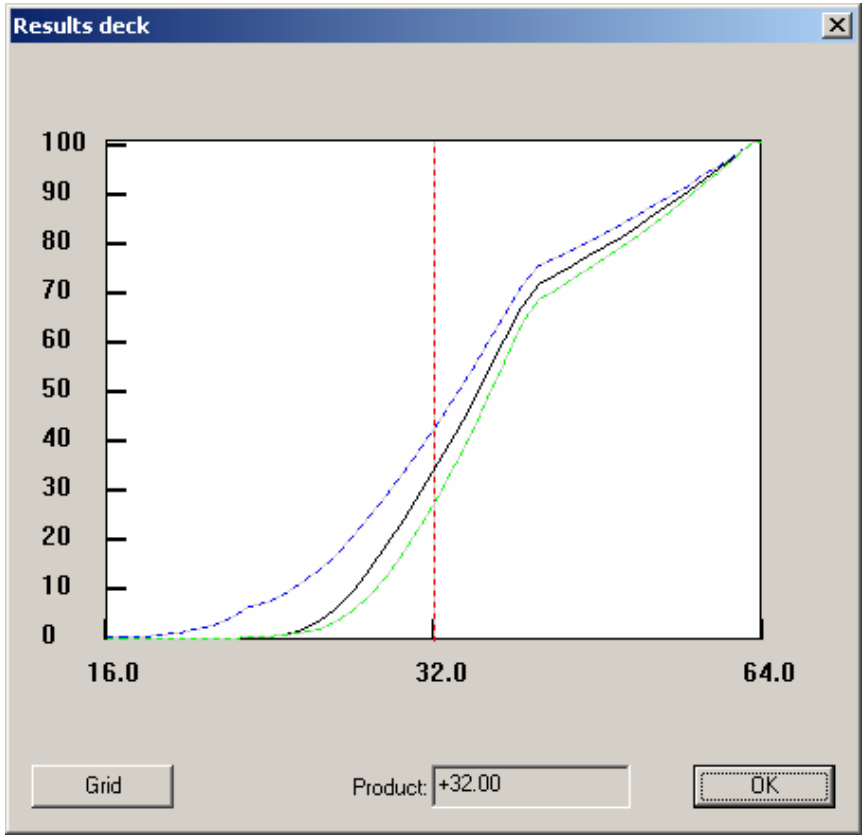


Results

Influence of Wear

- The PSD can be calculated along the deck

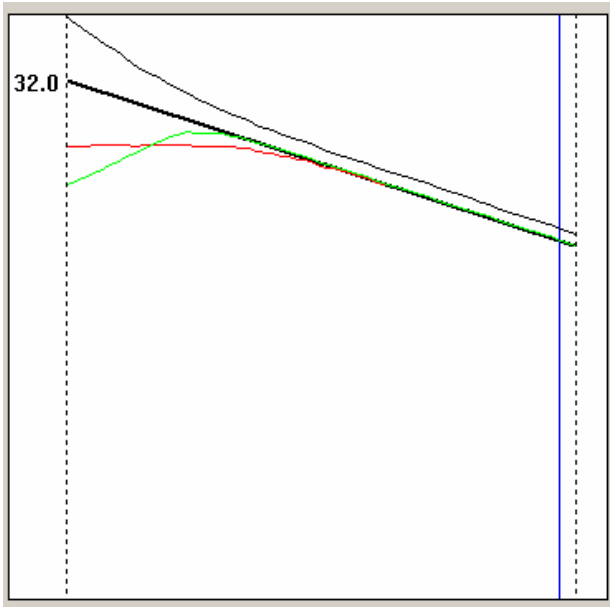


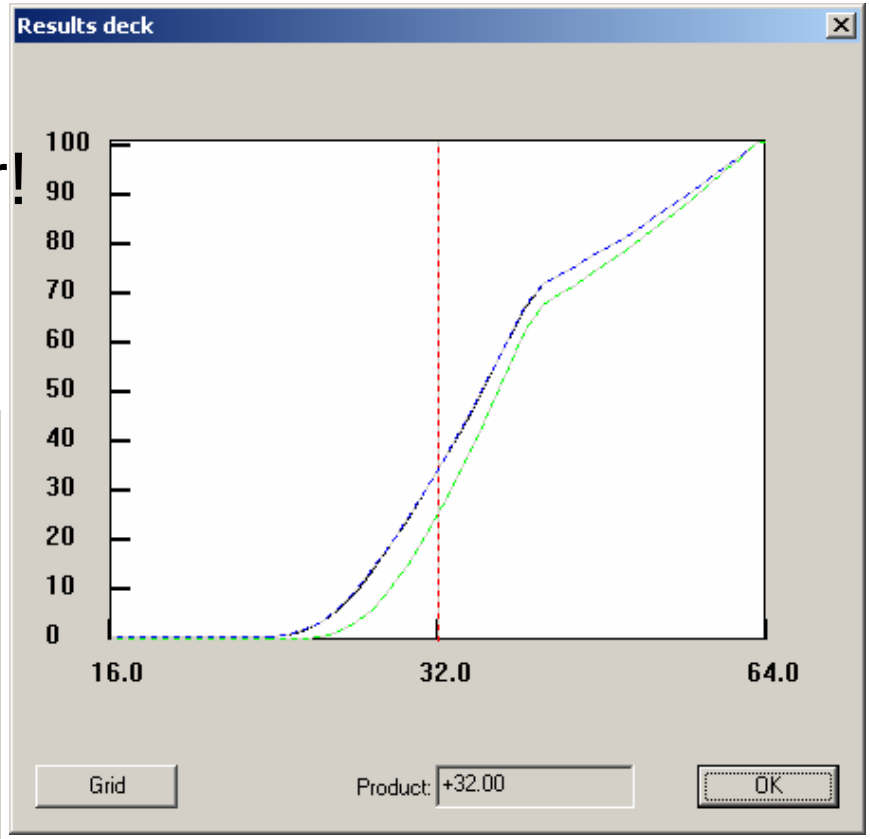


Results

Influence of Wear

- Change in PSD and capacity due to wear!





Results

Conclusions

- A more accurate model.
- Arbitrary geometry
- Wear
- A model suitable for optimisation purposes.

Future work

- Extend the knowledge for different materials wear rate.
- Continue the effort to develop the model for different cloth characteristics.