COVENTYA

LANTHANE TR 175

06.02.2009

Beyond the Surface

Current Situation: Cr^{6+} Quantity

ELV EC/2000/53 Guideline (End of Life of Vehicles) Order on CrVI dated July 1°, 2007

- Blue decorative Chrome-plating may contain 0.02 µg/cm² Cr^{VI}
- Yellow Chrome-plating may contain 5 - 15 µg/cm² Cr^{VI}
- Olive-green Chrome-plating may contain 10 - 50 µg/cm² Cr^{VI}
- All LANTHANE & FINIDIP Cr^{III} passed VDA Test , ISO 3613 Test

Current Situation: Cr^{6+} Removal

Tests second series at VDA Association lead to the following classification for clear finishes:

Deposit	Aspect	Plating Type	Sealer	White Rust	Red Rust
Zn	Clear	Barrel	No	96	240
Zn	Clear	Barrel	Yes	168	360
Zn	Clear	Rack	No	168	480
Zn	Clear	Rack	Yes	240	480
Zn-Fe	Clear	Barrel	No	168	360
Zn-Fe	Clear	Barrel	Yes	216	480
Zn-Fe	Clear	Rack	No	360	600
Zn-Fe	Clear	Rack	Yes	480	600
Zn-Ni	Clear	Barrel	No	120	720
Zn-Ni	Clear	Barrel	Yes	168	720
Zn-Ni	Clear	Rack	No	240	720
Zn-Ni	Clear	Rack	Yes	480	720

Protective Market & COVENTYA: History

- 1987: COVENTYA SAS, former S.C. Parker, introduced in France & Italy a new interactive reinforcement concept with **FINIGARD** on Cr^{6} - based Chrome-plating
- 1989: Zn/Fe & Zn/Ni processes & their passivates' introduction did by Weiland – today it is called COVENTYA GmbH
- 1989: introduction & launching of sharing, Cyanide-free Alkaline Zinc **OKLANE**
- 1997: first manufacturing testing with the CrIII passivate called **LANTHANE 310**
- 1997: LANTHANE 310 Renault Approval
- 2001: second generation quick development : **LANTHANE 315**
- 2003: new high-resistance passivate concept introduction: **LANTHANE TR 175**

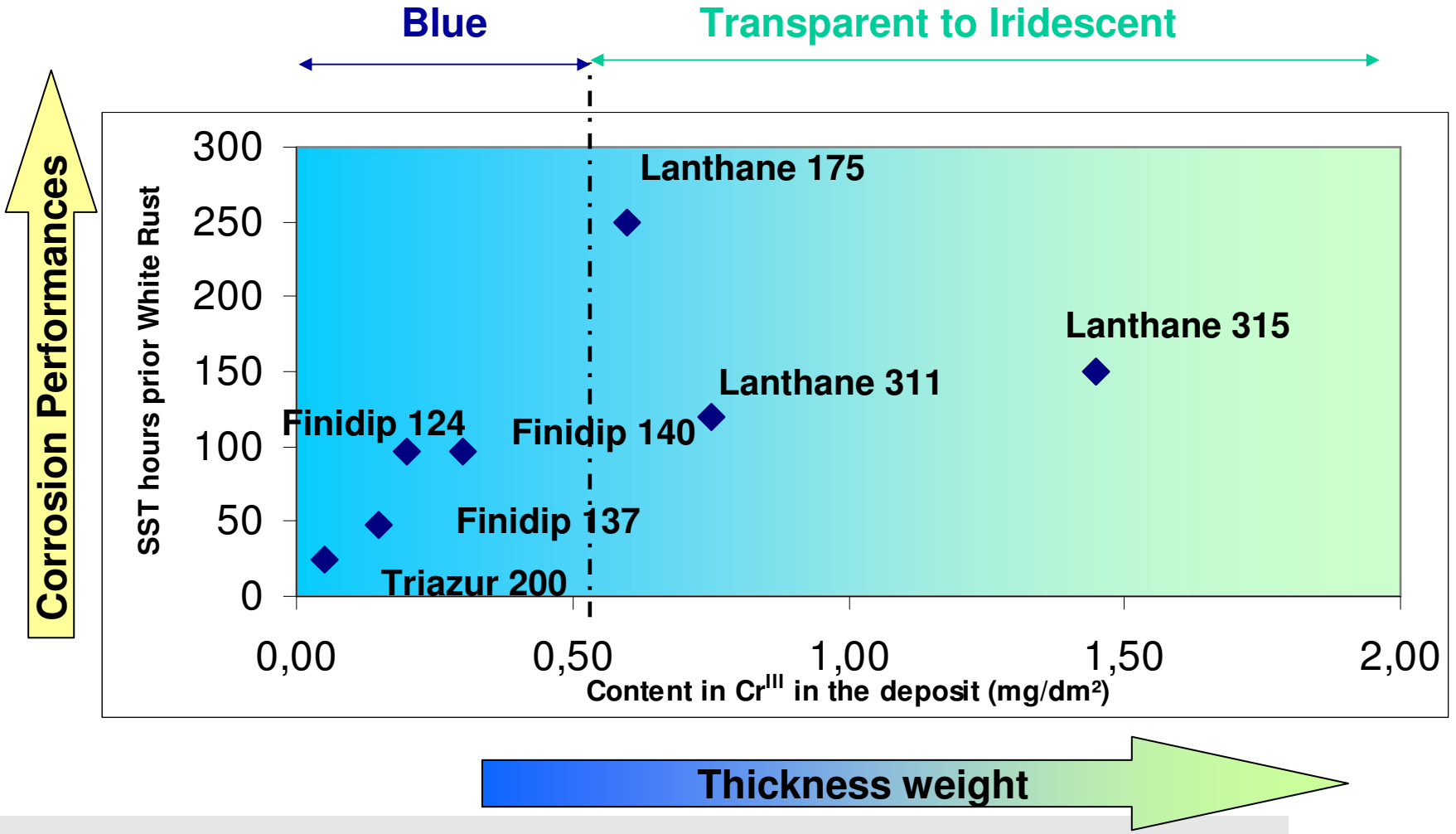
Cr^{6+}- Free Finishes on Zinc, Zn/Ni & Zn/Fe

COLOUR SELECTION GUIDE

Azzurro Decorativo S.B.< 24 h	**Azzurro Tecnico**	**Trasparente Grigio**	**Iridizzato**	**Nero**
Zn Puro Finidip 124 Finidip 137 Triazur 200	**Zn Puro S.B. 60 ÷ 80 h Finidip 124 Finidip 140**	**Zn Puro Lanthane TR 175 Lanthane 315**	**Zn Puro Lanthane 315**	**Zn-Ni Finidip 728 EX CBH 0311**
	Zn-Ni Finidip 128	**Zn-Ni EX CBG 0319**	**Zn-Fe Lanthane 315 Lanthane TR 175**	**Zn-Fe Finidip 726 EX CBH 0401**

Pure Zinc Cr^{+3} Passivates

CR^{III} PASSIVATES POSITIONING FOR PURE ZINC



Cr^{3+} Passivates' Current Limits

- Limited mechanic damage resistance
- It is difficult to passivate in the same effective way Alkaline Zinc deposits and Acidic Zinc ones
- Sleazy protection to corrosion
- It is necessary to next apply a Sealer to exceed 200 h white rust
- Solution & parts heating costs are too high
- High CrIII content. Its costs are too high

LANTHANE TR 175 : Answers

- Films having higher cicatrizant power
- Excellent results on Acidic Acid deposits too
- Corrosion resistance comparable to CrVI standards
- Disposable Sealer
- Solution heating lower energy waste
- Make-up & replenishment lower costs

LANTHANE TR 175 : Technical Features

- Thickness: 400 - 500 nm.
- Chrome quantity: 0,5 - 0,7 mg/dm2
- Dyphenylcarbazide Test: no signal
- Dangerous substances: Cobalt (< compared to LANTHANE 315)
- No fluorides, both free & complex
- It contains Sulphates & Nitrates
- It does not contain organic acids such as LANTHANE 315
- Film surface may show a thin layer against the light caused by Silica

LANTHANE TR 175: ready-to-use concentrations

Element	Lanthane 310 (311 + 312)	Lanthane 311 Finidip 12	Lanthane 315	Lanthane 175
CrIII g/l	4.6	4.6	10.0	3.1
Cobalt g/l	0.0	0.2	1.04	0.81
Nitrates g/l	20.5	20.5	30.0	11.0
Fluorides g/l	3.1	3.1	0.0	0.0
Silica g//l	Not stable	0.0	0.0	6.2

No fluorides

Limited Nitrates content

Lower Chrome & Cobalt concentrations

LANTHANE TR 175: Metals into Film

Cobalt is recognized as carcinogenic

- LANTHANE TR 175: 50% less of Co compared to LANTHANE 315

Element	Lanthane 311 T = 25°C	Lanthane 311 Finidip 12 T = 60°C	Lanthane 315 T = 60°C	Lanthane 175 T = 25°C
Cr III mg/dm^2	0.3 - 0.4	0.7 - 0.9	0.9 – 1.50	0.5 - 0.7
Cobalt mg/dm^2	0.0	0.08 – 0.10	0.12 - 0.16	0,.04 – 0.06

LANTHANE TR 175 : Technical & Working information

- Three Products:
  - PART A only in Make-up phase contains Chrome & Cobalt
  - PART B in Make-up and Replenishment phases contains Silica
  - PART C in Replenishment contains Chrome & Cobalt in their right ratios
- PART B has NOT to be mixed to other additives before using it. It has to be maintained at temperatures between 5 - 35°C.
- Temperature has to be 20 - 30° to avoid Silica separation. Keeping it under temperature control is very helpful.
- pH value has to be maintained within 1.8 – 2.6 to avoid Silica separation. To adjust it please use Nitric Acid and Sodium Hydroxide 20%.
- In case of total or partial Silica separation the solution can be easily adjusted filtering on paper and replenishing PART B.
- It would be better to use demineralized water but it is not necessary as it is for LANTHANE 315
- Referring to costs, it is fundamental to limit drag-out

Sealer – Top Coat: Nomenclature

In Automotive the word *Top Coat* was too generic, mixing up protective films and general painting

For this reason we choose to distinguish between:

- Sealer: active protective as low – thickness FINIGARD, within 2 µm.
- Top Coat: all painting kinds.

In IMDS tables, enclosed to "Zinc & Zinc Alloys Deposits Features" brochure, all Sealers & Top Coats categories are listed.

COVENTYA Sealers Line: Clear

Caratteristiche	FINIGARD 105	FINIGARD 111	FINIGARD 401	FINIGARD 450	FINIGARD 460
Composizione	Cere – Resine Acriliche – SiO_2 Soluzione Acquosa	Cere – Resine Acriliche – SiO_2 Soluzione Acquosa	Resine Acriliche Cere - SiO_2 Soluzione Acquosa	Resine Acriliche SiO_2 Soluzione Acquosa	Resine Acriliche SiO_2 Soluzione Acquosa
Deposito	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni
Passivazioni	CrIII – CrVI	CrIII - CrVI	CrIII – CrVI	CrVI	CrIII - CrVI
Applicazione	Minuterie - Viterie controllo C.A.	Minuterie - Viterie controllo C.A.	Generiche e Minuterie (1)	Generiche e Minuterie (1)	Generiche e Minuterie (1)
Formazione	30 ÷ 75%	100%	20 ÷ 40%	20 ÷ 40%	20 ÷ 40%
Metodo Operativo	Immersione Cestello	Immersione Cestello	Immersione Cestello Spruzzo Elettrostatico	Immersione Cestello Spruzzo Elettrostatico	Immersione Cestello Spruzzo Elettrostatico
Resistività Elettrica	Limita Contatto Elettrico	Limita Contatto Elettrico	Limita Contatto Elettrico	Limita Contatto Elettrico	Limita Contatto Elettrico
Coefficiente d'Attrito	0,15 ± 0,003	0,10 ÷ 0,12	≅ 0,16	≅ 0,18	≅ 0,16
Resistenza S.B.	Ottima	Ottima	Ottima	Buona	Eccellente
Aspetto	Film trasparente semilucido	Film trasparente semilucido	Film trasparente lucido	Film trasparente lucido	Film trasparente molto lucido
Effetto goccia	Accentuato		Limitato	Limitato	Assente
Resistenza UV CrVI	Limitata	Limitata	Limitata	Ottima	Limitata
Strippabilità	Buona in soluzioni alcaline a 80°C	Buona in soluzioni alcaline a 80°C	Ottima in soluzioni alcaline a 80°C	Ottima in soluzioni alcaline a 80°C	Insufficiente in soluzioni alcaline a 80°C
Mercato Auto	FIAT – Renault - PSA	VW – Audi – DC BMW	-	-	FIAT – Renault – PSA – VW – Audi DC - BMW

(1) When friction coefficient control is not required

COVENTYA Sealers Line: Black & Not-organic

Caratteristiche	ZINTHIUM 302	ZINTHIUM 302 L	ZINTHIUM 314	FINIGARD 200 A
Composizione	Cere – Resine Acriliche – SiO_2 - Grafite Soluzione Acquosa	Cere – Resine Acriliche – SiO_2 - Grafite Soluzione Acquosa	Cere – Resine Acriliche – SiO_2 - Grafite Soluzione Acquosa	Sigillante Inorganico a base di silicati in soluzione acquosa
Deposito	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni	Zn – Zn/Fe – Zn/Ni
Passivazioni	Nere CrIII – CrVI	Nere CrIII – CrVI	Nere CrIII – CrVI	CrIII – CrVI
Applicazione	Minuterie - Viterie controllo C.A. Generiche	Minuterie - Viterie difficili	Minuterie - Viterie difficili	Dove non è possibile impiegare i Finigard organici
Formazione	100%	100%	100%	5÷ 15%
Metodo Operativo	ImmersioneCestello Spruzzo Elettrostatico	ImmersioneCestello Spruzzo Elettrostatico	ImmersioneCestello Spruzzo Elettrostatico	Immersione e/o Cestello
Resistività Elettrica	Limita Contatto Elettrico	Limita Contatto Elettrico	Limita Contatto Elettrico	Non interferisce
Coefficiente d'Attrito	0,15 ± 0,003	0,15 ± 0,003	0,10 ÷ 0,12	≅ 0,22 ± 0,03
Resistenza S.B.	Ottima	Ottima	Ottima	Discreta
Aspetto	Film Nero Lucido	Film Nero Lucido	Film Nero Lucido	Velato con possibili residui salini nel tempo
Effetto goccia	Accentuato	Accentuato	Accentuato	Limitato
Resistenza UV CrVI	Ottima	Ottima	Ottima	N.A.
Strippabilità	Insufficiente in soluzioni alcaline a 80°C	Insufficiente in soluzioni alcaline a 80°C	Insufficiente in soluzioni alcaline a 80°C	Ottima
Mercato Auto	FIAT - VOLVO - SAAB	FIAT - VOLVO – SAAB Renault – PSA	VW – Audi – DC BMW	FIAT – Renault – PSA

Sealers: Choice Criteria

- FINIGARD 450 is good especially combined with CrVI passivates because of its limited reactivity to tarnishing action, accelerated by UV exposure.

- FINIGARD 460 has been developed to improve resistance to white films appearance on Zn-Fe & Zn-Ni black deposits.

- FINIGARD 200 A is an alternative from an economical point of view. It underlines a lot of limits as salinity residuals it leaves on parts. They appear after few-week stocking in warehouse. It is good used at 3 - 5% to neutralize passivates remaining acidity - especially Trivalent ones – when parts have not-plated ares.

Sealers: Choice Criteria

- FINIGARD 105 & 111 are specific for small parts with thread, especially when tightening couple control trough friction coefficient is required. Measurement methods are different, especially French, German & Swedish ones. For these reasons there are proper specifications one case at a time.

- Beyond FINIGARD, there are three other friction coefficient correctors:
  - FINITION BS 60, BS 61 & BS 62

LANTHANE TR 175 : Our Market Presence

- Already approved by HONDA, TOYOTA & NISSAN
- Our KIM is working to obtain final users' global approval
- To all OEM, approval will be required: for example:
  - Bosch
  - Maruyasu
  - Sanden
  - …

Protective: final considerations

Among clear passivates, LANTHANE TR 175 offers the best quality/price ratio for all Pure Zinc types

LANTHANE TR 175 has excellent position for OEM

Global offer possibility

COVENTYA developed important advantages compared with Surtec technology.