

XRF Analysis at Arkema Inc.

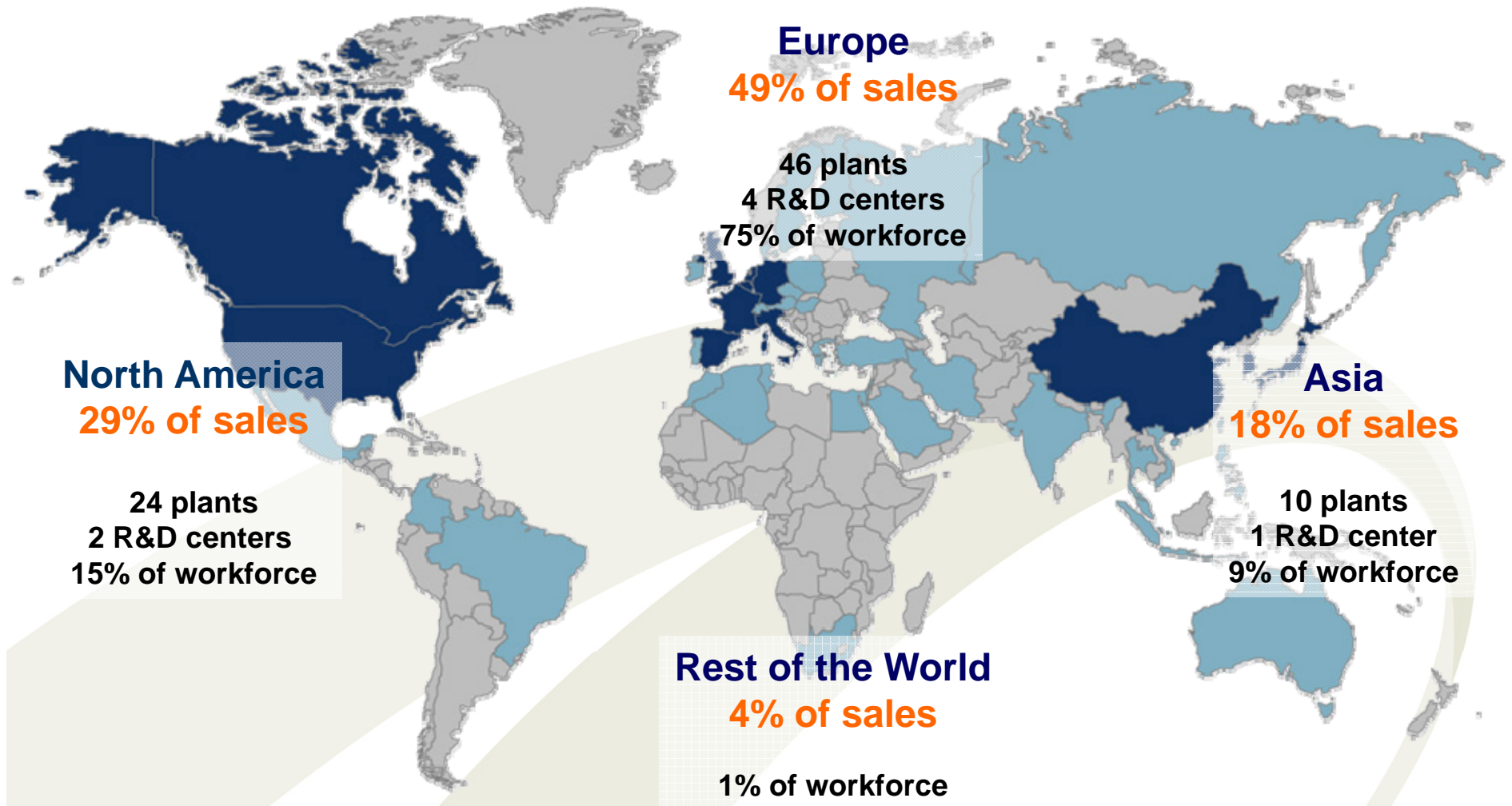
Tribute to the 20 year anniversary
of
the XRF short course at the University of Western Ontario



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King of Prussia, PA 19406, USA



Arkema - An International Presence in 40 countries



13,800 employees, 1,400 researchers, >2.5% of revenue for research
80 industrial sites, 7 research centers, €4.4 bn 2009 sales

Markets

Automotive

Vinyl Compounds,
PMMA, Fluorochemicals,
Technical Polymers,
Additives,
Organic Peroxides



Sport & leisure

Vinyl compounds,
PMMA,
Technical Polymers



Packaging

PVC,
Technical Polymers,
Additives,
Organic Peroxides



Chemical industry

Chlorochemicals,
Acrylics, Thiochemicals,
Technical Polymers,
Specialty Chemicals,
Organic Peroxides



Hygiene & beauty

Chlorochemicals, Acrylics,
PMMA, Thiochemicals,
Hydrogen Peroxide,
Technical Polymers



Electronics

Vinyl Compounds,
Thiochemicals,
Technical Polymers,
Specialty Chemicals



Construction

Vinyl Products, Acrylics,
Fluorochemicals,
Technical Polymers,
Specialty Chemicals,
Additives, Organic
Peroxides



Agrochemicals

Thiochemicals,
Specialty Chemicals



Paper

Chlorochemicals,
Hydrogen Peroxide,
Acrylics



Water treatment

Chlorochemicals,
Acrylics,
Hydrogen Peroxide,
Specialty Chemicals



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DURASTRENGTH®

PLASTISTRENGTH®

FASCAT®

BlocBuilder®

BIOSTRENGTH®

Forane®
FLUORO-CHEMICALS



pebax®
progress with membranes

LUPEROX®

Kynar®
Polyvinylidene Fluoride

Rilsan®

Altuglas®

Plexiglas®

Kynar Aquatec®



Tuffak®

SOLAR-KOTE®
Acrylic Capstock

Orgasol®

NANOSTRENGTH®
Advanced Materials

GraphiSTRENGTH®
Advanced Materials



SPOTLEAK®

PALADIN®

E-PURE®
MSA

ARKEMA
The world is our inspiration

XRF Lab in the US (King of Prussia)

- 3.6 kW Thermo ARL Advant'X Wavelength Dispersive X-ray Fluorescence
- Equipped with 5 crystals and 98-position automated X-Y sample changer
- UniQuant[®] package for semi-quantitative analysis



Typical uses for XRF at Arkema Inc. King of Prussia

- Sulfur analysis in thin polymer films
- Pigment and filler analysis in plastics (TiO_2 , CaCO_3 , SiO_2 , etc...)
- Tin analysis in liquid and solid thermal stabilizers
- Fluoropolymer compositional analysis in polymer blends
- Raw materials composition and purity
- Quality Control support for plant production
- Fast screening analysis using semi-quantitative approach
 - ❖ Plant troubleshooting
 - ❖ Chemical reaction troubleshooting
 - ❖ Reverse engineering
 - ❖ Analysis of multi-layered plastic profiles
 - ❖ Method development support for other elemental analysis techniques

Sample Preparation Approaches

- Grinding and cryo-grinding
- Pelletization with binder
- Combined hot/cold pressing of polymers to prepare disks
- Polymer solution casting on substrate (typically paints)
- Fusion with lithium borate salts
- Liquid samples



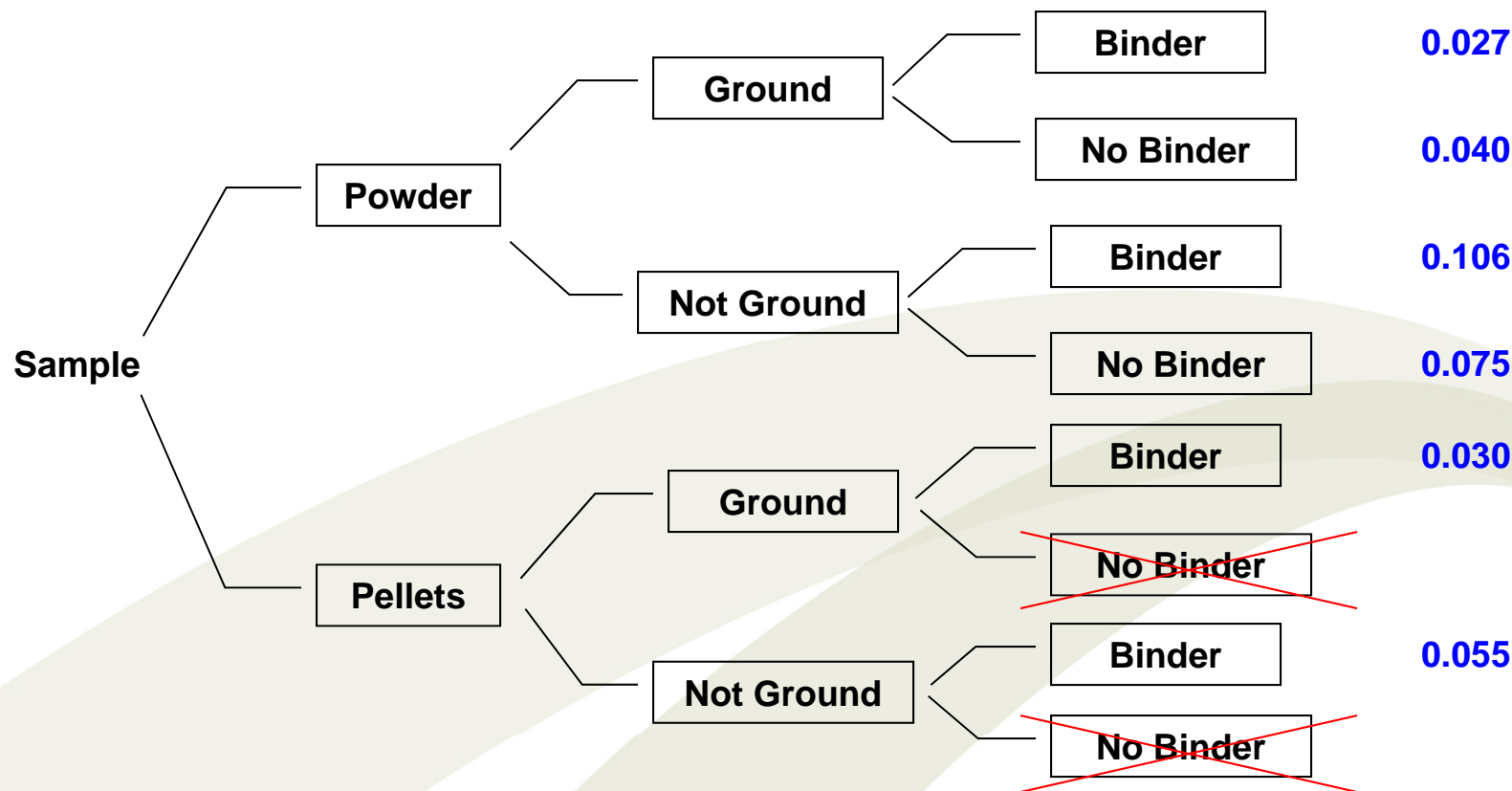
Sample Prep Equipment at Arkema Inc. - KoP



SiO₂ in Plastic Powder - Effect of Sample Prep on Accuracy

Poster presented at the 2007 Denver X-ray conference

Calibration Curve
Std. deviation, 2σ (wt%)



- Ground, binder, pressed or not *Best accuracy*
- Ground, no binder (powder) *Good accuracy*
- Not ground, binder, pellets *Acceptable*

XRF Networking beyond Arkema King of Prussia

- Interaction with plants in the US to work on common QC practices
- Support of customers in their own XRF development application
- Interaction with other R&D Centers
- Regular attendance at the Denver X-ray conference and presentation of work
- Follow online XRF discussions hosted by a major university
 - ❖ <http://listserv.syr.edu/archives/xrf-l.html>

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