

## Interior Finish Tolerances

### “Smoothness,” “Levelness,” “Thickness,” and “Mottling”

*based on excerpts taken from:*  
NPC Technical Manual 9<sup>th</sup> Edition

---

#### Hand-Crafted Finishes

Variations across the finished surface are expected with hand-crafted products. Minor fluctuations in thickness, levelness, texture, and coloration are inherent (unavoidable) characteristics to the process.

Currently, no National standards, methodologies, or test methods have been established that measure, grade, or determine absolute tolerances for acceptability of levelness, smoothness, texture, or coloration of interior finishes. Cementitious coatings will always have some normal fluctuation in each of the above characteristics due to the nature of the hand-crafted plastering application, the inherent variation of raw materials, and the ongoing effects of the hydration and curing processes. Therefore, tolerance levels for cementitious surface coatings are subjective.

Swimming pool interior finish coatings are considered “floating” finishes that must be leveled, smoothed, and finished by “free hand”. In other words, the interior finish coating is not cast-inplace, molded, screeded, or guided by template, as with most cementitious products. Therefore, all pool finishes will have some inherent fluctuations in smoothness, levelness, texture, and coloration across the finished surface.

#### Viewing Conditions

The pool should be full of water. The proper viewing condition for an inspection should be limited to pools and spas with clean water (ideally, in a chemically balanced condition) and a clean surface, free of algae, dirt, and debris.

The proper time of day for a visual inspection of a pool’s interior finish is in the morning, the afternoon, or on a cloudy day. These are considered the optimal times for viewing, allowing for a true and representative observation of the finish. Inspections or observations made when the sunlight is directly overhead, or on windy days, or in poor lighting conditions, are not considered a true representation of the appearance of the surface. Such conditions hinder the ability to observe the interior finish’s aesthetic features and imperfections.

Inspections or observations should not be made at night. Observations aided by pool lights or other sources of light that shine across the surface, instead of upon the surface, amplify imperfections and are not considered a true representation. Such lighting grossly exaggerates imperfections and/or the waviness across the surface finish.

## AESTHETICS AND TOLERANCES

### Smoothness

The NPC describes the 'smoothness' of a non-textured hard troweled plaster finish as being no rougher than very fine sandpaper (of 220 grit or finer), like the smoothness of an eggshell. The intent of smoothness is to create a swimming pool surface finish that is easily maintained and user friendly to bathers. However, it is not recommended that steps, benches, or walkout areas be overly smooth. Overly smooth finishes in these areas should be avoided to prevent slipping.

Exposed-aggregate finishes are not measured by smoothness but by 'texture'. They have surfaces where the cement binder has been removed from the surface to expose the sand or rock, resulting in a surface with raised sand or rock at the surface, creating a three dimensional (3D) affect, or texture.

### Texture

A basic tolerance for texture has not yet been established by the trade. The term 'texture' is predominantly used to describe the surface of exposed-aggregate finishes. Texture describes the three-dimensional (3D) aspect of the raised aggregate at the surface, as opposed to the non-textured smooth surface of the hard-trowel finish. So, the finish may have a fine texture or a coarse texture depending on the size and type of aggregate. There is no direct relationship between the raised "texture" of an exposed-aggregate finish and the "smoothness" of a hard-troweled finish. A textured finish can be smooth or rough, and a non-textured finish can be smooth or rough.

### Levelness

The interior finish of the swimming pool should be applied and finished so that it is consistent across the surface. All hand-troweled finishes have some inherent imperfections and waviness. Nevertheless, a reasonable 'levelness' should be attained. This means that no section of the surface should have excessive waviness in comparison to another section. Transitions between walls, coves, floors, benches, steps, tiles, or around plumbing fixtures and light fixtures should be smooth and uninterrupted.

The interior finish coating cannot be used to level the swimming pool substrate beyond the maximum thickness tolerance allowances. This means, plasterers must bevel up to the elevation of a tile line, piping, light fixtures, or other adjoining materials that are greater than  $\frac{3}{4}$ ". In this situation, plasterers are not able to make the entire finish the same thickness as the plumbing, lights, or adjoining material. Likewise, plasterers must bevel down to plumbing, lighting, or adjoining materials that are less than  $\frac{3}{8}$ ".

### Thickness

The cementitious surface coating should have an average minimum 'thickness' of  $\frac{3}{8}$ " and an average maximum thickness of  $\frac{3}{4}$ ". Though some fluctuation may exist across the cementitious surface coating, most

of the cementitious surface coating thickness should remain within these tolerance levels. Small areas of highs and lows, spanning no more than several inches in diameter per occurrence, are allowed an additional tolerance. This would include the filling of small holes, pits, or dig-outs (indentations around plumbing fixtures or lighting fixtures) in the substrate.

### **Color Variation (Mottling)**

Normal color variation (normal mottling) generally has a uniform shading, blotchy, or cloudy appearance across the surface of a cementitious surface coating. Normal color variation is a uniform variation across the surface resulting from the differences in moisture content and the rate of cement hydration (the reaction between the water and the cement) within the matrix of the surface coating. Normal mottling or shade variation is not considered a failure or defect. It is a normal characteristic of most cementitious products, not requiring remedy. These variations typically lessen or disappear over time.

### **Arbitration**

Whenever an issue cannot be resolved by the various Parties (homeowner, builder, plasterer, and/or service company) the NPC recommends that the Parties consider arbitration. Arbitration should only be undertaken by the following parties:

- An expert in swimming pool construction or the swimming pool plastering trade,
- A knowledgeable representative of the Registrar of Contractors,
- A knowledgeable representative of a Local, State, or Federal agency, or
- A knowledgeable consultant or representative of a construction materials failure analysis laboratory.

The selected Arbiter should have a general knowledge of swimming pool construction and maintenance, and a specific knowledge of the swimming pool plastering trade, in order to reach accurate conclusions based on observation, inspection, and testing.



#### **National Plasterers Council**

1000 N Rand Road, Suite 214

Wauconda, IL 60084

Ph: 847.416.7272

[mail@npconline.org](mailto:mail@npconline.org)

[www.npconline.org](http://www.npconline.org)