

## TUNGSTEN CARBIDE HC STARCK MS (Mining Solution)

**Description of Product** HC STARCK Mining Solution grades are designed for hard metal tools with a need for excellent wear resistance and toughness, for example in the field of mining and road construction tools, hot working tools, rolls as well as metal cutting applications. Due to highly crystalline WC grains, this grade series provides a homogeneous hard metal structure with a low amount of fine grains and therefore a lower hardness compared to the traditional coarse grain WC grades.

**Grades Available** **Product Designation**  
MS300, MS450, MS600, MS1200, MS4000

### Chemical Characteristics (Mass fraction in % [cg/g]; ppm [ $\mu$ g/g])

	Limit		
$C_{\text{total}}^{(1)}$	6.10	–	6.16 %
$C_{\text{free}}^{(2)}$	max.		0.06 %
Al	max.	15	ppm
Ca	max.	15	ppm
Co	max.	100	ppm
Cr	max.	100	ppm
Cu	max.	10	ppm
Fe	max.	150	ppm
Mo	max.	25	ppm
Na	max.	10	ppm
Ni	max.	100	ppm
Si	max.	20	ppm
S	max.	15	ppm

**Physical Characteristics & Oxygen content**

Fisher number (as supplied) [ $\mu\text{m}$ ]

Grades	Fisher Number (as supplied) [ $\mu\text{m}$ ]			Oxygen[%]
	Average	Min.	Max.	Max.
HC STARCK MS300	2.8	2.5	3.0	0.08
HC STARCK MS450	3.5	3.0	4.0	0.06
HC STARCK MS600	4.5	4.0	5.0	0.05
HC STARCK MS1200	12.5	10.0	15.0	0.05
HC STARCK MS4000	38.5	25.0	52.0	0.05

**Hard Metal Characteristics (target data, for reference only)\***

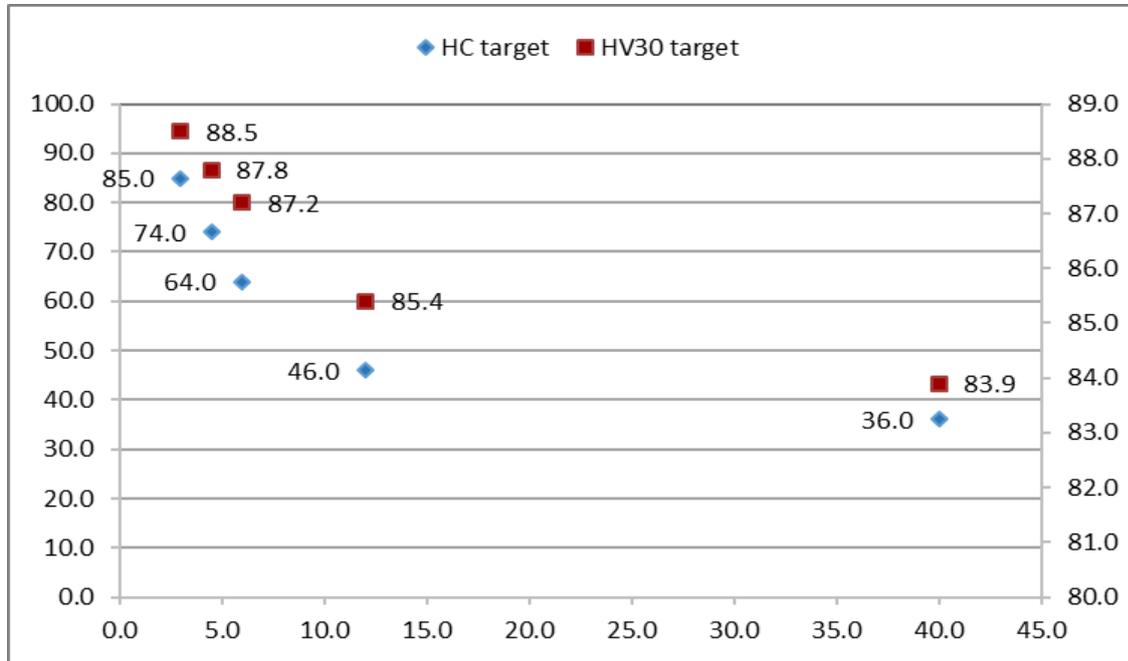
\*: Test conditions WC-10%Co

20h ball milling (balls:material = 2:1), pressing 160MPa, sintering 45minutes, 1420°C, vacuum

Magnetic Saturation target 90-95%

Grades	Coercive Force, HC [Oe]			Hardness [HRa]			MS[%]
	min	max	target	min	max	target	target
HC STARCK MS300	80.0	90.0	85.0	88.1	88.9	88.5	90-95
HC STARCK MS450	69.0	79.0	74.0	87.5	88.1	87.8	90-95
HC STARCK MS600	59.0	69.0	64.0	86.8	87.5	87.2	90-95
HC STARCK MS1200	43.0	49.0	46.0	85.0	85.8	85.4	90-95
HC STARCK MS4000	34.0	38.0	36.0	83.6	84.2	83.9	90-95

\*\* : evaluated in sintered structure using line scan method.



FSSS of WC powder [µm]

## Packaging

- 50 kg in 16 l steel drums with PE-bags  
Packaging unit = 1000 kg in 20 drums on CP1 pallet.
- 50 kg in 14 l steel drums with PE-bags  
Packaging unit = 1000 kg in 20 drums on CP1 pallet.

Other kinds of packaging are available on request.

## Storage and Handling

The user must observe all the appropriate safety regulations in force in the country of use. Store in a closed container.

## Documentation

An inspection document in accordance with EN 10204 is supplied with every shipment.

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