DEUREX®

THE WAX COMPANY

SYNTHETIC WAXES

DEUREX® EWAX

POLYETHYLENE WAXES

NATURAL WAXES

DEUREX® XWAX

SUGAR CANE WAXES

HYBRID WAXES

DEUREX® HWAX

HYBRID WAXES

AIR CLASSIFICATION PROCESS

FLAKES
e.g. DEUREX E 11 F

GRANULES
e.g. DEUREX E 11 G

FINE GRANULES
e.g. DEUREX A 20 K

POWDERS
e.g. DEUREX A 20 P

FINEST POWDERS
e.g. DEUREX E 09 A

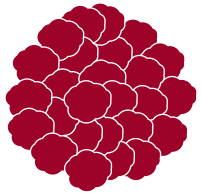
MICRO POWDERS
e.g. DEUREX S 3001 M

DEUREX AIR CLASSIFICATION PROCESS

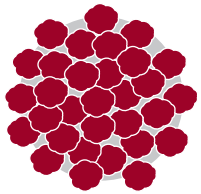
- Waxes are classified by air stream
- Wide range of delivery forms from fine granules through powder to micro-sized products
- Wind blows on a tree as metaphor:
  - Branches are not affected (slabs)
  - Twigs fall down (granules and fine granules)
  - Leaves fly through the air (powder)
  - Pollen fly far away (micro-sized products)
- Reasonable, clean and environmentally friendly technology
- All natural and synthetic waxes can be air classified
- Tailor-made particle sizes possible
- Production of hybrid and coated waxes
- Hybrid waxes are homogeneously blended products made of two or even more waxes
- Coated waxes work as carriers for various materials

DEUREX COATING PROCESS

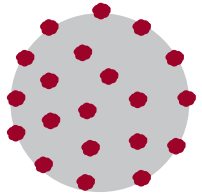
- The warm air classified products are coated with micro-sized and nano-sized additives
- Benefits of waxes and polymers are combined with benefits of additives:
  - PTFE for hardness and slip
  - Silica for matting and free flow
  - Diamond for extreme hardness
  - Zinc for matting
  - Benzoin for degassing
- Four distinct coating stages
  - Double coated waxes and polymers for dominating coatings properties
  - Fully coated waxes and polymers
  - Spot coated waxes and polymers
  - Eco coated waxes and polymers for dominating wax properties



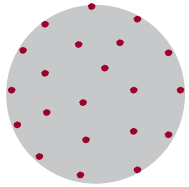
Double coated polymers for dominating coating properties



Fully coated polymers



Spot coated polymers



Eco coated polymers for dominating polymer properties

DEUREX® AWAX
AMIDE WAXES

DEUREX® EWAX
POLYETHYLENE WAXES

DEUREX® PTFE
MICRO-SIZED PTFE

DEUREX® HWAX
HYBRID WAXES

DEUREX® PWAX
POLYPROPYLENE WAXES

DEUREX® SiO2
MICRO-SIZED SILICA

DEUREX® TWAX
FISCHER-TROPSCH WAXES

DEUREX® XWAX
SUGAR CANE WAXES

AIR CLASSIFIED WAXES

DEUREX air classification technology allows various forms of delivery: From fine granules through powder to micro-sized products.

DEUREX air classification is a reasonable, clean and environmentally friendly technology. All natural and synthetic waxes can be air classified, tailor-made particle sizes can be produced.

HYBRID WAXES

Natural hybrid waxes combine benefits of sugar cane waxes with montan waxes and/or carnauba waxes.

Natural-synthetic hybrid wax combine a high acid value and flexibility of sugar cane waxes with high drop point and hardness of PE waxes.

Synthetic hybrid waxes combine various synthetic waxes such as PE waxes and amide waxes.

COATED WAXES

Coated waxes are waxes which work as carrier for various coating materials such as PTFE, Silica or Benzoin. The wax improves the dispersing properties and lifts the coating up to the surface of the powder coatings. From now on, it is possible to get the same results whilst using lower amounts of PTFE, Silica and other coating materials.

MASTERWAX®

The products of the Masterwax® series are concentrates which fulfill your requirements of additives with only one product. Waxes as lubricants, PTFE for scratch resistance, Benzoin as degassing agent, Silica for free flow – usually the purchase list of additives is long. From now on, DEUREX is in the position to concentrate all these products and their benefits in a new product serie: Masterwax®.

POWDER COATINGS

mainly consist of binding agents, additives, pigments and fillers. Nearly all raw materials exist in powder form.

BENEFITS

- Dry, free-flowing powder, no solvents required
- Applied electrostatically, cured under heat
- Finish is harder and tougher than conventional paints
- Mainly used for coating of metals, such as household appliances, aluminium extrusions, drum hardware, MDF and automobile and bicycle parts

DEUREX F 61 A

WAXES DURING THE PRODUCTION PROCESS

- Improve free flow and lubrication
- Lower energy consumption
- Work as degassing agents

WAXES IN THE END PRODUCT

- Improve colour output
- Adjust surface texture
- Adjust gloss and matting effects
- Improve surface hardness
- Provide slip

EPOXY POWDER COATINGS

(Baking temperature 140 °C)

- Outstanding chemical resistance
- High resistance to electric current
- Mainly used as primer coat
- Corrosion protection
- Only for indoor applications due to lack of light-fastness (UV components of the sunlight decompose the resin structure; binder degradation, matt coating, colour desaturation)

ACRYLATE POWDER COATINGS

(Baking temperature 140° C)

- Unfavorable mechanical properties by comparison
- High intolerance level with conventional powder coatings
- Benefits: perfect gloss and flow, very good weathering resistance
- Automobile industry
- Reduction in costs for energy thanks to low interlacing temperature

HYBRID POWDER COATINGS

(Baking temperature 170 °C)

- Epoxide and polyester resins are linked together
- Higher weathering resistance compared to pure epoxy systems
- Chemical resistance is sufficient for many applications
- All gloss and nearly all texture adjustments can be realized without any problems
- Almost unlimited adjustable colour range
- Polyester-Acrylate powder coatings are another hybrid system
- Improved mechanical behavior (compared to Acrylate powder coatings) and in particular a better compatibility with conventional powder coatings
- Gloss and flow as well as weather resistance are worse than in GMA systems

POLYESTER POWDER COATINGS

(Baking temperature 180 °C)

- Weatherproof
- More resistant to UV radiation
- Long-time protection in outdoor areas (facades)
- Worldwide famous due to unique property profiles
- Rarely used in Europe, because polyester powder coatings need to be labeled as toxic

POLYURETHANE POWDER COATINGS

(Baking temperature 170 °C)

- Very popular in US and Japan
- Very good gloss and flow
- Excellent chemical and weathering resistance
- Bulk of high weather resistance powder coatings (superdurables) are based on PU
- Also applicable as anti-graffiti paint
- High price level and energy costs due to higher interlacing temperatures

1 WEIGHING

The first production step is weighing, all elements of powder coatings need to be balanced in the correct mixing ratio. We are in the position to offer our products in tailor-made packaging sizes. That makes work a lot easier, you have the requested quantity of wax ready for weighing. For example, if you require 12.8 kg of wax for your charge, than we are able to supply you the material in a packing size of 12.8 kg. Thus, the processing step of weighing is not necessary.

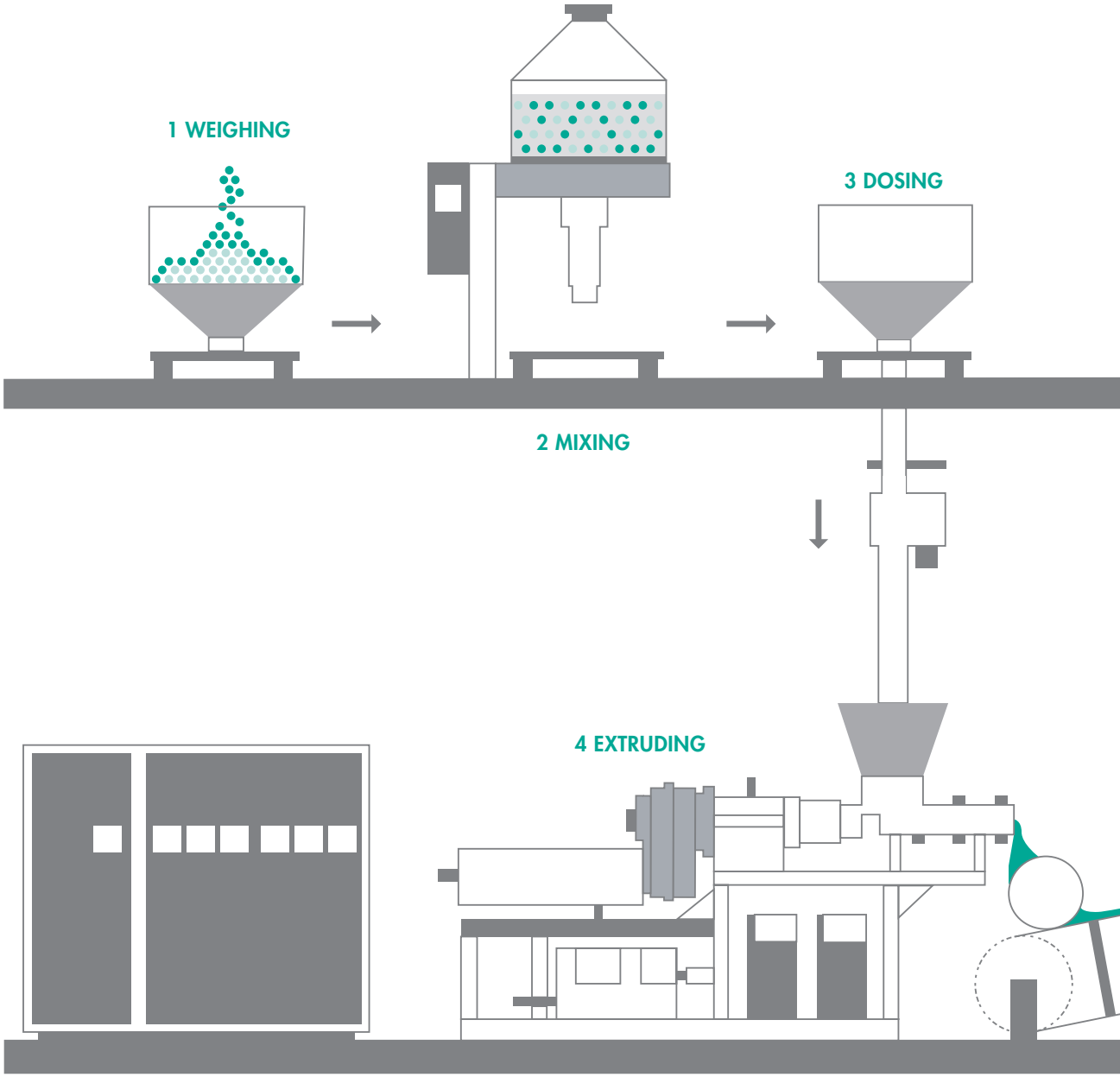
Besides pure waxes, we can offer you a wide range of combined products, which additionally simplify the weighing. Hybrid waxes are 2-in-1 waxes, which save the weighing process of different wax types. Coated polymers are 2-in-1 products, which contain important additives such as benzoin, silica, PTFE or zinc. A separate weighing step is not necessary, thus possible errors can be avoided. With DEUREX products you not only save time and money during weighing, but also in procurement, storage as well as administration.

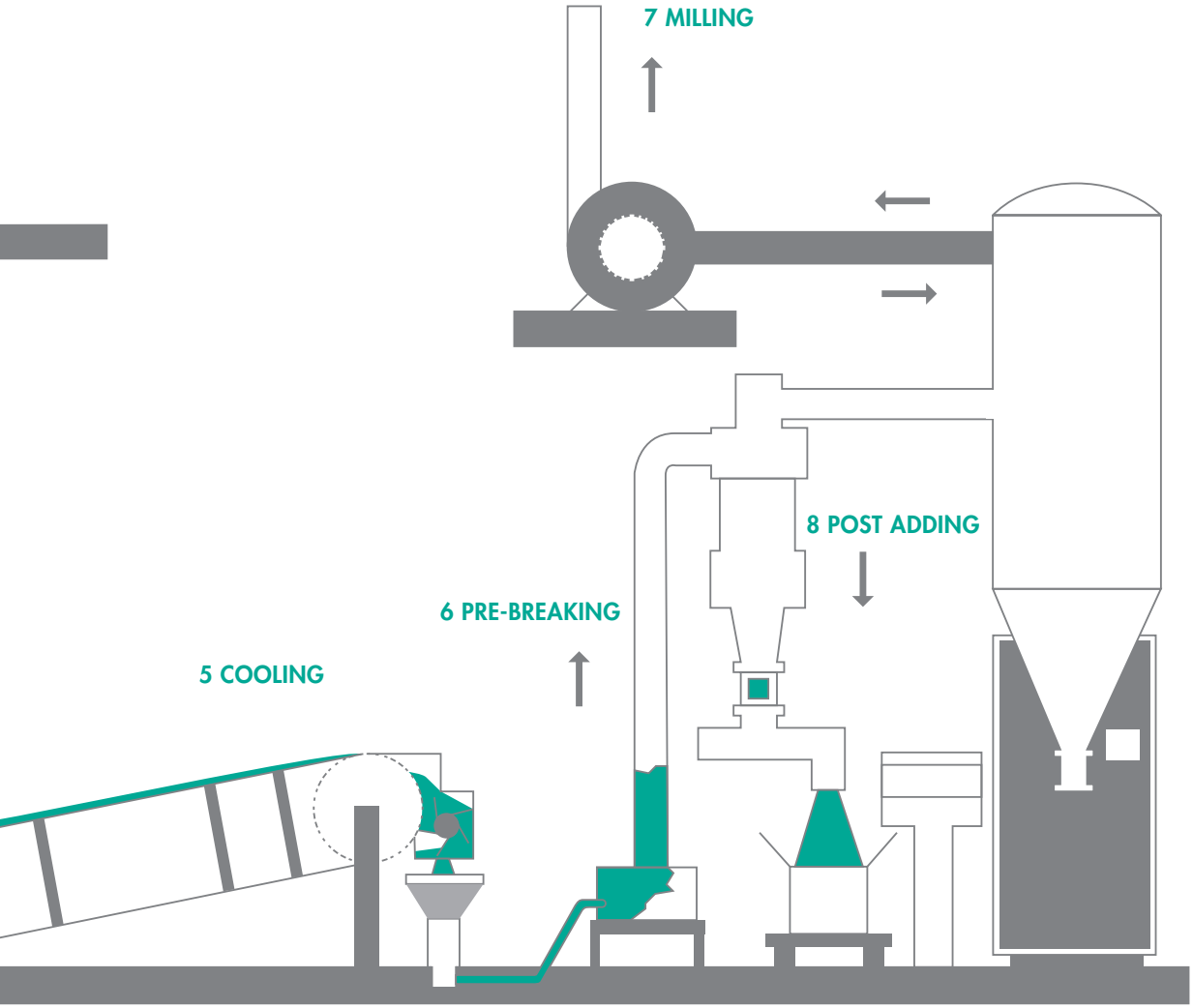
2 MIXING

DEUREX waxes are used in the pre-mix process in order to get the full advantage as a processing aid: The mixing procedure of different paint components is simplified. DEUREX waxes do not stick together, thus far agglomeration can be avoided. In this way, the use of even finer wax additives and wax additives with a tendency for agglomeration could feasibly be omitted. DEUREX air classified waxes with a finesse < 150 µm offer an excellent cost-benefit-ratio. During mixing, DEUREX air-classified waxes ensure a homogenous distribution of all paint ingredients.

3 DOSING

During precise dosing, the requested quantity of extruding material has to be fixed and fed into to the extruder. It is important that the mixture passes easily through the extruder without clogging. In this respect, DEUREX waxes support with their free flowing characteristics. DEUREX waxes ensure easy packing. The flee-flowing properties remain even after a longer period of time in the dosing unit.





4 EXTRUDING

Due to their excellent lubrication, DEUREX waxes increase the throughput and reduce the energy consumption of the extruder. Thus the production costs of powder coatings can be reduced. The graph shows how our products influence the throughput as well as the power consumption during extruding.

5 COOLING

After cooling of the melt on the cooling belt, the powder coating can be easily crushed in the primary crusher. The cooling period of waxes is defined by the c-chain distribution. The narrower the c-chain distribution, the more faster the wax cools down. DEUREX waxes support the cooling process, our waxes are tailor-made for this.

6 PRE-BREAKING

Glutinous, hydroscopic or even hydrophilic products interfere the pre-breaking process. DEUREX waxes are non-polar and crystalline. Thereby, pre-breaking can be simplified and can be accelerated.

7 MILLING

A high crystallization is the major benefit during milling. DEUREX waxes do not stick together or coagulate. Deurex waxes can be milled to each requested fineness.

8 POST ADDING

When using DEUREX waxes, usually a subsequent dosage is not necessary for setting gloss, matt or slip. All these before-mentioned properties can be adjusted by pre-selection of the correct wax type in the pre-mix.

For additives, which can be dosed only subsequently due to technical reasons, DEUREX guarantee a maximum particle size of 98% < x microns. A very good example is the diamond-coated polymer DEUREX D 6520 M, which gives the powder coating a hard surface impact. This polymer is added after extrusion due to its extreme hardness, in order to avoid damages of the extruder.

To disperse coagulates in the final blend, our „repair kid" DEUREX S 3001 M (micronized silica 98% <1 µm) can be given to the post add.

DEUREX®
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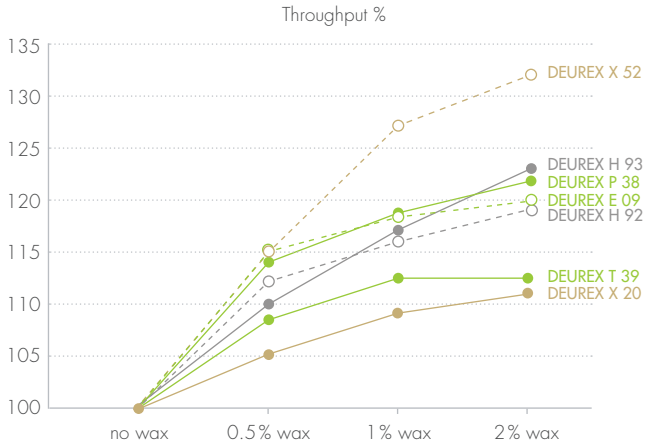
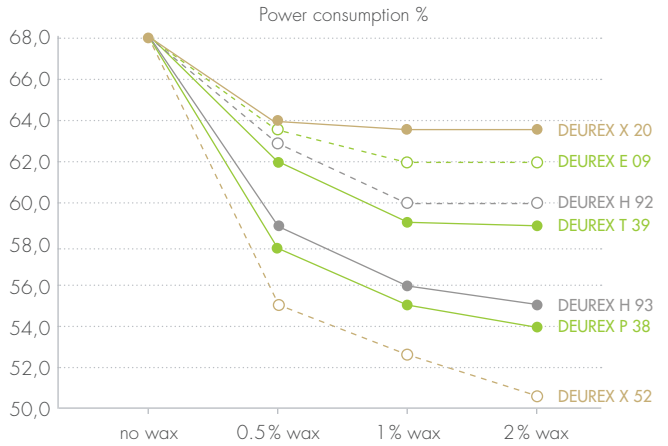
LUBRICANTS

DEUREX waxes improve lubricity and as a consequence the throughput of the powder coatings composition. Already a dosage level of 1 % improves the throughput by 10 to 30 %. The good dispersibility of DEUREX waxes homogenizes the premix.

Recommendation:

DEUREX X 52 A*	Sugar cane wax
DEUREX H 93 A*	Hybrid wax
DEUREX P 38 A*	Polypropylene wax
DEUREX E 09 A*	Polyethylene wax





POWDER REPAIR

Coagulation may occur during pre-mix, but also during post-add. Therefore, we recommend to add DEUREX S 3001 M in a dosage level of 1 - 2 %.

Recommendation:

DEUREX S 3001 M*	Nano-sized Silica

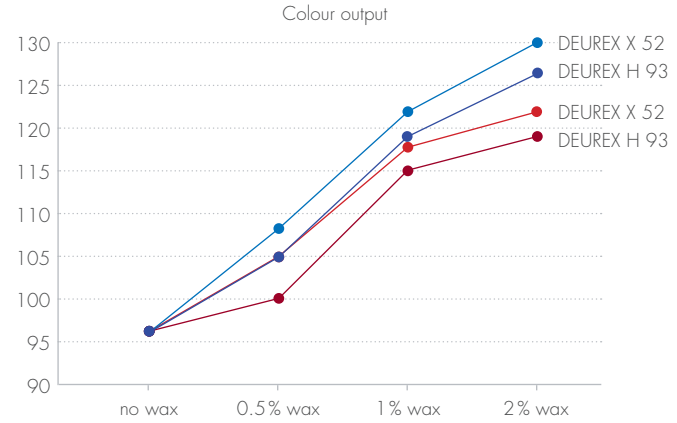
COLOUR OUTPUT

DEUREX waxes improve the dispersion of expensive pigments in the formulation significantly. Better dispersing leads to better homogeneity and in this way leads to higher color output. With DEUREX waxes you can either increase color output or decrease the amount of pigments and achieve the same color output.

Recommendation:

DEUREX X 52 A*	Sugar cane wax
DEUREX H 93 A*	Hybrid wax

- DEUREX X 52 - red violet ER 02
- DEUREX X 52 - blue A4R
- DEUREX H 93 - red violet ER 02
- DEUREX H 93 - blue A4R



BIO WAXES

If you are looking for sustainable products, we are in the position to offer you natural sugar cane waxes. Compared to other natural waxes (e.g. bees wax, Carnauba wax) there are no seasonal fluctuations. Sugar cane waxes can be supplied constantly.

Recommendation:

DEUREX X 20 A*	EBS wax based on sugar cane
DEUREX X 52 A*	Sugar cane wax

DEGASSING AGENTS

Degassing agents are used to carry sealed air bubbles to the surface of the coating to escape. Thus far, pin holes can be avoided and the surface stays even.

Recommendation:

DEUREX B 66 A*	Benzoin
DEUREX X 20 A*	EBS wax based on sugar cane
DEUREX H 92 A*	Hybrid wax
DEUREX S 3001 M*	Nano-sized Silica

SURFACE PROTECTION

Recommendation:

DEUREX F 61 A	PTFE double coated air wax
DEUREX F 62 A	PTFE fully coated air wax
DEUREX F 63 A	PTFE spot coated air wax
DEUREX F 64 A*	PTFE eco coated air wax
DEUREX D 6520 M*	Micro-sized diamond

* also available as post add version

The matting or gloss effect of a wax is defined by its carbon chain structure and length. DEUREX E 09 A creates glossy powder coatings due to its straight carbon chains, whereas DEUREX T 39 A creates matting effects. DEUREX is in the position to offer premium products for both requirements: Masterwax® Matting for matt powder coatings and Masterwax® Gloss for glossy powder coatings.

GLOSSING AGENTS

Recommendation:

MASTERWAX® GLOSS	Concentrated wax additive
DEUREX H 93 A	Hybrid wax
DEUREX X 20 A	EBS wax based on sugar cane
DEUREX H 92 A	Polyethylene wax

MATTING AGENTS

Recommendation:

MASTERWAX® MATTING	Concentrated wax additive
DEUREX T 39 A	Fischer-Tropsch wax

SLIP

Recommendation:

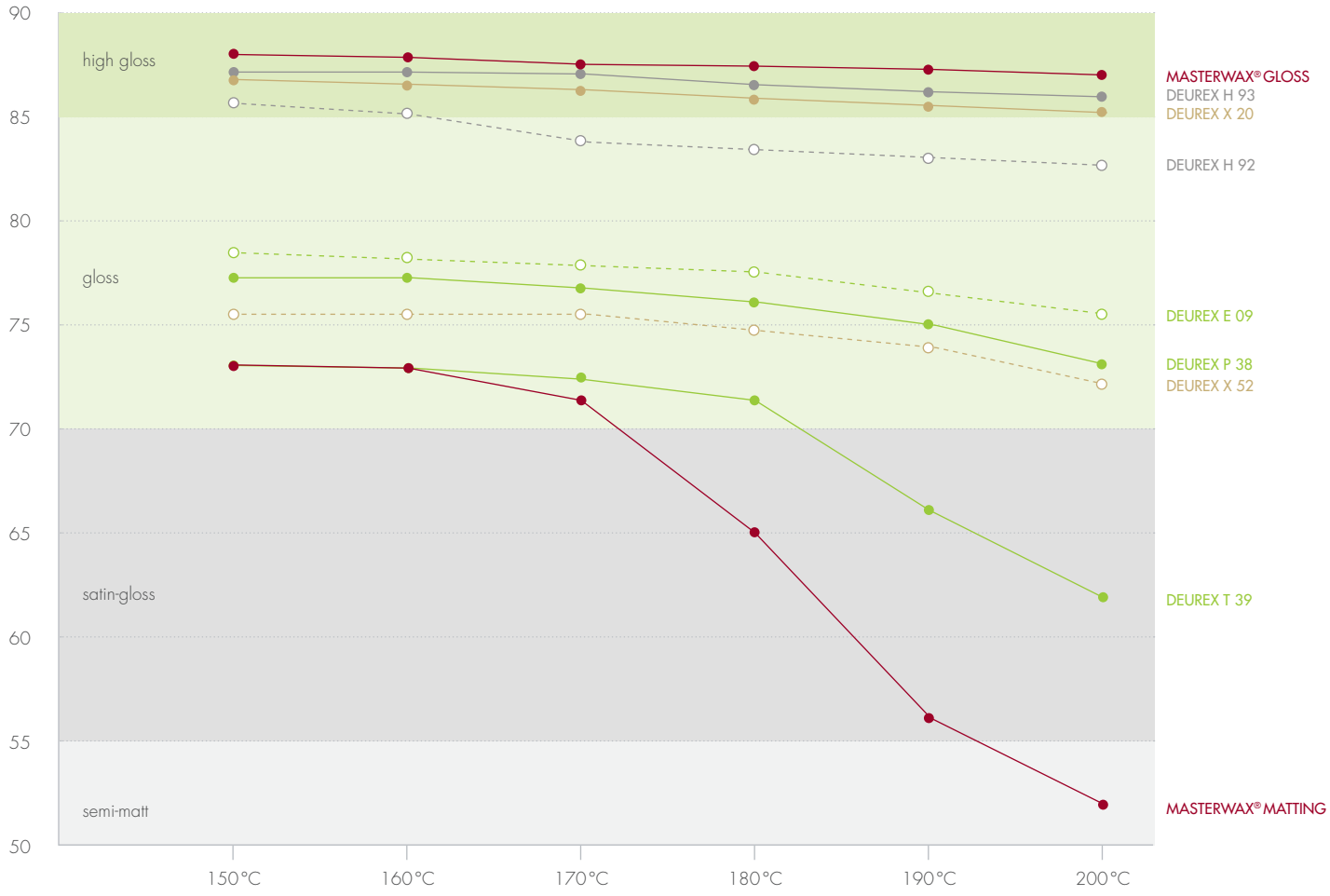
DEUREX E 09 A	Polyethylene wax
DEUREX P 38 A	Polypropylene wax
DEUREX T 39 A	Fischer-Tropsch wax
DEUREX X 52 A	Sugar cane wax

SURFACE PROTECTION

Recommendation:

DEUREX F 61 P	PTFE double coated wax powder
DEUREX F 62 P	PTFE fully coated wax powder
DEUREX F 63 P	PTFE spot coated wax powder
DEUREX F 64 P*	PTFE eco coated wax powder

Gloss Unit (GU), angle of measurement 60°



* also available as post add version

PRODUCT	CHEMICAL CHARACTER	DROP POINT °C	DENSITY g/cm³	ANTI BLOCKING	ANTI GRAFFITI	BIO WAX	DEGASSING	GLOSS	LUBRICANT
DEUREX E 09 A	Polyethylene wax	110 - 120	0.94 - 0.96					x	xx
DEUREX F 61 A	Polyolefin wax double coated with PTFE	110 - 120	0.94 - 0.95	x	xx				
DEUREX F 62 A	Polyolefin wax fully coated with PTFE	110 - 120	0.94 - 0.95	x	xx				x
DEUREX F 63 A	Polyolefin wax spot coated with PTFE	110 - 120	0.94 - 0.95		x				x
DEUREX F 64 A	Polyolefin wax eco coated with PTFE	110 - 120	0.94 - 0.95		x				xx
DEUREX H 92 A	Hybrid wax (polyolefin and amide)	130 - 140	0.97 - 0.99	x			x	xx	x
DEUREX H 93 A	Polymer-compound	50 - 60	0.94 - 0.96					xx	xx
DEUREX P 38 A	Polypropylene wax	145 - 155	0.92 - 0.98	x			x	x	xx
DEUREX T 39 A	Fischer-Tropsch wax	110 - 120	0.94 - 0.95					x	xx
DEUREX X 20 A	Amide wax made of sugar cane	140 - 145	0.98 - 1.00	xx		xx	xx	xx	
DEUREX X 52 A	Sugar cane wax	78 - 82	0.80 - 0.85			xx		x	xx
Masterwax® Gloss	Concentrated wax additive	110 - 120	0.94 - 0.96	x	x		xx	xx	xx
Masterwax® Matting	Concentrated wax additive	110 - 120	0.94 - 0.95	x	x		xx		xx
Masterwax® Texture	Concentrated wax additive	110 - 120	0.94 - 0.95	x	x		xx		xx
DEUREX F 61 P	Polyolefin wax double coated with PTFE	110 - 120	0.94 - 0.95	x	xx				x
DEUREX F 62 P	Polyolefin wax fully coated with PTFE	110 - 120	0.94 - 0.95	x	x				x
DEUREX F 63 P	Polyolefin wax spot coated with PTFE	110 - 120	0.94 - 0.95						x
DEUREX F 64 P	Polyolefin wax eco coated with PTFE	110 - 120	0.94 - 0.95						xx
DEUREX B 66 A	Benzoin	133 - 139*	1.25 - 1.35	x			xx		
DEUREX D 6520 M	Micro-sized diamond coated polymer	130 - 140	0.97 - 0.99		x				
DEUREX F 6008 M	Micro-sized PTFE	320 - 340*	2.15 - 2.25	x	xx				
DEUREX S 3001 M	Nano-sized Silica	1,600*	2.60 - 2.70	xx					

*melting point

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PRODUCT	MATTING	PROCESSING AGENT	RUB RESISTANCE	SCRATCH RESISTANCE	SLIP	SURFACE HARDNESS	TEXTURING	WEATHER RESISTANCE	POST ADD VERSION
DEUREX E 09 A		xx	x		xx			xx	DEUREX E 0920 M
DEUREX F 61 A	x	x	xx	xx		xx		x	
DEUREX F 62 A	x	x	x	xx	x	x		x	
DEUREX F 63 A	x	x	x	x	x	x		x	
DEUREX F 64 A	x	x	x	x	xx	x		x	DEUREX F 6414 M
DEUREX H 92 A			x	x		x		x	DEUREX H 9220 M
DEUREX H 93 A		xx			xx			x	DEUREX H 9314 M
DEUREX P 38 A		x			x			x	DEUREX P 3820 M
DEUREX T 39 A	x	xx	xx	xx	xx	x		xx	DEUREX T 3920 M
DEUREX X 20 A								xx	DEUREX X 2010 M
DEUREX X 52 A		xx			xx			x	DEUREX X 5217 M
Masterwax® Gloss		xx	xx	xx	xx	xx		xx	
Masterwax® Matting	xx	xx	xx	xx	xx	xx		xx	
Masterwax® Texture	xx	xx	xx	xx	x	xx	xx	xx	
DEUREX F 61 P	x		xx	xx		xx	xx	x	
DEUREX F 62 P	x		x	xx		xx	xx	x	
DEUREX F 63 P	x		x	x	x	xx	x	x	
DEUREX F 64 P	x		x	x	xx	x	x	x	DEUREX F 6414 M
DEUREX B 66 A		x							
DEUREX D 6520 M			xx	xx		xx			DEUREX D 6520 M
DEUREX F 6008 M			x	xx		xx			DEUREX F 6008 M
DEUREX S 3001 M		x							DEUREX S 3001 M

POWDER COATINGS

DEUREX WAXES FOR POWDER COATINGS • DEUREX WAXES FOR POWDER COATINGS •

DEUREX®

THE WAX COMPANY

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