LIA23512

LEAD INDUSTRIES ASSOCIATION, INC.

292 MADISON AVENUE
NEW YORK, N. Y. 10017
TELEPHONE — AREA CODE 212
OR 9-6036

December 21, 1965

SUBJECT: CHROME YELLOW SAFETY PAINT BROCHURE

To: MEMBERS OF THE LEAD INDUSTRIES ASSOCIATION, INC.

The enclosed booklet on chrome yellow safety paints has just been prepared by the LIA staff for distribution to highway and street engineers, plant safety personnel, shopping center and motor hotel managers, tunnel and turnpike authorities, railroad and airport maintenance managers, and to paint and pigment manufacturers for secondary distribution.

We feel this booklet will help insure continued use of lead chromate pigments for rapidly growing traffic marking applications (where reputedly cheaper sulfur pigmented paints constitute a threat), and will help convince safety engineers and industrial maintenance specialists that chrome yellow paint is the recognized standard for designating caution and for marking physical hazards--both in and out of plants.

Another area where it is expected that the booklet will be useful is in the virtually untapped market for delineating parking areas around motels, shopping centers, supermarkets, movie houses and the like, for at the present time there is no single group or agency to act as a "gelling agent" in recommending a uniform color for marking these areas. In addition, the booklet stresses the fact that yellow is inherently recognized in barrier applications, hence motorists tend to be more conscientious about parking within stalls and not straddling the lines.

Additional copies of this booklet, up to 25, may be obtained from LIA free of charge. Larger numbers may be had at our cost, $0.10 per copy.

Sincerely,

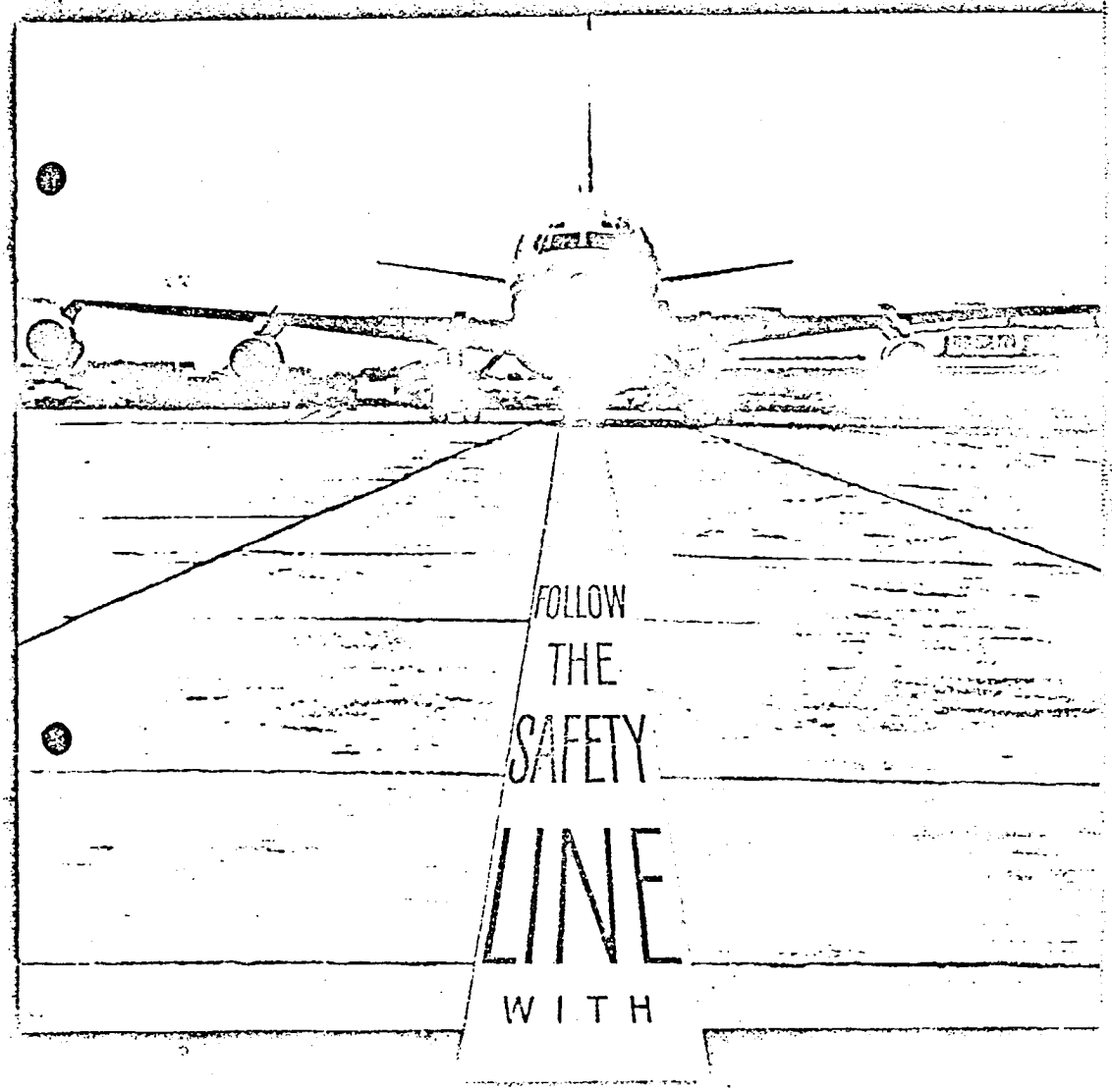
Jerome F. Smith

Jerome F. Smith

JFS:df
Enclosure

Look Ahead with Lead

LIA23513



Chrome Yellow

N 1874.01

WHY YELLOW?

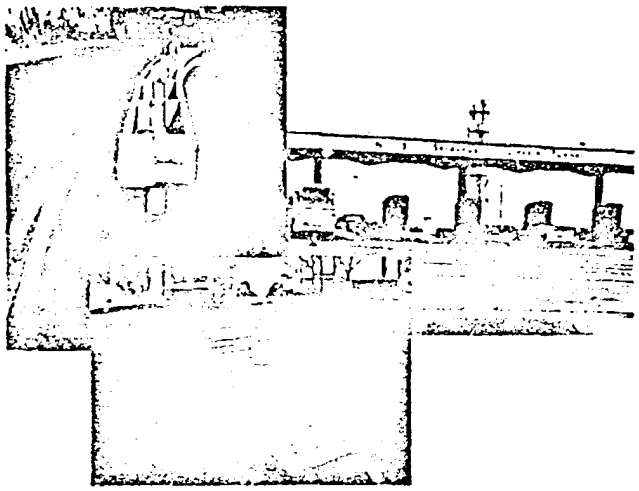
Yellow is the symbolic warning color. Yellow gets attention. It contrasts with any background. And it has traditionally been used to emphasize physical hazards. Yellow's safety value has received permanent recognition from numerous bodies concerned with public safety:

1. The American Standards Association, Inc.[1] recognized yellow's safety applications in its publication Z53.1-1953, SAFETY COLOR CODE FOR MARKING PHYSICAL HAZARDS AND THE IDENTIFICATION OF CERTAIN EQUIPMENT, Z35.1-1941 SIGNS, and A12-1932 on FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS.
2. The national Commission on Safety Education, National Education Association deals with school bus yellow in its TENTATIVE MINIMUM STANDARDS FOR TRANSIT AND METROPOLITAN TYPES OF SCHOOL BUSES.[2]
3. On a Federal level, the United States Department of Commerce, Bureau of Public Roads prescribes the use of yellow for traffic control in its MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS,[3] published in 1961.
4. Several other groups, including the American Association of Railroads, the United States Coast Guard and the Civil Aeronautics Administration have made use of yellow's unique attention getting qualities in their respective fields of interest.

WHY CHROME YELLOW?

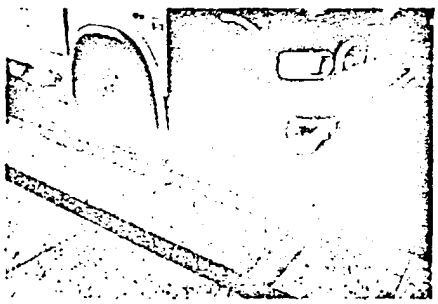
The yellow paint pigment that most readily meets the standard color requirements of the official bodies listed above is chrome yellow. In addition to meeting these color standards, chrome yellow possesses many other important qualities which make it the most versatile, low-cost pigment available today for traffic marking and other safety applications:

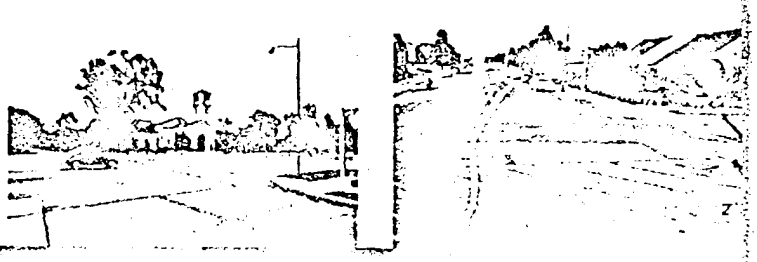
- Excellent lightfastness — good resistance to degradation by light
- Good tone purity, or saturation
- High color absorption coefficient
- Readily dispersed — low shear equipment can be used to produce enamels
- Available in a wide range of shades
- High index of refraction — good covering power
- Low solubility in oil, varnish, resins and standard vehicle constituents
- Relatively low cost
- Reasonable chemical resistance

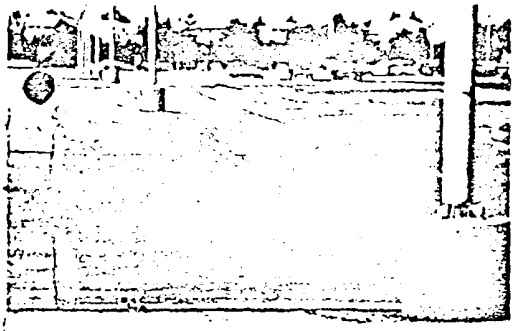


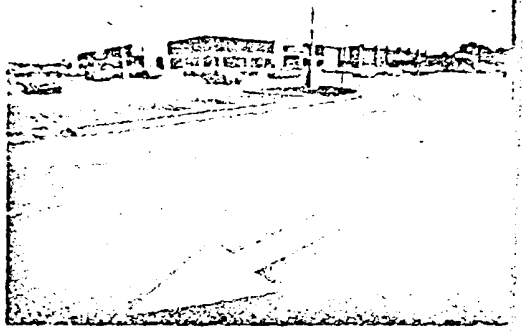
ON THE ROAD

IN THE CITY

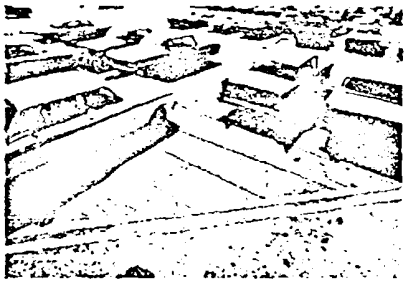








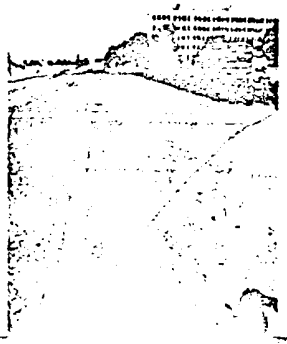
AT THE SHOPPING CENTER

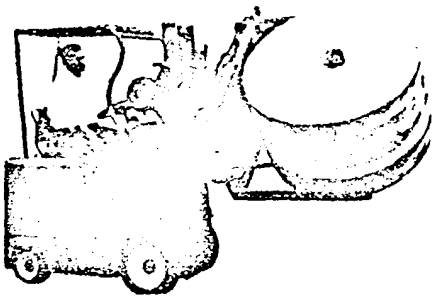


CAUTION

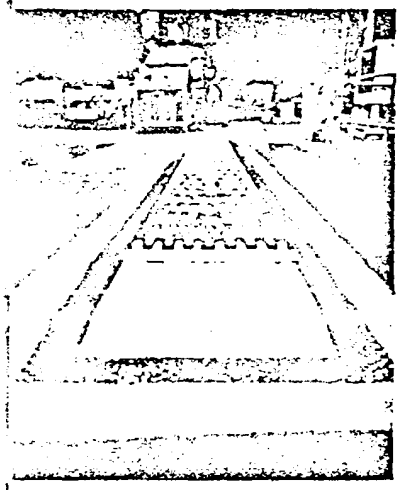
BE SURE IT'S CHROME YELLOW — There is no other yellow pigment, organic or inorganic, that — *without the addition of strengtheners, costly color additives, etc.* — is the correct color for "highway yellow"* established by the Bureau of Public Roads. In addition, no other yellow pigment offers the winning combination of excellent lightfastness, high opacity, and decidedly lower cost than it's organic counterparts. Chrome yellow pigments are tailor-made for specific vehicles and applications. Care must be taken in selecting the pigments to be used in any given system. One group may perform quite well in standard air-dry, oil vehicles, while another may be quite well suited to moisture-set vehicles or heat-set systems.

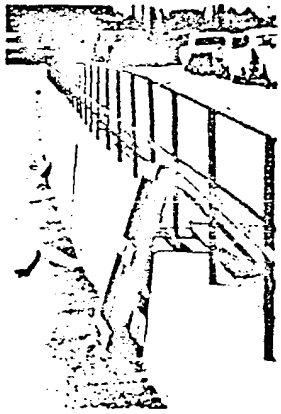
*Color cards showing the correct colors for highway signs may be obtained from the Bureau of Public Roads on request.





IN THE PLANT





TRAFFIC APPLICATIONS (

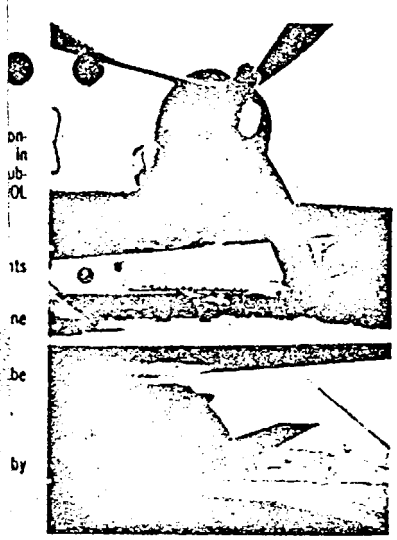
Chrome yellow plays an important part in the c trol of traffic throughout the fifty states and other parts of the world as well. The Bureau of P lic Roads' MANUAL ON UNIFORM TRAFFIC CONTR DEVICES prescribes yellow for:

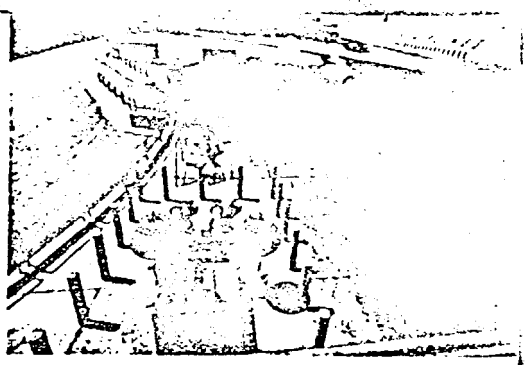
1. *Double center lines on multilaned pavemer*
2. No-passing barrier lines at:
   (a) No passing zones on two- and three-la roads
   (b) Pavement width transitions
   (c) Approaches to obstructions which must passed on the right
   (d) Approaches to railroad crossings
3. Curb Markings:
   (a) To show parking prohibitions covered signs or ordinance
   (b) On islands in the line of traffic

The Manual further recommends that all such mar ing lines be at least 4 inches and not more than inches in width. The yellow color to be used f these pavement markings is standardized, and c be most easily duplicated with paints contain large proportion of chrome yellow in the pig Besides calling for yellow in the specific paveme marking applications listed above, the Manual al suggests it be used to paint signal heads for co trast, on barricades (alternating with black stripe or solid yellow), on cones and drums, and sandbag

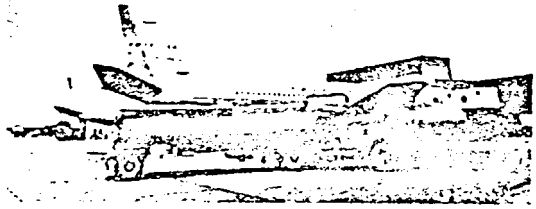
The Manual points out that particularly where use at night, these items should be coated with refle torized yellow paint. Of course, one of the mo important traffic control devices is the warnir sign. "With few exceptions," the Manual state "standard warning signs are diamond shaped, ha ing a black symbol or message on a 'highway yello background."

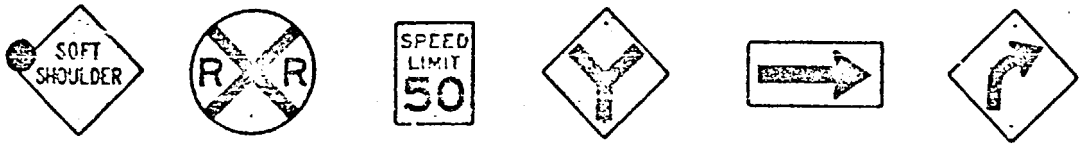
It should be noted that while the Bureau of Publi Roads' *MANUAL ON UNIFORM TRAFFIC CONTRO* DEVICES is not mandatory for any but Federal hig ways, *it has nevertheless been unanimously adopte* throughout the fifty states in a concerted effort b state highway engineers to establish nationwid uniform traffic control procedures. City and count traffic engineers are doing their part, too, to joi this effort in bringing streets and highways withi their jurisdiction into line with the Manual. For e ample, most large cities in addition to painting ye low those areas recommended by the Manual p earmark with yellow the following items: fir drants, fire lanes, school and church crosswalk

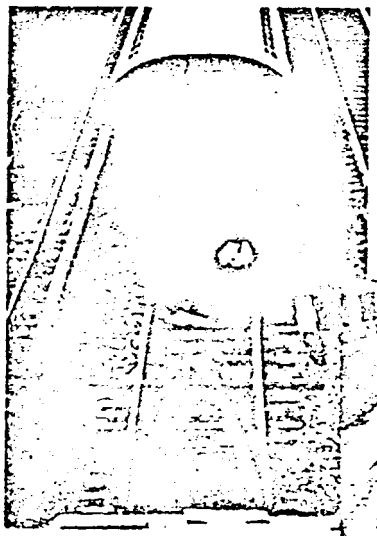




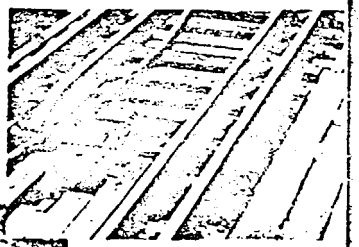
AT THE AIRPORT

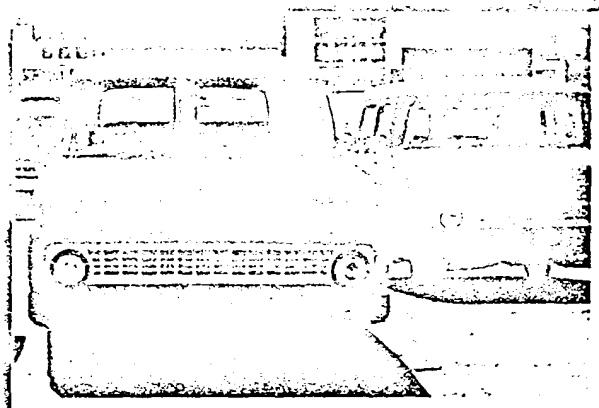


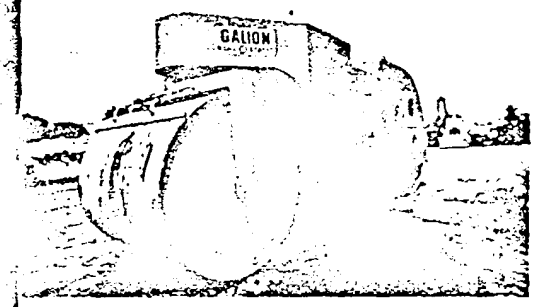




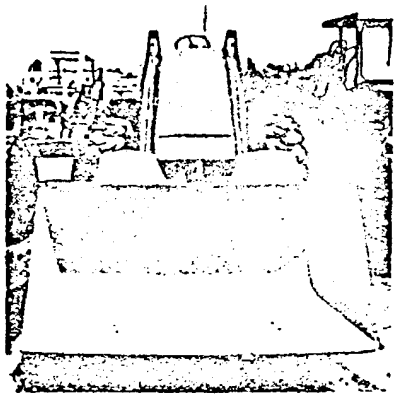
IN SUBWAYS AND RAILROAD YARDS





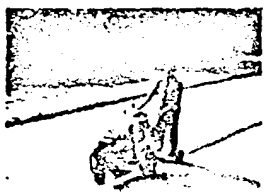


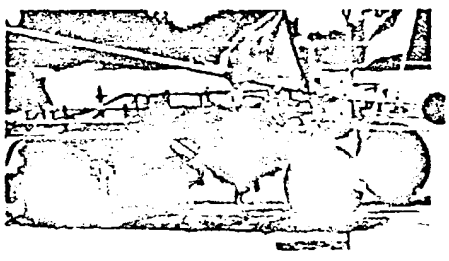
SERVICE VEHICLES



EASILY APPLIED

Great strides have been made in the development of a number of versatile highway striping machines said to be capable of reducing labor costs by as much as 50%. In addition, most of this equipment can be utilized for portable paint spraying to paint curbings, fire hydrants, railings, steps, traffic signs, and similar on location jobs. Sizes range all the way from small self propelled, hand guided units to mammouth, $30,000 machines capable of applying up to 4 stripes simultaneously at a speed of 8 to 10 mph. In addition, there are striping machines that apply heat set paints which dry within 60 to 90 seconds, obviating the need for protective devices while the paint is drying and thus considerably reducing -- often by as much as 30% -- the cost of application. Much of the equipment mentioned is ideally suited for a specific type of job, and by careful selection the prospective purchaser may obtain application machinery tailor-made for his needs.





INDUSTRIAL APPLICATIONS

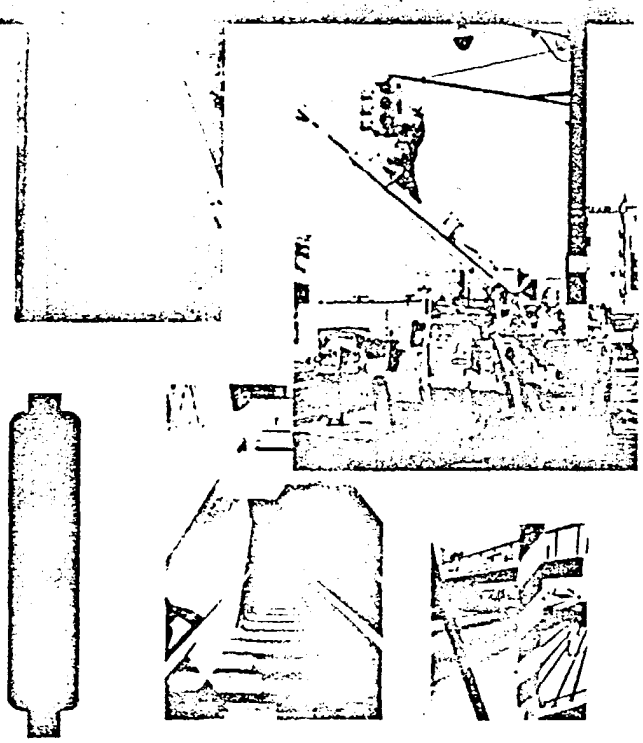
Chrome yellow paints have been widely used by industry for many years to mark physical hazards. However, since 1945 there has been an officially recognized SAFETY COLOR CODE which recommends the uniform marking of physical hazards and the identification of certain equipment with standard colors.[1] Numerous industrial plants and warehouses now employ the American Standard SAFETY COLOR CODE Z53.1-1953 which states:

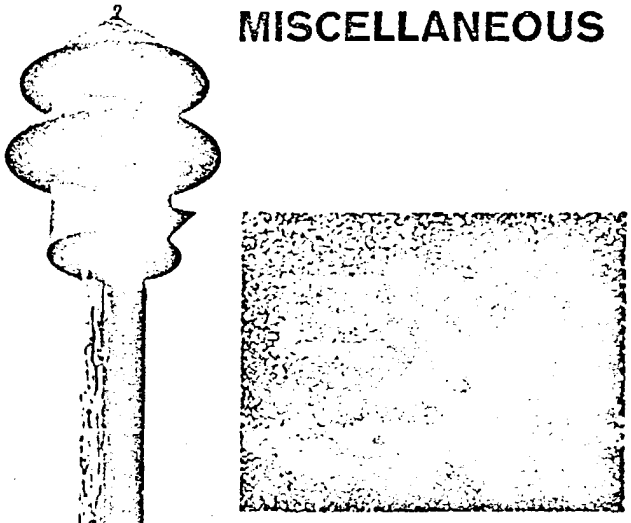
"Yellow shall be the basic color for designating caution and for marking physical hazards such as: striking against, stumbling, falling, tripping, and 'caught in between'." A partial list of applications follows:

- Construction Equipment.
- Coverings for guy wires.
- Exposed and unguarded edges of platforms, pits, and walls.
- Fixtures suspended from ceiling or walls which extend into normal operating areas (within the clearance diagram of plant traffic.)
- Handrails, guardrails.
- Horizontal lips of vertically sliding counterbalanced doors.
- Industrial locomotives (or areas thereon).
- Lower pulley blocks and cranes.
- Markings for projections, doorways, traveling conveyors, low beams and pipes, the frames of elevator ways and elevator gates.
- Material handling equipment.
- Pillars, posts or columns which might be struck.
- Waste Containers for explosive or highly combustible materials should have yellow band around the container.
- Piping systems containing dangerous materials.

It is worth noting, of course, that the paint pigment recommended to meet the SAFETY COLOR CODE'S standard for yellow is lemon chrome yellow.

Airports the world over use chrome yellow as a standard guideline for airplanes to follow as they taxi to and from parking aprons. Of course, planes are frequently greeted at the parking area by bright yellow fuel trucks, and maintenance men on yellow service ladders inspect the engines.





MISCELLANEOUS

In railroad yards and subways throughout the country, yellow designates caution along unguarded edges of platforms, top and bottom treads of stairways leading edges of "third rails", derails, switch mechanisms, and car stops at the ends of switch yard tracks.

Of course, not to be overlooked in its use of chrome yellow is the ubiquitous shopping center. One of the main attractions at shopping centers has been ample parking. And, in order to get maximum benefit from the costly apron provided in most shopping centers, owners are turning to chrome yellow lines to mark out parking stalls. Yellow is the one color which seems to make drivers more cautious about straddling lines and other improper parking tactics which harass shopping center management and irritate customers unable to find a berth for their car.

1 Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment. Published by American Standards Association, Inc., 10 East 40th Street, New York, New York 10016.

2 Tentative Minimum Standards for Transit and Metropolitan Types of School Buses issued by the National Commission on Safety Education, National Education Association, 1201 16th Street, N.W., Washington, D.C.

3 Manual on Uniform Traffic Control Devices for Streets and Highways. Published by U.S. Department of Commerce, Bureau of Public Roads, Washington, D.C.

For further information on chrome yellow pigments and paint systems, write Pigments Department Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017

Look Ahead with Lead

REPRESENTATIVE FORMULATIONS FOR YELLOW PAINT

Since a majority of the chrome yellow paints in use today are formulated to meet various performance specifications and may thus be proprietary, we are herein publishing only what might be considered "typical" formulations thought to be representative of those being used — however, this is in no way meant to imply that the formulations submitted herein are superior to any proprietary paint formulation utilizing chrome yellow as a pigment.

YELLOW TRAFFIC MARKING PAINTS

Note A combination of chrome yellows can be used on the pigment that will, on a dry paint film, match the Federal standard for Highway Yellow

PIGMENT:	% by Wt.
Chrome Yellow Medium, TT-P 346 Type III	38 4
Whiting	29 8
Magnesium Silicate, TT-P-403	8 4
Diatomaceous Silica	13 4
Mica	10 0
VEHICLE:	**% by Wt.**
Varnish, 50% Non-volatile	39.4
Chlorinated Paraffin	6 7
Chlorinated Rubber	13 7
Toluene TT-T-548 approximately	37 5
V M & P Naphtha, Distilling 200-300°F	2 4
6% Cobalt Naphthenate, TT-D-642	3
Pigment	35.0%
Vehicle	65.0%

PIGMENT:	% by Wt.
C P. Chrome Yellow Medium	30 0
Titanium-Calcium Pigment	10 0
Zinc Oxide	4 0
Zinc Stearate	1 0
Magnesium Silicate	45 0
Diatomaceous Silica	10 0
VEHICLE:	**% by Wt.**
Copal Varnish selected for its performance	90 0
V M & P. Naphtha	10 0
Pigment	55.0%
Vehicle	45.0%

ANTI CORROSIVE YELLOW METAL ENAMELS

Note A combination of chrome yellows can be used that will, on a dry paint film, match the standard shade of ASA Z53.1-1953 for yellow and may be used on items listed on page (7).

PIGMENT:	% by Wt.
C P. Chrome Yellow	100
VEHICLE:	
Alkyd Varnish (Not less than 50% solids)	90
Thinner Mineral spirits (90%) Xylene (10%)	10
Pigment	32.0%
Vehicle	68.0%

PIGMENT:	% by Wt.
C P. LL Chrome Yellow	69 89
C P. Med. Chrome Yellow	7 74
Basic Lead Silico Chromate	21 17
Organo Montmorillonite	1 16
VEHICLE:	
Alkyd Resin Solution (50% Solids)	77 53
Mineral Spirits	20 99
6% Zirconium	0 64
6% Cobalt	0 39
Anti-skinning Agent	0 29
95 Methanol - 5 Water	0 17
Pigment	32.46%
Vehicle	67.54%