# European Union ELV Directive: How will It Impact the Automotive & Metal Finishing Industries?

## 240 People Attend Detroit Branch Meeting to Get the Latest

By Dr. James H. Lindsay, AESF Fellow, AESF Technical Editor

The End-of-Life Vehicle (ELV) Directive 2000/53/EC was enacted by the European Parliament and the Council of European Union on September 18, 2000. The objective

On April 9, 2002, more than 240 people attended the monthly **AESF Detroit Branch meeting.** Not since the mid-1970s, when the branch met downtown at the Hotel Statler (now closed for many years), had the attendance approached that number. Back then, Dr. David Cole of the University of Michigan talked about the Wankel engine and all the functional chromium or other hard coatings that would go into it. Now the subject was trivalent chromates and the Endof-Life Vehicle (ELV) Directive from the European Parliament. The Wankel engine has faded to a curiosity. The ELV Directive, on the other hand, is not going to qo away.

was to prevent waste from the recovery, reuse and recycling of vehicles at the end of their lives (*i.e.*, when they hit the scrap yard). This includes components, spare parts and replacements. The entire legislation covers four heavy metals: cadmium, lead, mercury, and (the one impacting the metal finishing industry most) hexavalent chromium.

The original edict limited the amount of hexavalent chromium to 2.0 grams per vehicle, but only where the Cr(VI) was present for purposes of corrosion protection. All other uses of Cr(VI) were banned (*i.e.*, 0.0 grams per vehicle).

This has nothing to do with plated chromium metal. Though one might still encounter a misinformed individual who will

wrongly argue that the chromium metal plated from a hexavalent chromium solution is toxic, while that from a trivalent bath is not (yes, they're out there), what we are talking about here are chromate conversion coatings, in all



Automotive industry panel: (Standing, L to R) Elizabeth Hanna, AESF Detroit Branch education chair; Murli Prasad, General Motors; Duane Drobnich, Ford Motor Company; Mark Murray, AESF Detroit Branch president; (Seated, L to R) Ron Lash, Daimler-Chrysler Corp.; Naohiro Kunieda, Toyota Motor Corp.; Jeffrey Makorewicz, Toyota Technical Center (USA); Harish Bhatt, Visteon Corp.; and Dr. Tim Basner, Delphi Corp. (Thanks to Bob Goulet, CEF, AESF Fellow, for providing photos for this report.)

of their various hexavalent formulations. Primarily found on zinc- or zinc alloy-plated fasteners, tubing, brackets and other small parts, chromates have been the mainstay in providing adequate corrosion protection. These parts number in the thousands.

The complete text of the ELV Directive 2000/53/EC, as passed on September 18, 2000, is available as a pdf file at the GM Environmental website: www.gmw3059.com (http://www.gmw3059.com/Content/ ELVdir%20final%20text%20Sept%202000.pdf). The site takes time to load, so be prepared to wait.

Why should the European Parliament regulate American automobile manufacturers? After all, the United States and Canadian governments are not banning hexavalent chromium here. Simply put, automobile manufacturing companies are global in scope. With central design and worldwide manufacturing, there is no alternative. If they wish to sell products in Europe, they have to follow the directive. The prospect of manufacturing cars to one specification to be compliant in Europe, and to another in the rest of the world (or to several specifications in various parts of the world), would be an economic nightmare. For this reason, they are constrained to produce to one universal specification, and in this case, Europe is leading the way.

The effect is not unlike last year's veto of the GE-Honeywell merger by the European Commission, which was the first time that European authorities blocked a U.S.-only merger that had already been given clearance by the U.S. Department of Justice. To do business in Europe, one must comply with the dictates.

#### **Response to the ELV Directive**

Aware that these machinations were proceeding, suppliers have answered the need with a variety of hexavalent chromium-free finishes, including trivalent chromium passivates and chromium-free dip spin coatings, among others. New products are undergoing qualification and validation by the automakers and new specifications are being written and issued.

As enacted, the Directive applies to all 15 member states of the European Union, with compliance required by July 1, 2003. Of course, planning required that the replacement finishes apply to Model Year 2003, and model production typically starts in the latter half of the prior year. This meant that some of the finishes had to be in place by July 1, 2002—a tall order for most everyone.

Since the ELV Directive was issued, a period of silence has ensued, both from the automakers, the primary tier sup-

pliers and from Europe. It was with no little interest, therefore, that more than 240 people descended on the April meeting of the AESF Detroit Branch to hear a panel of speakers from the automotive industry and tier-one suppliers offer their take on where things stand, and what they want. The situation remains in a state of flux, through no fault of the auto industry or its suppliers.

#### The Word from the Industry

Attendees at the Detroit Branch meeting were fortunate to hear from a panel of the top players in the finishing community from the automotive industry. The lineup consisted of Ron Lash, Daimler-Chrysler Corp.; Murli Prasad, General Motors; Duane Drobnich, Ford Motor Company; Naohiro Kunieda, Toyota Motor Corp.; Jeffrey Makorewicz, Toyota Technical Center (USA); Harish Bhatt, Visteon Corp.; and Dr. Tim Basner, Delphi Corp.

Of major importance was what had happened to the ELV Directive since its enactment. The common thread of each panelist's story was delay within the European Union. It had become apparent that there was no standard test that the ELV Directive would recognize as valid for measuring the 2.0 grams of Cr(VI) per vehicle. As a result, the powers that be came to recognize that there would be some delay in implementing the directive. Unfortunately, at present, official action still awaits. Thus, the automakers and the suppliers have been in a state of uncertainty themselves.

The "news on the street" (the best indication of what is likely to happen, according to all of the speakers) is a good news-bad news scenario. The good news is that the implementation is likely to be delayed for four years, to July 1, 2007. Because of the question of reliably detecting 2.0 grams of Cr(VI) per vehicle, the bad news is that the standard is to be reduced to 0.0 grams Cr(VI) per vehicle. Hexavalent chromium is expected to be banned outright. None of this is official, though at the time of the meeting, action was expected within weeks.

Of course, the automakers and their suppliers cannot turn on a dime. Because the best guess is not a certainty, each has had to develop some plan of action and prepare for a more urgent schedule, just in case.

#### What Are Automakers Doing?

Lash reported that Daimler-Chrysler is preparing to eliminate hexavalent chromates from fasteners effective July 1, 2002, but will defer the requirement for the other parts until everything is clarified. However, any fasteners produced prior to that date will still be used in auto assembly. A Cr(VI)-free car is planned by July 1, 2003.

Drobnich noted that the Ford Motor Company finish usage worldwide involves more than 45 released finishes, 60 percent of which have Cr(VI) chemistry in one form or another. He outlined their requirements, which on fasteners include torque tension characteristics as well as corrosion performance. Ford's goals are to eliminate Cr(VI) in fastener finishes first, and to stay below the two-gram limit by 2003.

The General Motors goal, according to Prasad, is to eliminate Cr(VI) by the 2004 Model Year. Over the longer term, the desire is to remove all "chemical" chromium from the vehicle, including trivalent chromium (but not chromium metal). To implement this, GM is jointly developing new Cr-free finishes with suppliers, reducing the number of finishes and reducing complexity in the entire process. All specifications are to be revised by October 2002. The intent is not to use topcoats over the Cr(III) finishes.

Toyota is taking a slightly different approach. Kunieda described the situation in Japan, where an automotive recycling law is under discussion. The outlook for chromates is similar to the ELV Directive, but with a slightly delayed enforcement schedule.



Toyota's Makorewicz makes a point during the question-and-answer session. Toyota policy worldwide is to get below *one* gram Cr(VI) per vehicle by the end of 2002. To achieve this goal, they have selected a number of high-volume zinc and zinc-alloy parts and will eliminate Cr(VI) in those. As with the other companies, the concern is to suffer no loss in performance or increase in costs. A total ban of Cr(VI) is under discussion, with the 2006-2008 time frame being considered.

Bhatt ably presented Visteon's viewpoint. Their strategy is to work with both chromium-free and Cr(III) coatings. Process

selection must meet the specification—no more or no less. The supplier must certify to the automaker that the "no Cr(VI)" requirement is met. He noted that the timing is very critical, especially in light of the four to six months required for testing and validation. The bottom line, however, is that all must comply with the ELV Directive in order to stay in business.

Dr. Basner of Delphi stressed the procedures that must be followed for meeting Cr(VI)-free finish specifications and approved source qualification. The requirements for any of the proposed finishes must conform to a one-time validation regime that includes the usual corrosion and other performance requirements. After all, though the finish may change, the part still must perform according to design requirements.

A primary issue arising from the discussion that followed was the matter of the test to detect the two grams of Cr(VI). Bhatt noted that there are nine potential test methods that could be used, none of which is recognized by the European Union. They range from spectrography to leaching. In light of that, he pointed out that the best policy was to trust the suppliers.

Other issues discussed dealt with hexavalent contamination arising from a process changeover in a process tank (not allowed), and the policy toward service parts. The issue had a variety of responses, but existing service parts were considered to be exempt.

The End-of-Life Vehicle Directive has strongly impacted the automotive industry and its suppliers like no issue has in recent years. Prior to this, the elimination of cadmium, though of concern, was not as significant. Unfortunately, because the Directive enactment schedule has slipped, and no definitive new timing has been officially announced, the situation remains fluid. Each automotive entity has had to plan according to what each sees as the likely worst-case scenario (*i.e.*, that involving the earliest possible changeover). Each is doing the best it can under trying conditions. **PASF** 



### About the Author

Dr. Jim Lindsay, AESF Fellow, is the technical editor of Plating & Surface Finishing. He is a retired staff research engineer for General Motors Research & Development Center, Warren, MI.

A member of AESF since 1964, Dr. Lindsay is a past president of the Detroit Branch. On the national level, he is a past chairman of the

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