

PIGMENTS SPECIAL  
APPLICATIONS  
**SANODAL<sup>®</sup>, SANODURE<sup>®</sup>  
AND SANODYE<sup>®</sup> DYES**

For the dyeing of anodized aluminum

**PRODUCT NAME**

Dark shade      Light shade



**SANODYE YELLOW 3GL**



**SANODAL GOLD 4N**



**SANODURE FAST GOLD L**



**SANODURE ORANGE G**



**SANODYE ORANGE 2B**



**SANODYE GOLDEN ORANGE RLW**



**SANODURE ORANGE RL**



**SANODURE FAST BRONZE L**



**SANODYE BROWN R**



**SANODAL ORANGE 3LW LIQ.**

Dark shade	Light shade	Recommended dye bath pH range	Dye bath buffer*	Light fastness <sup>1</sup>	Outdoor application	Indoor application	Heavy metal free structure	Supply form	Single dye (s) Mixture (m)
g/l	g/l								
3.0	0.1	5-6	S	> 9	●	●	●	Granules	s
30 (24 min)	30 (30 s)	4.5	-	> 9 <sup>2</sup>	●	●		Powder	s
3.0	0.2	5-6	S	7-8		●		Granules	s
3.0	0.2	5.5-6.5	-	5-6		●		Granules	s
5.0	0.5	5.5-6	S	5-6		●	●	Powder	s
3.0	0.5	5.5-6.5	-	5-6		●	●	Granules	s
3.0	0.3	5.5-6.5	-	5-6		●	●	Granules	s
0.5	0.2	5-6	S	7-8		●		Granules	s
3.0	0.5	5-6	S	5-6		●	●	Granules	s
5.0	0.2	5-6	S	> 9	●	●		Liquid	s

**PRODUCT NAME**

Dark shade      Light shade

		<b>SANODAL RED B3LW</b>
		<b>SANODYE RED GLW</b>
		<b>SANODYE RED RLW</b>
		<b>SANODURE FIERY RED ML</b>
		<b>SANODYE MAGENTA LF</b>
		<b>SANODURE BORDEAUX RL</b>
		<b>SANODURE VIOLET CLW</b>
		<b>SANODYE VIOLET MRB NEW</b>
		<b>SANODYE BLUE 2LW</b>
		<b>SANODYE BLUE G</b>

Dark shade	Light shade	Recommended dye bath pH range	Dye bath buffer*	Light fastness <sup>1</sup>	Outdoor application	Indoor application	Heavy metal free structure	Supply form	Single dye (s) Mixture (m)
g/l	g/l								
5.0	0.2	5-6	S	> 9	●	●		Granules	s
4.0	0.1	5-6	S	7		●	●	Granules	s
2.0	0.2	5-6	S	7		●	●	Granules	s
5.0	0.2	5-6	S	6-7		●		Granules	m
4.0	0.4	5-6	S	8 (12µm)		●	●	Powder	s
5.0	0.5	5-6	S	6-7		●		Granules	s
0.3	0.1	5-6	S	6-7		●		Granules	s
5.0	0.2	5-6	S	3-4		●	●	Powder	s
3.0	0.1	5-6	A	> 9	●	●	●	Granules	s
3.0	0.1	5-6	A	> 9	●	●	●	Granules	s

**PRODUCT NAME**

Dark shade      Light shade



**SANODAL TURQUOISE PLW LIQ.**



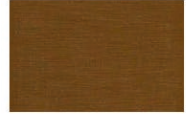
**SANODAL GREEN 3LW**



**SANODURE GREEN LWN**



**SANODURE BROWN GSL**



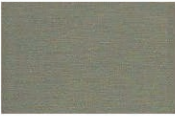
**SANODURE BRONZE 2LW**



**SANODURE BRONZE G**



**SANODURE YELLOW BROWN 2G**



**SANODURE OLIVE BROWN 2R**



**SANODURE GREY NL LIQ.**

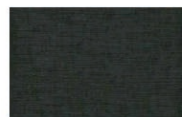


**SANODURE GREY HLN LIQ.**

Dark shade	Light shade	Recommended dye bath pH range	Dye bath buffer*	Light fastness <sup>1</sup>	Outdoor application	Indoor application	Heavy metal free structure	Supply form	Single dye (s) Mixture (m)
g/l	g/l								
5.0	0.1	5-6	S	>9	●	●		Liquid	s
3.0	0.2	5-6	S	>9	●	●		Granules	s
1.0	0.2	5-6	S	7-8		●		Granules	s
1.0	0.2	5-6	S	6-7		●		Granules	m
1.0	0.1	5-6	S	7		●		Granules	s
1.0	0.2	5-6	S	6-7		●		Granules	s
1.5	0.4	5-6	S	5-6		●		Granules	m
1.0	0.1	5-6	S	6		●		Granules	s
1.5	0.1	5-6	S	7-8		●		Liquid	s
0.3	0.1	5-6	S	7-8		●		Liquid	s

**PRODUCT NAME**

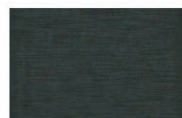
Dark shade      Light shade



**SANODAL BLACK 2LW**



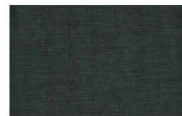
**SANODAL DEEP BLACK HBL LIQ.**



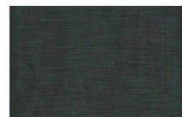
**SANODAL DEEP BLACK H3LW**



**SANODURE BLACK CRO**



**SANODYE BLACK OA**



**SANODAL DEEP BLACK MLW**

Dark shade	Light shade	Recommended dye bath pH range	Dye bath buffer*	Light fastness <sup>1</sup>	Outdoor application	Indoor application	Heavy metal free structure	Supply form	Single dye (s) Mixture (m)
g/l	g/l								
10.0	1.0	4.5	-	> 9	●	●		Granules	s
10.0	0.2	5-6	S	> 8 (12 μm) > 10 (25 μm)	●	●		Liquid	s
10.0	0.2	5-6	S	> 8 (12 μm) > 10 (25 μm)	●	●		Paste	s
10.0	0.2	6.5-7.5	-	3-4 (12 μm) 7-8 (20 μm)		●	●	Powder	s
10.0	0.6	5-6	S	> 8	●	●	●	Granules	s
10.0	-	4.5	-	> 9	●	●		Granules Powder	m

# QUALITY PRODUCTS FOR ANODIZED ALUMINUM

Heubach manufactures a full range of dyes and chemicals, many of which had been patented. In 2009 Heubach introduced Sanodye grades, which do not contain heavy metals as structure element. Heubach has initiated the development of an improved sealing process with the target to cover a wide spectrum of economic (e.g. energy efficiency) and environmental (e.g. heavy metal free structures) aspects. The manufacturing of Heubach's dyes involves multi-step syntheses and utilizes many different process technologies. Precision, cleanliness and attention to the detail are key components to offer the finest products on the market. Heubach offers its customers technical service (e.g. color matching support), assistance to improve their production processes and guidance to reduce waste in production.

## FOR THE DYEING OF ANODIZED ALUMINUM HEUBACH OFFERS THREE DYE RANGES:

### SANODAL

- Excellent light- and weather fastness properties
- Suitable for outdoor and indoor applications
- Applicable alone or in combination with an electrolytic dyeing process
- Broad shade range accessible
- Designed for many architectural needs

### SANODURE

- Comprehensive range of different colors, covering virtually all coloristic needs
- Good fade resistance properties
- Designed for indoor applications

### SANODYE

- Organic dyes with heavy metal free structures
- Good to excellent fade resistance properties
- Designed for interior or outdoor applications as indicated in our technical data sheets
- Organic dyes with heavy metal free structures for more environmentally conscious applications

## PRODUCTION CONDITIONS FOR THE ILLUSTRATIONS

<b>ANODIZING</b>	Current Density	1.2 – 1.8 A/dm <sup>2</sup>
	Voltage	12 – 20V
	Electrolyte	180 – 200 g/l free H <sub>2</sub> SO <sub>4</sub> 5 – 15 g/l Al
	Temperature	18 – 20 °C
	Time	25 – 75 min
	Oxide Layer	18 – 20 µm
<b>DYEING</b>	Temperature	25 – 60 °C
	Concentrations	See illustrations
	pH	Mainly 5.0 – 6.0 acetate buffered, exceptions see technical literature
	Time	10 – 35 min
<b>SEALING</b>	Temperature	> 96 °C
	Time	40 – 60 min
	Medium	Deionized water, pH 5.5 – 6.0 plus: 20 ml/l Anodal ASL (liq.) (Nickel sealing) or 3 g/l Anodal SH-1

*For detailed information on pretreatment, anodizing, dyeing and sealing conditions, please check our technical brochure:*

*Variations in Color: The dyeing of anodized aluminium.*

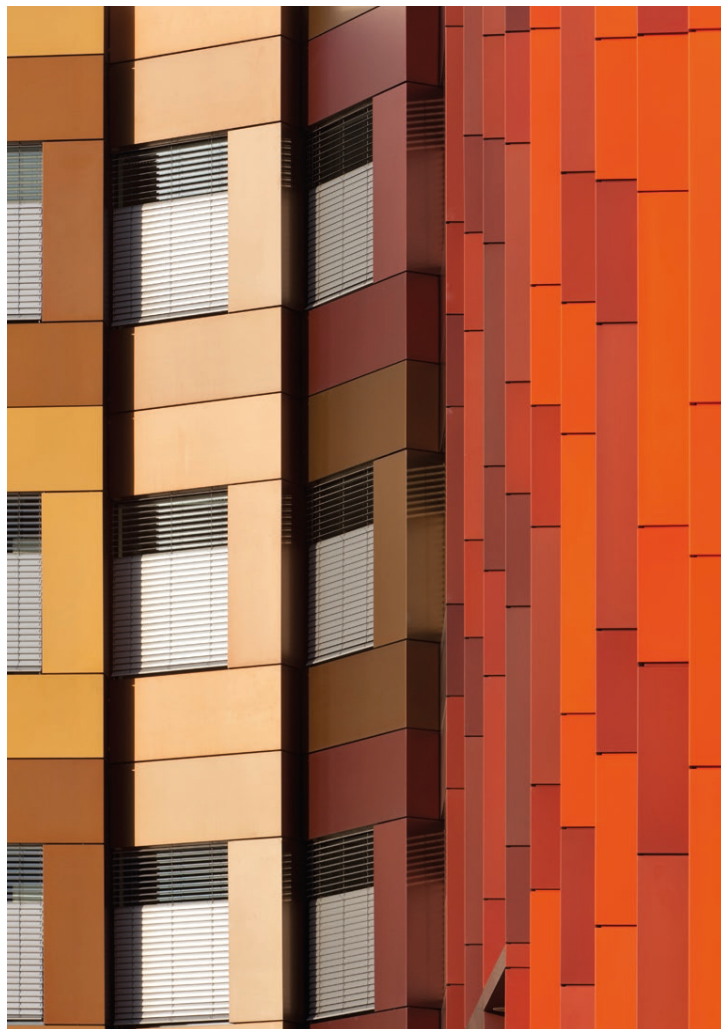


## IMPORTANT NOTES

- Pretesting in the customer specific material following the customer specific production process is absolutely necessary, especially with respect to compatibility and achievable shade
- The colored aluminum plaques cannot be used for tests of dye properties and coloristic comparisons

## ABBREVIATIONS AND EXPLANATIONS

- 1** The light fastness ratings relate to ISO 2135 and ISO 105B02 and were done with deep shades at 12  $\mu\text{m}$  anodized oxide layer thickness as described in our technical literature and do not necessarily refer to the illustrated plates in this shade card. With paler shades or lower oxide layer thicknesses, lower seal quality or softer layers, light fastness tends to be generally lower.
  - 2** A first break phenomenon for ferrioxalate containing dyes is well known and documented in the literature: Those kind of compounds show a fading after a short radiation time (approximately 100 h) which then does not further degrade.
- \* S SODIUM ACETATE BUFFERING:**  
Add 8.0 g/l sodium acetate trihydrate ( $\text{NaCOOH} \cdot 3\text{H}_2\text{O}$ ) into the dyeing tank; then slowly add approximately 0.4 ml/l acetic acid 100 % (conc.  $\text{CH}_3\text{COOH}$ ) until the pH 5 – 6 is achieved.
- \* A AMMONIUM ACETATE BUFFERING:**  
Add 5.0 g/l ammonium acetate ( $\text{NH}_4\text{COOH}$ ) into the dyeing tank; then slowly add approximately 0.5 ml/l acetic acid 100 % (conc.  $\text{CH}_3\text{COOH}$ ) until the pH range 5 – 6 is achieved.



<b>PRODUCT NAME</b>	Solubility 20 °C / 60 °F
	g/l
<b>SANODYE YELLOW 3GL</b>	100
<b>SANODAL GOLD 4N</b>	> 300
<b>SANODURE FAST GOLD L</b>	60
<b>SANODURE ORANGE G</b>	40
<b>SANODYE ORANGE 2B</b>	7
<b>SANODYE GOLDEN ORANGE RLW</b>	100
<b>SANODURE ORANGE RL</b>	40
<b>SANODURE FAST BRONZE L</b>	100
<b>SANODYE BROWN R</b>	> 300
<b>SANODAL ORANGE 3LW LIQ.</b>	misc.
<b>SANODAL RED B3LW</b>	150
<b>SANODYE RED GLW</b>	50
<b>SANODYE RED RLW</b>	100
<b>SANODURE FIERY RED ML</b>	75
<b>SANODYE MAGENTA LF</b>	85
<b>SANODURE BORDEAUX RL</b>	50
<b>SANODURE VIOLET CLW</b>	20
<b>SANODYE VIOLET MRB NEW</b>	95
<b>SANODYE BLUE 2LW</b>	5

<b>PRODUCT NAME</b>	Solubility 20 °C / 60 °F
	g/l
<b>SANODYE BLUE G</b>	3
<b>SANODAL TURQUOISE PLW LIQ.</b>	misc.
<b>SANODAL GREEN 3LW</b>	100
<b>SANODURE GREEN LWN</b>	40
<b>SANODURE BROWN GSL</b>	10
<b>SANODURE BRONZE 2LW</b>	5
<b>SANODURE BRONZE G</b>	15
<b>SANODURE YELLOW BROWN 2G</b>	20
<b>SANODURE OLIVE BROWN 2R</b>	30
<b>SANODURE GREY NL LIQ.</b>	misc.
<b>SANODURE GREY HLN LIQ.</b>	misc.
<b>SANODAL BLACK 2LW</b>	50
<b>SANODAL DEEP BLACK HBL LIQ.</b>	misc.
<b>SANODAL DEEP BLACK H3LW</b>	misc.
<b>SANODURE BLACK CRO</b>	40
<b>SANODYE BLACK OA</b>	20
<b>SANODAL DEEP BLACK MLW GRAN.</b>	50
<b>SANODAL DEEP BLACK MLW</b>	50



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