Engineering solutions on in-monolith optics, ESS

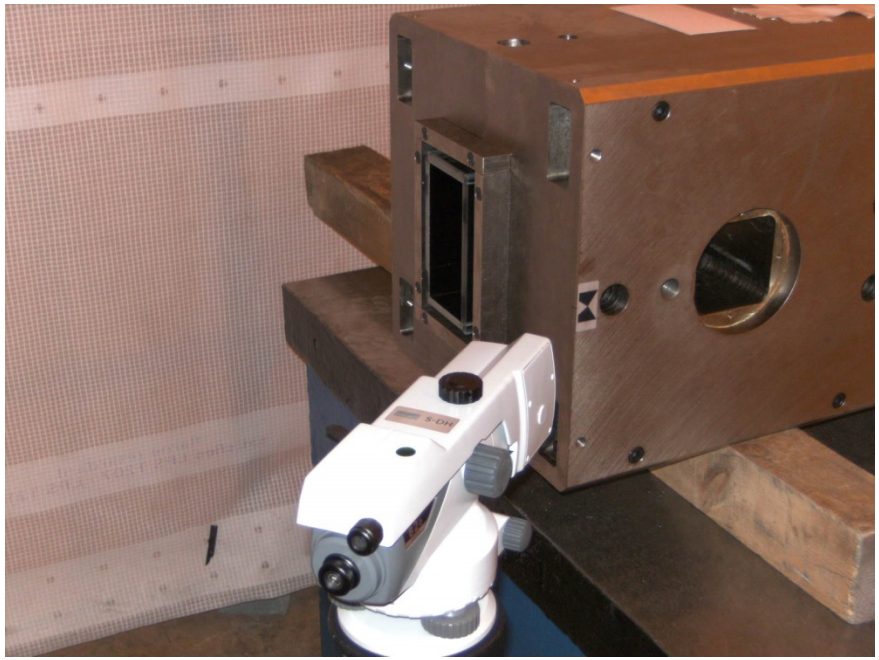
S-DH

www.neutronguide.com

www.boron10coatings.com

1. Past Performance
2. Metallic Substrate
3. Glass Substrates

1. Past Performance



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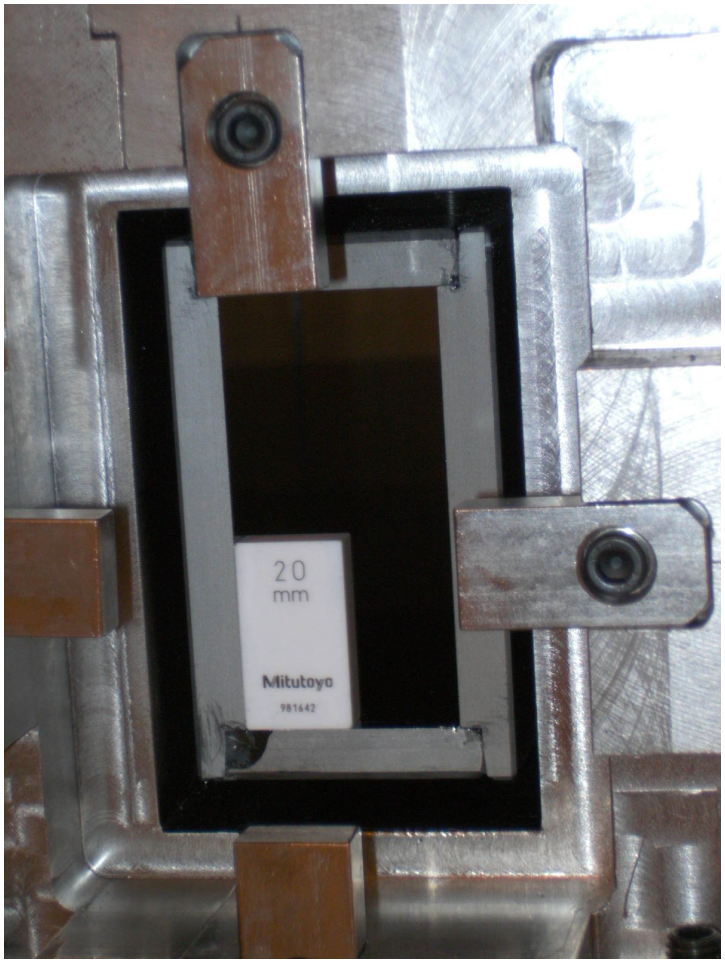

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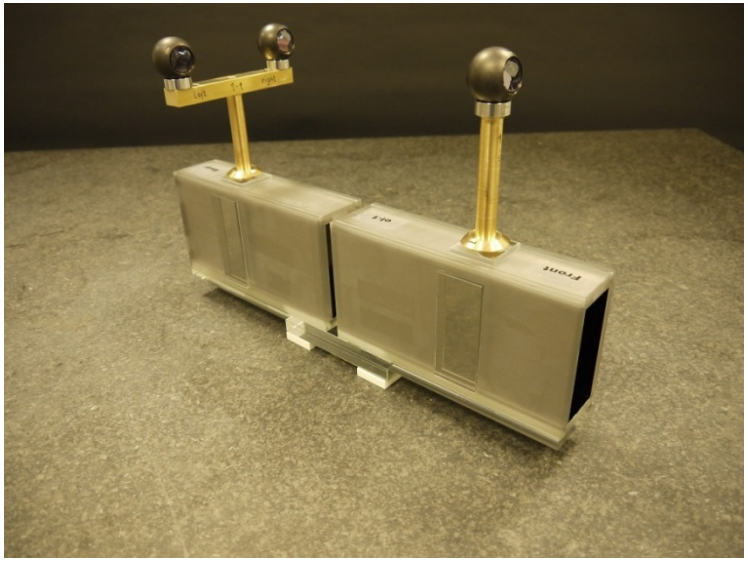

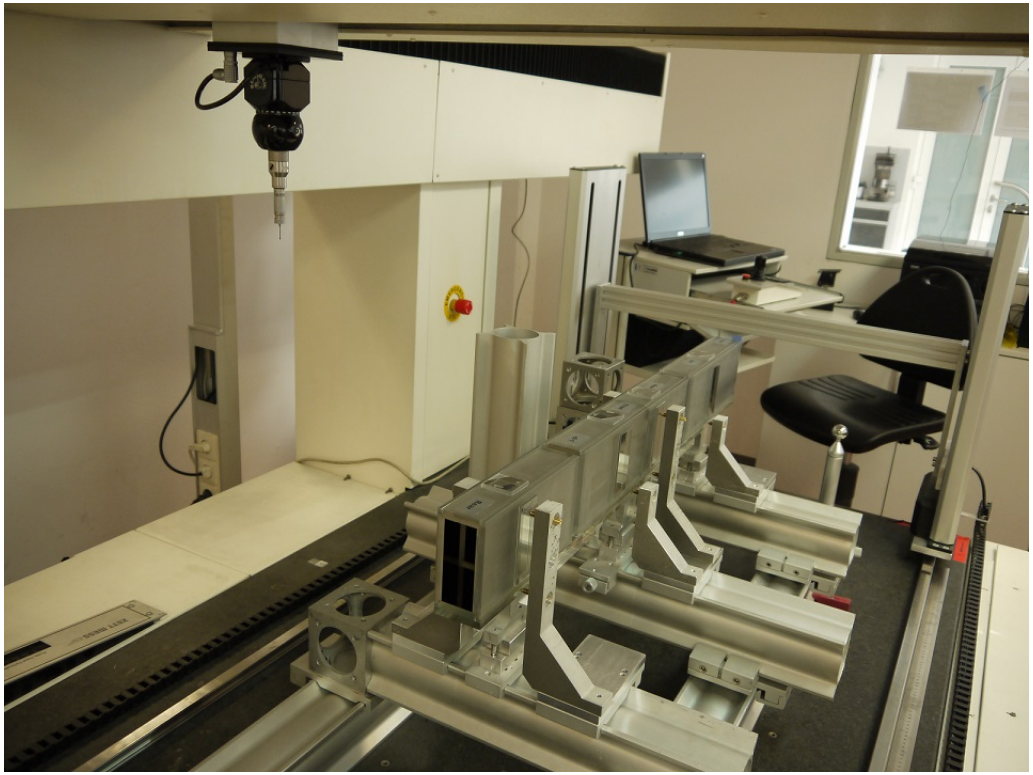

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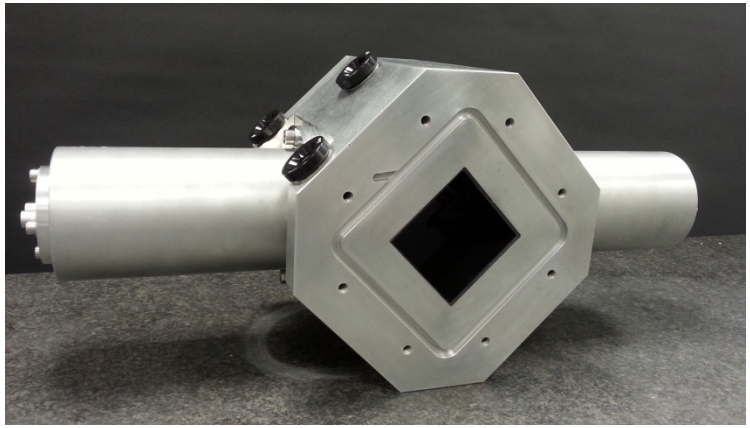

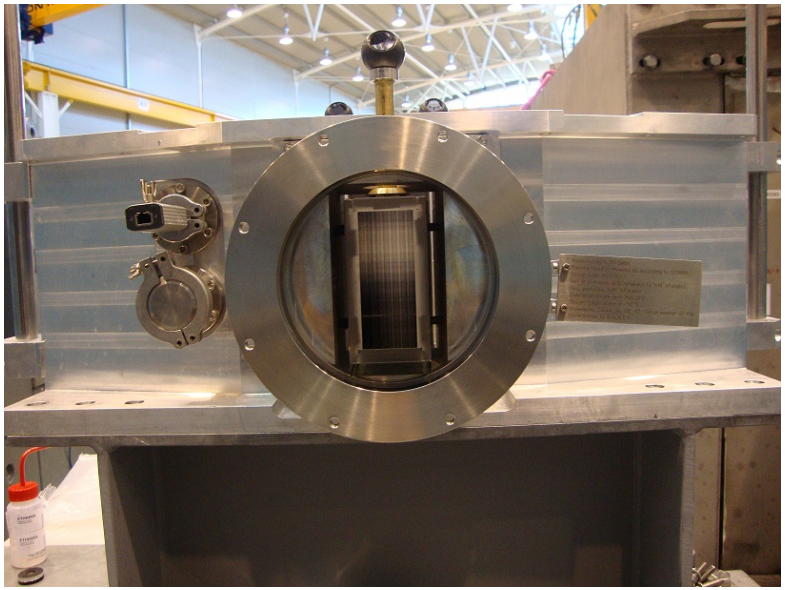

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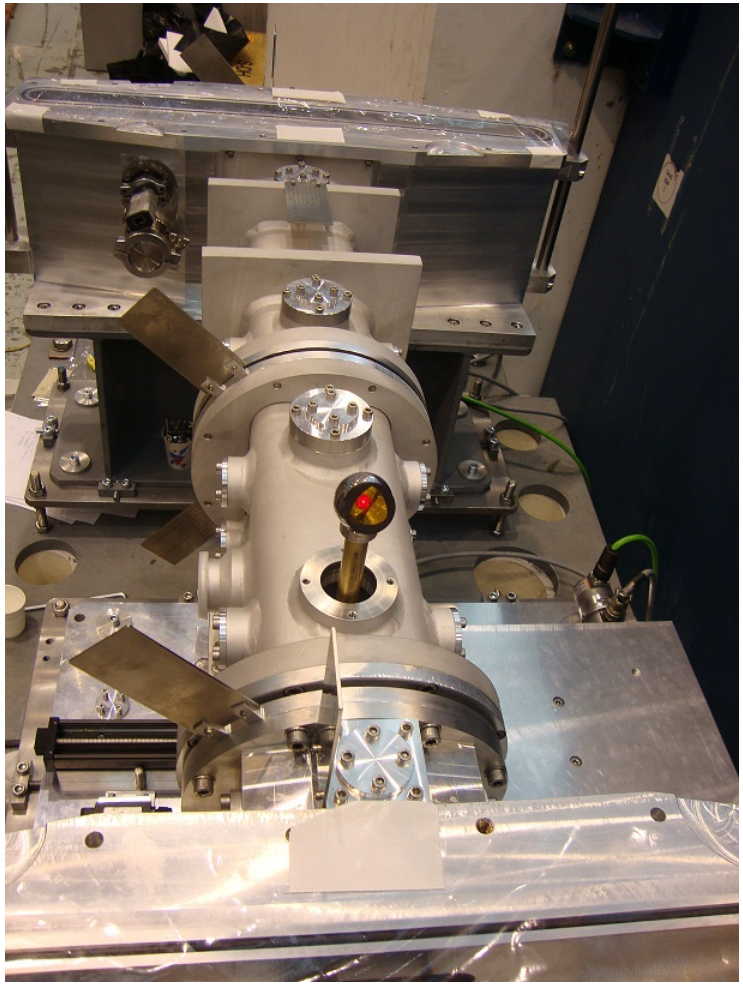
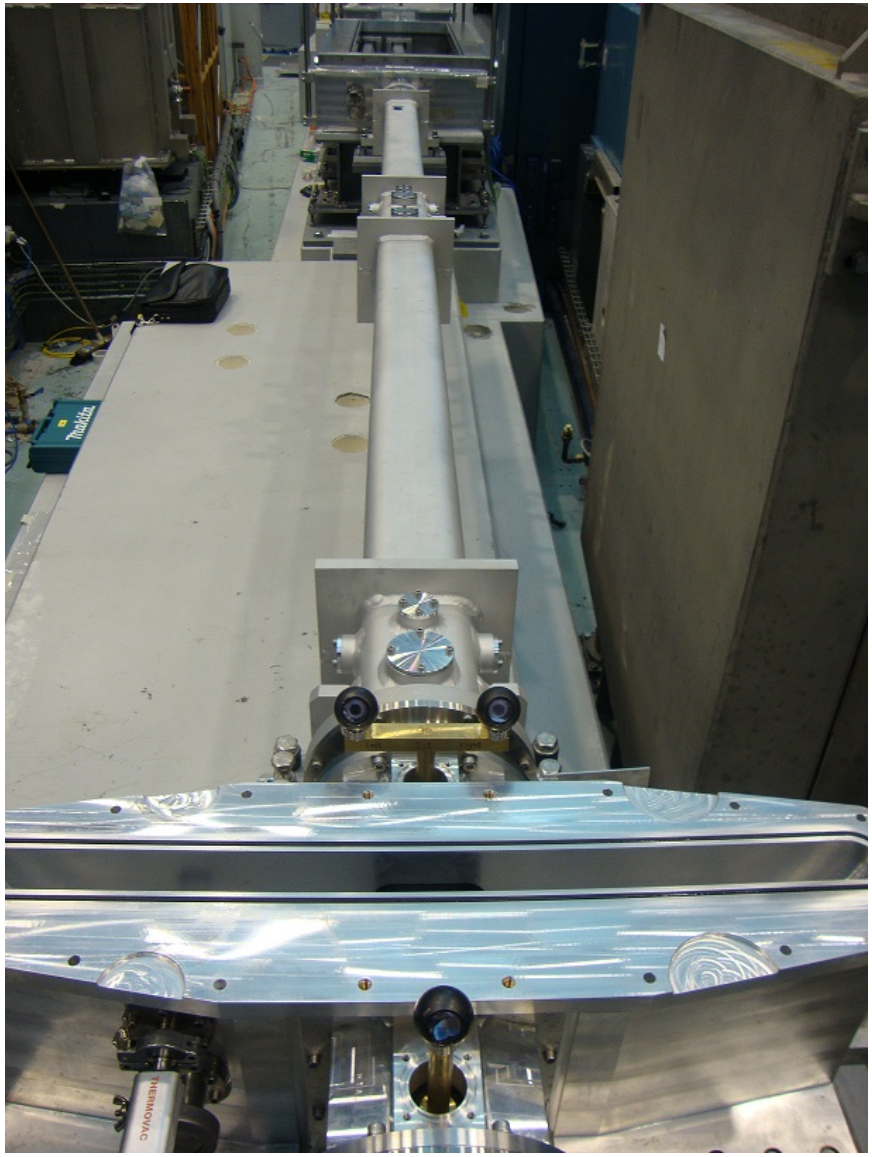
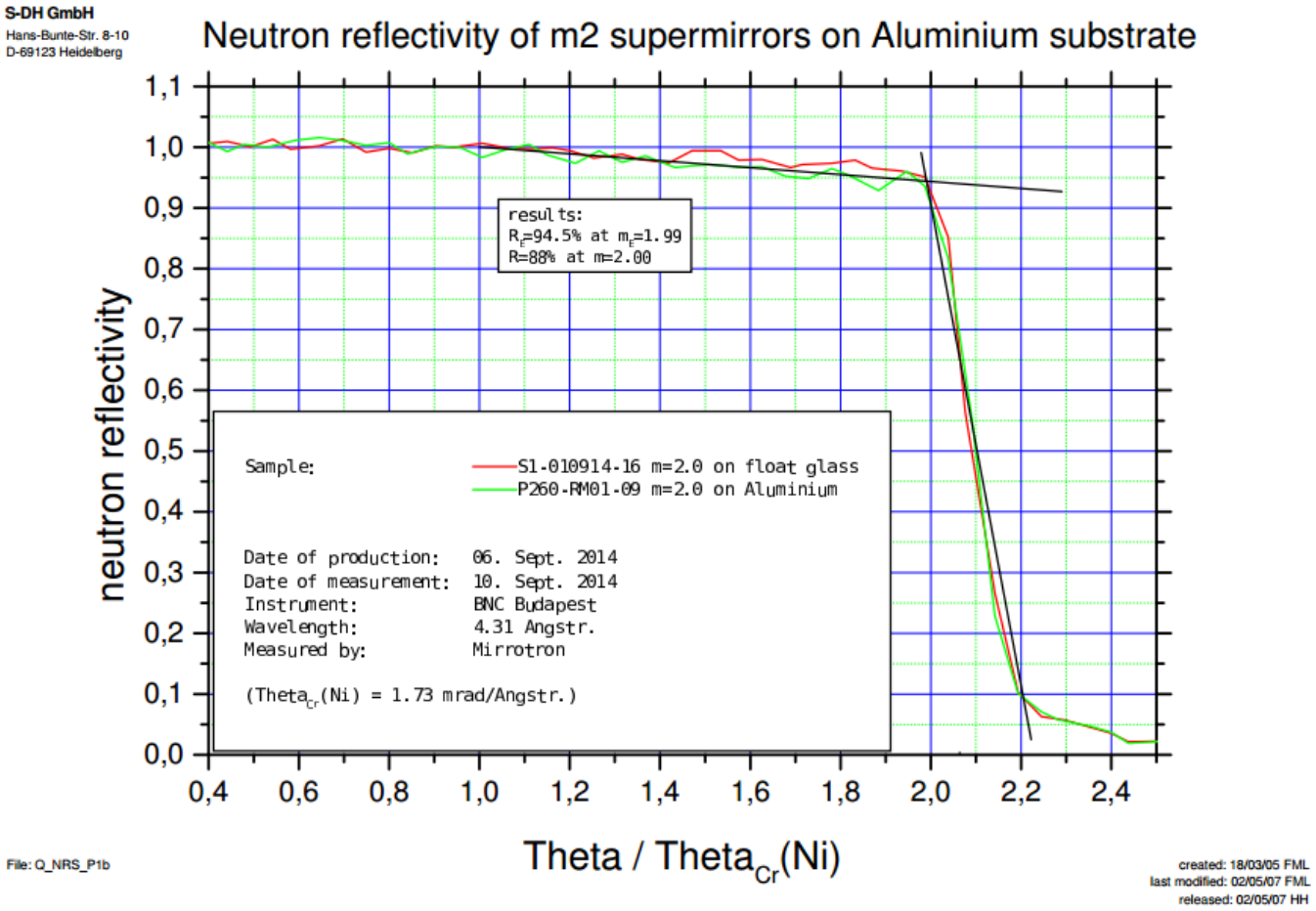




2. Metallic Guide
2.1 Aluminium



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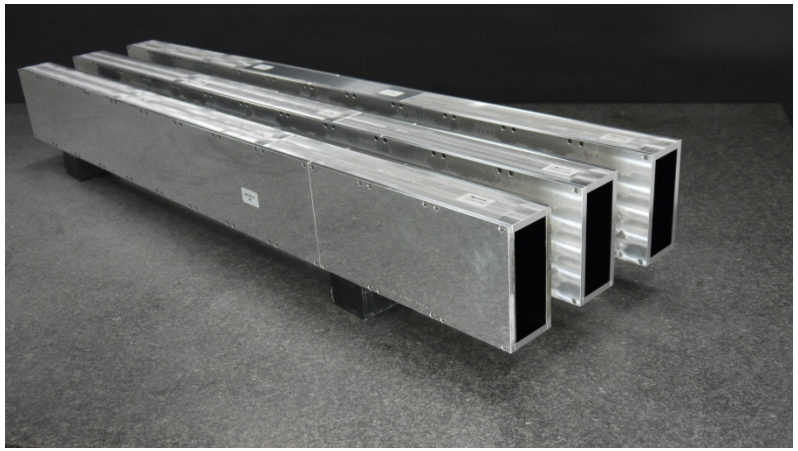

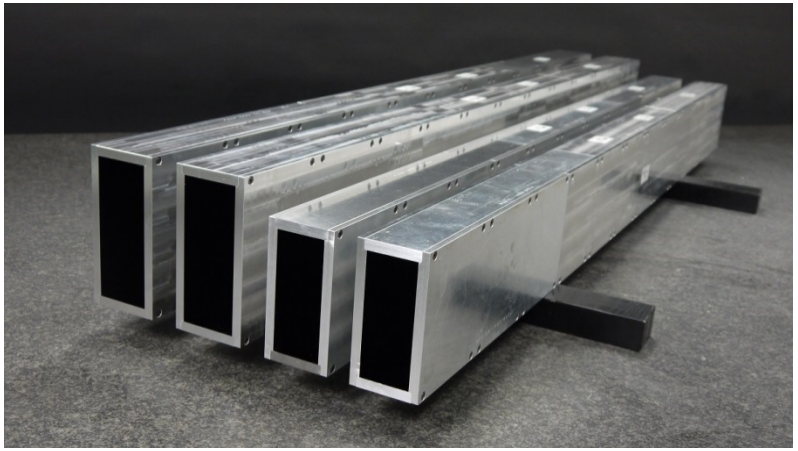

We manufactured more than 10 meter inpile-neutronguides with m=2 coatings

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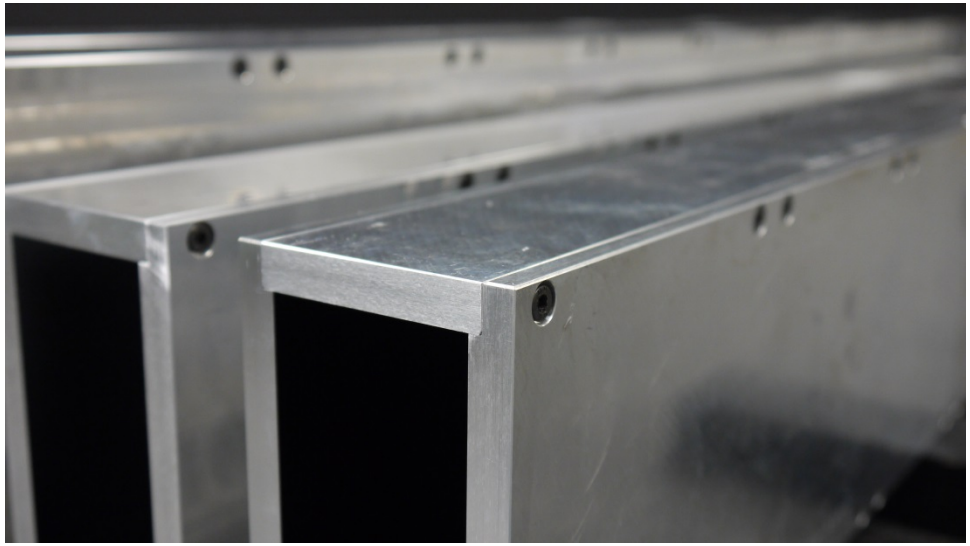
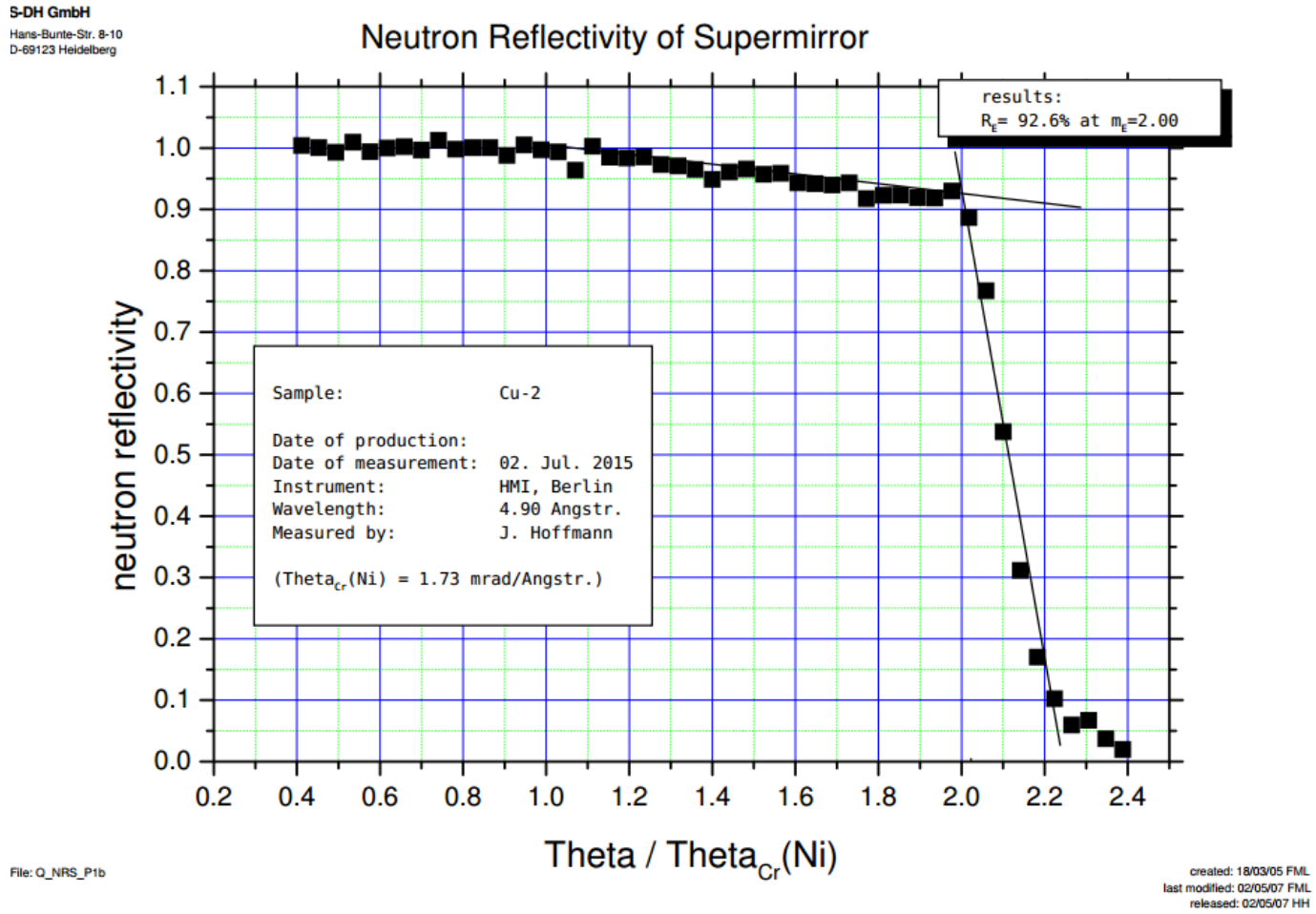


The Neutron Reflectivity over 63 measurements of m=2 supermirrors : 92.8 %

2. Metallic Guide
2.2 Copper



3. Glass Substrate

Glass Substrate used for neutronguides	Density Change *(1) (2) after sample penetration of about 1E18n/cm2 %	Lifedose *(2) with vacuum housing sample penetrating fluence n/cm2	Lifedose *(2) with vacuum housing beam fluence n/cm2
Floatglas,			> 1.00 E+20
N-BK7, Schott	+1.3	> 1.50E+17	> 2.00E+18
S-BSL7, OHARA	+1.3	> 1.50E+17	> 2.00E+18
Borkron N, Schott	-1.0	2.77E+16	3.70E+17
N-ZK7, Schott	-1.0	2.77E+16	3.70E+17
A88-66, Corning	-0.8		
K8, LZOS			
Borofloat 33, Schott	-2.0	**2.10E+15**	**2.80E+16**
Pyrex	-2.0		
Duran (Borosilikatglas 3,3)			

Measurements of density change: (1) W. Kaiser (2) J. Beaucourt, R. Boffy, M. Kreuz, U. Köster, F.J. Bermejo; Why neutron guides may end up breaking down? Some results on the macroscopic behaviour of alkali-borosilicate glass support plates under neutron irradiation ; Nuclear Instruments and Methods in Physics Research B

3. Glass Substrate

Following risc factors can reduce the lifetime of a glass neutron guide **up to two order of magnitude**:

1.) **Self evacuated**
2.) Stress because of weight
3.) Stress because of low or high temperature
4.) Stress because of mechanical load

Use Borofloat only after a Chopper or a Velocity Selector