



## **Use of PFOA in critical photographic applications**

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## State of the art photographic material = “high tech, high chem” product

### § Simultaneous coating of up to 18 layers ...

- coating width: up to 3.60 meter
- coating thickness:     wet thickness of layers from 40 to 190  $\mu\text{m}$   
                                     dry thickness of layers ranging from 3 to 12  $\mu\text{m}$

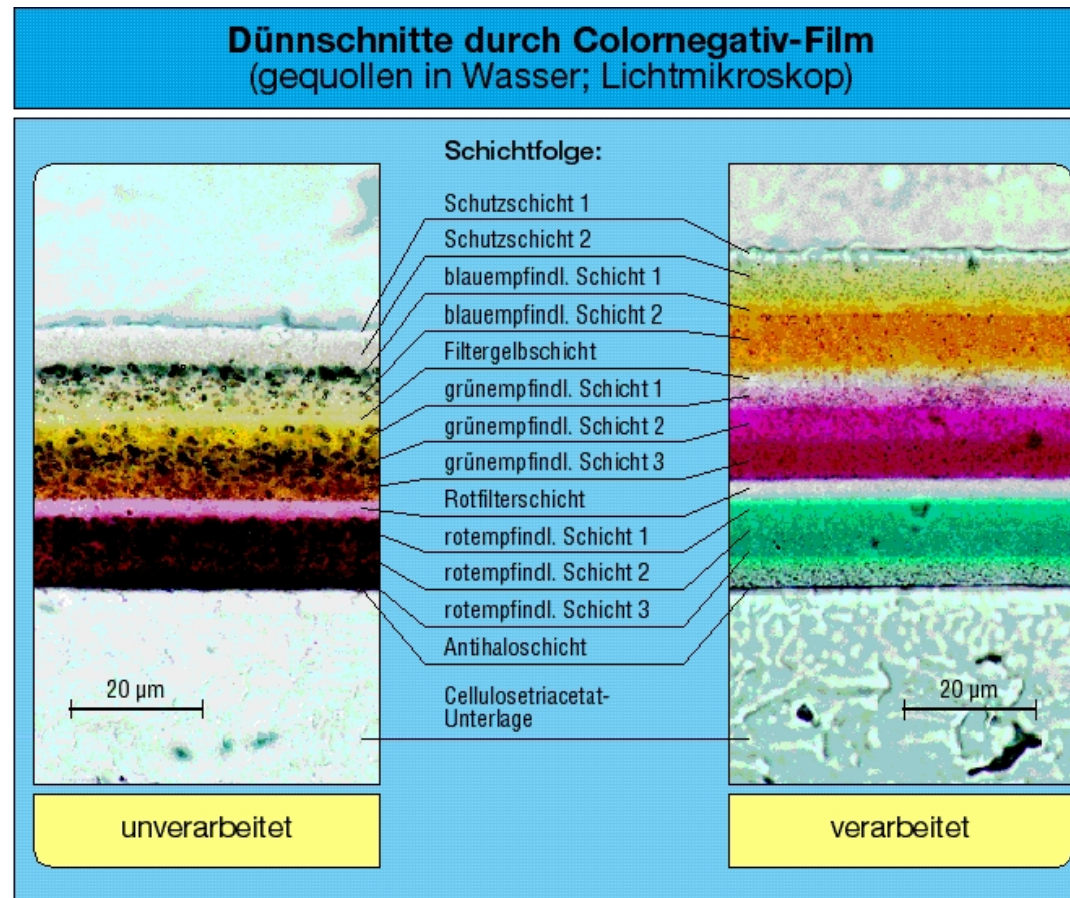
... with up to 200 different chemicals

- no mixing of chemicals throughout different wet layers
- super optimised - many decades of product optimisation

... at coating speeds up to 350 m/min

### § Example: cross section of a colour film

## State of the art photographic material = “high tech, high chem” product



## Uses of PFOA-related substances by the photo imaging industry

- § Photo imaging industry member companies use
  - very small amounts
  - in critical manufacturing operations
  - to manufacture a small number of films, papers and printing plates
  - for medical, professional, industrial, and consumer applications
  - manufactured predominantly in Europe, the USA, Japan and China.
- § As demonstrated by the study of RPS Advies these uses account for 2-5% or less of the total use of PFOA in the European Union.

## Uses of PFOA-related substances by the photo imaging industry

- § PFOA-related substances provide
  - antistatic control,
  - surface tension control,
  - friction control,
  - and dirt repellant qualities – combined into one molecule.
- § These properties have become even more important for state of the art materials that are more sensitive to light
  - faster film speeds,
  - more sensitive diagnostic X-ray productsand for digital products that are processed dry,  
and require the use of perfluorinated coating aids.

## Uses of PFOA-related substances by the photo imaging industry

- § PFOA-related substances also provide important safety features by controlling build-up and discharge of static electricity.
- § The antistatic properties of these materials are important for
  - preventing employee injury,
  - preventing damage to operating equipment,
  - preventing product damage,
  - minimizing manufacturing waste and
  - to control fire and explosion hazards.

## Uses of PFOA-related substances by the photo imaging industry

§ PFOA-related substances also meet the technical specifications for use in products as they:

- lack photoactivity and thus do not interfere with the imaging process,
- promote uniformity of processing results by controlling surface wetting properties,
- control splicing tape adhesion properties,
- are compatible with photo-retouching materials,
- improve camera, projector, printer transport to eliminate unwanted photographic effects,
- prevent the build-up of particles that can clog magnetic strip readers.

## No alternatives for (PFOS)/PFOA are (yet) available for some critical materials

- § PFOA-related substances are unique in that they provide the combination of all these properties into one molecule.
  - to date the combination of all these properties has not been found with any other single class or combination of chemicals except for PFOS.
  - alternatives do not currently exist for the few remaining critical product applications.
- § Only very small quantities of PFOA-related substances are required in imaging media, in the range of 0.1-0.8 • g/cm<sup>2</sup>.



## **Occupational exposure is controlled = poses no significant risk to human health**

### § Occupational exposure during manufacturing

- is minimal: PFOA-related substances are not volatile and used as working solutions in water – after coating they are bound within the coating matrix – moreover products generally have protective surface overcoats
- employees wear protective clothing, eye shields, gloves where chemical preparations occur.
- transfer and coating operations are automated with only minimal human intervention because coatings must be conducted in a clean environment.

## Occupational exposure is controlled = poses no significant risk to human health

### § Occupational exposure during use

- the concentrations of PFOA-related substances in photographic films, plates and some of the papers are very low and range from 0.1-0.8 • g/cm<sup>2</sup> in the coating.
- this material is furthermore predominantly not available for human contact, since it is contained within the coating matrix and not on the surface of the coating and is generally bound to the components of the matrix.

## Environmental exposure is controlled = poses no significant risk to the environment

### § Environmental exposure during manufacture

- releases from production plant are directed to waste water facility: PFOA-related substances predominantly bound to sludge which is incinerated.

### § Environmental exposure during use

#### § Wet film processing of medical film represent worst case

- highest concentration of PFOA-related substance required (high sensitivity film)
- in addition: the only film with emulsion layer coated on both sides of film.
- maximum carry-over in processing (only two steps followed by rinsing)

#### § Analytical data for typical hospital setting in Germany

- in wash water section:  $PEC/PNEC = 0.000\ 24 \ll 1$
- at the emission point:  $PEC/PNEC = 0.000\ 000\ 010 \ll 1$

## **Occupational and environmental exposure are controlled = poses no unacceptable/ significant risk to human health or the environment**

- § during manufacturing of imaging materials
  - inherently low occupational exposure potential (solutions in water)
  - employees wear personal protective clothing, eye glasses and gloves where chemical preparation occurs
  - coating process itself is fully automated and carefully controlled to maintain a clean environment
- § during use (professional & consumer)
  - PFOA-related substances predominantly not available for human contact (within coating matrix)
- § environmental exposure: PEC/PNEC  $\ll 1$

emissions from photo imaging processes and products do not present a significant environmental or health concern

## Major efforts from industry with respect to voluntary reduction and substitution of PFOA

- § voluntary efforts have resulted in decreased uses in photo imaging industry
  - period 2004-2008: a total average volume of 2.6 tonnes PFOA and APFO per year used in photographic industry.
  - data demonstrate a markedly decreasing trend:
    - volume in 2004 slightly above 3 tonnes per year
    - volume in 2008 slightly below 2 tonnes per year
- § PFOA-related substances remain only in some critical applications
- § Only very small quantities of PFOA-related substances are required in imaging media, in the range of 0.1-0.8 • g/cm<sup>2</sup>.

## No alternatives for (PFOS)/PFOA are (yet) available for some critical materials

§ ... despite major efforts resulting in extensive reduction of the use of (PFOS)/PFOA

- requiring a derogation to prevent disruption of future manufacturing should regulatory restrictions on manufacturing & use be imposed

§ In support of this it is stated that – although replacements do not currently exist for the few remaining critical product applications – further reductions in use of these substances are anticipated as the transition continues towards newer digital imaging technologies. In addition, because the photo imaging industry has already discontinued all non-critical uses of PFOA-related substances and provides appropriate controls to minimize exposures and releases to the environment, we believe that additional control measures for our ongoing critical uses are not necessary.

## Recaputlative

- § State of the art photographic material = “high tech high chem” product,
- § requiring the combination of unique properties of PFOA in one molecule.
- § Occupational and environmental exposure are controlled during manufacturing & use of imaging materials,
- § posing no unacceptable/relevant risk to human health or environment.
- § Major efforts by industry since 2000 wrt voluntary programme resulted in extensive reduction of (PFOS)/PFOA, however
- § No alternatives are (yet) available for some remaining critical materials.
- § In view of the above a derogation is needed to prevent disruption of future manufacturing should regulatory restrictions be imposed.
- § Considering remaining emission from imaging industry processes and products we believe that such a derogation would not present a significant environmental or health concern.

## Questions?

I will gladly try to answer them ...