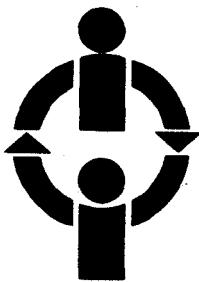


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SPI Resin Identification Code

A White Paper to Evaluate Options To Improve the Code's Effectiveness

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And
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Preamble

This document, the product of joint efforts between the National Recycling Coalition and The Society of the Plastics Industry, Inc. reflects information discussed during a series of facilitated meetings and conference calls held in the first half of 1993.

Participants in these meetings agreed to focus their efforts on the following problem statement which addresses concerns not only about the code but the use of the chasing arrows as well:

- The SPI resin identification code is being used beyond its original intent and its current capabilities.
- There is a need for appropriate understanding and proper use of the chasing arrows.

NRC and SPI discussed the need for a *recycling code*, but determined that such a code was beyond the scope of this group's work. NRC may consider such a code and criteria for its use for all materials in the future.

The following individuals participated in these discussions:

- NRC:** Marsha L. Rhea, NRC Executive Director
Edgar Miller, NRC Director of Policy and Programs
Patricia Moore, NRC Board, Policy Research Committee Chair
Terry Guerin, NRC Board, President
Harry Benson, NRC Board
Coy Smith, NRC Board
- SPI:** Larry Thomas, SPI President
Bob Valle, SPI Director and Chairman of SPI Plastic Bottle Institute
Ron Bruner, SPI Vice President Communications
John Dubeck, Keller & Heckman
Elizabeth Seiler, Grocery Manufacturers of America
Pat Toner, SPI Vice President Technical Affairs
- Facilitator:** Jerry Huntley, NRC Board Member and Director of Recycling for the American Plastics Council

As NRC and SPI representatives completed their initial evaluation process, they agreed that certain steps should be taken to move forward to improve upon the code. In addition to gathering input from stakeholders and designing changes to the code, the delegations will work together to advocate any agreed upon change and to educate on the appropriate use of the resin identification code.

The following recommendations were reached by consensus and form an action plan for the next phase of the project:

- Obtain and evaluate stakeholder input on potential changes to the SPI resin identification code, including those identified by the group.

- Design changes based on findings from previous step.
- Whenever advocacy action is necessary to implement change, SPI and NRC will act in partnership.
- Implement an education program.

Given the extensive number of state laws mandating use of the code and the potential multi-million dollar costs associated with changing molds, any proposed modifications to the code must be examined for both their benefit and economic impact. Because the discussions to date have involved a relatively few individuals and organizations, both NRC and SPI recognize that opportunities for comment must be provided for many others who have vested interests in the code, before developing firm recommendations on any changes.

Readers of this document wishing to express their views on the problems and options outlined herein may submit written comments (typewritten, please) in duplicate by no later than Wednesday, September 8, 1993 to:

**Marsha Rhea, Executive Director
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**Larry Thomas, President
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**Please reference *Questions for Stakeholder Input* (page 17) in your response.
Thank you.**

Executive Summary

The National Recycling Coalition (NRC) and the Society of the Plastics Industry, Inc. (SPI) began a series of discussions in February, 1993 to help make plastics recycling more successful by evaluating the use of SPI's voluntary resin identification code.

The resin identification code, which includes a number from 1 to 7 surrounded by chasing arrows with a resin acronym, was developed by SPI in 1988 in response to requests from recyclers for help in identifying the types of plastics being sorted in their facilities, after a survey of recyclers was conducted by SPI's Plastic Bottle Institute to determine their needs. Although developed by SPI as a voluntary code, it is now mandated by separate laws in 39 states. It also is being used in some form internationally, including in Europe, Canada, Brazil, Latin America and Japan. In the past few years as plastics recycling has evolved, some recyclers have expressed concern over the code's lack of technical specificity. Furthermore, as recycling has become more commonplace and definitions of recyclability have changed, some consumer confusion over the use of the chasing arrows symbol has been reported.

At the end of 1992, SPI was in the midst of reviewing its resin identification code for both domestic applications and international coding considerations. NRC, meanwhile, was considering a policy regarding SPI's resin identification code and the use of the chasing arrows. SPI solicited NRC's input on the coding system to factor in the views of key NRC members as it laid the groundwork for plastics recycling in 1993 and beyond. To provide a forum for parties interested in the issue, each group designated six representatives from its staff, board of directors and others to attend initial meetings, and a facilitator was agreed upon.

Initially, the group set out to identify and understand the issues related to the resin identification code and the chasing arrows symbol, with a goal of producing consensus recommendations. From the outset, NRC and SPI agreed that the code was being used beyond its original intent and current capabilities and that there needed to be appropriate understanding and proper use of the chasing arrows. During the course of four meetings, NRC and SPI examined SPI's original intent in developing the code with the chasing arrows symbol, as well as the benefits and problems of using the code and the chasing arrows. The group also reviewed resin coding systems being developed nationally by the American Society for Testing and Materials (ASTM) and internationally by the International Organization for Standardization (ISO).

Having explored the extent of the need and opportunities to improve upon the code, the joint group developed four consensus recommendations for how SPI and NRC should get more input from interested parties, design potential changes to the code, and together proceed with implementing those changes, as well as educate on the resin identification code. The group also began brainstorming on preliminary options to improve upon the code and arrows.

Once SPI and NRC meeting participants had completed this evaluation process, SPI's Executive Committee agreed that SPI should continue discussions in an attempt to reach agreement with NRC on how the code might be improved upon within a reasonable time frame.

This report details the key issues, reached by consensus between SPI and NRC, surrounding the SPI resin identification code and its use of the chasing arrows. It is intended to provide information to stakeholders interested in possible changes to the code and solicit their comments and recommendations. SPI and NRC recognize that there are numerous interested parties and decision-

makers whose support is necessary if any changes to the code are to be implemented in a timely and cost-efficient manner. During the second phase of this project, NRC and SPI will use a consensus process to ask specific questions, evaluate that input, and recommend potential changes to the resin identification code that will benefit plastics recycling and be consistent with the needs of the various stakeholders.

Nature of the Problem

The SPI resin identification code presents two distinct problems with regards to plastics recycling:

- It lacks technical specificity in that all plastic resin grades within a particular number of the code sometimes cannot be recycled together to produce an economically viable material.
- Some consumers see the resin identification code with the chasing arrows symbol and assume that it indicates the material can be recycled, when it may not be accepted in their particular local recycling program.

Recyclers must generate a quality stream of post-consumer plastics that will have market value. Public confusion about which plastics are locally recyclable introduces contamination into the post-consumer stream of plastics and creates an economic cost for every party that must handle it. This contamination, caused by collection of materials not specifically requested by a recycling program, adds residue disposal and other processing costs.

The most persistent reported problem is with the code designation #2, HDPE. Two common grades of HDPE exist within this category: blow molded (for bottles) and injection molded (for containers). Because these two grades have substantially different melting behaviors, they cannot typically be processed together into a high-quality recycled material. However, consumers believe that because they are coded the same, both should be accepted in a recycling program that may specify *only bottles*. Recycling processors reported additional frustrations because the coding system is too broad to provide material that meets current market specifications.

SPI chose the 3-sided arrow design to draw attention to the code and make it distinguishable from existing marks on bottles. However, some consumers see the arrows on a plastic package or product and assume it is accepted in their own community's recycling program, when it may not be.

Frequently recycling program managers are required to explain why they do not accept the wide array of plastics which are "recyclable" because they have the chasing arrows marked on the containers. Unless the material is recyclable in that community's program, many recycling advocates believe the chasing arrows mislead environmentally conscious consumers. Some recyclers believe it is necessary to end this consumer confusion by revising the resin coding system and limiting the use of the chasing arrows to packaging that is clearly recyclable in the community where it is distributed. However, consumer product companies express their concern that in a national marketplace this degree of differentiation is unrealistic. Alternatively some recycling advocates believe the use of the chasing arrow symbol on plastics packaging should be dropped altogether.

Resin Identification Code (RIC) Chronology

1984-87—State legislators and environmentalists call for mandatory coding of plastic bottles by resin type. SPI opposes legislation proposed in several states on the basis that recycling industry is not ready to accommodate resins other than PET and HDPE and that all PET and much of the HDPE could be sorted by shape, i.e., soda and milk bottles.

November, 1987—Facing increasing legislative pressure, SPI conducts a survey of recyclers and collectors to see if they feel they could benefit from a resin identification code. SPI's Plastic Bottle Institute selects a system "of six separate materials and a mixed category identified simply by a single digit number inside a [. . .] distinctive symbol for bottles 16 ounces or larger." System is intended to be simple and easy to implement; 3-sided arrow design is chosen to draw attention to code and make it distinguishable from existing marks on bottles. Informal feedback obtained by previewing the code to environmentalists leads to the last minute addition of resin abbreviations.

April, 1988—After completing a search for trademark conflicts, SPI launches the RIC as a voluntary system to assist recyclers in sorting plastic containers. System is intended for bottles only; code to appear on bottom of bottle. The code is defined as solely an identification of resin type; the voluntary code does not identify the resins as suitable for recycling using any particular technology. The recommended three year phase-in is expected to cost \$6 million, but faster legislated timetables increase the cost to \$10 million. At this point no state or federal laws directly govern use of or define the term "recyclable" as requiring the availability of local facilities.

September, 1988—The first objection to the arrows in the RIC comes from the Northeast Recycling Council (NERC). It contends that the 3-arrow symbol is a recyclability claim that should not be made in the absence of a broad recycling system for all coded resins.

October, 1988—Four states adopt mandatory coding laws that incorporate the basic elements of the SPI system. Earliest compliance date is January 1, 1990.

September, 1989—SPI releases guidelines for voluntary use of code on rigid plastic containers from 8 ounces to 5 gallons.

January, 1991—RIC legislation consistent with the basic elements of the SPI system is in place in some form in 27 states as of this date.

1991-92—FTC, EPA and State Attorneys General Task Force on green claims all agree that RIC, if placed in inconspicuous location, is **not** a recyclability claim. Code is accepted as a mere identification of resin type by provisions in New York, Rhode Island and California statutes or regulations dealing with recycling.

December, 1992—New York State Attorney General, on behalf of nine states' Attorneys General, suggests RIC may be misleading. SPI replies that **proper** use of RIC is not misleading.

March, 1993—RIC required by statute in 39 states by this date. None requires local recycling capability as a condition for use.

Original Intent/Benefits of the Code and Current Problems

During the NRC/SPI meetings, there was consensus on the following points relative to the original intent of the code and its benefits, as well as current problems. Please note that the group separated the code and chasing arrows issues and that the chasing arrows analysis follows.

Intent

- **A voluntary code** – It was not designed to reflect a certification process. SPI did not have any authority to "enforce" how it was used.
- **Simple resin identification** – It was never intended to be a claim of recyclability or recycled content.
- **Assist recyclers (sorters)** – At the time of development, the stated need was to assist sorters at recycling plants in determining what type of plastic a bottle was made from; it was not intended for use by the general public as evidenced by the recommended inconspicuous use on the bottom of the bottle.
- **Avoid conflict with the chasing arrows symbol used by the paper industry on its products** – The code was based on research on other trademarks and coding systems.
- **Preempt inconsistent legislation** – At the time numerous "coding systems" were being discussed in different states. The SPI code was offered as a nationally uniform approach.
- **Promote national uniformity to maintain flow of commerce** – National brand consumer products are routinely produced and distributed across state lines. To avoid a potential distribution gridlock caused by different requirements in different states, a common code was essential. All 39 states that require some kind of resin identification code specify a mark consistent with the SPI-developed RIC.
- **Originally for the bottom of bottles only ranging in size from 16 ounces to 5 gallons** – Although SPI subsequently released guidelines for its use on rigid containers from 8 ounces to 5 gallons (September, 1989), it does not recommend use of the code on film, bags, durable products or other rigid containers.
- **Implement as rapidly as possible without incurring excessive cost** – Modifying molds used to produce bottles and rigid containers is expensive and time consuming, particularly if the modification is not done during the regular maintenance cycle of the mold. As a result, the code was recommended for "phase in" over several years.

Benefits

- **Broadens number and types of containers that can be recycled beyond milk jugs and soda bottles**
- **Differentiates between different resin types**
- **Provides consistency in identification**
- **Achieves sufficient national uniformity to avoid gridlock in commerce**

- **Makes public and recyclers aware of variety of plastics and their potential recyclability**
- **Can make it easier for consumers to recycle plastic**
- **Makes it easier for recyclers (sorters) to identify plastic**
- **Allows consumer to make informed choices on recyclability**

Problems

- **Misused in communication with the public** – Some firms use it as a green marketing tool; it also is sometimes used inappropriately as a public education tool for recycling programs.
- **The code is being misused** – Examples: it is not always on the bottom of the bottle; it is being used on film, non-rigid containers, durable goods, and on containers under 8 ounces; and some manufacturers have miscoded resins
- **Code categories are too broad** – All resins within a particular category cannot be recycled together.
- **Perceived as a “recycling” code** – Some recycling coordinators treat it as a recycling code and use it for educational purposes, instead of as a resin identification code.
- **Lack of awareness on recommended usage** – No one is aggressively providing education on the proper use of the code, nor discouraging improper use.
- **Contributes to unrealistic expectations** – The code is intensifying certain public, government and industry expectations to collect and recycle plastics beyond current economic and technical feasibility.
- **Intent of the code is misunderstood by the public and industry** – This raises concerns among consumers, recyclers and industry.
- **Code is too broad** – The broadness of the code results in the collection of non-spec material which adds to operational costs of recycling, labor and residue disposal.
- **There are inconsistencies in the use of the code on multi-layer bottles** – In some cases these bottles may be able to be recycled with the base resin, but legislation in several states prohibits coding that would encourage this.
- **During the on-line sorting process, the code is not helpful** – It is unlikely that any code can be used effectively during manual, on-line sorting. However, a code can help guide those who manage the sorting line.
- **The code is not easy to read on small containers** – This is one reason why it is not recommended for bottles of less than 16 ounces.

Original Intent/Benefits of the Chasing Arrows and Current Problems

Intent

- **Differentiate the resin number from other marks on bottom of the bottle** – Manufacturers place a variety of numbers and letters on the bottom of bottles to identify particular molds/machines as to age, ownership, etc. Something was needed to distinguish the resin code from these other marks.
- **Options were limited because other symbols were in use** – Research on trademarks, etc., determined that almost all common symbols (square, circle, triangle, etc.) already were claimed by someone.
- **Relate code to recycling for recyclers (sorters)** – With multiple letters/numbers on the bottom of most bottles, there was a need to readily distinguish the resin code for sorters.
- **Reflect the potential (technical) recyclability of all plastics from a 1987 perspective** – At the time the code was developed, plastics recycling was truly in its infancy. Plastics generally weren't perceived as being recyclable. The arrows helped to indicate that the container was potentially recyclable.

Benefits

- **Arrows have increased awareness of recycling and facilitated plastic recycling**
- **Arrows have differentiated resin number from other marks on the bottom of containers**
- **Arrows have raised visibility of the code**
- **Arrows can easily identify the information as relating to recycling and potentially could be used as a recycling code**

Problems

- **Interpreted as claim of current and local recyclability and/or recycled content** – Some consumers assume arrows mean recyclability and then object when they can't actually recycle the items.
- **Need to recognize changes in definition of recyclability from technically feasible to economically viable and locally available** – When introduced in 1988, use of the arrows was intended to signify that plastic bottles were recyclable from a technical perspective. Changes in consumer perceptions over the past six years have eclipsed the original intent of using the arrows.
- **There are no formal data upon which to evaluate the magnitude/ significance of consumer confusion caused by the arrows** – Evidence to date of consumer confusion is largely based on anecdotal reports from NRC members and others. Statistical validation of the degree of confusion could help overcome industry opposition to any potential changes in the code.

- **Due to a lack of education, the arrows, which are required by law as part of a resin identification code for plastics, are being equated with the recycling emblem –** In the absence of a formal national "recycling code," the resin identification code has been used by some to fill this void.
- **Arrows are being used for green marketing instead of inconspicuously on bottom –** Since it was developed and introduced as a voluntary code by SPI, enforcement by other than the states mandating it is problematic. SPI has recommended, since the code's introduction in 1988 (before green marketing became fashionable), that it be placed only on the bottoms of bottles and containers.
- **Unqualified use of arrows erodes consumer confidence in recycling –** Consumers who collect coded plastic containers for recycling – only to find out that resin type cannot be recycled in local programs – have expressed their dismay with the recycling program and recycling in general. When consumers' confidence in recycling erodes, the supply of recovered materials from households is threatened.

Stakeholders

NRC and SPI recognize that there are numerous interested parties whose support is necessary if any changes to the code are to be implemented in a timely and cost efficient manner. Listed here are some of the people and organizations which have an interest in, or are affected by, the resin identification code and were identified during the NRC/SPI discussions:

Categories of Stakeholders:

- Material Flow:**
- Resin manufacturers
 - Mold makers
 - Package manufacturers
 - Additive manufacturers
 - Closure manufacturers
 - Plastics engineers
 - Consumer product companies
 - Distributors
 - Consumers
 - Retailers
 - Collectors/haulers
 - Handlers/MRFs
 - Reclaimers
 - End-users/PCR purchasers
- Government:**
- International
 - Federal
 - State
 - Local
 - Recycling coordinators
 - Recycling educators
 - Regional recycling cooperatives
 - Politicians
 - Regulators
- Interested Parties:**
- Trade associations
 - Environmental organizations
 - Public interest groups
 - Media
 - Standard setting organizations

Decision-Makers

It was recognized during the NRC/SPI discussions that although the code began life as a voluntary procedure offered by SPI to the plastics/recycling industries, events of the past five years have made the code mandatory for all practical purposes. The fact that laws in 39 states now mandate use of the SPI code means that it is no longer voluntary and that SPI is **not** in a position to unilaterally change the code even if it should choose to do so. The discussions attempted to distinguish between **those with the authority to *make* changes** and **those who can only *advocate* changes**.

Those with *authority* to make a change:

- Legislators
- Federal Trade Commission
- Environmental Protection Agency
- State Attorneys General
- Packagers

***Advocates* most likely to cause change:**

- SPI
- NRC
- ASTM
- ISO
- Environmental Groups
- Any stakeholder

Preliminary Options to Improve the Code's Effectiveness

To generate comments from interested parties and stakeholders, NRC and SPI brainstormed on options to improve the code's effectiveness in the following three areas of activity: education and opinion research on the code, changes/limits for the code, and legislative issues. Some of the options listed, by their very nature, are mutually exclusive. *Note: These are only preliminary options for potential improvements; they have not been reviewed, prioritized, analyzed or endorsed by the boards of either SPI or NRC, but were simply categorized for further analysis.* Stakeholder comment on the options below will be used to launch further analysis by SPI and NRC on how to improve upon the resin identification code.

Options for addressing the identified problems fall into the following areas of activity:

- Education/Opinion Research on the Code
- Changes/Limits to Code and/or Arrows
- Legislative Action

A. Education/Opinion Research on the Code

Some education activities are expected to take place in advance of potential changes/limits to the code. Therefore this list reflects both short and long term options.

Opinion Research (short term):

- Accumulate formal data on the magnitude and significance of consumer confusion caused by the arrows and the code.
- Accumulate data on the effects of recommended change.

Education Program Components (short term):

- Design a communications program to industry members and other related trade associations to educate them about the specifics of proper use of the code. Guidance should be taken from state laws and SPI technical bulletins, and include:
 - ◆ Placement of code on bottom of containers
 - ◆ Minimum size requirements for code
 - ◆ Recommendation of ASTM codes for non-bottles and non-rigid containers
 - ◆ Product labeling
 - Product advertising
- Help Recycling Coordinators design programs to educate the public about proper use of the code.

Education Program Components (long term):

- Develop an education program that addresses any future changes to the code.

B. Changes/Limits to Use of the Code and/or Arrows

Limit the Use of Existing Code:

- Eliminate the code.
- Limit use of code to bottles and rigid containers.
- Limit use of code to *bottles only*.
- Enforce use on the *bottom* of bottles.
- Prevent use of code on product labels and in advertising.

Revise Existing Code:

- Expand code's specificity to distinguish between grades of resins.
- Add numbers to include additional resins.
- Revise category "7" to allow identification of specific resin type.
- Remove the chasing arrows.
- Change chasing arrows to different symbol.

Use New Code:

- Adopt ASTM system.
- Adopt ISO system.

C. Legislative Issues

- Advocate federal legislation to preempt state laws based on recommendations.
- Revise state laws to allow for greater flexibility in implementing changes to the code recommended by this group.

Questions for Stakeholder Input

All stakeholders are invited to respond to any questions which are applicable to your operations or which address your concerns. You may respond in narrative form or to specific questions, but please address all relevant points from this list of questions. As noted in the *Preamble*, please respond in typewritten form, noting whether your comments reflect personal concerns and experience or those of a referenced organization.

A. Describe your current involvement with the SPI resin identification code.

1. How are you currently using the code?
2. What benefits or problems does it offer you?
3. Do you use it in any communications with the public?

B. Should the code be changed or limited ?

1. Which of the proposed options would you prefer and under what conditions would any of the other options be acceptable? If none are acceptable, what would you recommend?
2. What impact would the proposed options have on your business or organization's operations?
3. What specific economic impact would the proposed options have on your business or organization?
4. Is there a need to identify the resin composition of plastic products that are not bottles or rigid containers?
5. What types of numbers, symbols and/or letters should a new resin identification code consist of, if one is adopted?
6. Should the code be consistent with international standards such as the coding system developed by the International Organization for Standardization (ISO)?
7. Should the chasing arrows continue to be used to distinguish the code from other information on the package?

C. How should any changes be implemented?

1. What is the feasible time frame for a change (economically and/or operationally)?
2. What is the minimum time to incorporate a change in your operations?
3. Can existing molds be modified or would a change require total replacement?
4. Who will need to be educated about a change and what should be the content and form of that education program?
5. Since existing state laws preclude implementation of virtually all of the identified options unless those laws are amended or preempted, how would you recommend that changes be implemented legislatively?
6. What steps can be taken to prevent any revised resin identification code from being used beyond its intent and capabilities in the future?

ASTM, ISO and SAE Coding Systems

SPI's Resin Identification Code was developed for use on plastic bottles, and subsequently was extended to include rigid plastic containers. Concurrently, but independently, The American Society for Testing and Materials (ASTM), the International Organization for Standardization (ISO), and the Society of Automotive Engineers (SAE) were developing generic resin identification coding systems. The brief descriptions below attempt to highlight the differences in the systems.

ASTM:

Description

ASTM Designation: D 1972 - 91
"Standard Practice for Generic Marking of Plastic Products"¹

Format



ACRONYM

Example



PET

This coding system consists of a resin acronym placed under a triangular outline. Blends or copolymers and alloys may be indicated by separating acronyms with a slash (/) symbol. Revisions are under consideration which will harmonize this standard with the ISO International Standard 11469 described below.

Scope

"The purpose of this standard is to provide a system for uniform marking of products which have been fabricated (excluding additives) from polymeric materials. The acronyms (abbreviations) used are to provide for generic identification of the polymer(s)."¹

Significance and Use

"This marking system is to provide assistance in identification of products for making subsequent decisions as to handling, disposal or waste recovery."¹

Further information on this standard is available from: ASTM, 1916 Race St., Philadelphia, PA 19013.

ISO:

Description		
International Standard 11469		
"Generic Identification and Marking of Plastic Products"²		
	Format	Example
	>ACRONYM<	>PET<
	+ = Blend	
	/ = Copolymer	
<p>This coding system consists of a resin acronym placed between the "greater than/less than" symbols. Blends or copolymers and alloys may be indicated by separating acronyms with a plus (+) or slash (/) symbol as appropriate.</p>		

Scope

"This international standard specifies a system of uniform marking of products for use that have been fabricated from plastics materials. This marking system is useful in assisting the identification of plastic products for subsequent decisions as to handling, waste recovery, or disposal. The abbreviated terms (abbreviations, acronyms, initials, symbols and other codes) used are to provide generic identification of the plastics.)²

Further information on this standard is available from: American National Standards Institute, 1430 Broadway, New York, NY 10018.

SAE:

Description		
SAE J 1344		
"Marking of Plastics"³		
	Format	Example
	SAE ACRONYM	SAE PET
	+ = Blend or Multi-layer	
	/ = Copolymer	
<p>This coding system consists of a resin acronym in a box preceded by "SAE." Blends or multi-layer and copolymers may be indicated by separating acronyms with a plus (+) slash (/) symbol as appropriate.</p>		

Scope

“This SAE Recommended Practice provides a system for marking plastics parts to designate the general type of material from which the part was fabricated.”³

Purpose

“The purpose of this recommended practice is to provide information to facilitate:

- Selection of materials and procedures for repairing and repainting plastic parts
- Collection and handling of parts for subsequent recycling”³

Further information on this standard is available the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

Path Forward: Phase II

After NRC and SPI finished their evaluation of the SPI resin identification code, both parties agreed that there needed to be a formal process for obtaining and evaluating input from key stakeholders as identified elsewhere in this white paper. Since SPI's current resin identification code has only been in existence for six years, participants agreed that every effort should be made to come to consensus on the most balanced, practical solution that will work in the long term for all affected parties.

Phase II of the NRC/SPI resin code identification discussions will focus on obtaining and evaluating the input generated by this white paper and designing potential recommendations on the resin identification code. At the end of Phase I, the original representatives from NRC and SPI developed a process to broaden the input and expertise of the group. Three Work Groups were designated to complete specific tasks:

- Evaluate and design changes and/or limits to improve the resin identification code.
- Develop and discuss ways to implement changes together, through legislation and other avenues.
- Design a program to educate relevant groups on the proper use of the code and conduct opinion research.

A Technical Analysis Work Group will review the proposed options for improving the code and arrows and analyze the costs and benefits of each option, as well as how these options might be implemented. After evaluating each option and any input received from stakeholders, that committee will report back to the original Phase I group.

An Implementation/Legislation Work Group will plan how any proposed changes to the code and arrows might be implemented across the country. Since there are 39 states with different laws that specify the current coding system, this group will begin developing a strategy that will support any recommendations that come from the NRC/SPI resin identification code discussions.

An Education/Opinion Research Work Group will develop, oversee, and evaluate opinion research on problems with the code and chasing arrows. Research will target specific parties in the recycling community that have expressed frustration with the code and arrows. This group will also design educational programs to promote the proper use of the SPI resin identification code.

Each Work Group will be comprised of two members from the Phase I group (one each from SPI and NRC) and other key stakeholders. All three of these Work Groups will meet this summer and fall to complete their respective tasks and develop consensus on their particular aspects of the coding system. The work that comes out of these groups will be used to produce a second white paper on the resin identification code. The original group of 12 representatives from NRC and SPI will meet in December to finalize recommendations to bring to the NRC and SPI boards in January, 1994.

