



map

INNOVATIVE COATINGS
FOR YOUR TECHNOLOGY

REACH management for MAP space products

22nd April 2015, ESA/ESTEC, Noordwijk, The Netherlands

reach

obsolescence risk management for space programs



Agenda

1. Company overview and mission
2. REACH Management
3. Some examples
 1. Chromium-free primers
 2. Water-based paints
4. Conclusion



INNOVATIVE COATINGS
FOR YOUR TECHNOLOGY

A brief introduction... ...who we are



INNOVATIVE COATINGS
FOR YOUR TECHNOLOGY

Our mission, Our job...

« We develop efficient coatings and services for satellites and launchers, with high technological heritage that create value for our customers ».



INNOVATIVE COATINGS
FOR YOUR TECHNOLOGY

MAP is the European leader of Satellite and Launcher coatings



Our key figures

29 years of expertise


36 collaborators

6.2 M€ turnover

15% of annual TO invested in R&D

37% export

Our concern is ... to help our customers in their quest for efficiency

- 
1. Coatings with a flight heritage and MAP technical support
 2. Sustainable process that limits the vagaries
 3. Improved product-process combinations to save time on the critical path

1. Coatings with a flight heritage and MAP technical support

- Our products are evaluated or qualified by European organizations like CNES, ESA, according to space standards
- Organizations such as JAXA, NASA, ISRO and scientific institutes also select our coatings for testing
- The space industrialists worldwide have been trusting us for more than 25 years, by allowing us to participate in the thermal regulation of their satellites
- CNES Qualification reports, Technical data sheets
- Dedicated presentations
- Technical support (Additional Characterizations in our laboratory)
- Local dedicated support (Local agent)
- Products with extended shelf life

2. Sustainable process that limits the vagaries

- MAP is certified ISO 9001 and EN9100
- MAP products are ITAR free and are not subjected to delivery restrictions
- Short delivery time
- MAP applies more than **5 000** satellite parts every year
- MAP can organize workshop, e-learning tutorials or training sessions on MAP painting process
- Dedicated offers according to projects (i.e. 2 year contract)
- 1 to 2 visits of our customers per year

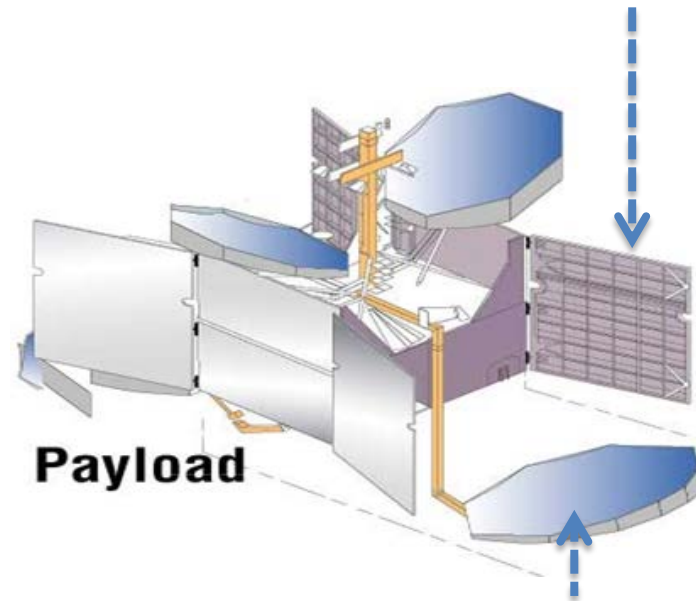
3. Improved product-process combinations to save time on the critical path

- *Fast curing process*

**FAST
CURING**

- ✓ *1 hour drying at Room Temperature*
- ✓ *15 hours at 70 °C*

*white thermal coatings
(SG121FD, SG122FD, PCBE, PSB, and PSBN)*

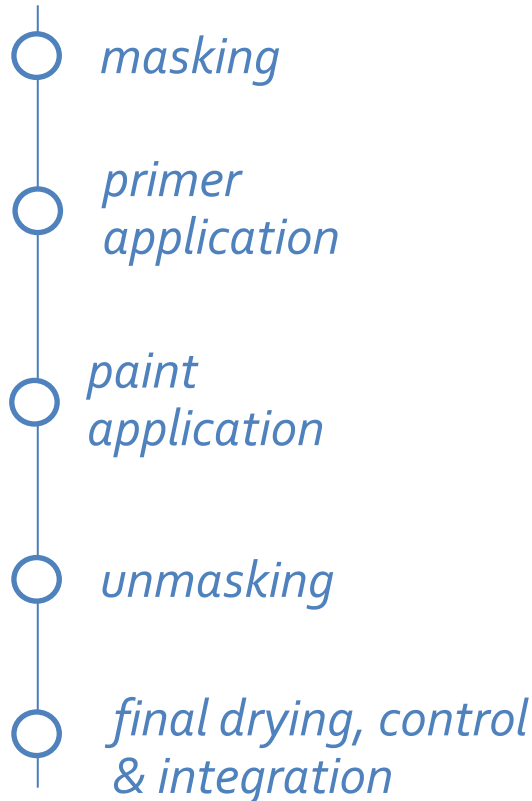


*black thermal coatings
(PU₁, PUK, PNC)*



FAST CURING

painting cycle



✓ *Developed in partnership with & approved by CNES (DCT/TV/TH-2014-0010593)*

- *outgassing test*
- *thermal cycling tests*
- *adhesion tests compliance*
- *electrical resistance compliance*



CENTRE NATIONAL D'ÉTUDES SPATIALES

11

*Thanks to MAP "Fast Curing" process,
you will save time on the planning*

*from 28 days to
24 hours*

To be keep in mind:

No delivery issue: our mission is to provide our customers with long term product
No technical performance decrease when substituting raw material

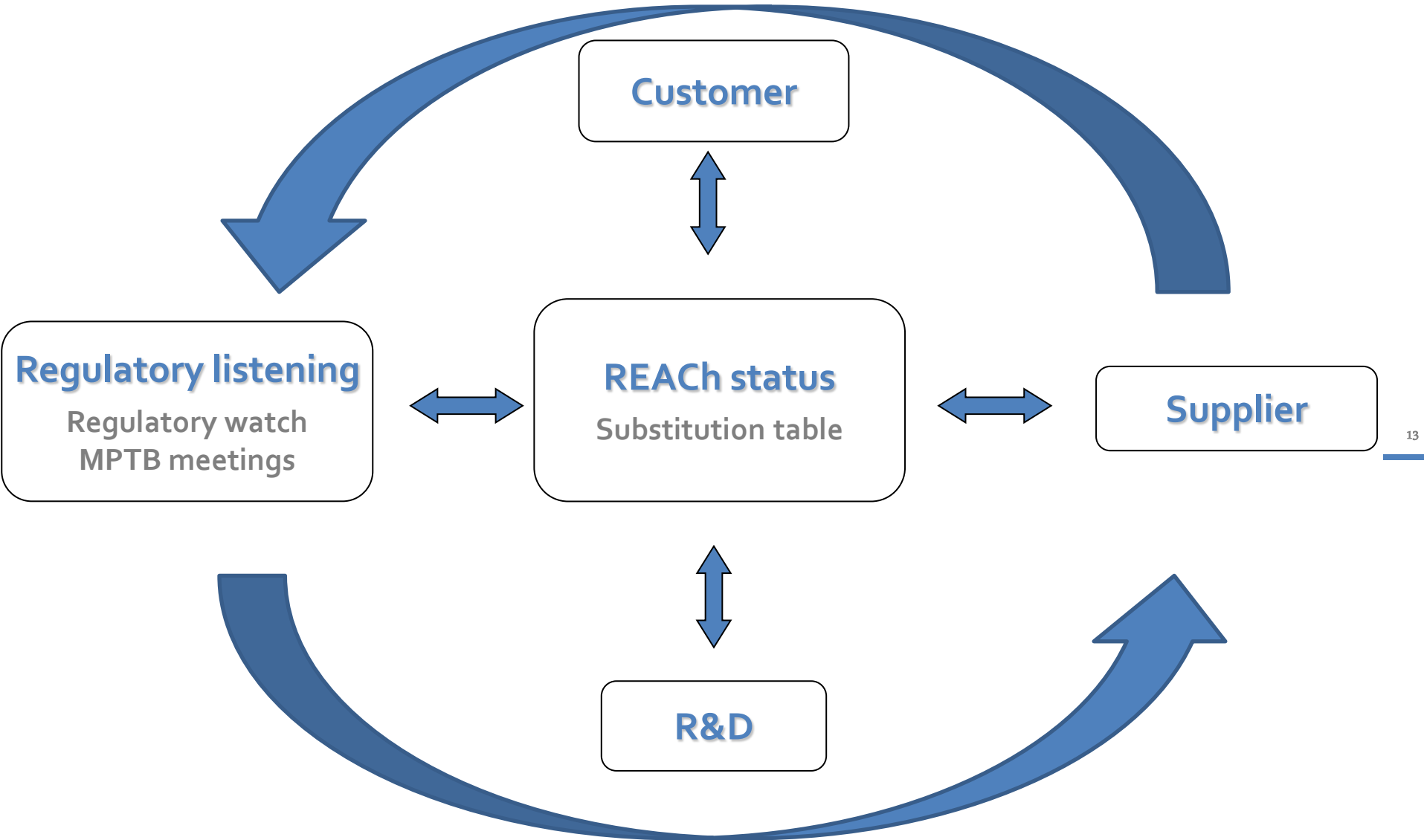
2 levels:

1) Current product range:

- Substitution of raw materials if possible
- Development of alternative products

2) New development:

Take into account the forbidden substances or “suspicious” substances



Substitution table: internal tool

Class	Definition
CL, A or HC	R&D use forbidden [Candidate, Authorisation or Concern list]
P ₁	R&D use forbidden. Priority 1 = MAP raw material substitution in progress
P ₂	Priority 2 = MAP raw material substitution to be done R&D use possible → REACH status and customer agreement

	Criticality	P1
MAP references	MAP raw material code	MP0163
	MAP product	Chromated primer
Identification	CAS number	11103-86-9
	Authorization (forecast)	
	Candidate list (REACH)	X
	High concern (ESA)	X
	Sin list	
Lists	SVHC (CMR 1, 2), (PBT), (vPvB), (R52, R53)	
	CMR 3	
	PDSL	X
	CES	X
	Priority list (EURAM)	
	AFSSET	X
	GIFAS	
	Category	C1
	Problem identification	Carcinogen T N PDSL (ZnCrO4 100%) + REACH : CES, GIFAS, ASD lists
	Composed of	Cr (VI)
Management of the substitution	Working group	MPTB
	Specification	TDS + CNES qualification
	Alternative solutions	E' primer or MAPSIL® SILICo
	Availability	Available
	Evaluation	yes
	MAP validation	Yes
	CNES qualification	incomplete

REACH management

Substitution table:

Zinc chromate

1) Launchers

MAP AERO P and MAP AERO WP: substitution by MAPSIL® SILICo

2) Satellite

PS and Phosmap 11 primers: substitution by MAP® AQ PS, PSX, E' or MAP® EPOX 11

3) Surface treatment (launcher and satellite)

Alodine 1200 and BR127: possible alternatives with MAPSIL® SILICo or MAP® EPOX 11

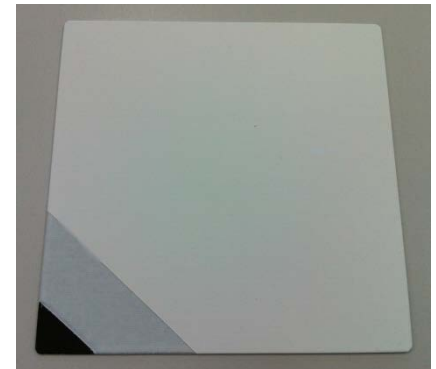
MAPSIL® SILICo

- Alternative to chromated primers used for launchers applications
- CNES qualified with white antistatic coatings (MAP® AQ STATIC & MAPSIL® AS)
- Alternative to Alodine – used with silicone and PU based paints or alone
- ESA – NASA evaluation in progress for Alodine alternative

MAP® AQ PS : substitution of PS primer

CNES qualification under progress

- ✓ *Development in partnership with & approved by CNES (DCT/TV/TH/-2011-4384, DCT/TV/TH/-2011-5588, DCT/TV/TH/-2011-3938 & DCT/TV/TH/-2013-2456)*



MAP[®] AQ PU₁ and MAP[®] AQ PUK paints development

Low VOC black PU paints for space application to provide an alternative to:

- Z306 → MAP[®] AQ PU₁
- Z307 → MAP[®] AQ PUK



18

Focusing on :

- ITAR, EAR regulation: No dependence to North American technology
- REACH, ROHS, VOC regulation: According to the environment regulation
- Industrial sustainability: Design and manufacture in accordance with ISO 9001, EN9100 and property rights

Even if MAP®AQ PU1 paint is already space qualified, MAP still produces PU1

PU1

Polyurethane Solvent

VOC = 521 g/L



R36/38/48/20/11/63/65/67/63/42/43/26/40
S23/36/37/16/26/33/9/28/45/60



H225/315/319/361d/336/373/331/334/317/351
P201/202/2010/260/280/370/378/261/284/342/311
/403/2033



MAP®AQ PU1

Polyurethane water-based

VOC = 12 g/L



R52/53/43/10
S23/24/37/60/61



H332/317/335/412/261

MAP® AQ PU₁ and MAP® AQ PUK paints development

- ✓ Equivalent properties to solvent-borne paints
- ✓ Use on space substrates validated
- ✓ Systems REACH, VOC and ITAR/EAR compliant
- ✓ Use as alternative to Z306 & Z307



Optical baffle - stellar diurnal sensor of the PILOT experiment (stratospheric balloon)
MAP® AQ PU₁

MAP commitment:

- ✓ Coatings with a flight heritage and MAP technical support
- ✓ Sustainable process that limits the vagaries
- ✓ Improved product-process combinations to save time on the critical path

REACH management:

- ✓ Internal process: Quality and R&D departments
- ✓ Internal tool: Substitution table

Results:

1. Substitution of Chromium-based anticorrosion primers
 1. MAP® AQ PS and MAPSIL® SILICo: qualification in progress (ESA/NASA)
 2. MAP® EPOX 11: qualification in progress (TAS)
2. Development of low VOC, REACH compliant water-based paints:
 1. MAP® AQ PU1 & MAP® AQ PUK qualified by CNES



map

INNOVATIVE COATINGS
FOR YOUR TECHNOLOGY

www.map-coatings.com

22

Guillaume Sierra - MAP
R&D Manager

+33 (0)534 012 700

g.sierra@map-coatings.com

m.nowak@map-coatings.com

reach

obsolescence risk management for space programs

