

POWDERLAB

*Comparison between
Industrial Spray Powder
and Powderlab Grains*



1. INTRODUCTION

In order to test the Powderlab, two types of body composition have been tested: Porcelain tile and Wall tile. Each composition, which is obtained with the crusher, contains the same moisture than the standard composition vs all the properties are compared.

Results are showed in the following sections.

2. PORCELAIN TILE

Standard Porcelain tile industrial spray powder contains 6% dry basis of moisture, so the unfired bisque is humidified at this moisture and is introduced in the Powderlab in order to obtain the grains ready to press.

Powderlab grains are pressed at the same conditions than the standard industrial spray powder, 350 Kg/cm² of pressing pressure and during 3 seconds. Results are showed in the tables below:

- Green properties

Table 1. Porcelain Tile

Green properties		
Property	Industrial Spray powder	Powderlab Grains
Green apparent density (g/cm ³)	2.093	2.153
Post-press expansion (%)	1.09	0.98
Green mechanical strength (kg/cm ²)	7.6	8.7

- Dry properties

Table 2. Porcelain Tile

Dry properties		
Property	Industrial Spray powder	Powderlab Grains
Post-dryer shrinkage (%)	-0.04	-0.05
Mechanical strength 20' (kg/cm ²)	25.8	28.2
Mechanical strength 3h (kg/cm ²)	29.2	28.4

For dry mechanical strength samples are introduced in the dryer at 180°C in two time intervals: 20 minutes, to simulate an industrial horizontal dryer, and 3 hours to simulate the behaviour of an industrial vertical dryer. In both situations, after the dryer at 180°C samples are introduced in another dryer at 100°C during 20 minutes in order to homogenise its temperature. After that the test is carried out.

- Fired properties

Table 3. Porcelain Tile

Fired properties		
Property	Industrial Spray powder	Powderlab Grains
Temperature (°C)	1180	1180
Water absorption (%)	0.49	0.59
Lineal shrinkage (%)	5.39	4.92
Piroplasticity·10 ⁶ (mm ⁻¹)	1.460	1.463

3. WALL TILE

Standard Wall tile industrial spray powder contains 6% dry basis of moisture, so the unfired bisque is humidified at this moisture and is introduced in the Powderlab in order to obtain the grains ready to press.

Powderlab grains are pressed at the same conditions than the standard industrial spray powder, 263 Kg/cm² of pressing pressure and during 3 seconds. Results are showed in the tables below:

- Green properties

Table 4. Wall tile

Green properties		
Property	Industrial Spray powder	Powderlab Grains
Green apparent density (g/cm ³)	2.143	2.191
Post-press expansion (%)	1.00	0.94
Green mechanical strength (kg/cm ²)	9.7	8.9

- Dry properties

Table 5. Wall tile

Dry properties		
Property	Industrial Spray powder	Powderlab Grains
Post-dryer shrinkage (%)	0.12	0.10
Mechanical strength 20' (kg/cm ²)	41.2	41.2
Mechanical strength 3h (kg/cm ²)	39.1	40.6

- Fired properties

Table 6. Wall tile

Fired properties		
Property	Industrial Spray powder	Powderlab Grains
Temperature (°C)	1120	1120
Water absorption (%)	12.69	12.38
Lineal shrinkage (%)	-0.43	-0.55