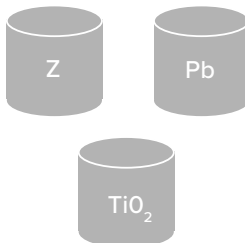


# Manufacturing Process



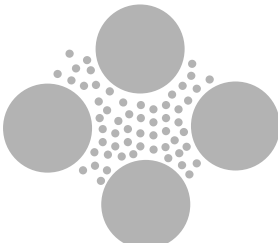
**1 RAW MATERIALS**  
The first step is to weigh



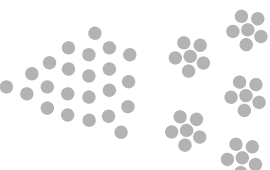
**2 MIXING**  
Dry mix and ball mill the raw materials



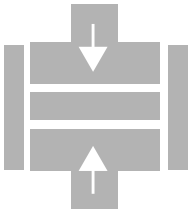
**3 CALCINING**  
The uniform mixture is then heat treated (calcined) during which the components react to form the polycrystalline phase



**4 MILLING**



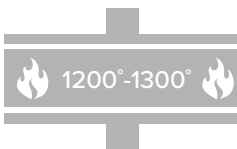
**5 SPRAY DRYING**  
The calcined powder is spray dried to add binder in order to increase its reactivity and to improve pressing properties.



**6 PRESSING**  
Shaping by dry-pressing



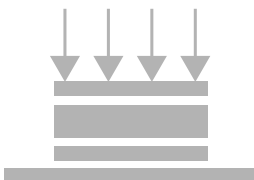
**7 BINDER BURNOUT**  
The binder is burnt out by slowly heating the green ceramics to around 700°C



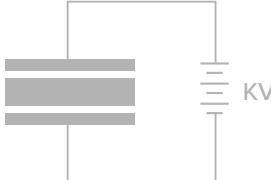
**8 SINTERING**  
The parts are transferred to another furnace, where they are sintered between 1200°C and 1300°C




**9 GRINDING/POLISHING**  
The dimensional tolerance of fired parts is improved by cutting, grinding, lapping etc.



**10 ELECTRODING**  
Electrodes are applied either by screen printing, chemical plating or vacuum deposition



**11 POLING**  
Poling then is carried out by heating in an oil bath above Curie temperature, and applying an electrical field of 2-8 kV/mm to align the domains in the material.



**12 FINAL INSPECTION**  
Final inspection is performed after a minimum of 24 hours later, and includes testing of electrode-ceramic bonding as well as measurement of dimensional tolerances, dielectric and piezoelectric properties.