

RLM – COLOURS OF THE GERMAN LUFTWAFFE

The aircrafts of the German LW (Luftwaffe) in WWII were painted with standardized paints. The colours of this paints were registered as RLM# (Reichs Luftfahrt Ministerium). In certain regulations it was exactly determined where and when the colours had to be used. The sources as a whole are very poor and if you would like to know more about it, you'll find some books in the appendix. We have to make a distinction between paint and colour in the following paragraphs.

Basically I can say that there is a difference between pre-war splinter camouflage until approx. 1938, splinter camouflage in RLM65/RLM70/RLM71 (just to read 65/70/71), attack camouflage of fighters until approx. 1944 and camouflage in the last months of battle. The aircrafts from production line were delivered in standardized camouflage which was modified at front line.

Examples for the camouflages of the German Luftwaffe in WWII :	
pre-war camouflage until approx. 1938	61/62/63
early biplane-fighters, prototypes	02
splinter camouflage (green) - aircrafts except sea-aircrafts until the end of 1939, later bomber, transport aircrafts and battle-aircrafts	65/70/71
3- colour desert camouflage (Africa)	78/79/80
nightfighter (firstly black only)	75/76
fighter approx. Since the end of 1939	65/70/71
fighter France and Battle of Britain	early 02/65/71
attack camouflage of fighters from 1941 until 1944	74/75/76
fighter 1944-45	76(84)/81/82(83)

The paints were produced by different paint producers in German occupied territory; the situation became more complicated because of the war. This was the reason why only low-grade and domestically produced pigments were used for the paint's production. Therefore it was already impossible to produce a precise colouring in the early stage of war. Paints reacted to differently weather and high altitude radiation. On the basis of black and white photography it is nearly impossible to identify for variant shade of grey with certainty (i.e. RLM 65 and RLM 65 A). The colour photos from WWII are not proper for an exact identification of colours, since after that long time a variation of colours occurred. And with today's colour films you will get different results by constant ratio of light. To make this confusion perfect, you have to know that in the last months of war every bottle of old and new colour was used and had been mixed in a ratio of 1:1 according to the regulation (Luftwaffenvorschrift) of the LW.

So, for the today's modeller, there is no standard RLM#. For the later colours like RLM81 / 82 / 83 no RLM colour sample card existed. Original aircraft parts and sections had to be used for the present creation of colour sample cards. Personally I put the main focus on a harmonic camouflage. Many RLM# colours have a cross reference to a RAL# (Reichs Ausschuss Lacke).

Today there are some paint producers, like GUNZE, TESTORS, JPS-COLOR, LIFE-COLOR etc., which have the RLM colours in their production program. These colours are labelled with these RLM#. These colours have to be used with attention, but they are much closer to the original colour than products from HUMBROL, REVELL, etc. The colours from GUNZE were produced on the basis of the RAL colour sample card. For the aircraft as well as the vehicle colours. At least this applies to number 4## and higher. In my opinion these colours are quite accurate and they are good to handle with an airbrush.

■ COMMENT FOR RLM-COLOUR CHART:

This chart includes all known RLM colours, the colour RLM 84 is not given, since this colour did not officially exist. Also not given is RLM 99 where 99 means shade irrelevant. RLM 00 means clear varnish. All RLM colours were labelled with numbers and not with the term. For some colours the versions are known. If this is the case I mentioned the number of known versions in the column versions. Most of the versions were brighter or darker, with just one exception. RLM 81 ; the mentioned FS number is a brown violet shade, like it can be seen on colour profiles. It is supposed that this shade was brought directly to the units and was applied there. The other variants of RLM 81 are more olive green. I abstained from colour specification in FS numbers, for the variants of RLM 81, since they vary too much according to the sources.

■ HOW DID I GET THE COLOUR REFERENCES ?

In the web you find a lot of colour charts with cross references to different paint producers. After comparison I found out a lot of differences in the charts. Since most of the producers are not from DIN and RAL compound areas, I decided to work on the FS (Federal Standard) basis. I got the up-to-date colour sample cards FS-595b from the States. Many colour charts, like the IPMS Colour Cross Reference Guide or the FS # on the Aeromaster decal sheets are compound on the FS-595a. Therefore I also wrote these numbers down. (source: IPMS colour Cross Reference Guide). Unfortunately a lot of numbers of colours were deleted when there was the change from FS-595a to FS-595b. These colours are mentioned extra and shown in blue.

I took as a reliable source the book *The Official Monogram Painting Guide for German Aircraft 1935-1945* to specify the colours based on FS-595b. In this book are some colour sample cards (painted, but not printed), which are made on specification from the German RAL-institute. I compared these colour sample cards with such one from FS-595b and wrote down the corresponding colour number. Non of these FS numbers corresponds to 100%; all FS numbers with greater differences are specially mentioned in yellow.

I took the RAL numbers from the book *Surface Protection Treatment (Oberflächenschutzverfahren)*, which is quite a reliable source. Whenever an RAL # did exist the colours from Revell and Humbrol are referenced by this RAL #. These colours are specially mentioned in green. I used the Humbrol Authentic Colours as a conversion chart (the colours didn't fit well) and by means of the Humbrol # I made a reference to the corresponding Revell #. These colours are specially mentioned in red. Unmarked Humbrol and Revell colours are referenced by FS 595b.

RLM	Var	TERM	APPLICATION	FS-595b	FS-595a	RAL	Revell	Humbrol
00		water pale	protecting coat					
01		silver	undercarriage, coats	17178	17178	9006		
02		RLM-grey	interior, camouflages, prototypes	34159	36165	7003	45	86
03		silver grey	early paint	37200	37200			
04		yellow	markings	33538	33538	1004		154
05		ivory	early paint for glider	33798	37880			
11		grey						
21		white	markings	27780	37886	9001	5	34
22		black	markings	37038	37038	9004	8	33
23		red	markings	31302	31140	3020		
24		dark blue	markings	25053	25053	5000	56	25
25		pale green	markings	34090	34115	6000	365	
26		brown	early camouflages, markings	30109	30109	8004		
27		yellow	markings	33637	33637	1021		
28		claret red	markings	30045	30032			
41		grey	interior	36463	36440	7011	71	92
42		grey				7012	77	79
61		dark brown	camouflages until approx. 1938	30040	30040	8019	81	10
62		green	camouflages until approx. 1938	34159	34128	6003	361	117
63	2	pale green	camouflages until approx. 1938	36375	36373	7033		115
64		light blue	called exportcolour	35526	35414			
65	2	pale blue	undersurfaces	35352	35352		55	65
66		black grey	interior (cockpit visible)	37030	36081	7021	9	184
67		dark olive	called exportcolour	34098	34098			
68		pale olive	called exportcolour	34258	34097			
69		lichtloh	called exportcolour	33695	33596			
70		black green	camouflge, propeller	34052	34050			91
71		dark green	camouflage	34083	34079		363	30
72		green	camouflage - sea-aircraft	37030	36081			
73		green	camouflage - sea-aircraft	36081	34092			32
74	2	dark grey	camouflage	36081	34086			32
75		midium grey	camouflage	26132	36122			140
76	3	light blue	camouflge, undersurface	36473	36473			175
77		pale grey	markings	26420	36493	7035	371	196
78		pale grey	undersurfaces - Africa	35352	35352			122
79		sand yellow	camouflage - Africa	30219	30215		382	118
79		sand brown	camouflage - Africa	33448	33434		382	118
80		olive green	camouflage - Africa	34079	34052			116
81	3	brown violet	camouflage since approx. 1944	30045	34087		66	155
82	2	pale green	camouflage since approx. 1944	34096	34128	6003	361	117
83	2	dark green	camouflage since approx. 1944	34138	34138	6006		108
91		dural grey	Lufthansa - colour					

- = just approx. right shade
- = does not exist anymore in FS595b
- = referenced by RAL#
- = referenced by Humbrol Authentic Colors

Comments to RLM-79: At the beginning of the war in Africa RLM-79 sand - brown was used. This paint was probably in Italian stocks. Later on RLM-79 sand - yellow was used, which was paler than sand - brown.

Comment to FS-Number System: 1xxxx = gloss, 2xxxx = semi - gloss, 3xxxx = flat. Corresponding to the flat colour shade 34138, no semi - gloss or gloss shade must exist.

■ THE SCALE-EFFECT

An additional aspect of determination of shades of colours is the scale effect. Every model reflects because of its smaller size less light than the original. Therefore a model painted with original colours looks always too dark. To avoid this effect we can mix to every colour a higher amount of white. At this topic there are many different opinions.

The amount of white can be calculated by the following formula:

Scale : 2 = % of white has to be added to the basic colour

Example: 1:72 > 72:2 = 36% white to be added, 1:32 > 32:2 = 16% white to be added

This formula can not be adopted for big (1:24) and small scales (from 1:144 and higher). At the scale of 1:24 you can abstain from adding white. The formulas mentioned above are often published. They are also published in The Official Monogram Painting Guide to German Aircraft. This book is in Europe and in the States quite common.

British modellers prefer it a little bit darker, formulas from Ian Huntley:

1:32 - 7%, 1:48 - 10%, 1:72 - 15%, 1:144 - 23%

(from: Ian Huntley - Scale Aircraft modelling Vol. 5 / # 10)

Basically you must be careful, since colours might change. Red to pink. Black to grey. If you work on basis of chromatic you can avoid the change of shade.

■ CONCLUSION:

"The scale effect is one of the most controversy fields in modelling. The discussion is very old and until now there is no satisfactory solution for every modeller. We use 3 different colour sample cards, all of them should have original colour samples from RLM-colours. The different shades of this cards differ quite often very much. If we think to use for every scale a different card so it would be too much to find the right shade. The thing would not match. We should consider that the colours of the camouflage should fit and the painting should look good. There is nothing more to add."

(this is the comment of Revell-Germany about Luftwaffe colours)

This schedule is not considered as the absolute truth of colours. I am always open for hints and information concerning this matter.

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SOURCES

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different charts from paint producers