

metalac

HAND-MADE ENAMEL COOKWARE PRODUCTION SPECIFICITIES



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In cookware production applying enamel manually is not just a technical process, but a true art bringing warmth to each piece that carries a story with it - a story of patience dedication and skill of our workers who carefully create every detail. Although sometimes visual effects may bring slight variations, these small irregularities are inherent in our production process and it is the uniqueness of each piece that makes it special authentic and irreplaceable. Every detail from surface preparation to application of enamel requires high precision and expertise, and it is the hands of our skilled enamellers that contribute to the originality of each product. Our commitment in work is not only about producing cookware, but to make and create lasting values that will bring functionality aesthetics and warmth of shared moments to your kitchen.

In the world of mass production it is this hand-crafting that adds value to the product - each piece has its own character, story and spirit. Each piece goes through various stages in which precise work is invested but at the same time can lead to minor deviations and specific features that we address in the text to follow.

Enamel is a specific and demanding material. It is a glass coating that is applied to metal and then fired at high temperatures and as a natural part of the production process certain visual irregularities may appear, like small spots, uneven colour, traces of oven supports, small variations in enamel layer thickness or slight nuance differences. These specific features are not defects they don't affect the use value of cookware, its durability or safety during use or longevity but come as a result of the manufacturing process nature.

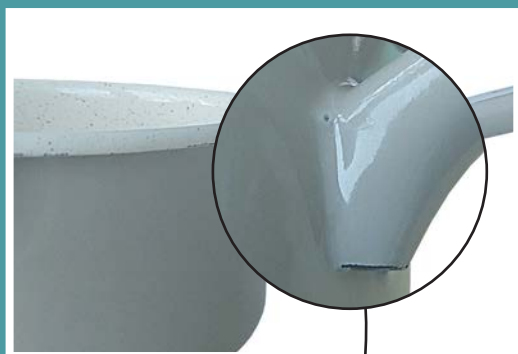


This document was created to give our partners a clear and transparent insight into all the features appearing on handmade enamelware and to present the most common visual irregularities that may appear during the production process.

We believe that well-informed partners better understand the value of production and that authenticity of these small differences add beauty and uniqueness to each piece. Being informed also helps strengthening trust in our work and that's why we want our partners to be familiar with all aspects of the product - both the beautiful and the less ideal - because each piece has its own story and uniqueness that comes precisely from the way it was made.

The photos in this document illustrate the specifics of hand-made production and in some photos the effect is more emphasized to give a closer description. We thank you for your trust and look forward to our continued cooperation.

1



BLISTER ON THE HANDLE WELDED JOINT

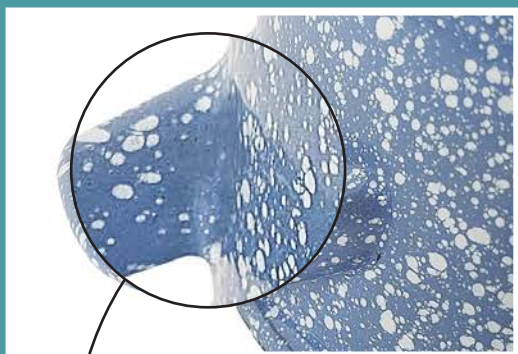
A phenomenon occurs at the electrically welded joint between handle and cookware body. Later in the enamelling process, in the firing oven at very high temperatures, the air trapped in the handle after welding escapes from the inside of the handle in the weldment zone leaving a small black opening which we call a blister.



Number of specificities tolerated

ONE
on each handle

2



SPOT NOT COVERED WITH ENAMEL ON THE HANDLE WELDED JOINT

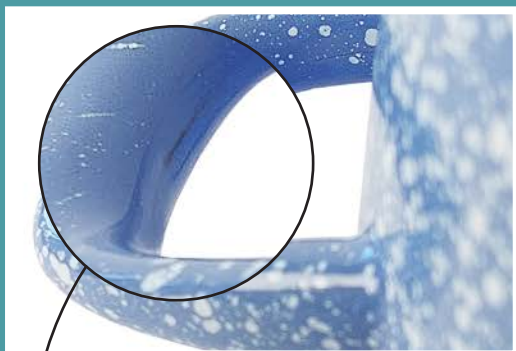
A phenomenon that occurs at the welded joint of handle and cookware body and it is consequent to enamelling technique. In the firing oven the air trapped in the handle after welding escapes from the inside of the handle and evaporates at high temperatures leaving a dark dot or dark line trace as if cover enamel is missing in that spot.



Number of specificities tolerated

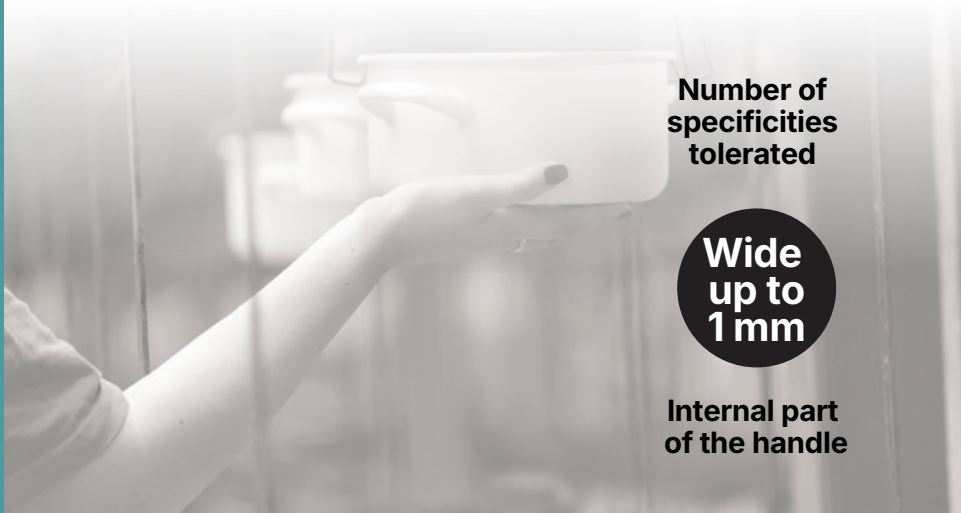
ONE
on each handle

3



ENAMEL LOOKS SEPARATED ON THE HANDLE SEAM

A phenomenon that manifests as a dark line on the inside of metal handle where two pieces of sheet metal are joined and occurs during enamelling i.e. firing of enamel, due to the properties and behaviour of enamel it visually looks as if the joint line is not covered with enamel.



Number of specificities tolerated

Wide up to 1 mm

Internal part of the handle

4



BLISTER INSIDE THE HANDLE

The geometry of classic cookware metal handles is such that on the inside there is a small hole for technical and technological reasons to let residue air from enamelling evaporate in later phase of firing at high temperatures. The so called technological hole is necessary as to obtain certain quality of enamel in the welding area and the phenomenon manifests as a dark blister at the spot of the mentioned hole.



Number of specificities tolerated

TWO
on each handle

5



NOT COVERED WITH ENAMEL ON THE INSIDE OF THE HANDLE

The geometry of classic cookware metal handles is such that at manual dipping of a cookware piece into enamel, exceeding enamel has to be eliminated from the inside of the handle with appropriate movements of the worker. In further phases upon drying and firing on the some areas on inside of the handle could be without the covering enamel. The handle is however fully covered by the ground enamel which is applied in the previous immersion operation.

Number of specificities tolerated

One arena on the internal part of the handle



6



NOT COVERED AROUND THE HOLE ON THE HANDLE

Some classic items have metal handles with a technical-technological hole on one end as in enamel drying phase items are hanging on hooks. Such dried enamel layer in the following phase of firing at high temperature could separate from the hole edge at the point it was hanged and it is manifested as lack of enamel in that spot.

Number of specificities tolerated

in one area of the handle hole



7



BURNT ENAMEL ON THE HANDLE

At manual enamelling i.e. dipping, enamel is evenly distributed over the item surface with appropriate movements of the worker. Enamel is therefore applied over the handle in a thin layer and in case of delicate colours the enamel underneath is visible as a dark shadow, precisely because of the thin covering enamel. The metal handles have such a shape that the enamel stays there a thin layer regardless of the dipping method which contributes to this visual effect on the enamel surface.



Number of specificities tolerated

Part of the handle in one area

8



YELLOWING OF ENAMEL

A phenomenon that most often manifests on metal handles as a consequence of somewhat thinner enamel layer on the surface of the handle which is due to its geometry very demanding for enameling by manual dipping in production of our classic cookware. For this reason after firing and depending on enamel colour, a slight yellowing of varying intensity may occur on the enameled handle surface.



Number of specificities tolerated

On the handle or under the rim

9



HOOK TRACES INSIDE THE HANDLE

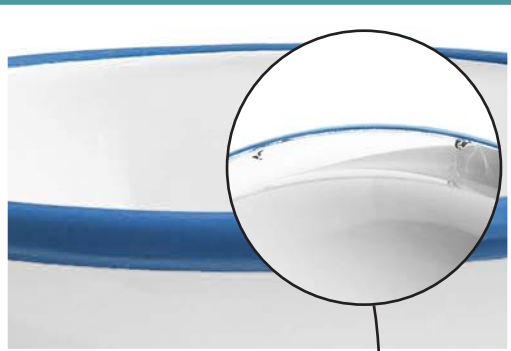
One of key stages of the enamelling process is oven firing at high temperatures. Cookware items coated with wet enamel layer and dried are then placed onto the oven chain by the operator, hanging them on (two) dedicated metal hooks. The metal hooks are in contact with the item i.e. internal part of the handle in two points, if the handle has appropriate geometry, and leave traces visible after the firing process.



Number of specificities tolerated

2

10



HOOK TRACES UNDERNEATH THE RIM

One of key stages of the enamelling process is oven firing at high temperatures. Cookware items coated with wet enamel layer and dried are then placed onto the oven chain by the operator, hanging them on (two) dedicated metal hooks. The metal hooks are in contact with the item i.e. internal part of the rim in two or more points, in case of larger diameter items. After the firing process when items are taken off the hooks there remain visible traces underneath the rim in points of contact with hooks.

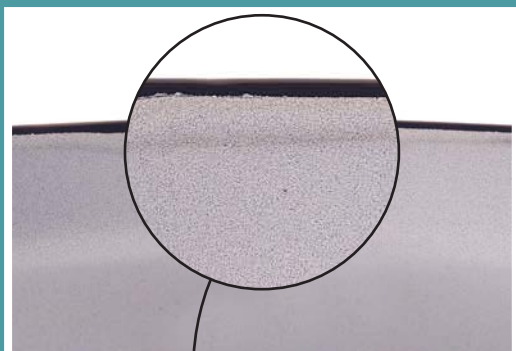


Number of specificities tolerated

2-6
in different parts of rim

Depending on the item size

11



WATER LINE

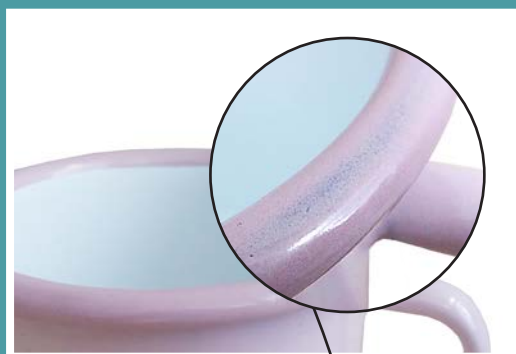
A phenomenon that manifests as a line on the internal surface near the cookware item top few millimetres under the rim all way around. The phenomenon is caused by water passing from one enamel to the other enamel during their contact in the enamelling process and as a result of balance of two phases, wet and solid. In case of coloured internal enamels the phenomenon could be visually more pronounced compared with bright or white internal enamel.

Number of specificities tolerated

All the circumference of the item



12



BURNT RIM ENAMEL

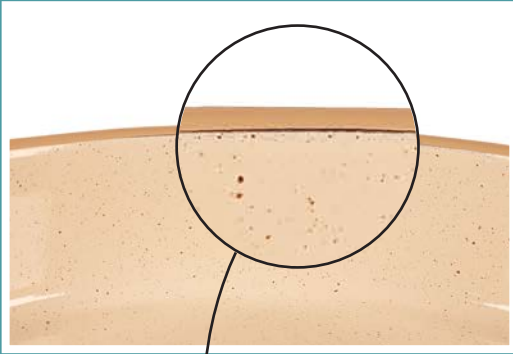
Enamel is applied on the cookware rim with a specific hand movement. It means that enamel application can't be completely uniform so dark shades appear in certain areas of the rim as if not sufficiently covered by enamel, which is characteristic of the enamelling process of such surfaces.

Number of specificities tolerated

Part of the rim, not the whole surface



13

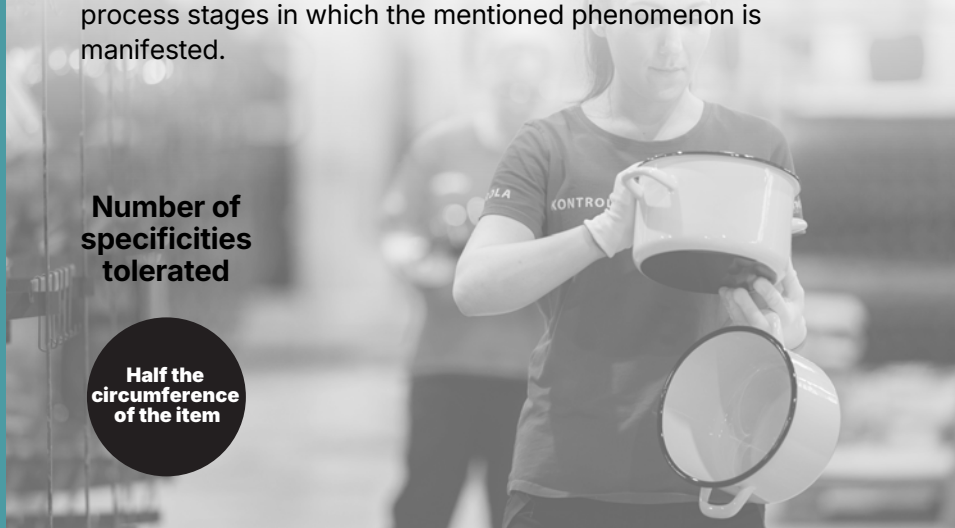


BLACK LINE BETWEEN RIM AND INTERIOR ENAMEL

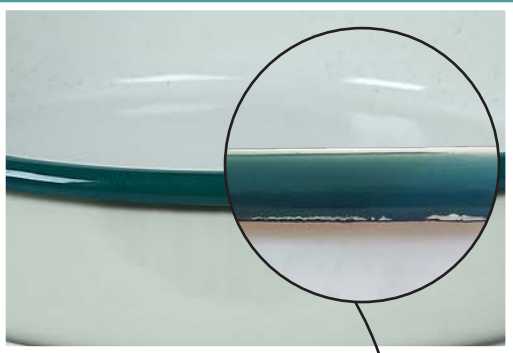
In the phase of cookware enamelling process where the operator applies enamel over the rim surface and the rim enamel colour is different from internal enamel colour, the two enamels do not completely join which is manifested as a thin dark line between them. This results from the application technique and from physical-chemical processes on the border of the two phases, wet and dry, where two enamels (rim and internal) meet since the rim enamel is dry while the internal enamel is wet in one of the process stages in which the mentioned phenomenon is manifested.

Number of specificities tolerated

Half the circumference of the item



14

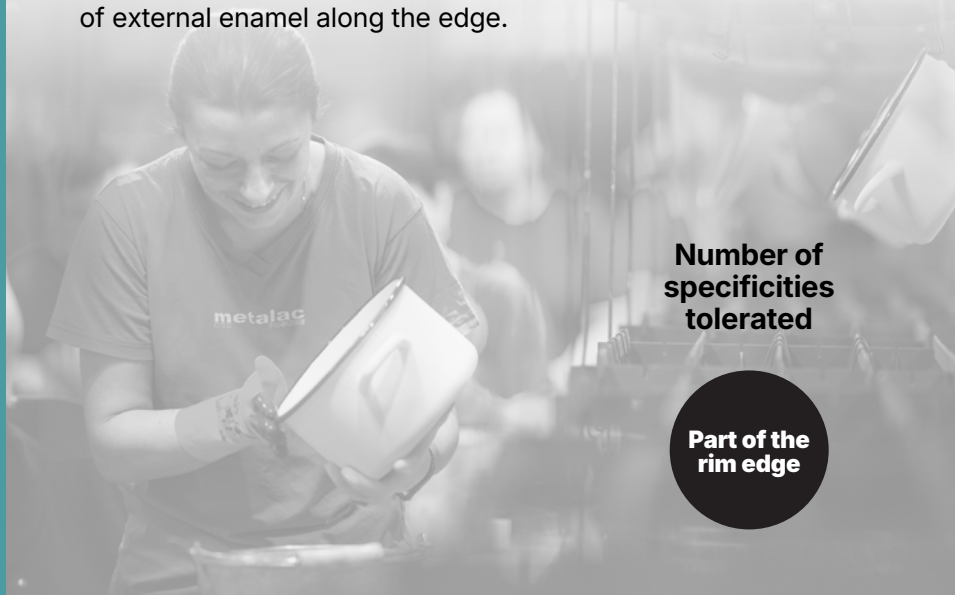


RIM NOT CLEAN FROM EXTERNAL ENAMEL

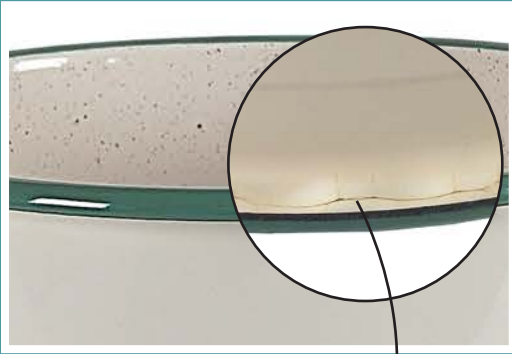
At cookware enamelling by manual dipping and the rim is in different colour comparing to external surface of the cookware item in one stage of the process an operator wipes off the excess of enamel from the rim after dipping. In a later stage of the process during drying enamel could additionally flow onto the rim surface and be visible after firing in the area where it has not been completely wiped so the rim remains in the colour of external enamel along the edge.

Number of specificities tolerated

Part of the rim edge



15



ENAMEL EXCESS NOT REMOVED UNDER THE RIM

Classic cookware enamelling process involves manual dipping into ground enamel by a worker using appropriate utensils and appropriate movements in order to uniformly distribute the enamel over the cookware surface being enamelled inside and outside. Specifically for the external surface of cookware items with classic enamelled rim dipping operation involves removing excess enamel from under the rim. It may happen that some enamel remain in the rim and in later drying and firing stages show as a phenomenon of thickening or a wavy surface.

Number of specificities tolerated

2-5 cm
Depending on the item size



16



ENAMEL PARTICLES

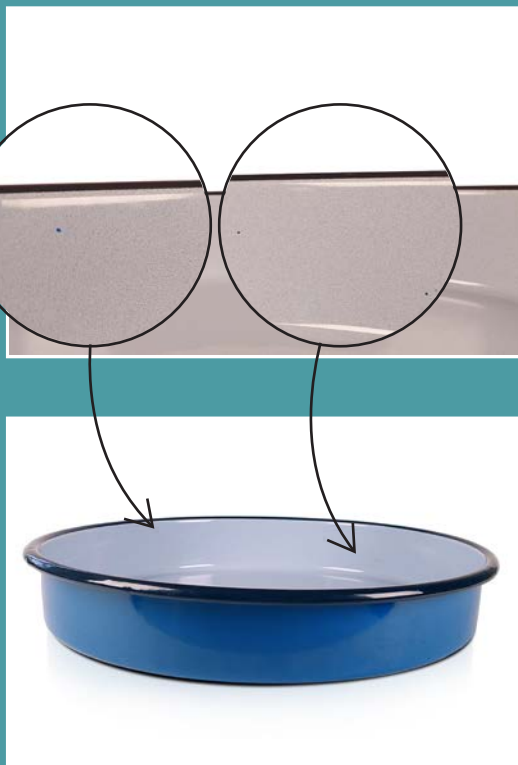
Dust particles present in the production process environment as well as the particles in the raw materials used for enamel preparation, in various stages of the process inevitably come into contact with products that are being enamelled. Manifested as tiny dark impurities fused into enamel they are particularly visually expressed on bright enamel colours, mostly on white and similar shades of white and cream and usually concentrated in one area on the exterior or interior surface, even appearing in completely different areas of a cookware item.

Number of specificities tolerated

3-5 particles interior/ exterior



17



SPRINKLED WITH OTHER ENAMEL

Certain enamelling operations involve exclusively manual work. When applying liquid enamel on interior and exterior surfaces droplets of enamel from one surface come into contact with the other surface of that same cookware item. After firing when the enamel gets its final look those droplets appear on the surface as tiny dots in the colour of the other enamel.

Number of specificities tolerated

3-5

in one area of the item interior / exterior

Depending on the item size

18



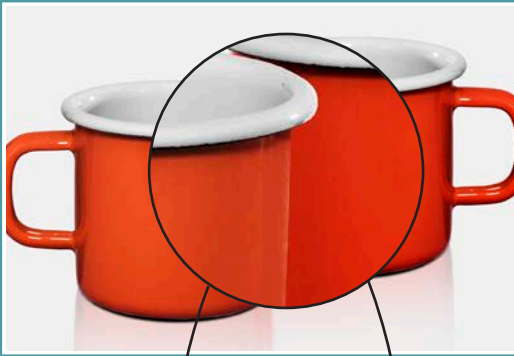
COLOUR SEPARATED ON THE ENAMEL SURFACE

Something darker lines from the enamel shade could be observed on the enamelled surface. Such lines are resulting from the process of liquid enamel application onto the cookware surface and originate from colour pigments used to obtain desired colour of fired enamel. With some sensitive colours this phenomenon is more pronounced, but it is inherent in the process and not completely avoidable for given enamel colour.

Number of specificities tolerated

part of the item surface interior / exterior

19



ENAMEL COLOUR NUANCING

Enamel is fired at high temperatures to obtain its final look and shine. In such conditions there may be a change in colour nuances due to temperature sensitivity of the pigments contained in the colour. Considered variety of enamel colours, wide range of products and temperature conditions of the process it is obvious that slight deviation and change in colour nuance are inherent in the process without taking into account a number of other technical and technological factors that may affect this phenomenon.

Number of specificities tolerated

5-10%
Difference visible with naked eye

20



MINOR FLAWS IN THE DECOR

Application of decor transfers over the cookware item surface is a fully manual operation and involves wetting of transfers with water. After the worker has visually positioned the transfer an excess of water between the transfer and the cookware is squeezed out using a special rubber utensil. If a bit of moisture remains, later in the firing process to get final appearance of the decor, explosive vapour occurs and in these spots on the decor surface leave traces like small bubbles that visually seem as if the decor is damaged.

Number of specificities tolerated

2

On one side of the item

23



TECHNOLOGICAL HOLE ON THE HANDLE

The air captured inside the handle at welding of the handle to the cookware body, goes out during firing at high temperature through the dedicated technological hole situated underneath near the end which is welded to the body. As a consequence of air coming out a small black dot may be visible in the area of the hole.

Number of specificities tolerated

1-2
on each handle



24



LACK OF COVERING ENAMEL AROUND THE HOLE

Some items have holes on the body and in one of the enamelling process phases these holes could be closed with dried enamel, which is cleaned (hole reopened) manually with an adequate tool immediately before cookware is fired in the oven. At this cleaning operation enamel could separate in the area around the hole which after firing is manifested as lack of enamel in that area, but dark ground enamel layer which fully covers the cookware surface is visible beneath.

Number of specificities tolerated

Two to three holes





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