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DATA SHEET BHTS CURRENT LEAD APPLICATION TAPE TYPE I

For further Informations, please contact:

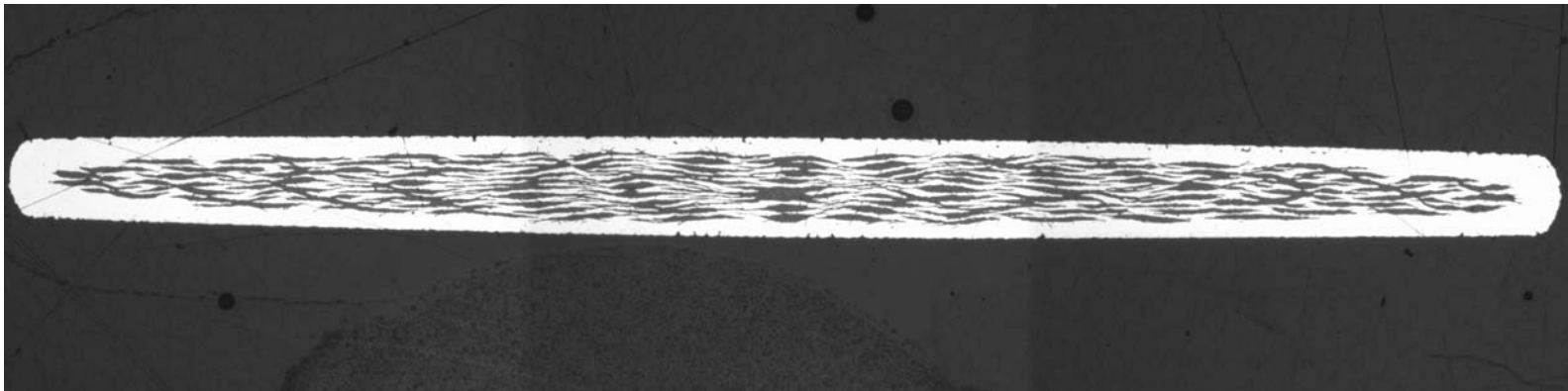
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General characteristics of the BHTS current lead application tape

BHTS CURRENT LEAD APPLICATION Bi-2223 TAPE TYPE 1	
matrix composition [wt.-%]	AgAu5 / AgAu5Mg0.2
tape dimension width [mm]	4.00 (+/- 0.20)
tape dimension thickness [mm]	0.220 (+/- 0.03)
filament number	121
filling factor [%]	abt. 30
matrix porosity [%]	< 1
final density of the oxide core [%]	> 85
critical tensile strength [room temperature, MPa]	> 100
critical bending radius [room temperature, mm]	< 35
young's modulus [GPa]	60
I_c (77 K, 1μV/cm) [A]	> 90
n-value	> 15
available unit length [m]	≤ 300 / 500

Table 1: Overview of general characteristics of the BHTS current lead application tape type 1



Picture 1: metallographic cross section of a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

The critical current of the BHTS HTS tape as a function of length

$L=297 \text{ m}; L_u=0.5 \text{ m}$
 $77 \text{ A} \leq I_{c1} (1 \mu\text{V/cm}) \leq 86 \text{ A}; < I_c > 82 \text{ A} \pm 1.13$
 $19 \leq n \leq 39; < n > 32 \pm 3.36$
 $81 \text{ A} \leq I_{c2} (2.5 \mu\text{V/cm}) \leq 89 \text{ A}; < I_c > 85 \text{ A} \pm 1.24$
 $77.5 \text{ K} < T < 77.7 \text{ K}; 77.6 \text{ K} \pm 0.04$

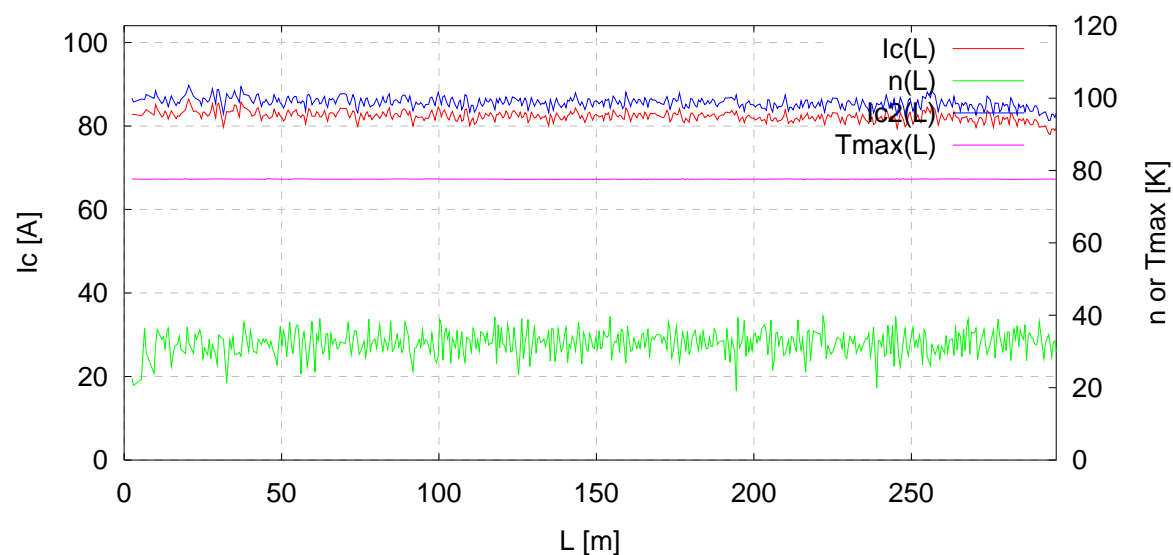


Figure 1: $I_c(L)$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1, tap distance 0.5 m

The geometry of the BHTS HTS tape as a function of length

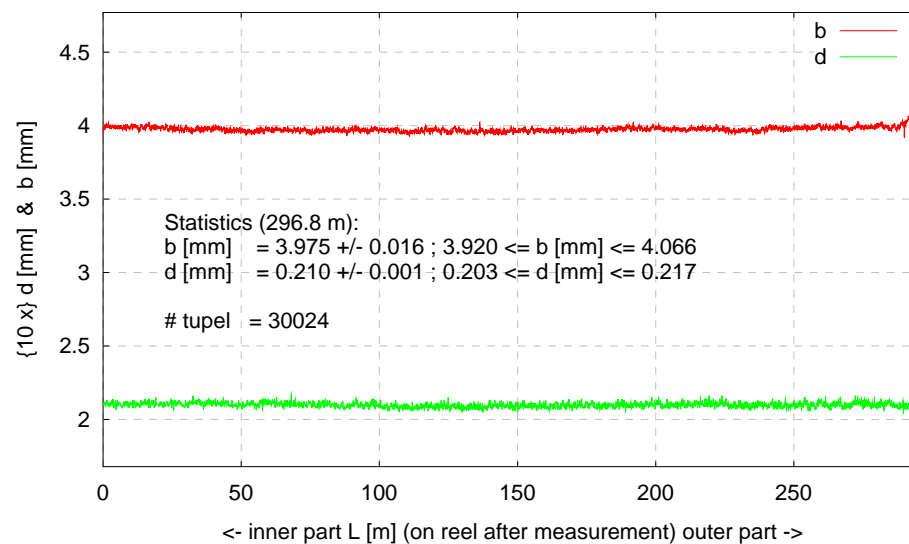


Figure 2: Width $B(L)$ and thickness $D(L)$ of a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1, resolution 10 mm

The critical current of the BHTS HTS tape as a function of temperature in self field

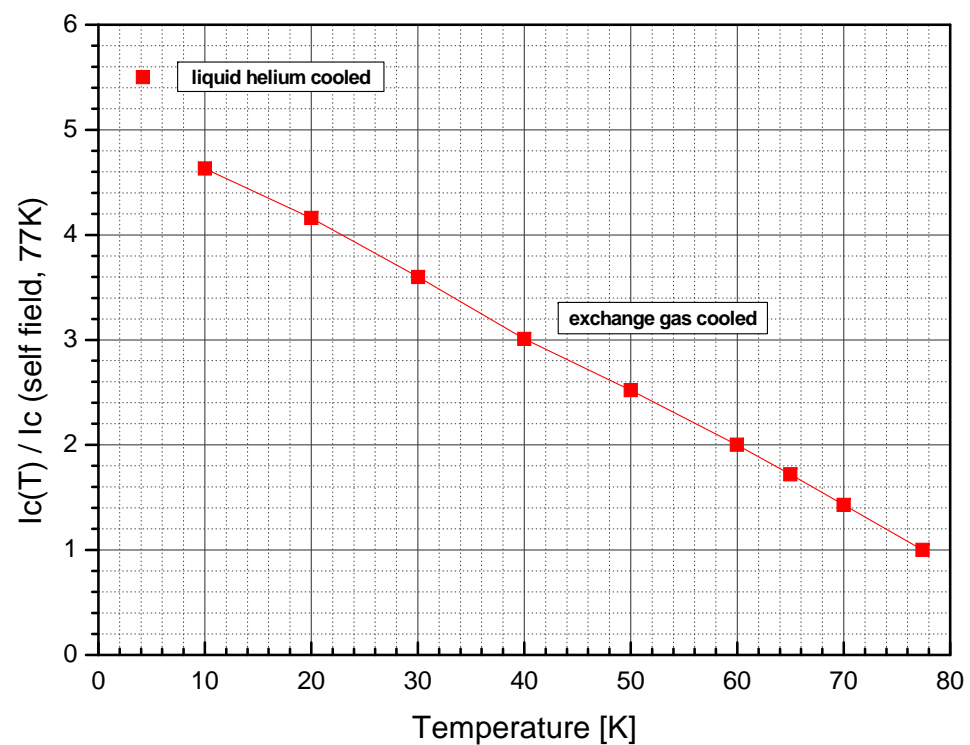


Figure 3: $I_c(T)$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

The critical current of the BHTS HTS tape as a function external magnetic field and temperature

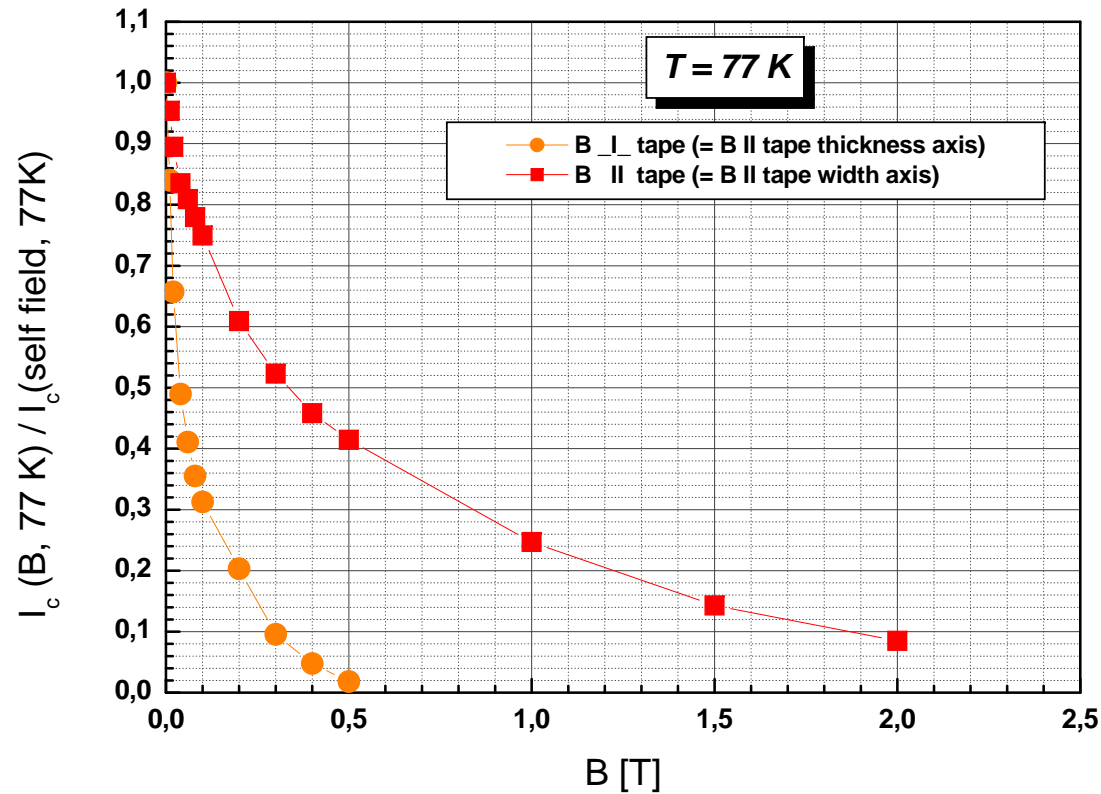


Figure 4: $I_c(B)$ at $T = 77\text{ K}$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

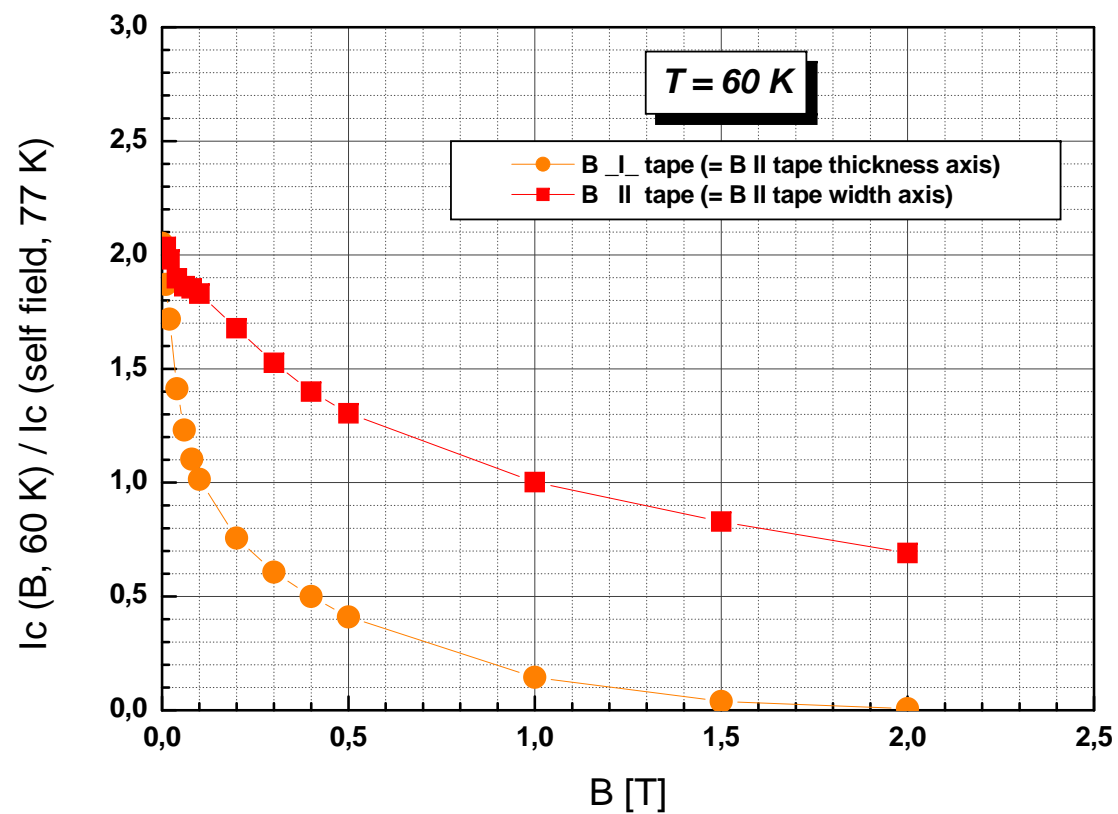


Figure 5: $I_c(B)$ at $T = 60\text{ K}$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

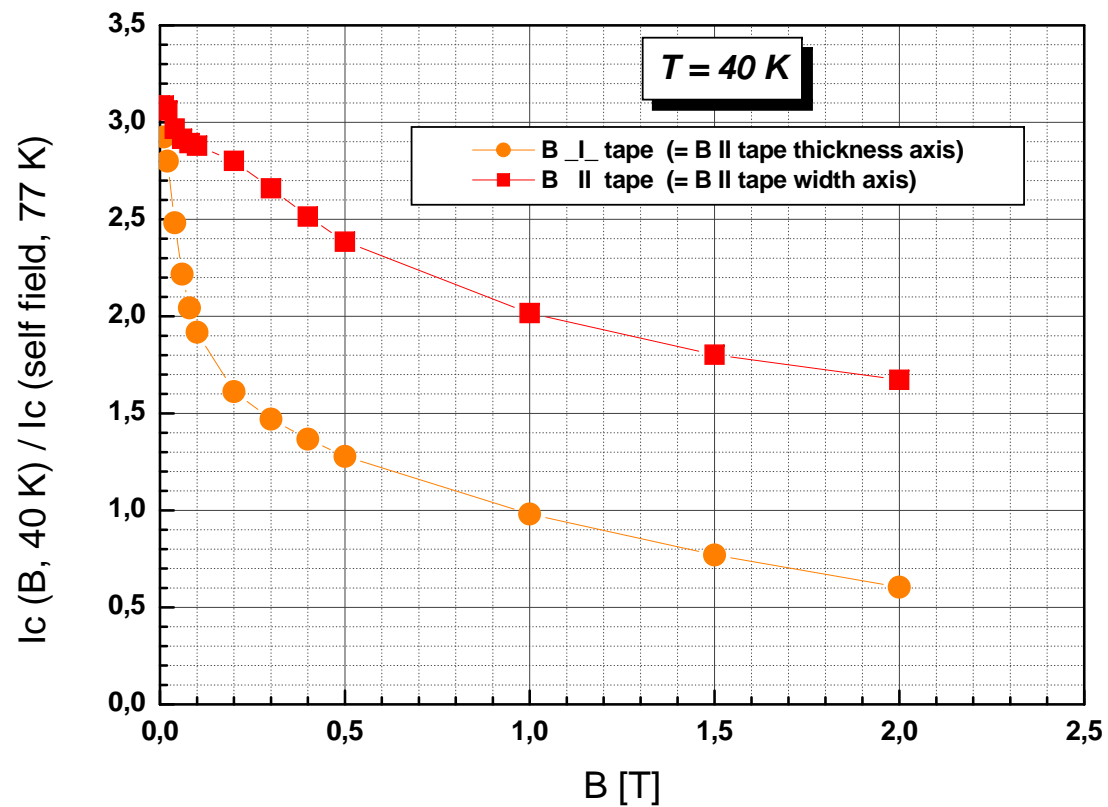


Figure 6: $I_c(B)$ at $T = 40\text{ K}$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

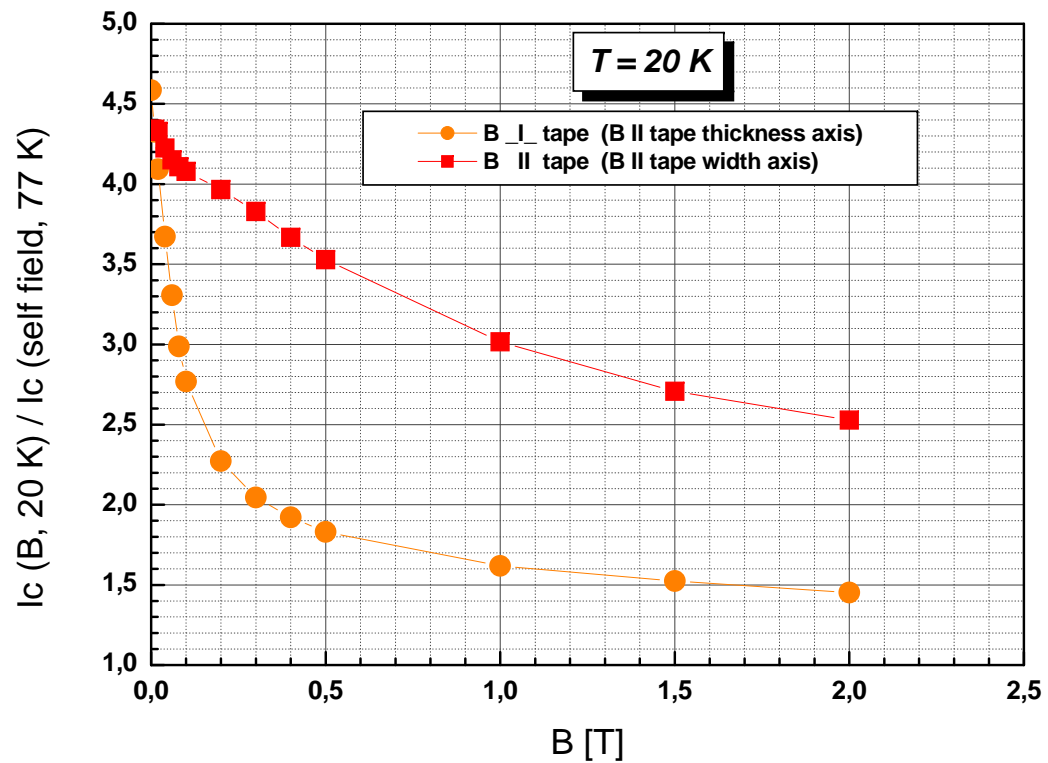


Figure 7: $I_c(B)$ at $T = 20\text{ K}$ for a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 current lead tape type 1

The critical current of the BHTS HTS tape as a function of stress and bending radius

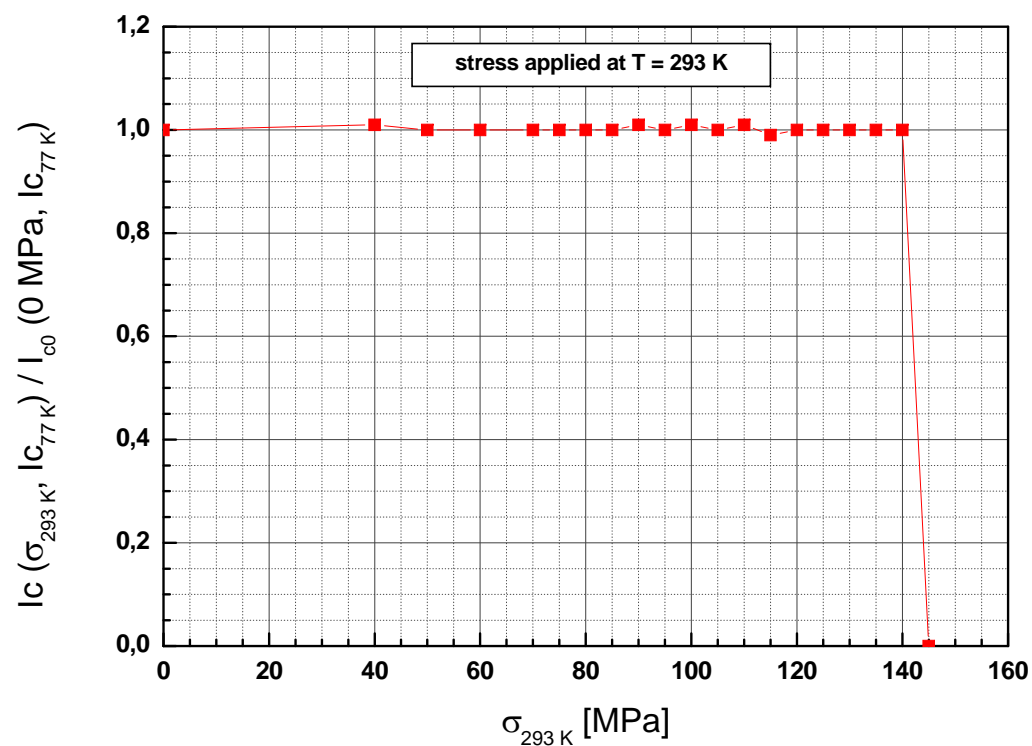


Figure 8: I_c (stress) at $T = 77\text{ K}$ (stress applied at 293 K) of a BHTS AgAu5/AgAu5Mg0.2 HTS tape type 1

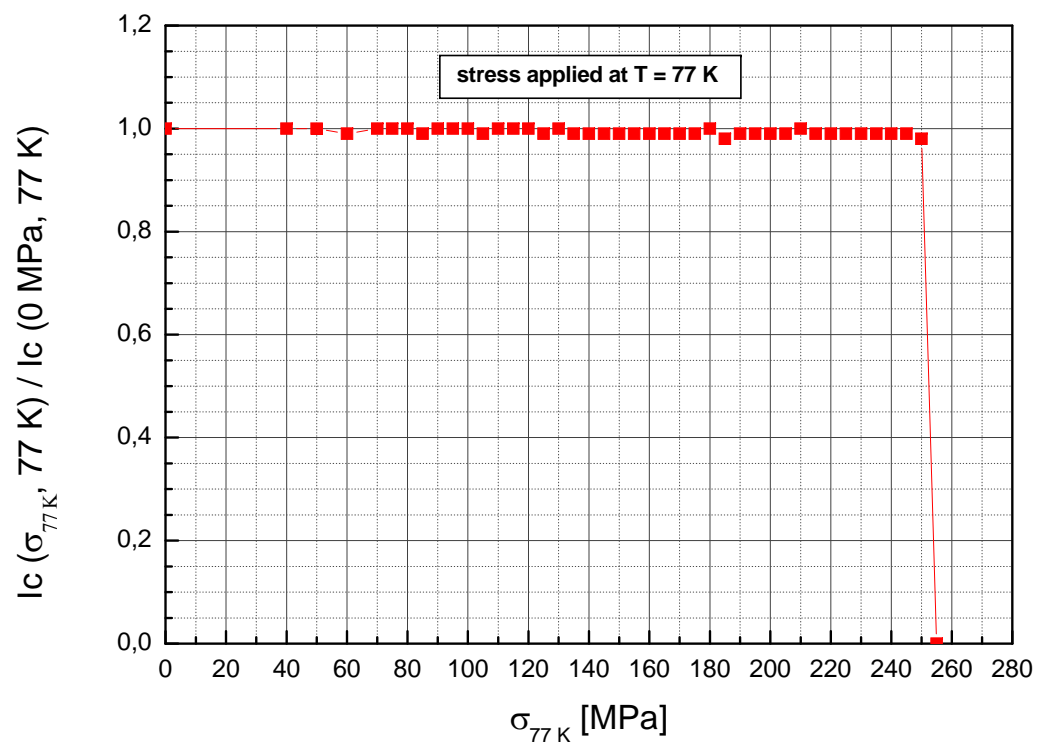


Figure 9: I_c (stress) at $T = 77 \text{ K}$ (stress applied at 77 K) of a BHTS AgAu5/AgAu5Mg0.2 HTS tape type 1

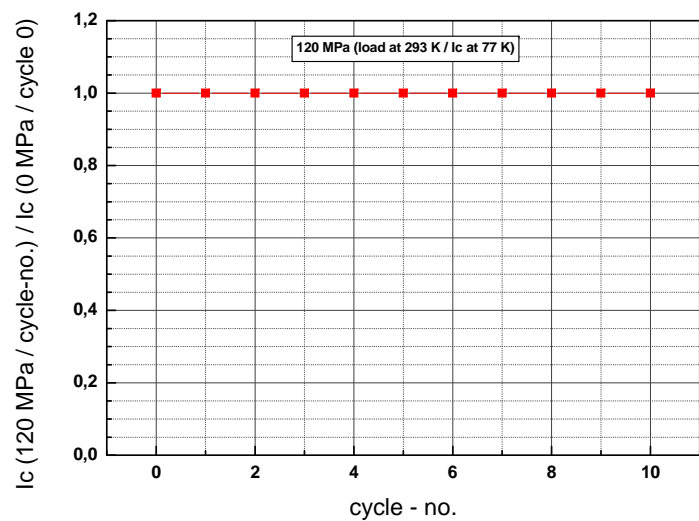
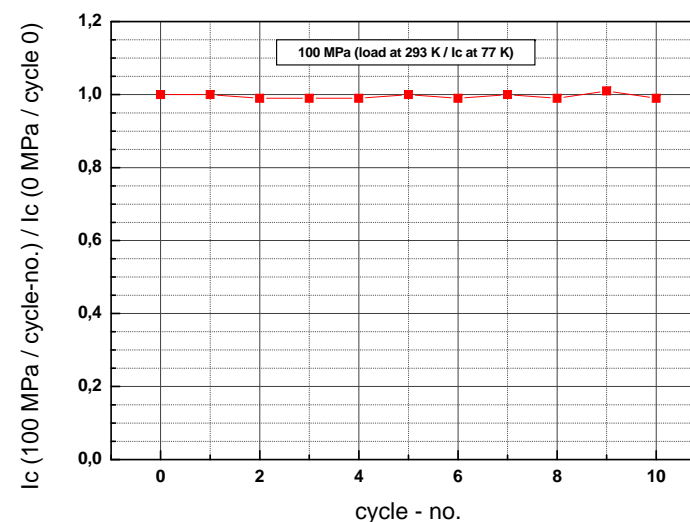
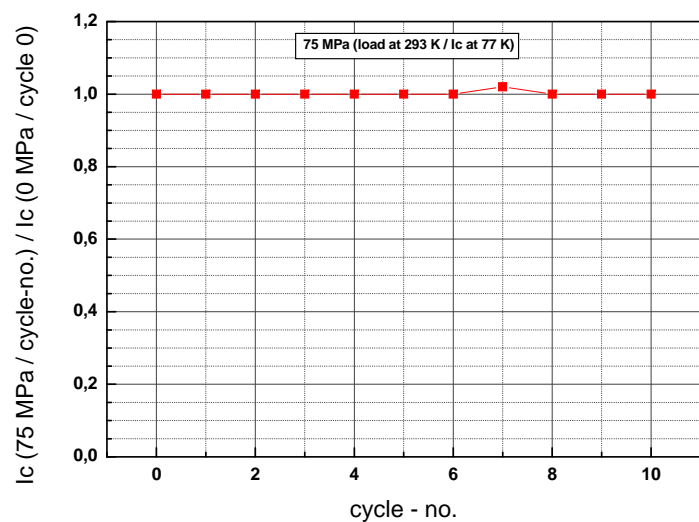


Figure 10: I_c (stress) at $T = 77 \text{ K}$ (stresses of 75 MPa, 100 MPa and 120 MPa applied at 293 K for ten times with intermediate I_c measurement at 77 K) of a BHTS AgAu5/AgAu5Mg0.2 HTS tape type 1

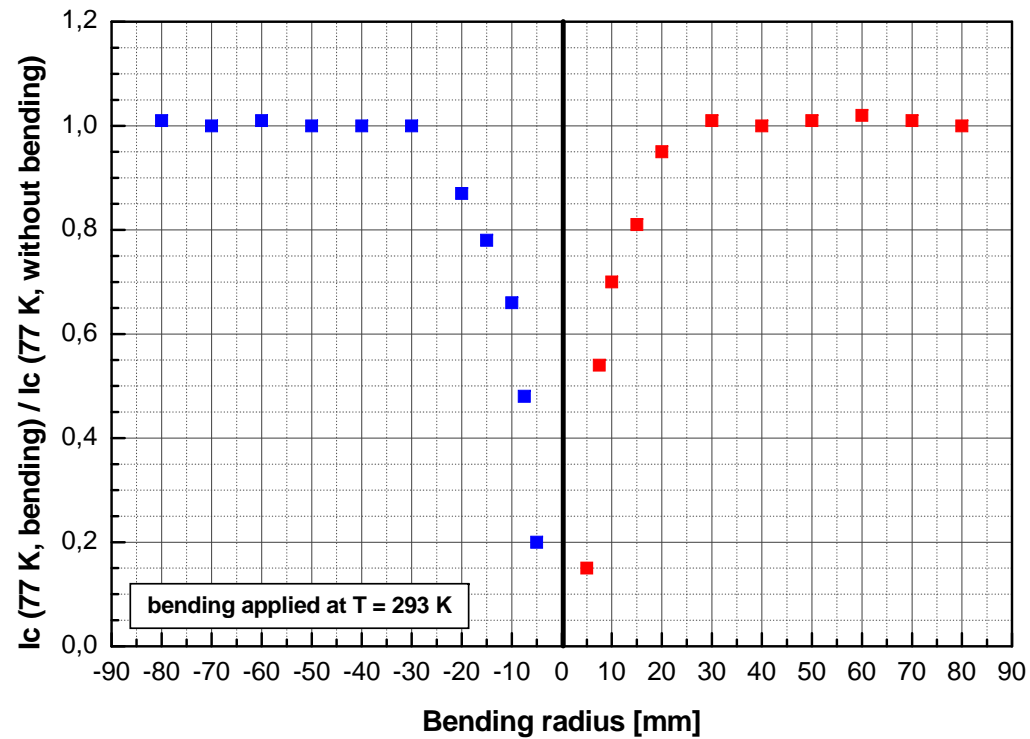


Figure 11: I_c (bending) at $T = 77\text{ K}$ (bending applied at 293 K) of a BHTS AgAu/AgAuMg0.2 HTS tape type 1

The electrical resistivity of the BHTS HTS tape as a function of temperature

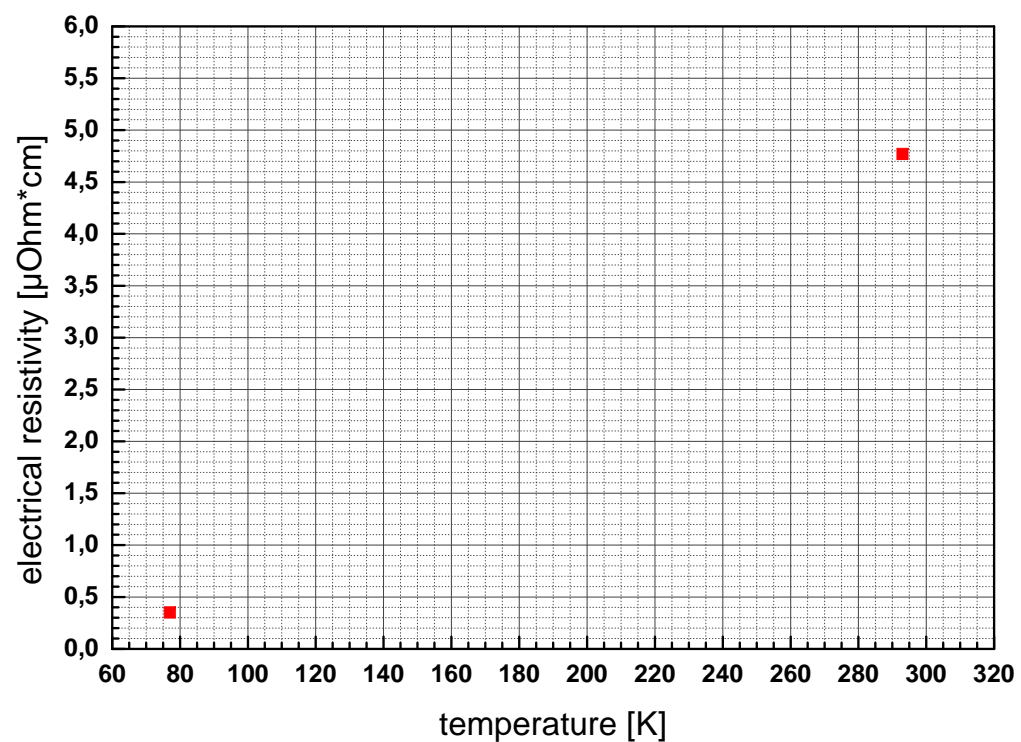


Figure 12: Electrical resistivity of a BHTS AgAu5/AgAu5Mg0.2 HTS tape type 1

The thermal conductivity of the BHTS HTS tape as a function of temperature

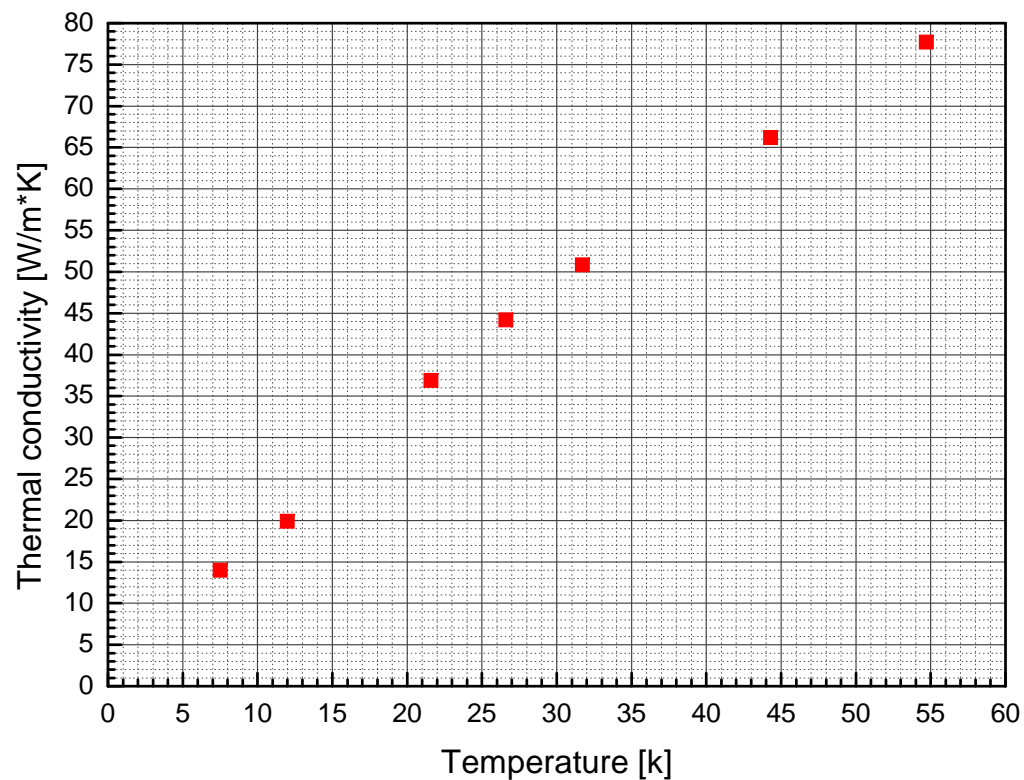
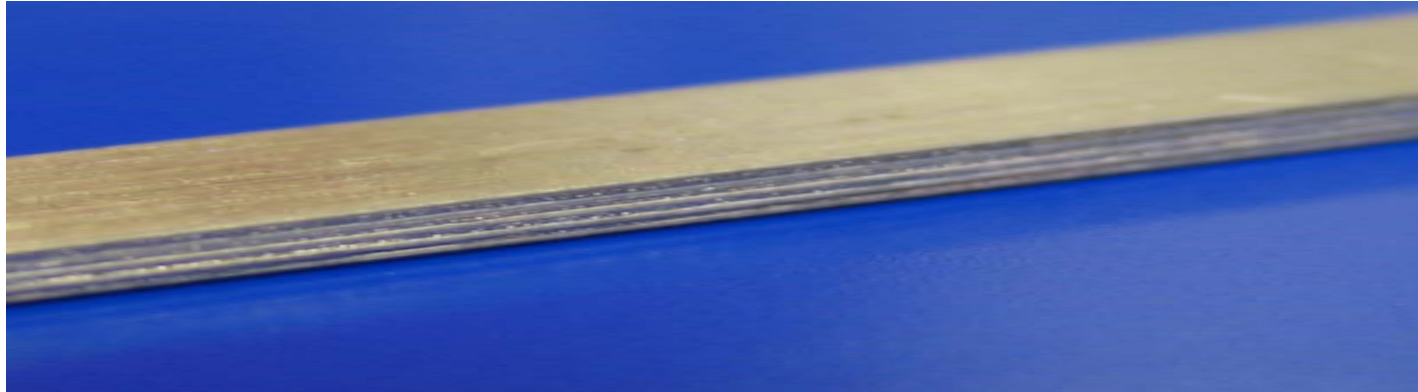


Figure 13: thermal conductivity of a BHTS AgAu5/AgAu5Mg0.2 HTS tape type 1 (measurement performed by CERN)

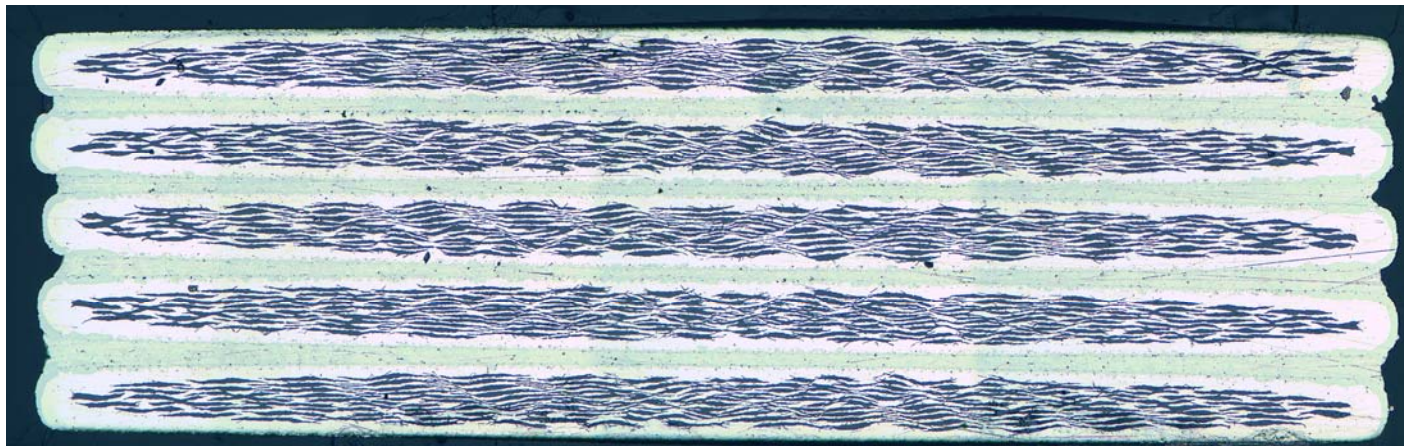
HTS Stacks made of BHTS HTS current lead tape type 1

Number of HTS tapes in stack	I _c (77K, s.f.)
3	215
4	265
5	305

Table 2: Overview of I_c characteristics of stacks made of BHTS current lead application tape type 1



Picture 2: BHTS AgAu5/AgAu5Mg0.2 Bi-2223 stack made of 5 current lead tapes type 1



Picture 3: metallographic cross section of a BHTS AgAu5/AgAu5Mg0.2 Bi-2223 stack made of 5 current lead tapes type 1

The thermal conductivity as a function of temperature: comparison between single tape and triple stack

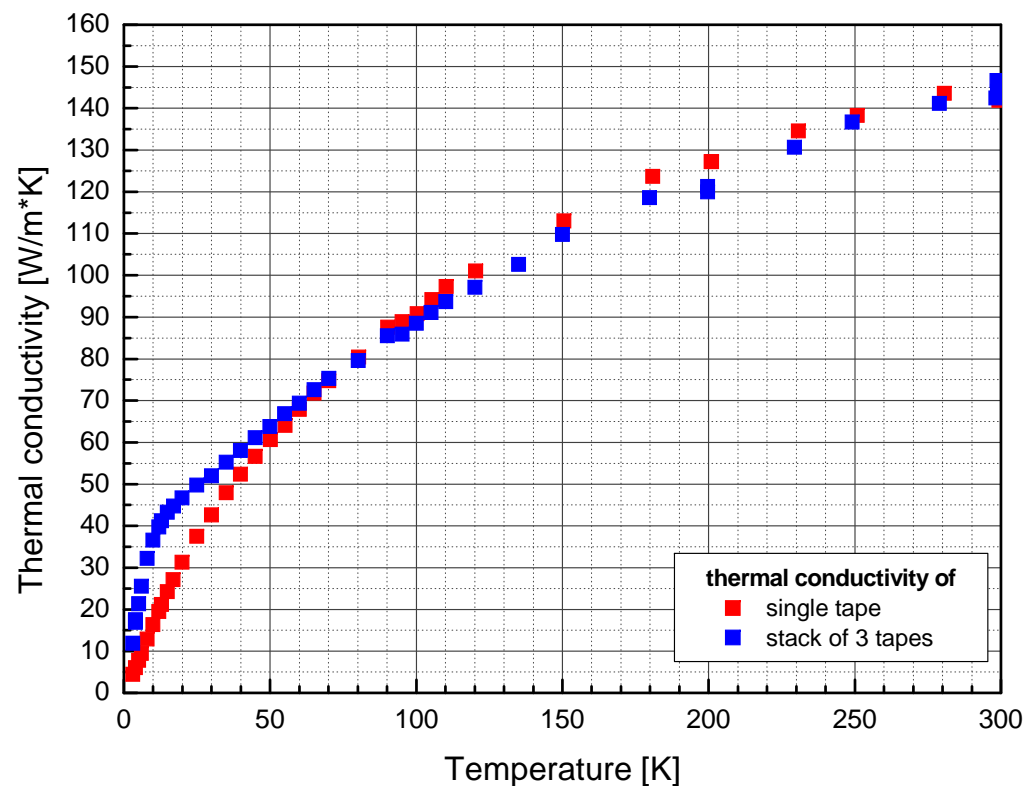


Figure 14: thermal conductivity, comparison of a stack of 3 BHTS AgAu5/AgAu5Mg0.2 HTS tapes and the single tape type 1 (measurement performed by Forschungszentrum Karlsruhe)