



**Iron and Steel Powders for  
Sintered Components**



# Low Alloyed Steel Powders for Sintered Components

TYPICAL DATA - Sintered properties at P=600 MPa, T=1120°C, t=30 min, Atm=90/10N<sub>2</sub>/H<sub>2</sub>, dT/dt=0.8°C/s)

| Powder properties                               | Astaloy™<br>atomised prealloyed powder grades  |       |       |      | Distaloy®<br>diffusion alloyed powder grades  |       |       |       |      |       | Premixed<br>grades   |        |
|---|--|-------|-------|------|---|-------|-------|-------|------|-------|--|--------|
|   | CrA  | CrM   | 85 Mo | Mo   | AQ  | AB    | AE    | DC    | DH   | HP    | PNC60  | PASC60 |
| AD, g/cm <sup>3</sup>                           | 2.85   | 2.78  | 3.00  | 3.00 | 3.05  | 3.05  | 3.05  | 3.05  | 3.03 | 3.08  | 2.65   | 3.14   |
| Flow, s/50 g                                    | 27   | 27    | 25    | 25   | 27  | 27    | 27    | 25    | 25   | 25    | 30   | 25     |
| <b>Powder chemistry</b>                         |  |       |       |      |   |       |       |       |      |       |  |        |
| Mo*, %  |  | 0.50  | 0.85  | 1.50 | 0.50  | 0.50  | 0.50  | 1.47  | 1.47 | 1.41  |  |        |
| Ni, %   |  |       |       |      | 0.50  | 1.75  | 4.00  | 2.00  |      | 4.00  |  |        |
| Cu, %   |  |       |       |      |   | 1.50  | 1.50  |       | 2.00 | 2.00  |  |        |
| Cr, %   | 1.80   | 3.00  |       |      |   |       |       |       |      |       |  |        |
| P, %  |  |       |       |      |   |       |       |       |      |       | 0.60   | 0.60   |
| <b>Green properties with<br/>0.8% lubricant</b> |  |       |       |      |   |       |       |       |      |       |  |        |
| GD 600 MPa, g/cm <sup>3</sup>                   | 7.04   | 6.96  | 7.15  | 7.10 | 7.17  | 7.17  | 7.18  | 7.10  | 7.10 | 7.08  | 6.88   | 7.08   |
| GD 4.2 t/cm <sup>2</sup> , g/cm <sup>3</sup>    |  |       |       |      |   |       |       |       |      |       |  |        |
| GS 600 MPa, N/mm <sup>2</sup>                   | 26   | 15    | 13    | 13   | 13  | 13    | 14    | 13    | 12   | 13    | 20   | 16     |
| <b>Sintered properties</b>                      |  |       |       |      |   |       |       |       |      |       |  |        |
| % C, as sintered                                | •  | •     | •     | •    | ••  |       |       |       |      |       |  |        |
| % Cu  | 0.60   | 0.45  | 0.60  | 0.60 | 0.50  | 0.50  | 0.50  | 0.50  | 0.50 | 0.50  | -  | -      |
| SD, g/cm <sup>3</sup>                           | 2.00   | -     | 2.00  | 2.00 | -   | -     | -     | -     | -    | -     | -  | -      |
| DC g-s. %                                       | 6.95   | 6.90  | 7.05  | 7.00 | 7.13  | 7.12  | 7.10  | 7.10  | 7.02 | 7.08  | 7.14   | 7.25   |
| HV10  | 0.15   | -0.12 | 0.31  | 0.30 | -0.02   | -0.08 | -0.16 | -0.22 | 0.12 | -0.15 | -1.00  | 0.68   |
| YS, MPa   | 350  | 400   | 330   | 350  | 400   | 180   | 200   | 190   | 210  | 250   | 130  | 150    |
| TS, MPa   | 920  | 920   | 620   | 810  | 1020  | 375   | 420   | 510   | 500  | 530   | 280  | 300    |
| A, %  | 990  | 1030  | 730   | 980  | 1130  | 620   | 750   | 720   | 660  | 890   | 380  | 450    |
| IE, J   | 0.30   | 0.30  | 0.60  | 0.40 | 0.30  | 3.00  | 2.80  | 2.50  | 1.80 | 2.30  | 11.00  | 15.00  |
|   | 15   | 14    | 14    | 16   | 13  | 27    | 30    | 30    | 14   | 26    | 32   | 45     |
| <b>Applications</b>                             | <ul style="list-style-type: none"> <li>- Medium to high strength parts as sintered</li> <li>- High strength and wear resistant parts when sinterhardened</li> <li>- Gears, synchronizing and oil pump parts</li> </ul> |       |       |      | <ul style="list-style-type: none"> <li>- High strength applications in sintered and sinterhardened condition</li> <li>- High strength and wear resistance when sinterhardened, especially Distaloy DC and Distaloy DH</li> <li>- Parts where good dimensional control is critical</li> <li>- Gears, synchronizing and oil pump parts</li> </ul> |       |       |       |      |       | <ul style="list-style-type: none"> <li>- High ductility parts</li> <li>- Medium strength parts when C is added</li> <li>- Lock and safety parts</li> <li>- Soft magnetic applications (PASC 60)</li> </ul> |        |

\* Distaloy DC, Distaloy DH and Distaloy HP contain pre-alloyed Mo.

- Sinterhardening (dT/dt=2.5°C/s), tempering at 200°C, 30 min in air.
- Hardening at 920°C, 20 min, C-pot 0.6%, oil quenching at 60°C, tempering at 200°C, 60 min in air.



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| Powder properties                            | Sponge iron powder grades  |          |         | Atomised iron powder grades  |           |           |
|--|--|----------|---------|--|-----------|-----------|
|  | NC100.24   | SC100.26 | MH80.23 | AHC100.29  | ASC100.29 | ABC100.30 |
| AD, g/cm <sup>3</sup>                        | 2.43   | 2.68     | 2.30    | 2.99   | 2.99      | 3.02      |
| Flow, s/50 g                                 | 31   | 29       | 34      | 24   | 24        | 24        |
| <b>Powder chemistry</b>                      |  |          |         |  |           |           |
| Mo, %  |  |          |         |  |           |           |
| Ni, %  |  |          |         |  |           |           |
| Cu, %  |  |          |         |  |           |           |
| Cr, %  |  |          |         |  |           |           |
| P, %   |  |          |         |  |           |           |
| <b>Green properties with 0.8% lubricant</b>  |  |          |         |  |           |           |
| GD 600 MPa, g/cm <sup>3</sup>                | 7.00   | 7.11     | 6.75    | 7.15   | 7.20      | 7.26      |
| GD 4.2 t/cm <sup>2</sup> , g/cm <sup>3</sup> | 6.6  | 6.7      | 6.3     |  |           |           |
| GS 600 MPa, N/mm <sup>2</sup>                | 21   | 15       | 29      | 13   | 14        | 13        |
| <b>Sintered properties</b>                   |  |          |         |  |           |           |
| % C, as sintered                             | 0.80   | 0.80     | 0.80    | 0.80   | 0.80      | 0.80      |
| % Cu   | 2.00   | 2.00     | 2.00    | 2.00   | 2.00      | 2.00      |
| SD, g/cm <sup>3</sup>                        | 6.80   | 6.90     | 6.67    | 6.96   | 7.02      | 7.02      |
| DC g-s. %                                    | 0.12   | 0.17     | -0.05   | 0.10   | 0.10      | 0.11      |
| HV10   | 170  | 180      | 155     | 180  | 185       | 185       |
| YS, MPa                                      | 410  | 395      | 360     | 450  | 460       | 470       |
| TS, MPa                                      | 530  | 520      | 440     | 570  | 585       | 590       |
| A, %   | 2.00   | 2.50     | 1.90    | 1.80   | 2.00      | 2.40      |
| IE, J  | 12   | 13       |         | 12   | 14        | 14        |
| <b>Applications</b>                          | <ul style="list-style-type: none"> <li>- Low to medium density parts</li> <li>- Self-lubricating bearings, especially MH80.23 and NC100.24</li> <li>- Parts with complicated geometry where high green strength is essential in order to avoid green cracks</li> <li>- Shock absorber parts</li> </ul> |          |         | <ul style="list-style-type: none"> <li>- Medium to high density parts</li> <li>- Soft magnetic applications, especially ABC100.30</li> <li>- Clutch and pulleys</li> </ul> |           |           |

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