

*Passion  
for  
Progress*





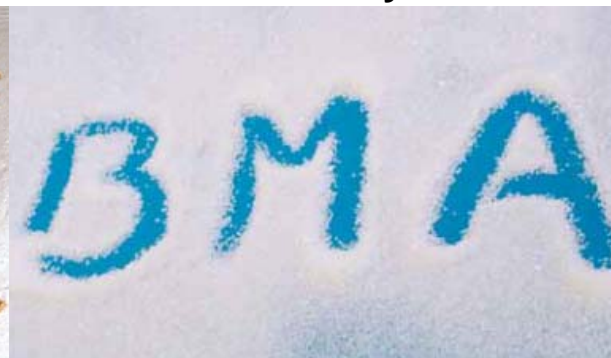
# Material selection: Change through new production requirements?

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Irma Geyer  
Dr.-Ing. Andreas Lehnberger  
BMA Germany



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## ■ *Material selection - Criteria & Developments*

## ■ *Example from practice : Sugar End*

- Pans
- Centrifugals
- Drum dryer

## ■ *Conclusion*



# Material selection - Criteria & Developments

## ■ *Sugar production equipment*

### ■ *Decades ago the material selection was based on*

- Material strength
- Corrosion resistance
- Availability
- Current prices

### ■ *Nowadays additional requirements*

- According to the process step where the equipment has to be installed
- Food safety (hygiene)
- Operational reliability
- Maintenance friendly
- New Regulation: EC N°1935/2004 on materials and articles intended to come into contact with food

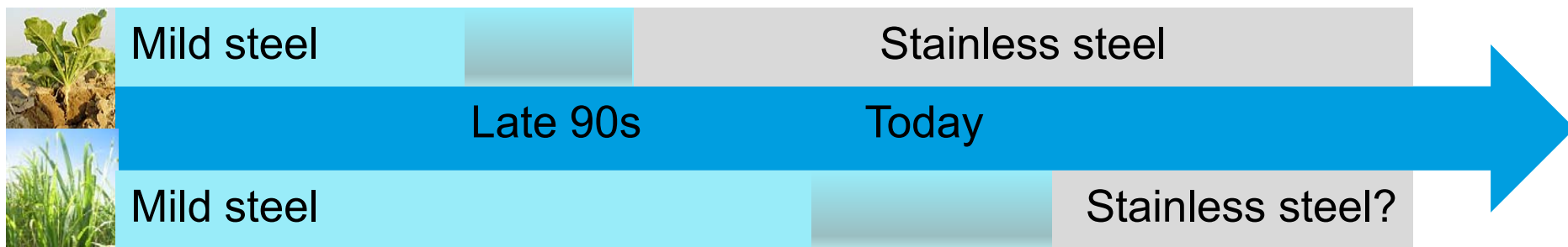


# Material selection - Criteria & Developments

■ *Equipment design for white beet sugar*

■ *Use of stainless steel*

## Beet sugar industry



## Cane sugar industry

■ *Others materials*

- Sealing materials
- Transparent material
- Coating
- ...

*Will the development in beet industry also occur in the cane sugar industry?*

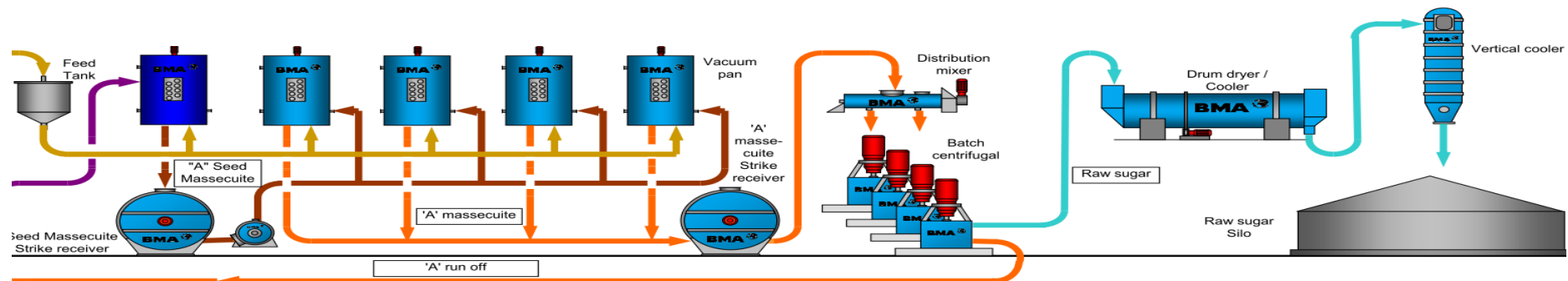


# Example from practice : Sugar End

- *Final product must meet quality requirements*
- *Quality requirements have become stronger over the time*
- *Material selection is a key issue to ensure that final product quality and safety is reached*

## ■ *Focus*

- Pans
- Centrifugals
- Drum dryer



# Batch Pan

## ■ *Calendria*

- In early stages mild steel, reduced life time due to corrosion
- Since the late 90's stainless steel is standard for all products

**Corrosion resistance**

## ■ *Stirrer*

- Only cladding offers the best strength properties

**Material strength**

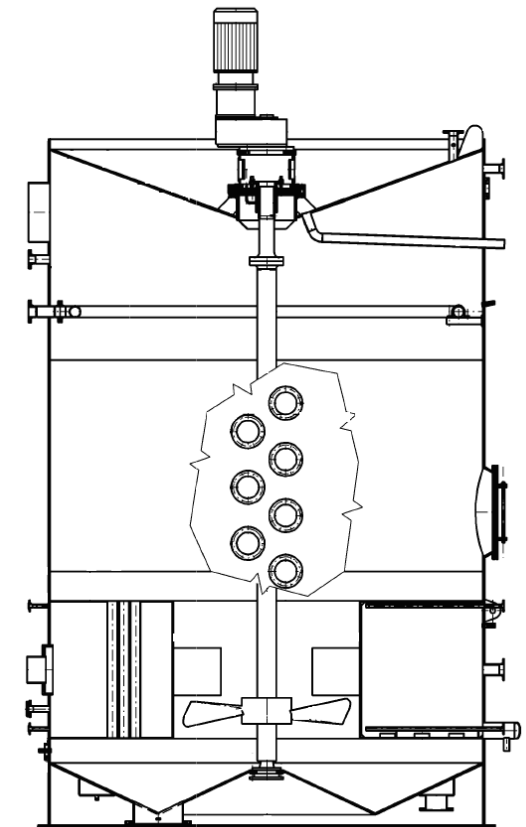
## ■ *Vapour chest*

- In early stages carbon steel: is no more suited due to rust particles **Product quality**
- Cladding: not suited due to low resistance to frequent temperature changes

- Solid stainless steel **Material strength**

## ■ *Sight glasses*

- Borosilicate only **Product safety**





# Continuous Pan

## ■ **VKT: BMA vertical Continuous Pan**

- Stacked batch pans
- In general the same criteria as batch pans except vapour chest

## ■ **Vapour chest**

- Cladding possible: no frequent temperature changes due to continuous operation
- Increased life time with low additional investment in sugar factories
- Solid stainless steel recommended for refineries

**Maintenance free**



# Batch Centrifugal

- ***Housing part in contact with sugar crystals***
  - In 1981: Stainless steel was an option
  - In 1998: Stainless steel except the housing cover
  - In 2012: Stainless steel, option centrifugal frame and basket housing
  
- ***Basket: Stainless steel since the early 90s *Product quality****
  
- ***Basket hub: cast stainless steel *Product quality and longer service life****
  
- ***Screen: stainless steel since the late 80s *Product quality****
  
- ***Light: LED instead of halogen, option *Product safety****



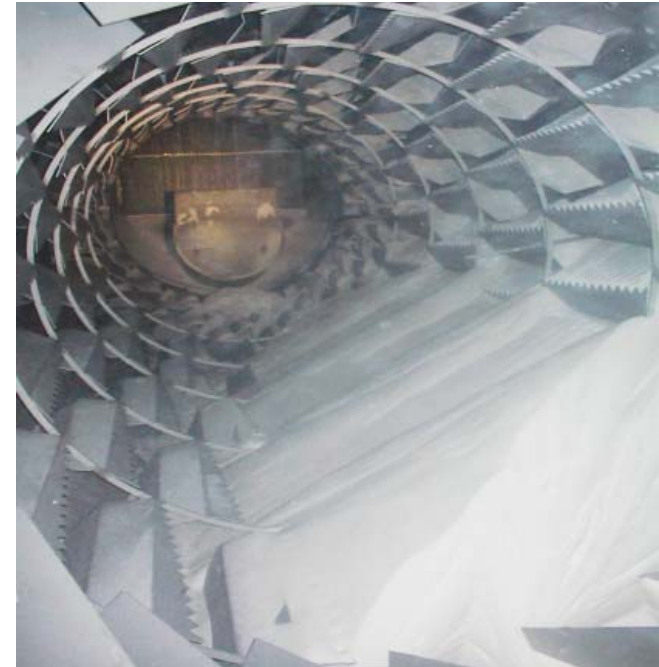
# Continuous centrifugal

- **Housing part in contact with sugar crystals**
  - Stainless steel since 2009, was offered as a option since the early 90s
  - Housing and structure in stainless steel as an option **Maintenance free**
  
- **Basket: Stainless steel for decades **Product quality and affordable****
  
- **Screen**
  - Segmented screens CrNi
  - Wedge wire screen, Stainless steel **Long service life**
  
- **Glass**
  - Borosilicate
  - Plexiglas



# Sugar drum dryer

- **Final dry product**
  - No corrosion
  
- **Drum dryer in carbon steel *Operation costs***
  - Extended life time possible
  - But content of rust particles, especially at start of operation
  
- **Drum dryer in solid stainless steel design since late 90's *Product quality***
  - No off-spec sugar recycling
  - Meet the increased product quality requirements
  
- **Riding ring**
  - Normal steel with stainless steel cladding***Material Strength***

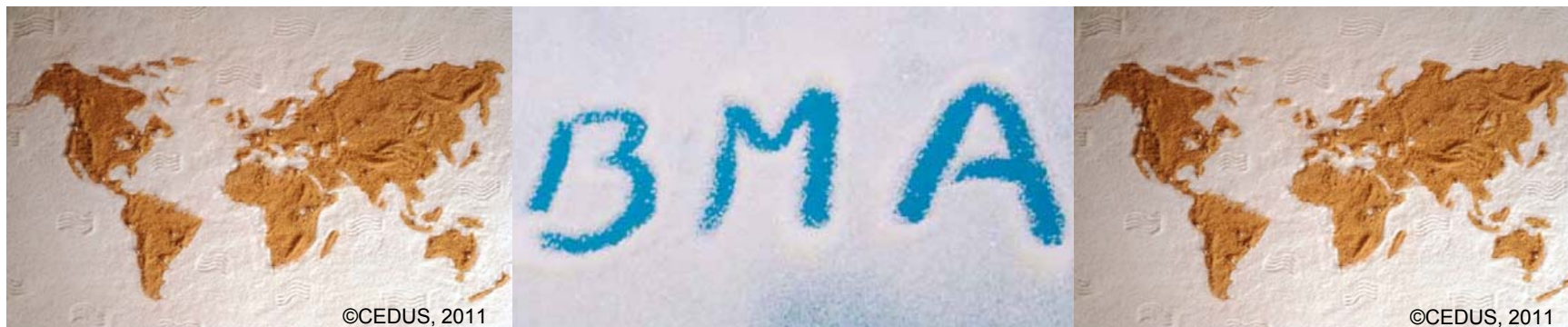


# Conclusion

- ***Material selection has change over the time***
  - Stainless steel is the standard in white beet sugar
  - Started with only sections that are in contact with the final product
  - Today sometimes completely in stainless steel
  
- ***Will the development in beet industry also occur in the cane sugar industry?***

**YES!**

***When? Let us talk about it now!***





**Thank you for your attention!**