

# Technical Data Sheet

## Ceramic Powders and Formulations for Passive Components Lowfire X7R Type Dielectric Powders

### Application

Ferro's X7R type dielectric powders are designed for use in the manufacture of Class II MLCC and single layer capacitor components where X7R type TCC characteristics are required.

These products are compatible with precious metal conductors and fire in air at the ranges indicated below.

Compatible electrode and termination ink products are also available from Ferro.

Most of these products are formulated and processed to be RoHS compliant unless noted otherwise. See individual Product Data Sheets for details.

### PME X7R Type Lowfire Products (Sintering Temps: 1080 - 1040°C)

Product Code		X7R212L	LF-222M	X7R262L	AD302L	LF-K3000	LF-K4000
Dielectric Type		X7R	X7R/X8R/BX	X7R	X7R	X7R/X8R	X7R
Dielectric Constant	@ 1 kHz	2100	2300	2800	3000	3050	4000
RoHS Compliant?		No	Yes	No	Yes	Yes	Yes
PbO Content	%	<5	0	<5	0	0	0
CdO Content	%	0	0	0	0	0	0
Typical Fired Layer for DF < 2.5%	µm	9	≤ 2.0% at 20µm	17	8	≤ 2.0% at 20µm	≤ 2.0% at 20µm
RC Product at 25°C, 50V and 1kHz	ΩF	> 20,000	> 10,000	> 20,000	> 20,000	> 10,000	> 5000
RC Product at 125°C, 50V and 1kHz	ΩF	> 500	> 1000	> 1000	> 5000	> 1000	> 1000
Breakdown Strength	V/µm	> 40	> 40	> 50	> 40	> 40	> 40
Particle Size	D50 µm	1.2	0.6	1.2	0.4	0.6	0.8
Surface Area	m <sup>2</sup> /g	2.1	2.7	2.3	3.6	2.1	2
Powder Density <sup>1</sup>	g/cc	6.0	5.8	6.0	5.9	5.8	5.8
Peak Firing Temperature	°C	1115	1080	1120	1140	1080	1080
Time at Peak Temperature	Hours	3	3	2	3	3	3
Electrode Composition	Ag/Pd	70/30	80/20	70/30	70/30	80/20	80/20
Ferro Electrode Ink Product		EL44-135	EI-8020-X7R	EL44-135	EL44-135	EI-8020-X7R	EI-8020-X7R
Ferro Termination Ink Product <sup>2</sup>		TM63-150	TM63-150	TM63-150	TM63-150	TM63-150	TM63-150

<sup>1</sup> Helium Pycnometer.

<sup>2</sup> Products shown are for platable applications. Other types are available.



EU RoHS Directive 2011/65/EU

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