



## Technical Data Sheet (TDS)

**Product Name:** XT 60% Silver on Ketjenblack EC300J Grade T

**Fuel Cell Store SKU Numbers:** 11080071, 11080072, 11080073

**Form:** Fine powder

**Application:** Catalyst for electrochemical applications and other R&D use cases

### 1. General Information

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Parameter	Specification
Appearance	Fine, porous black powder
Composition (wt%)	~ 60 wt% Ag, ~40 wt% Carbon support
Support	Ketjenblack EC300J
Molecular Formula	Not applicable (heterogeneous composite)
Metal Purity	≥ 99.9 % (Ag metal basis)
Storage	Store in a tightly sealed, antistatic container under dry conditions at room temperature.

### 2. Physical Properties

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Property	Value
Particle Morphology	Nanocrystalline Ag clusters uniformly dispersed on high-surface-area carbon
Average Particle Size	40.6 μm (D <sub>50</sub> , Laser Diffraction)
Particle Size Range	μm (D <sub>10</sub> – D <sub>90</sub> )
BET Surface Area	In the range of 290 - 330 m <sup>2</sup> /g
Bulk Density(loose Powder)	~0.32 - 0.48 g/cm <sup>3</sup>
Color	Black

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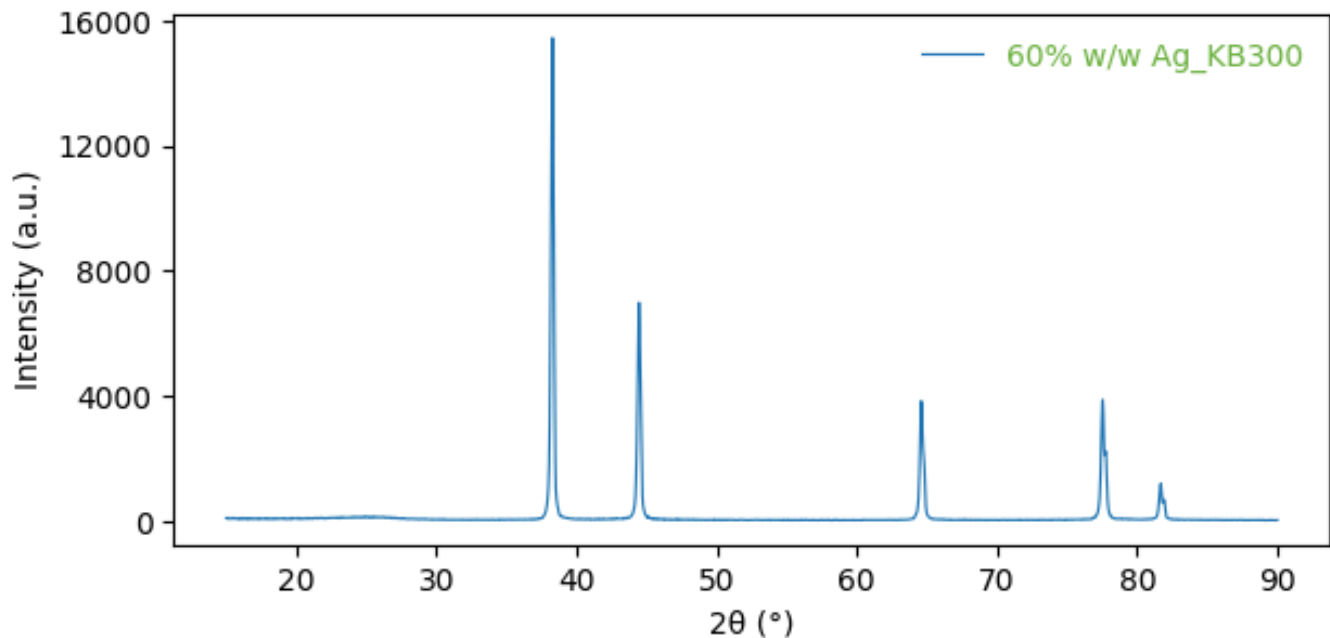
### 3. Structural Characterization (X-ray Diffraction)

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**Phase Identified:**

- **Structure** : Face-centered cubic (fcc) Silver (0)
  - **Database Reference:** COD Card No. (9011607); JCPDS No. (04-0783)
  - **Space Group** : *Fm-3m*
  - **Secondary Phases** : None detected
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- **Instrument:** Rigaku MiniFlex 300/600
- **Cu-K $\alpha$  radiation** ( $\lambda = 1.5406 \text{ \AA}$  | **scan rate:** 0.5°/min | **step size:** 0.02°(2 $\theta$ ),
- **2 $\theta$  range:** 10–90° | **optics:** Monochromator





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### Selected Diffraction Peaks:

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hkl Plane	2 $\theta$ (°)	d-spacing (Å)	FWHM (°)	Crystallite Size (nm)	Relative Intensity (%)
(111)	38.27	2.349	0.21	43.5	100.0
(200)	44.44	2.036	0.20	43.4	49.75
(220)	64.59	1.441	0.20	48.8	31.32

### Lattice Parameters:

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Parameter	Value (Å/°)
a = b=c	4.0763 Å
$\alpha, \beta, \gamma$	90°

### Bond Distances:

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- Ag-Ag nearest-neighbor distance: 2.8824 Å
- Consistent with FCC 12-fold cubic coordination.

## 4. Surface Area Analysis (BET)

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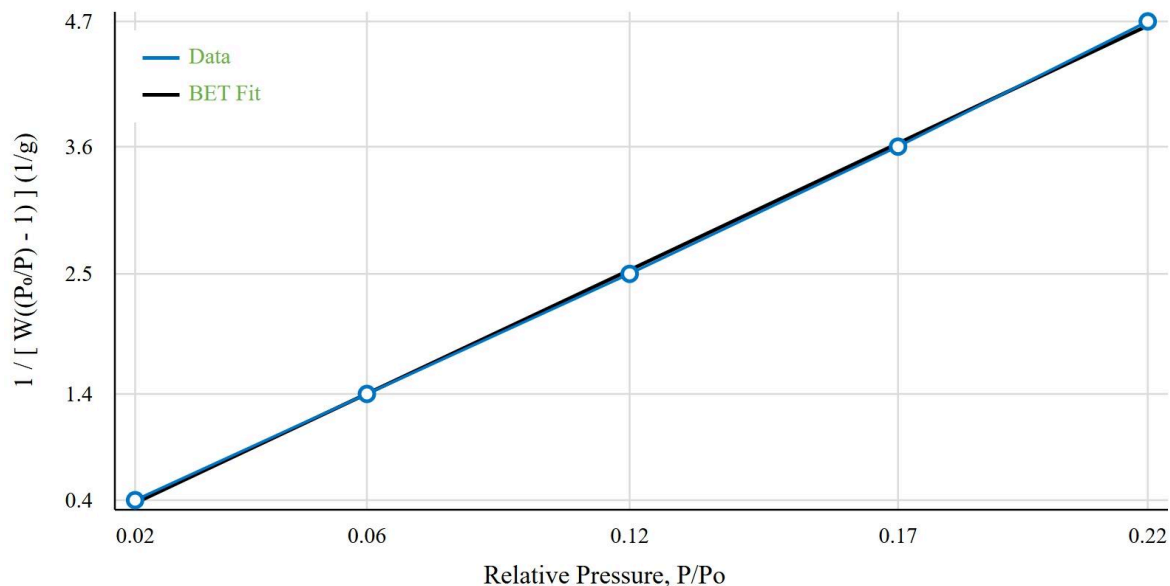
Instrument: Anton Paar QuantaChrome NOVA

Adsorption gas: N<sub>2</sub>, Bath temperature: 77.3 K

- Degassing Conditions: 4 hrs, 100°C  
Sample Weight: 0.2947 g  
Sample Volume: 0.07556 cc  
Equilibration Time: 60 sec (adsorption/desorption)  
Relative Pressure Range (P/P<sub>0</sub>): ~0.02 – 0.3  
Analysis Time: 105.2 minutes



Multi-Point BET Plot



### BET Results Summary:

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**BET surface area** for this particular production batch: **306.617 m<sup>2</sup>/g**,

**C constant:** 1043.944,

**slope:** 11.347 (1/g),

**intercept:** 00.0108 (1/g),

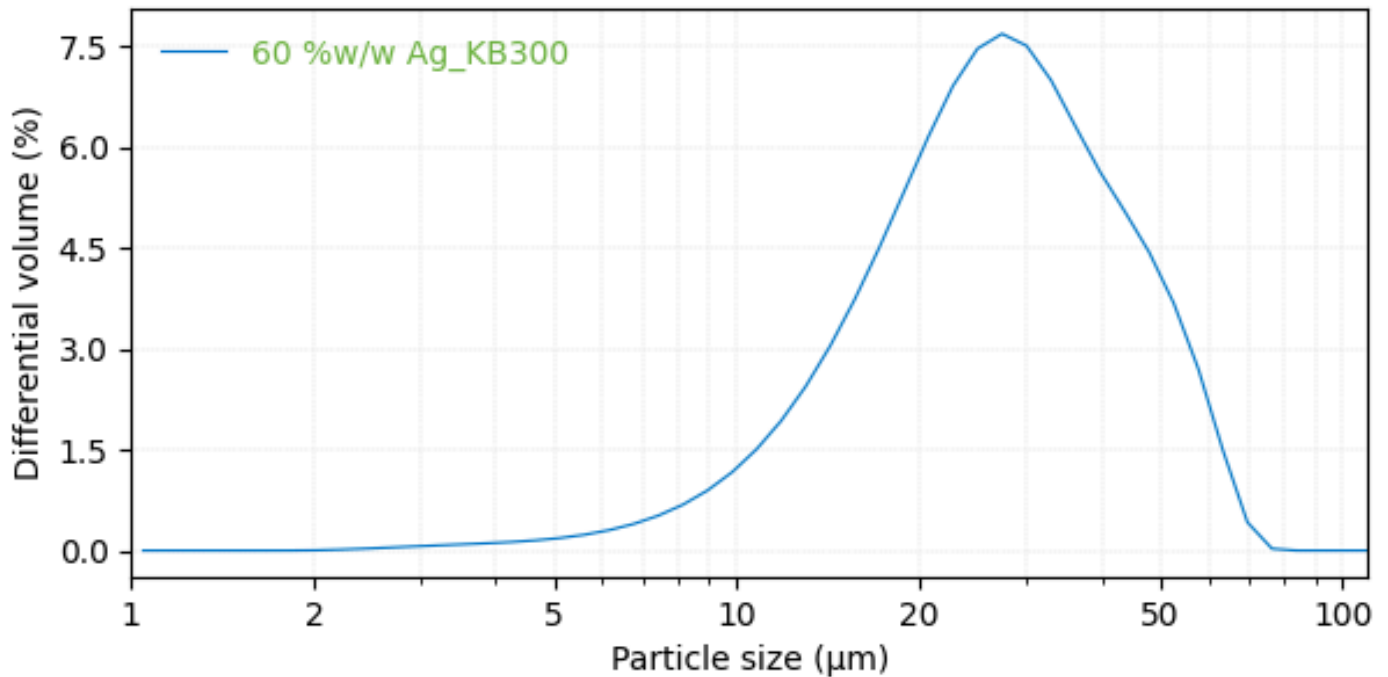
**correlation coefficient (r<sup>2</sup>):** 0.9999

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## 5. Particle Size Distribution (Laser Diffraction):

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**Instrument:** Beckman Coulter LS 13 320 | **Fluid:** Water  
**Measurement Type:** Average of 3 runs



### Percentile Values:

- **D<sub>10</sub>: 13.75 µm**
  - **D<sub>25</sub>: 19.81 µm**
  - **D<sub>50</sub>: (Median): 28.05 µm**
  - **D<sub>75</sub>: 38.88 µm**
  - **D<sub>90</sub>: 50.84 µm**
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## 6. Handling and Safety

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- **PPE:** nitrile gloves, P-100/N95 dust mask, safety goggles.
- **Exposure:** avoid inhalation or skin/eye contact.
- **Ventilation:** Work in a fume hood or well-ventilated area to limit airborne dust.
- **Combustion risk:** carbon support is combustible; silver nanoparticles can catalyse oxidation. Keep away from strong oxidisers, sparks, and open flames.
- **Disposal:** follow local regulations; recycle the silver content whenever feasible.