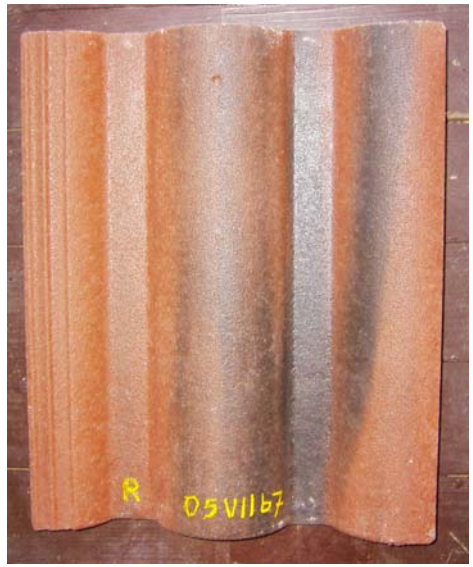
CONCRETE ROOF TILES

Distribution Training



imagine the possibilities™

T. Ferrari

13-16 September 2005

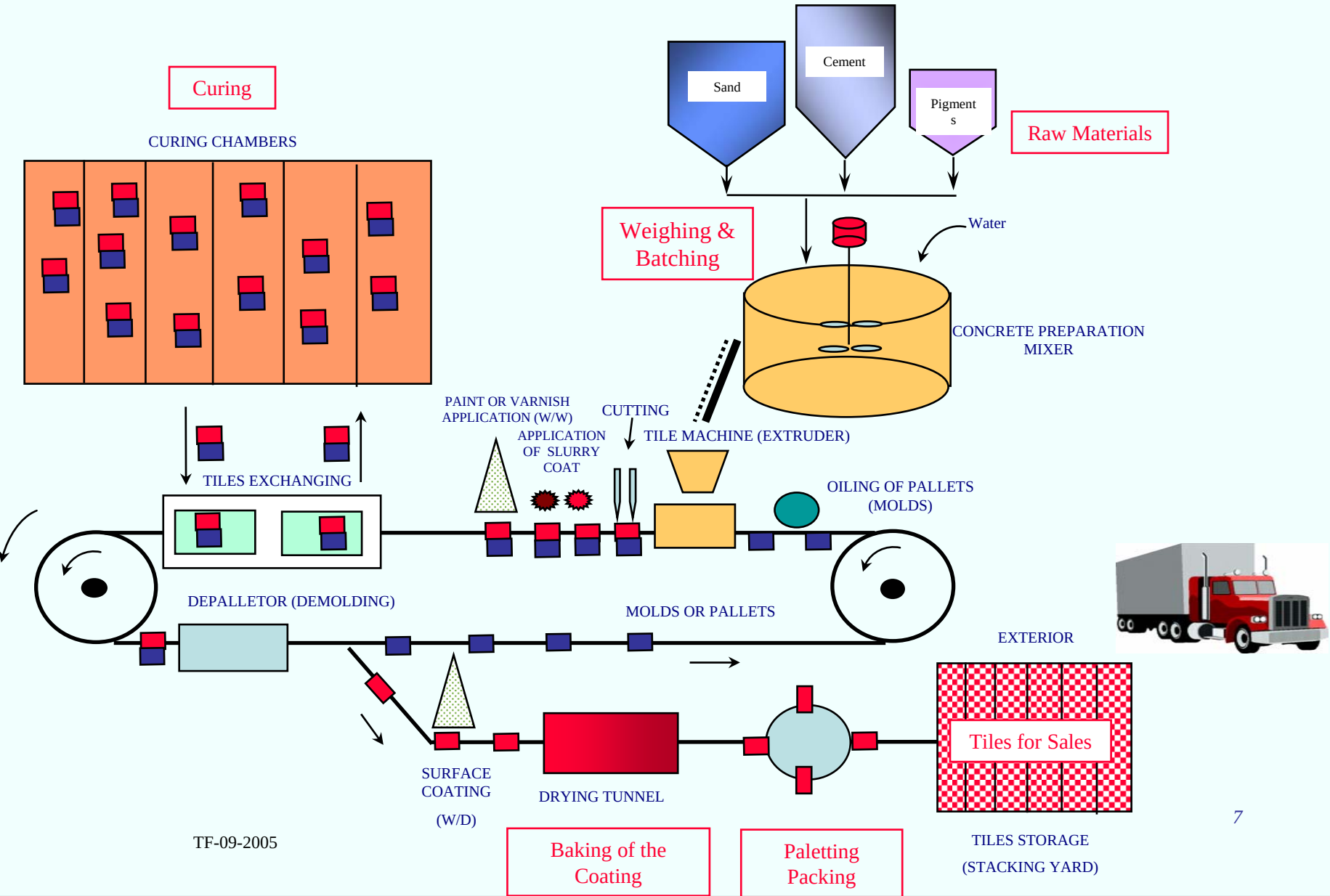
ROHM AND HAAS

Concrete Tile Composition

Cement	:	20-25 %
Sand	:	65-70 %
Water	:	8 %
Pigments	:	1-2 %

The water / cement ratio is kept around 0,40
The very large majority of the European tiles are mass pigmented.

CONCRETE ROOF TILES PRODUCTION



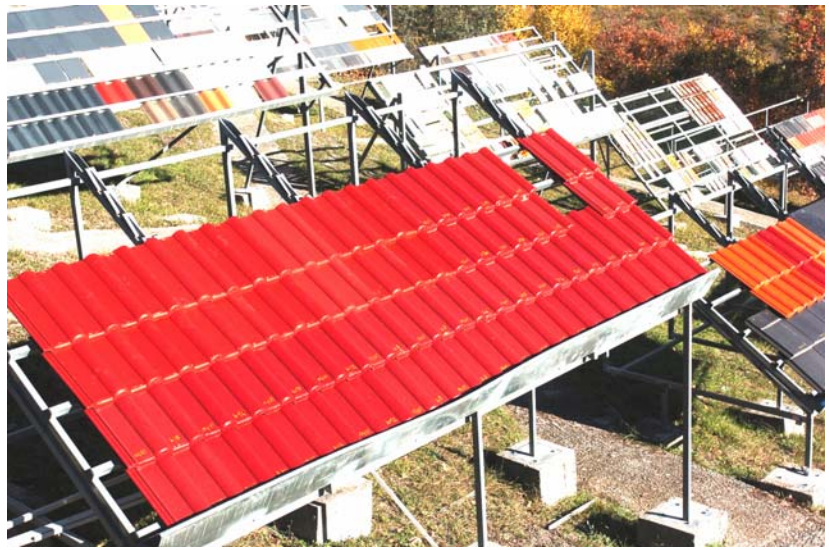
Polymers for Concrete or Slurry modifications

- Primal B 60-A, today replaced by Primal E-330 EF

- Primal E-330 EF
  - increase the mechanical strength
  - improve workability
  - prevent cracking in thin layer applications like slurries
  - (act partially as a ”cement plasticizer”)
  - improve acid rain resistance
  - improve freeze - thaw resistance
  - improve adhesion of coatings
  - recommended polymer level above 10%

Product line for Concrete Roof Tiles

- Primal E-822K
  - All applications wet on wet and wet on dry in pigmented and transparent applications
- Primal 2001LF
  - Environmental friendly , pigmented applications
- Primal AC 339
  - Clear coats wet on dry



Wet Paint Requirements

Provide correct, efficient and economical application

- paint stability (no viscosity changes ,no separation or sedimentation, no floatation of the used pigment).
- low foaming tendency, blistering, cratering or other surface defects.
- Recycling of overspray (no coagulates or build up in the spray booth).
- sagging resistance and good flow on the tile
- low toxicity and environment friendliness

Coating requirements

Provide final appearance and resistance

- hiding for paints and transparency for clear glaze coats
- efflorescence resistance (primary and secondary)
- whitening resistance
- scratch and blocking resistance
- dirt and water pick up resistance
- color, gloss retention and durability in general

Tile requirements

Provide concrete protection and long durability

- Protect the substrate and the environment
- (even if concrete is very durable; acrylic coatings provide a longer decorative and protective durability)
- improved resistance to acid rain or atmospheric pollution
- improved resistance to freezing
- longer resistance to the growth of algae and microorganisms