POLYMER MODIFIED BITUMEN (PMB)

Polymer modified bituminous materials can bring real benefits to highway maintenance/construction, in terms of better and longer lasting roads, and savings in total road life costing.

The term polymer basically means a combination of a large number of similar smaller molecules or "monomers" into large molecules or "polymers". The main polymers used to modify bitumen are:

- Natural Rubber
- Styrene-Butadiene-Styrene (SBS)
- Ethylene-Vinyl Acetate (EVA)

Manufacture PMB up to 65% faster than Conventional Technology

Advantages of using PMB

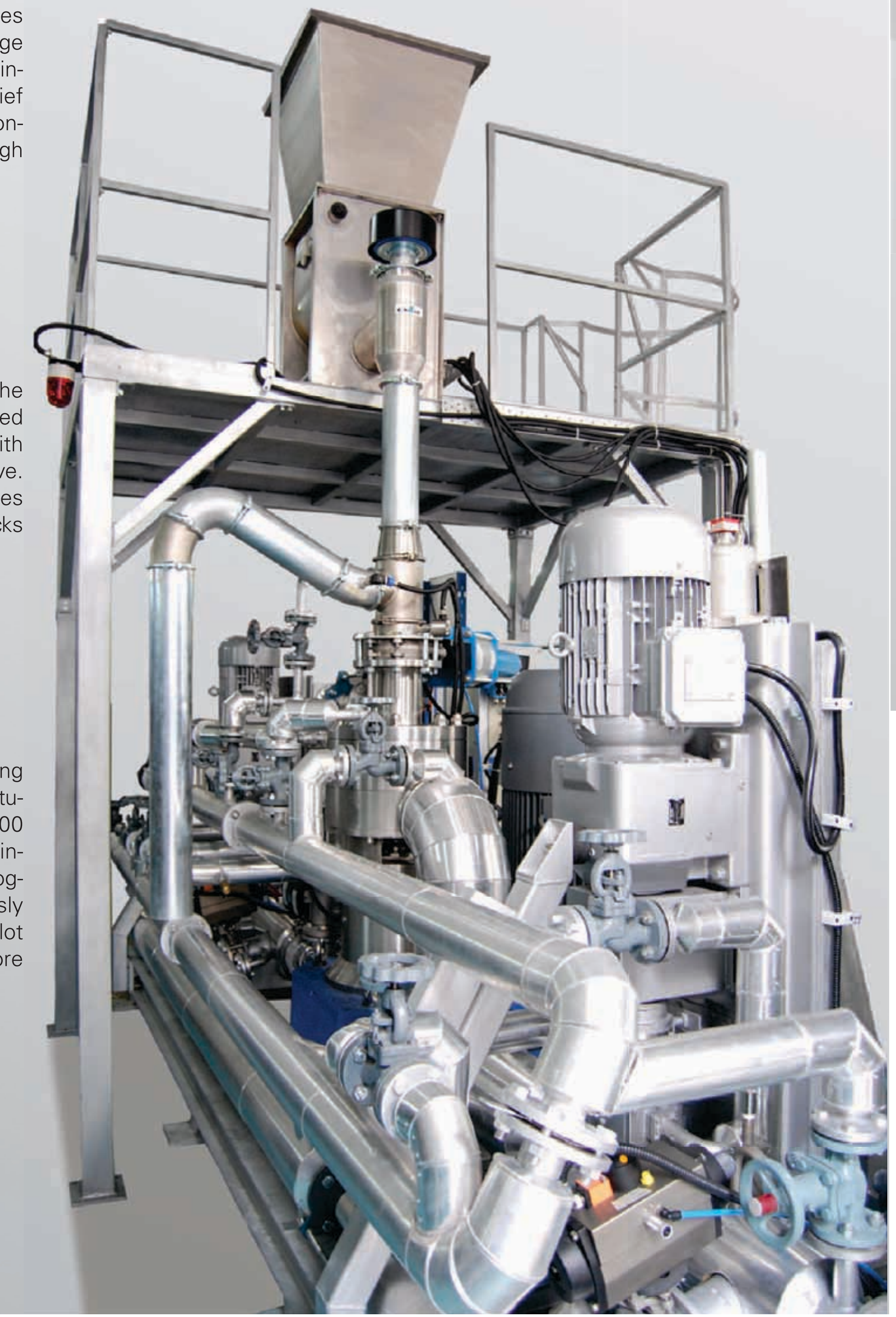
The cohesion and adhesion to mineral aggregates is higher. The range of plasticity (temperature range between breaking point and the fusion point) is increased. There is greater elastic recovery after relief and higher fatigue resistance. Apart from road construction other uses of PMB are production of high quality roofing-cardboard and damp-proof layers.

Conventional PMB Manufacturing Technology

This is a batch process involving large footprint for the manufacturing facilities. The polymer is introduced separately into a CSTR containing hot bitumen with mild stirring. Dispersion is slow and less effective. There is little flexibility and longer production times are required. The batch processes poses bottlenecks when production increase is considered.

Modern IKA® Inline Technology

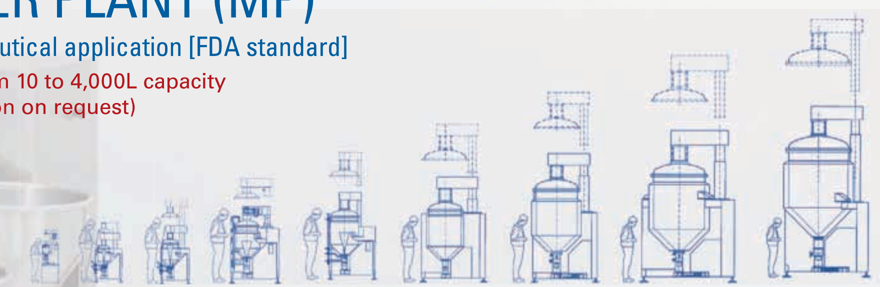
This is a continuous process with continuous dosing and incorporation of polymers (SBS/EVA) and bitumen into the inline IKA® Dispax Reactor DR 2000 PB. Because of intensive mixing at high shear finest dispersion is achieved in a single pass. Homogenized finished product is directly and continuously transferred to storage. The process provides for a lot of flexibility and production time is reduced by more than 60 percent.



MASTER PLANT (MP)

For pharmaceutical application [FDA standard]

- Available from 10 to 4,000L capacity (Customisation on request)



FEATURES

- Viscosity range from liquid to paste (approx. 100 Pas)
- High or low level circulation loop for flexible capacities within the vessel
- Feeding of solid or liquid additives without vacuum in the mixing vessel
- Choice of counter rotating agitator for higher viscosities
- Multifunctional pumping and dispersing machine DBI 2000/...
- CIP -cleaning, for which the DBI 2000/ ...serves as pump and feeds the rotatable spray nozzles
- Exchangable dispersing tools
- The complete plant can be supplied in Ex-protected form to the 94/9 EG (ATEX 95) directive

APPLICATIONS

- Pharmaceuticals
- Cosmetics
- Food and beverages
- Chemicals
- Colours, lacquers and dyestaffs

STANDARD PRODUCTION PLANT (SPP)

For all basic operations requiring mixing & dispersing technology

- Available from 25 to 4,000 capacity

Ready to assist you...

For further assistance or enquiry regarding magicLAB®, LABOR-PILOT, PROCESS-PILOT and other IKA® Process Technology product range, suitability of application purposes, customised solutions for your needs, trial applications, repair and servicing, please contact IKA® from the details listed below:

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usa@ika.net www.ikausa.com

Designed to work perfectly

INDUSTRIAL PROCESS PRODUCT OVERVIEW

IKA®

IKA® 100 years

Designed to work perfectly

WORLD- FIRST!

SCALING UP METHOD FROM R&D AND LABORATORY-BASED FORMULATION TO INDUSTRIAL SCALE MANUFACTURING

IKA®

FOR PHARMACEUTICAL, COSMETICS, FOOD, PETROCHEMICAL & CHEMICAL INDUSTRIES

PILOT SCALE

LABOR-PILOT Basic version

Working temp. :	Max. 120°C
Sealing type:	Special lip seal up to 3bar
Motor power:	1.5 kW motor with on/off switch
Speed:	RPM 7,000
Flow rate:	300L/hr (as H_2O)

IDno.: S097950
(to configure with UTL module)

LABOR-PILOT (with integrated VFD)

Working temp. :	Max. 120°C
Sealing type:	Special lip seal up to 3bar
Motor power:	2.2 kW Non-Ex. proof motor with integrated inverter
Speed:	RPM 3,160 - 13,750
Flow rate:	200- 700L/hr (as H_2O)

IDno.: U075171
(to configure with UTL module)

LABOR-PILOT suitable for VFD operation without ATEX CERTIFICATION

Working temp. :	Max. 120°C
Sealing type:	Special lip seal up to 3bar
Motor power:	2.2 kW Ex. proofT4 motor suitable for VFD
Speed:	RPM 3,160 - 13,750
Flow rate:	200- 700L/hr (as H_2O)

IDno.: U090762
(to configure with UTL module)

PROCESS-PILOT (including thermosyphon)

Working temp. :	Max. 120°C
Sealing type:	Double mechanical seal up to 10bar
Motor power:	2.2 kW
Speed:	RPM 7,000
Flow rate:	300L/hr (as H_2O)

IDno.: T058102
(to configure with UTL module)

PROCESS-PILOT (with integrated VFD including thermosyphon system)

Working temp. :	Max. 120°C
Sealing type:	Double mechanical seal up to 10bar
Motor power:	4 kW Non-Ex
Speed:	RPM 3,160 - 13,750
Flow rate:	200- 700L/hr (as H_2O)

IDno.: U075172
(Optional choice of configuring either UTL module or CMS module)

PROCESS-PILOT Ex. proof motor suitable for VFD including thermosyphon system with ATEX CERTIFICATION

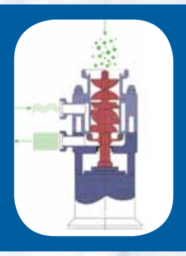
Working temp. :	Max. 120°C
Sealing type:	Double mechanical seal up to 10bar
Motor power:	4 kWT4
Speed:	RPM 3,160 - 13,750
Flow rate:	200- 700L/hr (as H_2O)

IDno.: U090764
(to configure with UTL module)

LAB SCALE- Formulation development
magicLAB®

all modules

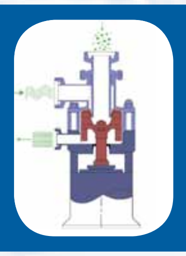
INTERCHANGABLE MODULES FOR VARIOUS APPLICATIONS



MHD module

Inline continous solid-into-liquid incorporation with dispersing.

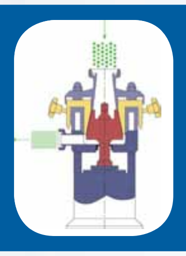
Example: Incorporation of hydrocolloids (carbopol, gum), carbon black, TiO_2, powder, ceramic powders



CMS module

Inline batch solid-into-liquid incorporation with recirculation.

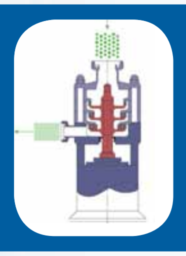
Example: Mineral salts ($CaCO_3$, MgO), starches, various hydrocolloids, Aerosil®



MK module

Inline wet milling & particle size reduction of thick, pastry, creamy, moderately viscous products.

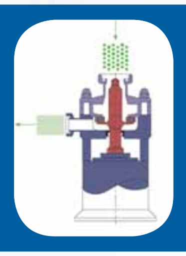
Example: Metal-oxide slurries, pigments slurries, sauces, creams, lotions



DR module

Inline three stage dispersing for optimal homogeneity of various suspensions and emulsions.

Example: Personal care products, cosmetics, pharmaceutical & nutriceutical, chemicals



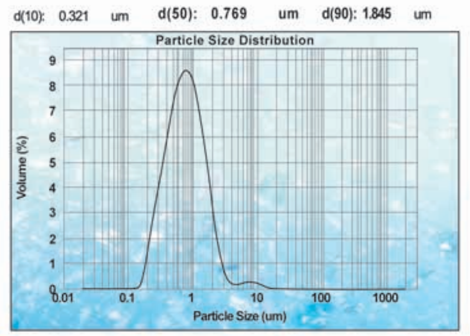
UTL module

Inline single stage dispersing for optimal homogeneity of various suspensions and emulsions.

Example: Personal care products, cosmetics, pharmaceutical & nutriceutical, chemicals

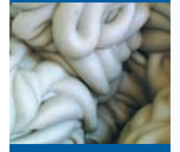
IKA® Sample of particle size analysis report

TiO_2 Suspension



Alumina

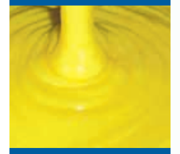
Carbopol



Polymer

Colour paste

Pectine



Spice sauces

Acrylic resin

Calcium carbonate

TEMPERATURE UP TO 320 C
CUSTOMISED VERSIONS & PLANTS FOR PRESSURISED & HAZARD APPLICATIONS

Aseptic LABOR-PILOT (in full stainless steel pharmaceutical construction, with water-cooled motor)

LABOR-PILOT
(in full stainless steel food grade construction)

Reactor for polymerisation.
Example: **Synthetic fibres**

Customised for polymerisation.
Example: **Spandex**

FDA Standard Pharmaceutical industrial version

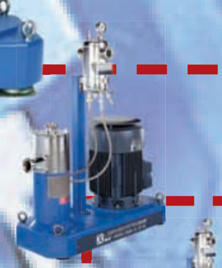
SCALE-UP FOR INDUSTRIAL

2000/50

2000/40

INDUSTRIAL SCALE

2000/30



2000/20

2000/10

2000/05

2000/04 PILOT SCALE

LAB SCALE
magicLAB®

For Capacity (x 10^3 Ltr/hr)

125 | 70 | 30 | 20 | 8 | 2.5 | 0.7 | 0.3