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/* Low Contrast Phantom with supra-slice and subslice contrast targets */
/* similar to the Catphan (TM) CTP515 Low Contrast Phantom */
/* Stefan Schaller, 5.1.99 */

#define CTMAT(x) formel=H2O dichte=x
#define LEN 100

#define A0 87.7082
#define A1 108.3346
#define A2 126.6693
#define A3 142.7121
#define A4 156.4631
#define A5 167.9223
#define A6 177.0896
#define A7 183.9651
#define A8 188.5487

#define B0 110.6265
#define B1 142.7121
#define B2 165.6304
#define B3 179.3814

Phantom
/* ++++ module body ++++++ */
{ "00" [Cylinder_z: x= 0.000 y= 0.000 r=10.0 l=LEN ] CTMAT(1.0) }

/* ++++ supra-slice 1.0% targets ++++++ */
{ "10" [Cylinder_z: x= 5*cos(A0) y= 5*sin(A0) r=0.75 l=LEN ]
CTMAT(1.010) }
{ "11" [Cylinder_z: x= 5*cos(A1) y= 5*sin(A1) r=0.45 l=LEN ]
CTMAT(1.010) }
{ "12" [Cylinder_z: x= 5*cos(A2) y= 5*sin(A2) r=0.40 l=LEN ]
CTMAT(1.010) }
{ "13" [Cylinder_z: x= 5*cos(A3) y= 5*sin(A3) r=0.35 l=LEN ]
CTMAT(1.010) }
{ "14" [Cylinder_z: x= 5*cos(A4) y= 5*sin(A4) r=0.30 l=LEN ]
CTMAT(1.010) }
{ "15" [Cylinder_z: x= 5*cos(A5) y= 5*sin(A5) r=0.25 l=LEN ]
CTMAT(1.010) }
{ "16" [Cylinder_z: x= 5*cos(A6) y= 5*sin(A6) r=0.20 l=LEN ]
CTMAT(1.010) }
{ "17" [Cylinder_z: x= 5*cos(A7) y= 5*sin(A7) r=0.15 l=LEN ]
CTMAT(1.010) }
{ "18" [Cylinder_z: x= 5*cos(A8) y= 5*sin(A8) r=0.10 l=LEN ]
CTMAT(1.010) }

/* ++++ supra-slice 0.3% targets ++++++ */
{ "20" [Cylinder_z: x= 5*cos(A0+120) y= 5*sin(A0+120) r=0.75 l=LEN ]
CTMAT(1.003) }
{ "21" [Cylinder_z: x= 5*cos(A1+120) y= 5*sin(A1+120) r=0.45 l=LEN ]
CTMAT(1.003) }
{ "22" [Cylinder_z: x= 5*cos(A2+120) y= 5*sin(A2+120) r=0.40 l=LEN ]
CTMAT(1.003) }
{ "23" [Cylinder_z: x= 5*cos(A3+120) y= 5*sin(A3+120) r=0.35 l=LEN ]
CTMAT(1.003) }
{ "24" [Cylinder_z: x= 5*cos(A4+120) y= 5*sin(A4+120) r=0.30 l=LEN ]
CTMAT(1.003) }
{ "25" [Cylinder_z: x= 5*cos(A5+120) y= 5*sin(A5+120) r=0.25 l=LEN ]
CTMAT(1.003) }
{ "26" [Cylinder_z: x= 5*cos(A6+120) y= 5*sin(A6+120) r=0.20 l=LEN ]
CTMAT(1.003) }
{ "27" [Cylinder_z: x= 5*cos(A7+120) y= 5*sin(A7+120) r=0.15 l=LEN ]
CTMAT(1.003) }

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{ "28" [Cylinder_z: x= 5*cos(A8+120)  y= 5*sin(A8+120)  r=0.10  l=LEN ]
CTMAT(1.003)  }

/* ++++ supra-slice 0.5% targets ++++++ */
{ "30" [Cylinder_z: x= 5*cos(A0+240)  y= 5*sin(A0+240)  r=0.75  l=LEN ]
CTMAT(1.005)  }
{ "31" [Cylinder_z: x= 5*cos(A1+240)  y= 5*sin(A1+240)  r=0.45  l=LEN ]
CTMAT(1.005)  }
{ "32" [Cylinder_z: x= 5*cos(A2+240)  y= 5*sin(A2+240)  r=0.40  l=LEN ]
CTMAT(1.005)  }
{ "33" [Cylinder_z: x= 5*cos(A3+240)  y= 5*sin(A3+240)  r=0.35  l=LEN ]
CTMAT(1.005)  }
{ "34" [Cylinder_z: x= 5*cos(A4+240)  y= 5*sin(A4+240)  r=0.30  l=LEN ]
CTMAT(1.005)  }
{ "35" [Cylinder_z: x= 5*cos(A5+240)  y= 5*sin(A5+240)  r=0.25  l=LEN ]
CTMAT(1.005)  }
{ "36" [Cylinder_z: x= 5*cos(A6+240)  y= 5*sin(A6+240)  r=0.20  l=LEN ]
CTMAT(1.005)  }
{ "37" [Cylinder_z: x= 5*cos(A7+240)  y= 5*sin(A7+240)  r=0.15  l=LEN ]
CTMAT(1.005)  }
{ "38" [Cylinder_z: x= 5*cos(A8+240)  y= 5*sin(A8+240)  r=0.10  l=LEN ]
CTMAT(1.005)  }

/* ++++ subslice 1.0% targets 7mm long ++++++ */
{ "40" [Cylinder_z: x= 2.5*cos(B0)  y= 2.5*sin(B0)  r=0.45  l=0.7 ]
CTMAT(1.010)  }
{ "41" [Cylinder_z: x= 2.5*cos(B1)  y= 2.5*sin(B1)  r=0.35  l=0.7 ]
CTMAT(1.010)  }
{ "42" [Cylinder_z: x= 2.5*cos(B2)  y= 2.5*sin(B2)  r=0.25  l=0.7 ]
CTMAT(1.010)  }
{ "43" [Cylinder_z: x= 2.5*cos(B3)  y= 2.5*sin(B3)  r=0.15  l=0.7 ]
CTMAT(1.010)  }

/* ++++ subslice 1.0% targets 3mm long ++++++ */
{ "50" [Cylinder_z: x= 2.5*cos(B0+120)  y= 2.5*sin(B0+120)  r=0.45  l=0.3 ]
CTMAT(1.010)  }
{ "51" [Cylinder_z: x= 2.5*cos(B1+120)  y= 2.5*sin(B1+120)  r=0.35  l=0.3 ]
CTMAT(1.010)  }
{ "52" [Cylinder_z: x= 2.5*cos(B2+120)  y= 2.5*sin(B2+120)  r=0.25  l=0.3 ]
CTMAT(1.010)  }
{ "53" [Cylinder_z: x= 2.5*cos(B3+120)  y= 2.5*sin(B3+120)  r=0.15  l=0.3 ]
CTMAT(1.010)  }

/* ++++ subslice 1.0% targets 5mm long ++++++ */
{ "60" [Cylinder_z: x= 2.5*cos(B0+240)  y= 2.5*sin(B0+240)  r=0.45  l=0.5 ]
CTMAT(1.010)  }
{ "61" [Cylinder_z: x= 2.5*cos(B1+240)  y= 2.5*sin(B1+240)  r=0.35  l=0.5 ]
CTMAT(1.010)  }
{ "62" [Cylinder_z: x= 2.5*cos(B2+240)  y= 2.5*sin(B2+240)  r=0.25  l=0.5 ]
CTMAT(1.010)  }
{ "63" [Cylinder_z: x= 2.5*cos(B3+240)  y= 2.5*sin(B3+240)  r=0.15  l=0.5 ] CTMAT(1.

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