



TICO®

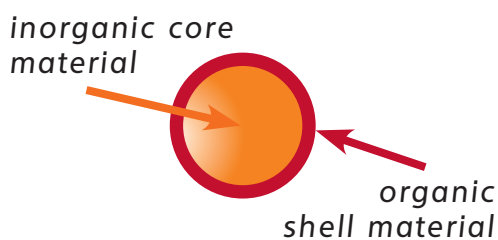
The high performance lead -  
and cadmium - free alternative

**heubach**

COMPETENCE IN COLOR



The idea behind TICO®



TICO®s are a new class of high performance yellow, orange and red pigment preparations.

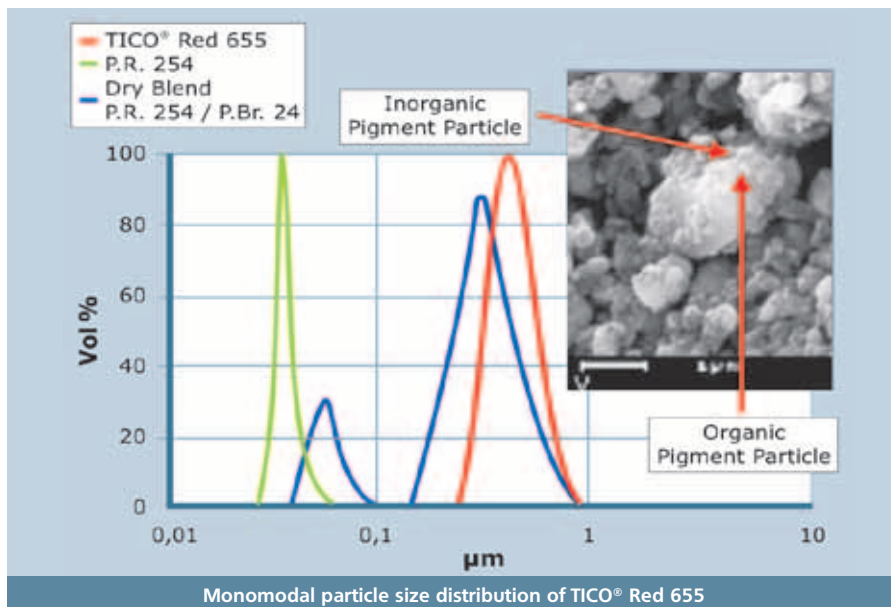
These titanium based colorants exhibit maximum gloss, opacity, strength and durability, which cannot be achieved with today's well established blends between organic High Performance Pigments and white / yellow titanium or bismuth vanadate pigments.

TICO® stands for Titanium Color made by a proprietary co-finishing process to attach the organic colorants to the surface of titanium carrier pigments.

As a result TICO®s develop full color saturation and high gloss, low dusting properties and are easy to disperse.

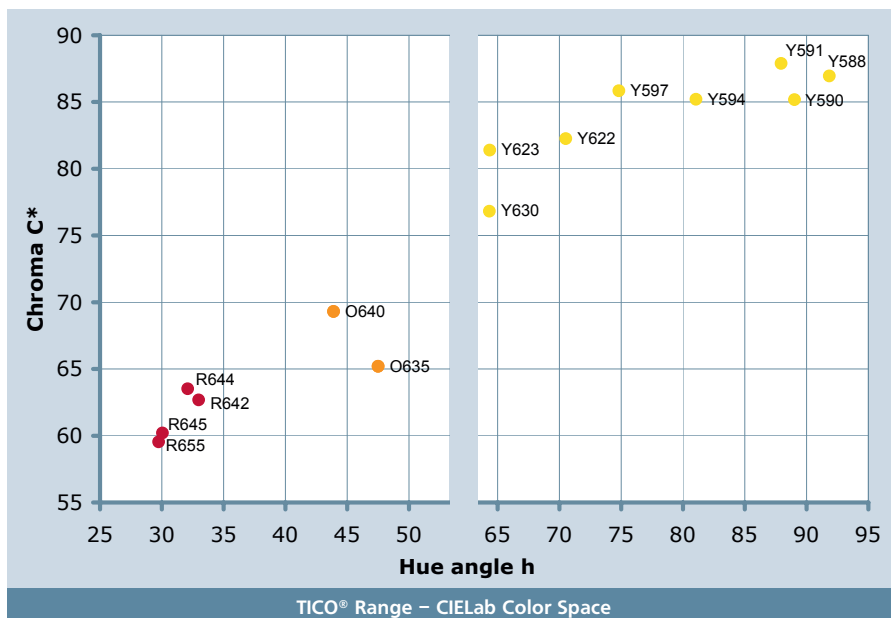
### Pigment morphology

TICO® hybrid pigments are a combination of a specially micronized CIC pigmentary core particle and a pre-dispersed organic colorant attached to the surface of the core particle.



### TICO® Color Space

The enhancement of chromaticity is an inherent characteristic of the TICO® pigment technology. The TICO® color space comprises the yellow, orange and red pigment preparations.



### Application areas

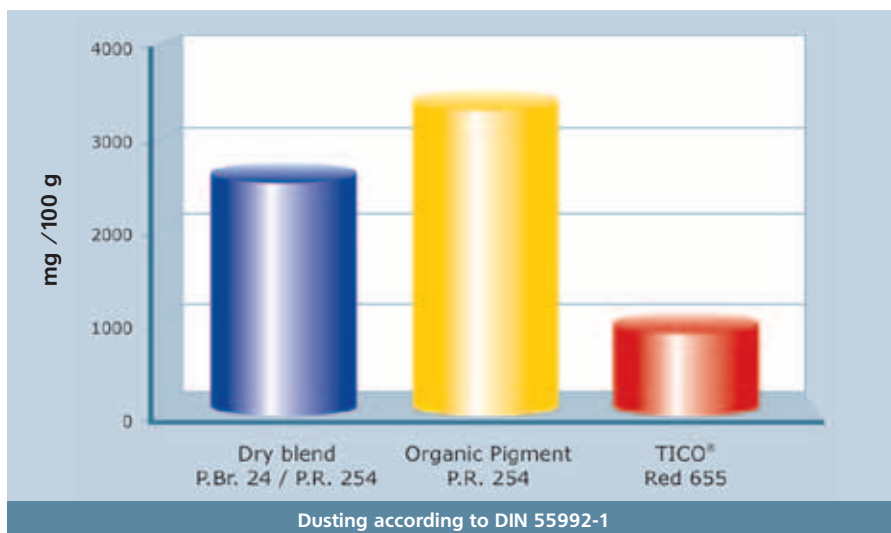
Tico hybrid pigments can be used with the majority of the commonly used binder types. The main application areas are:

- › Automotive Coatings
- › General Industrial Coatings
- › Powder Coatings
- › Coil Coatings

### Outstanding processing characteristics

High performance organics and inorganic pigments differ significantly with respect to their surface characteristics and their specific weights.

The new technology resolves this problem by its hybrid morphology. TICO® preparations exhibit a significantly reduced dusting during its handling which is the best basis for a perfect manufacturing hygiene.

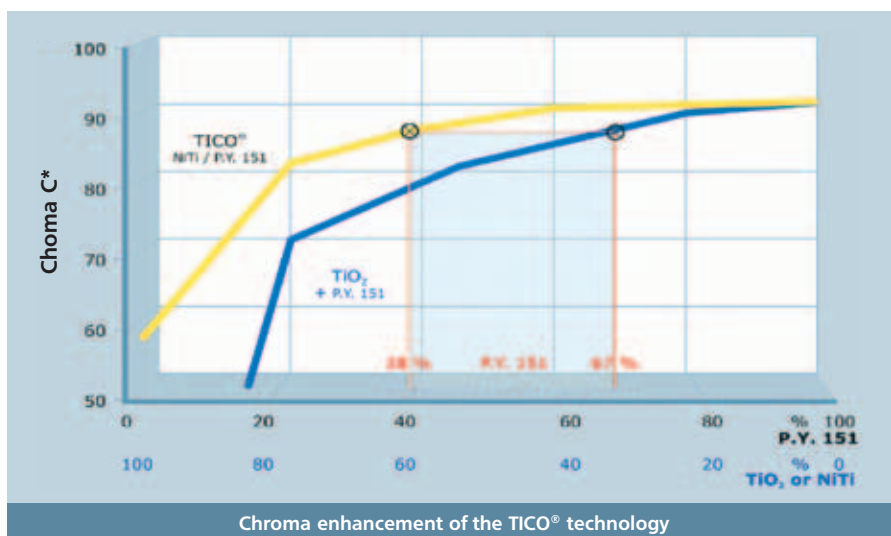


Due to the pre-dispersed state of its components the TICO® technology also allows significantly shorter grinding times more comparable to that of pure inorganic pigments and less risk for overgrinding and color shift.

In comparison to straight blends also the oil absorption can be greatly decreased allowing for high pigment loading in colorant pastes.

### Chroma enhancement

The enhancement of chromaticity is an inherent characteristic of the TICO® pigment technology. TICO® achieves e.g. identical color saturation at only 38% organic pigment loading as compared to 67% P.Y. 151 for a titanium dioxide blend.



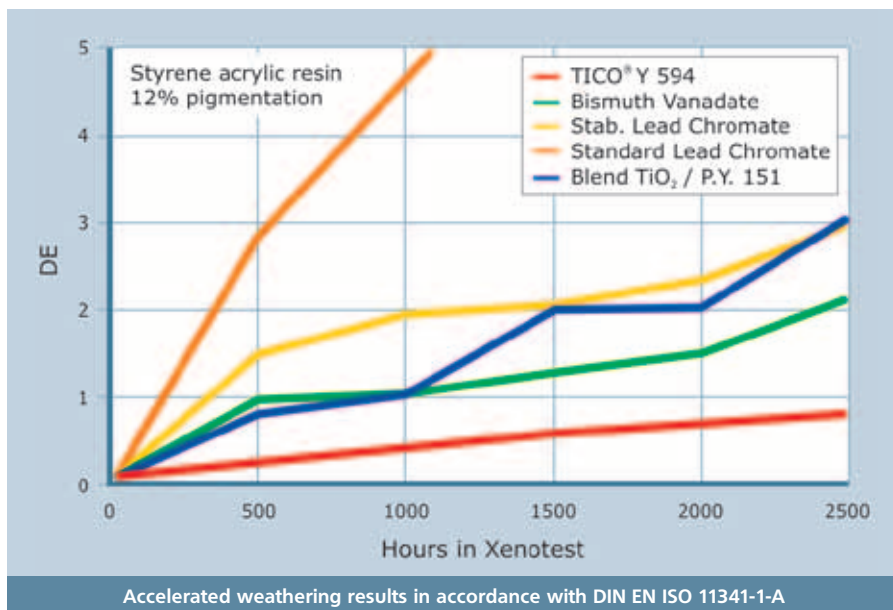
Besides several technical advantages e.g. increased opacity of the paint film the reduction of the organic content is a great potential cost saver!



### Improved fastness properties

In TICO®s the valuable organic pigments are protected by the specially designed titanium carrier pigments, which leads to outstanding light and weather fastness.

As opposed to titanium dioxide, which has been known to exhibit photocatalytic activity accounting for weather induced degradation mechanisms, the new titanium carrier pigments of TICO® act like UV-absorbers and protect the sensitive organic pigment from UV-attacks.



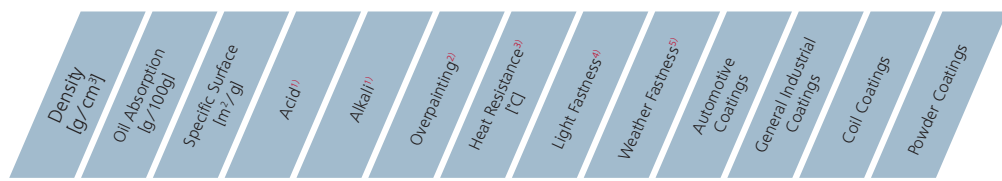
### Value-in-use

TICO®s are highly opaque and sufficiently saturated to cover important full shade industry colors like e.g. defined in the RAL register, but also branded shades.

Formulation costs with TICO®s are lower if compared to alternative high performance color solutions.

RAL 3000 [Flame Red]	Lead	TICO®	Vanadate	Organic
Molybdate Red	75.9%			
Pigment Red 52:2	8.2%			
Pigment Orange 36				51.9%
Pigment Red 254			44.6%	
Pigment Red 178				15.7%
Bismuth Vanadate			29.4%	
TICO® Red 655		50.2%		
HEUCODUR® 6R		39.7%		
Iron Oxide Red	4.5%	10.1%	17.4%	7.1%
Titanium Dioxide	11.4%		8.6%	25.3%
Cost Ratio	1	3	4	6

Formulations are adjusted in opacity

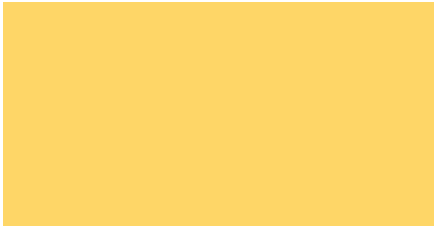


Product	Full Shade	Reduction [1:3 TiO <sub>2</sub> ]	Physical Data			Fastness Properties						Applications			
			Density	Oil Absorption	Specific Surface	Acid (1)	Alkali (1)	Overpainting (2)	Heat Resistance (°C)	Light Fastness (4)	Weather Fastness (5)	Automotive Coatings	General Industrial Coatings	Coil Coatings	Powder Coatings
TICO® Yellow 588			3.3	15	5.3	5	5	5	200	8	5	●●	●●	●	●
TICO® Yellow 590			2.8	23	8.4	5	5	5	250	8	5	●	●	●●	●
TICO® Yellow 591			2.5	24	5.3	5	3 - 4	5	250	8	5	●	●	●	●●
TICO® Yellow 594 <sup>6)</sup>			2.5	22	6.8	5	3 - 4	5	200	8	5	●●	●●		●
TICO® Yellow 597 <sup>6)</sup>			2.4	21	7.1	5	3 - 4	5	200	8	5	●●	●●		●
TICO® Yellow 622 <sup>6)</sup>			2.7	22	6.0	5	5	5	200	8	5	●●	●●		●
TICO® Yellow 623			2.8	26	4.9	5	5	5	220	8	5	●	●		●●
TICO® Yellow 630			3.0	16	5.1	5	5	5	250	8	5	●	●	●●	●
TICO® Orange 635			2.9	19	11.8	5	5	5	250	8	5	●	●	●●	●
TICO® Orange 640			2.5	26	5.9	5	5	5	200	8	5	●●	●●		●
TICO® Red 642 <sup>6)</sup>			2.9	19	7.5	5	5	5	200	8	5	●●	●●	●	●
TICO® Red 644			2.5	26	8.2	5	5	5	250	8	5	●	●	●	●●
TICO® Red 645			2.9	15	5.8	5	5	5	250	8	5	●	●	●●	●
TICO® Red 655			2.7	15	7.5	5	5	5	200	8	5	●●	●●	●	●


●● Our Recommendation    ● Potential Use

<sup>1)</sup> Pigments were dipped into hydrochloric acid or sodium carbonate solutions of varying concentrations. Rating: 1 = poor, 5 = excellent  
<sup>2)</sup> [AM (160°C/30 min)] - Assessment of bleeding of a white NC-topcoat using the Grey Scale according to DIN 54002. Rating: 1 = severe, 5 = none  
<sup>3)</sup> Pigments were tested in an alkyd/melamine system with 30 minutes baking time. Temperature range 160°C to 250°C.  
<sup>4)</sup> Light Fastness [Full shade] was tested in an alkyd/melamine system. Assessment with Blue Wool Scale according to DIN 54003. Rating: 1 = very poor, 8 = outstanding  
<sup>5)</sup> Weathering Fastness [Full shade] was tested in a waterborne acrylic resin system. Assessment with Grey Scale acc. to DIN 54001 after 2000h Arc Xenotest acc. to DIN EN ISO 11341-1-A. Rating: 1 = poor, 5 = very good.  
<sup>6)</sup> Pigments partially contain P.Y. 83 and should not be used at processing temperatures exceeding 200° C due to potential cleavage to 3,3' - dichlorobenzidine (DCB) under these conditions.


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<i>Sunflower Yellow</i>	TICO® Yellow 594	0.3 %	
	HEUCODUR® Yellow 6R	8.9 %	
	HEUCODUR® PLUS Yellow 150	90.8 %	


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<i>Signal Yellow</i>	TICO® Yellow 594	66.2 %	
	TICO® Yellow 622	15.1 %	
	HEUCODUR® Yellow 255	14.9 %	
	Iron Oxide Yellow	3.8 %	


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<i>Brilliant Orange</i>	TICO® Yellow 594	45.0 %	
	TICO® Orange 640	54.6 %	
	TICO® Red 655	0.4 %	


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<i>Pure Orange</i>	TICO® Orange 640	86.7 %	
	HEUCODUR® Yellow G 9180	13.3 %	

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<i>Tornado Red</i>	TICO® Red 655	85.7 %	
	Pigment Violet 19	14.3 %	

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<i>Salsa Red</i>	TICO® Red 655	66.7 %	
	Pigment Violet 19	33.3 %	

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® = Registered trademark of Heubach GmbH

Our product specific and application information are based upon our current knowledge. They are non-binding and cannot be taken as a guarantee. The processing company must establish the suitability of individual products itself. As their use lies beyond our knowledge and control, we cannot accept any liability relating to the use of our products in particular applications. In addition to that, the legal rights of third parties must always be considered. The specification agreed between the customer and ourselves is the basis upon which our general sales and delivery conditions are set and is the deciding factor concerning any liabilities. Our standard specification is then valid if no specification has been agreed upon between the customer and ourselves.

[www.heubachcolor.de](http://www.heubachcolor.de)

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