

Recycling

DR. JÜRGEN HUTSCHENREUTHER



**European Standards of Asphalt
(German version of standards)**



The roads in Europe with



Raw Materials

- Aggregates
(TL Gestein – rocks)
- Bitumen
(TL Bitumen)
- Emulsions
(TL BE / Bitumen Emulsions)

Asphalt as the road product

- ASPHALT
 - TL Asphalt
 - ZTV Asphalt



European Asphalt Standards

- **DIN EN 13108**
Requirements for composition, characteristics, production and delivery of asphalt mixes

Products	Asphalt Concrete (AC)	Part 1
	Asphalt Concrete for thin layers	Part 2
	Softasphalt	Part 3
	Hot Rolled Asphalt	Part 4
	Stone Mastic Asphalt (SMA)	Part 5
	Mastic Asphalt (MA)	Part 6
	Porous Asphalt (PA)	Part 7
	Recycling Asphalt (RA)	Part 8
Quality	First material control	Part 20
	Own production control in asphalt plant	Part 21
- **DIN EN 12697**
Methods for testing of asphalt
Part 1 to 43

Standards in Germany

Standards in 2 parts:

- Part 1:
Requirements for materials und material mixes (TL)
- Part 2:
Contract conditions for construction works (ZTV)

additionally

- Technical testing requirements / methods (TP)
Standards
Technical characteristics
Hints / remarks

First Mix Design → responsibility by the asphalt producer !!!

- Should be done for each product (design composition) before first application
- Maximum validity 5 years
in certain cases earlier testing necessary
- Should be done on asphalt mixes, produced in the laboratory according to the design composition
- It shall confirm the requirements according to technical delivery conditions of TL Asphalt-StB
- **It do not confirm suitability for the designed application based on the construction contract**

New Mix Design necessary, if

- Change of supplier of mineral aggregates
- Change of type of mineral aggregates
- Change of quality of mineral aggregates
- Change of type of bitumen

Supervision, Certificates

- First inspection of the mixing plant and own production control with final certificate
- Permanent / continuous supervision of own production control, once a year – official inspection
- Who? → special supervisor → authorized companies with authorized personal
 - Dr. H Institute for Certification and supervision

RECYCLING –
according EU standards -zero loss method

Recycling - Basics

The most famous law:

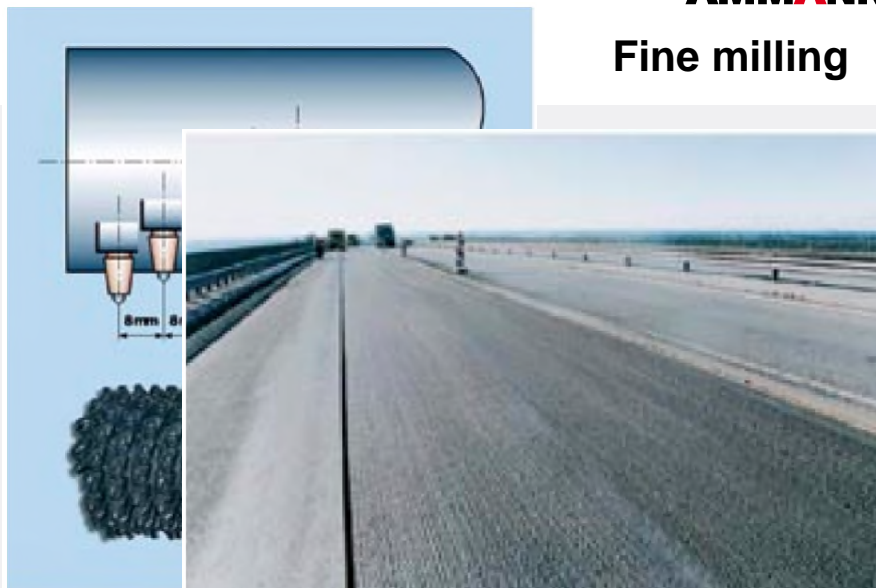
The Quality of asphalt produced with reclaimed material has to have the same quality like asphalt produced with virgin material according the standardization.

- Selected relaim
- Selected storage
- Special mix design
- production technology

Selected reclaiming of material

- **Cold milling** machines are now bearing asphalt layers with thicknesses up to 30 cm in one operation from. By the choice of milling heads and their arrangement on the milling the milling pattern can be controlled.
- **Fine milling** is possible to produce a base, on the thinner asphalt layers can be applied. With cold milling machines but also the individual asphalt layers can be selectively expanded so that materials with well-defined properties for re-use are (in hot mixing plants) available.
- When the milling is to pay attention to the ingredients in layers to be milled (eg. asbestos) and appropriate health and safety measures to be taken.

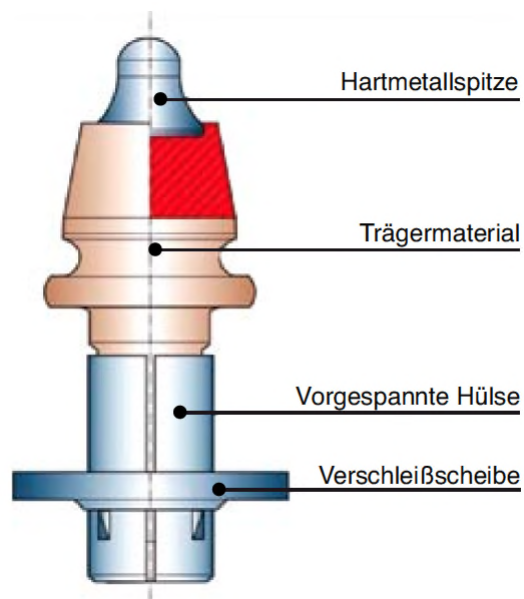
Fine milling



AMMANN
standard milling



AMMANN
milling head



AMMANN

Large milling machine in operation



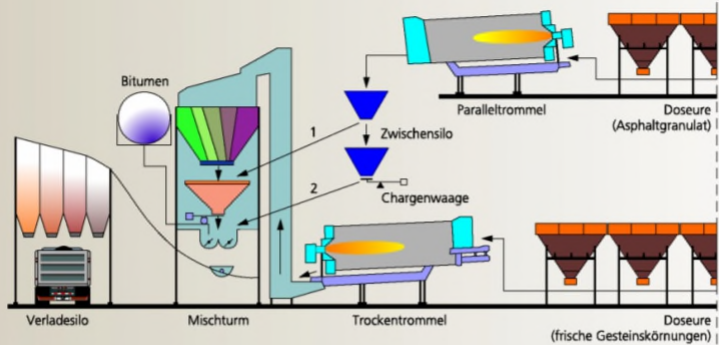
Reclaiming

AMMANN



Recycling

New technology in plant – parallel drying drum



- 1 Zugabe in die Gesteinskörnungswaage
- 2 Zugabe in den Mischer

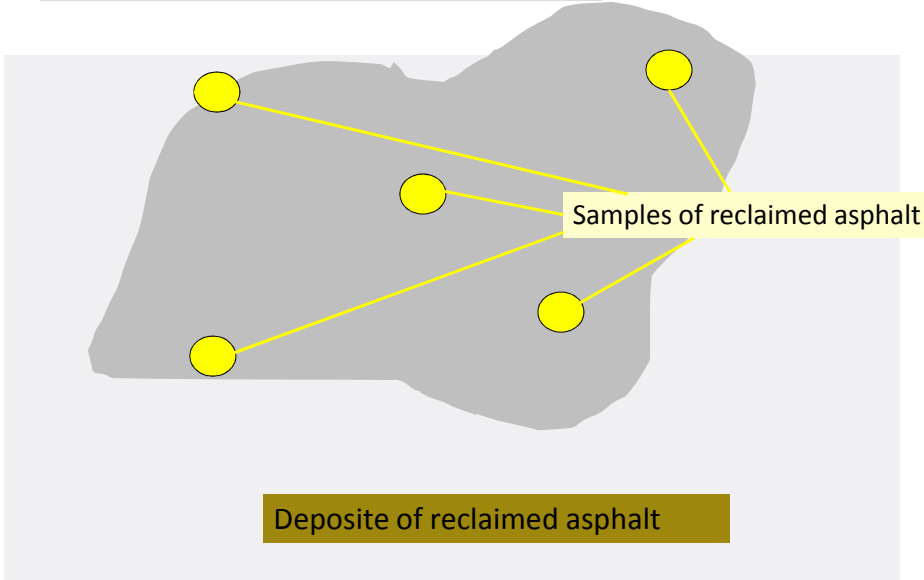
Recaimed material



Storage for reclaimed asphalt



Taking min 5 samples of the deposite (reclaimed asphalt)



Take min 5 samples of the deposite (reclaimed asphalt)

Producing an average sample of the 5 deposite samples (reclaimed asphalt)

Test the average sample of the deposite in the lab (reclaimed asphalt)

Make a new mix designand using the Test results of the average sample of the deposite (reclaimed asphalt) , adding the new modified Bitumen with **CCBit113AD®** and **aggregates**

Using for the new asphalt the maximum possible amount of the deposite asphalt (reclaimed asphalt)

Effects

- The 100% recycling technology is totally environmental friendly
- It is a demand of EU standardisation
- 100% = no loss in material
- By using 50% reclaimed material you have to add 50% virgin aggregates and CCBit113AD® mod. Bitumen, according the new developed mix design.
- **Saving up to 50% of costs!!!**

German (EU) regulations

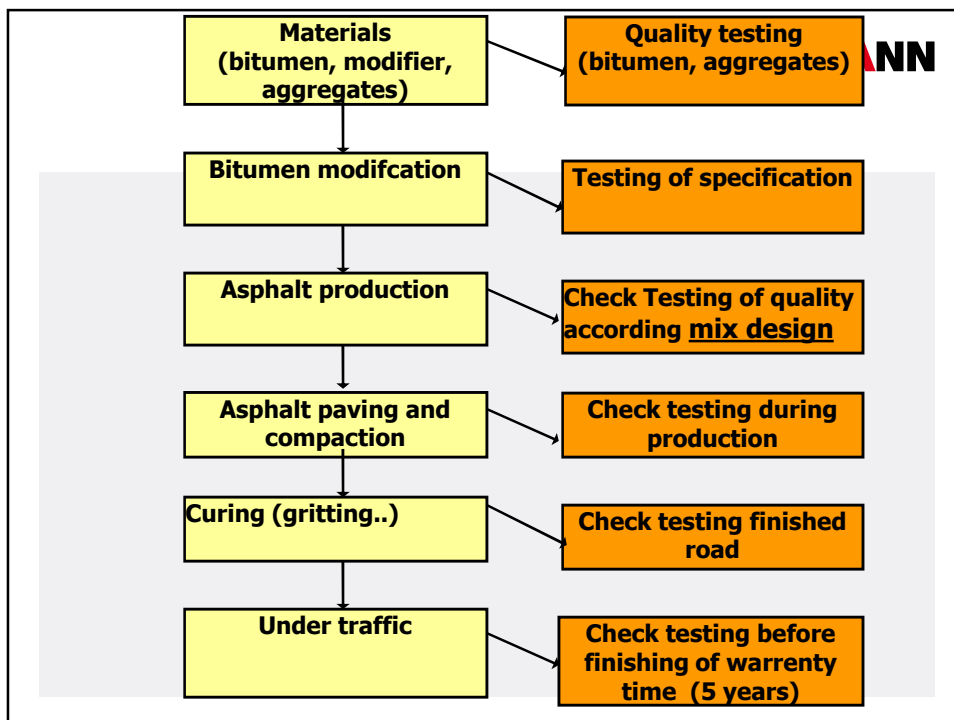
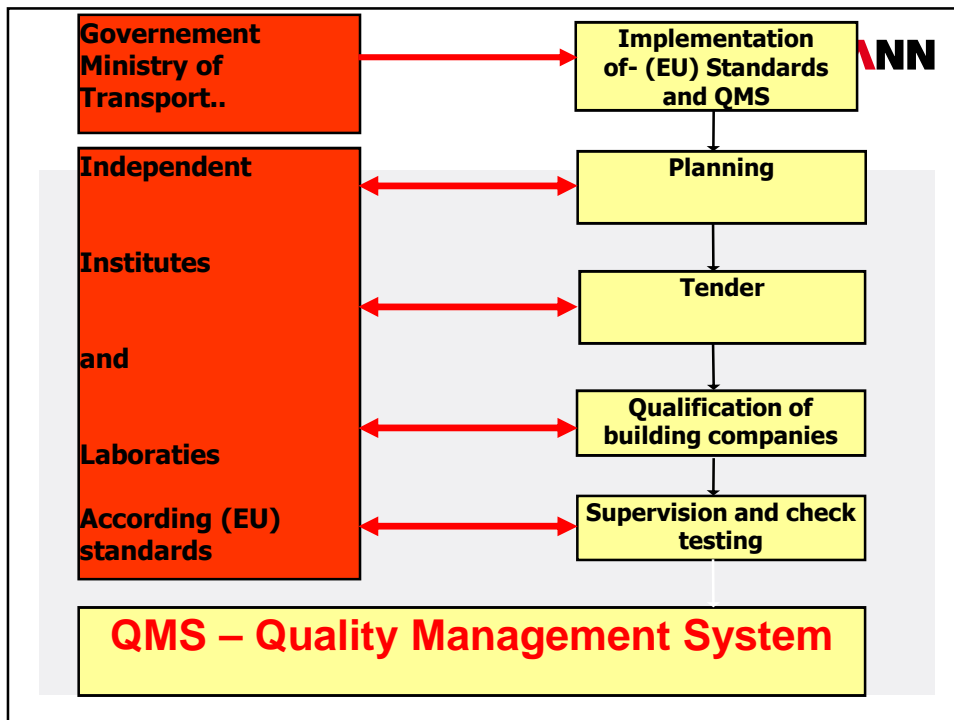
Asphaltgranulat aus	Zugabemöglichkeiten zur Herstellung von Asphaltmischgut für					
	Gussasphalt	Walzasphaltdeckschicht	Asphaltbinderschicht	Asphalttrag-schicht	Asphalttragdeck-schicht	Asphaltfunda-tions-schicht
Gussasphalt	++	o	o	+	o	o
Walzasphaltdeckschicht	-	++ ¹⁾	++	+	+	+
Asphaltdeck- ²⁾ und Asphaltbinderschicht	-	o ³⁾	++	+	+	+
Asphaltbinderschicht	-	o ³⁾	++	+	+	+
Asphalttrag- oder Asphalttragdeckschicht	-	-	-	++	o	+
Asphaltfundationsschicht	-	-	-	o	-	++

++ vorrangig (höchste Wertschöpfungsstufe)
 + möglich, aber ohne volle Ausnutzung der technischen Eigenschaften und Wirtschaftlichkeit
 o bedingt möglich, nach besonderer Prüfung
 - nicht möglich
¹⁾ nach den TL Asphalt-StB
²⁾ i.d.R. nicht aus Gussasphalt
³⁾ nach gesonderter Aufbereitung

**Quality and using Dr. H. Technologies (CCBit113®)
 – 15 years without maintenance**



**A4 State Highway in Germany
 (in use for over 18 years)**



**INDEPENDENT LAB: making mix design
and Check Testing of quality in lab and on site**



Hamburg Device: Steel Wheels in Water Bath at 50°C

New Device: Rubber Wheels in Air Bath at 60°C (In Compliance with the European Standard)



**Inspection on site
and Check Testing of quality**

Jürgen Hutschenreuther
Thomas Wörner

AMMANN

German version is out now, russian version is out now

Asphalt im Straßenbau
2. Auflage

KIRSCHBAUM

AMMANN

for technical support:
DR. HUTSCHENREUTHER
INGENIEURGESELLSCHAFT FÜR
BAUTECHNISCHE PRÜFUNG MBH

www.hutschenreuther.de
www.facebook.com/Dr.Hutschenreuther

