




DATASHEET
FOR CULTURAL HERITAGE OBJECTS TO BE ANALYSED

Object name:	<i>Disc fibula / Almandinscheibenfibel</i>	
Owner/institute /museum:	Hungarian National Museum	
inventory number:	76.1.45.	
Site:	Kölked-Feketekapu, Grave A279	
date:	end 6 th -beginning 7 th c.	
quantity:	1	
size:	D: 3,1 cm; D _{inlays} : 2,4 cm; H: 2 cm; W: 20,08 g	
material(s):	Fe; Au; bronze; garnet;	
accessories:	special Al sample holder; conditional report; couriered	
estimate value:	6.000 Euros	
insurance:	insured by the HNM	
requirements on the owner's part:	should be moved during the experiments only by the courier of the HNM. should be kept in a safe (humidity: 30-45%; 20-25 °C) after and before measurements.	
parts to be analysed/where to shoot with the beam:	<p>structure: iron band and possible iron or other metal backplate beneath the bronze plate with the partly missing needle case.</p> <p>according to preliminary result: gold lining the cells instead of the expected and common silver; so mapping for gold over the whole object</p> <p>elemental composition of the cement-like sticking material below the stones (est. thickness: 5 mm; mainly Ca-carbonate or -sulphate); composition for determining the workshop</p> <p>the composition of the bead in the center: natural pearl or glass/calcite imitation</p>	
archaeological question to be solved	<p>This fibula stems from one of the most important sites where Germanic population was detected under the Avar rule in the Carpathian basin. In the Kölked site, the Avars of the 6-7th cc. allowed the Germanic people to have their own aristocracy and warriors even after the Avar conquest.</p> <p>The type of this disc fibula was commonly used along the River Rhein (Franks) and in Southern Germany (Alemanni). Some fibulas occurred in Langobardic cemeteries of the Carpathian basin in the middle third of the 6th c.</p> <p>The fibula is dated to the earliest phase of the Kölked cemetery. The unusual iron band may be part of the original design or some later repair. The production technique together with the elemental composition of the sticking material of the garnet inlays may identify the workshop by comparison with (destructive) chemical analyses available for both Western and Eastern examples. Possibly help in determining the ethnicity of the Germanic population (Gepidic or Langobardic).</p>	
analyses done:	in the MTA-IKI PGAA: bulk elemental composition; NR	
archaeological results:	the fibula exhibits gold instead of the more common silver (95% of this type contains guilt silver) making the piece a very rare one, which confines its provenience.	
Literature:	Kiss 1996; Vielitz 2003; Horváth 2008	
Appendices (if attached)	-	


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Object name:	Belt mount /Gegenbeschlag with glass and metal inlays	
Owner/institute /museum:	Hungarian National Museum	
inventory number:	69.1.205.	
Site:	Környe, Grave 66	
date:	middle third 7 th c.	
quantity:	1	
size:	D: 6,1 cm; W: 5,1 cm; Th: 0,3 cm; W: 29,49 g	
material(s):	Fe; Ag; copper; brass; coloured glass	
accessories:	special Al sample holder; conditional report; couriered	
estimate value:	6.000 Euros	
insurance:	insured by the HNM	
requirements on the owner's part:	should be moved during the experiments only by the courier of the HNM. should otherwise be kept in a safe. (humidity: 30-45%; 20-25 °C)	
parts to be analysed/where to shoot with the beam:	Main structure supposed to consist of 2 iron plates soldered together	
	the soldering material (around the edges): elemental composition; Cu based alloy	
	space between the iron plates: empty or some filling (Ca based material or organic)	
	the form, the depth of the incrustations: Ag, Cu, Ca, S +glass	
	the elemental composition of the cement-like sticking material under the glass and the copper (est. thickness: 0,2 cm)	
archaeological question to be solved	<p>Together with the disc fibula from Kölked this belt mount is part of the remains of the 7th c. Germanic population in the Avar Empire (in the Carpathian basin). The Környe cemetery is very close to the Kölked one, there are even stample-matches (??) between different ceramic vessels of the 2 sites.</p> <p>The Germanic people living in Transdanubia had excellent western connections, not only before the Avar conquest but also after it. The men belt sets changed according to the recent changes of merovingian belt garnitures: the forms of the mounts and the combinations in the sets are very similar. Only the decorations differed in some details. According to some technical analyses (with optical microscope, 2D X-ray on both faces and tomography on the western pieces with X-ray cross-section microphotos) the Carpathian basin iron belt sets were made with more-or-less the similar method and were and similarly decorated. The planned analyses are expected to better the examination of these similarities and differences.</p>	
analyses done:	in the MTA-IKI PGAA: bulk elemental composition; NR	
archaeological results:		
Literature:	Salamon-Erdélyi 1965; Kiss 1996; Martin 1980; Martin 1996; Tamáschka 2004; Illerhaus-Goebbels-Riesenmeier 1994	
Appendices (if attached)	-	


DATASHEET
FOR CULTURAL HERITAGE OBJECTS TO BE ANALYSED

Object name:	<i>Disc fibula / Almandinscheibenfibel</i>	
Owner/institute /museum:	REPLICA (made in the Hungarian National Museum)	
inventory number:	-	
Site:	imitation of the Kölked-Feketekapu, Grave A279	
date:	modern imitation of the end 6 th -beginning 7 th c. original	
quantity:	1	
size:	D: 3,1 cm; D _{inlays} : 2,4 cm; H: 2 cm	
material(s):	copper, galvanoplast, tin, enamel, guilt, silvered, see-mussel	
accessories:	no	
estimate value:	Not applicable	
insurance:	no	
requirements on the owner's part:	none	
parts to be analysed/where to shoot with the beam:	bead in the center: sea-mussle	
	the very shape of the replica is similar to the original for making the supports	
	the rough structure can be seen on the replica but the materials are different: email, mother-of-pearl, galvanoplast	
archaeological question to be solved	mostly for modelling form and dimensions of the original; to design sample holder and possible measurements	
analyses done:		
Literature:		
Appendices (if attached)	documentation of the production	


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FOR CULTURAL HERITAGE OBJECTS TO BE ANALYSED

Object name:	<i>Disc fibula / Almandinscheibenfibel</i>	
Owner/institute /museum:	REPLICA (made in the University of Bonn)	
inventory number:	-	
Site:	imitation of the Kölked-Feketekapu, Grave A279	
date:	modern imitation of the end 6 th -beginning 7 th c. original	
quantity:	1	
size:	D: 3,1 cm; D _{inlays} : 2,4 cm; H: 2 cm	
material(s):	Fe, bronze,Au, garnet, cement, glass	
accessories:	no	
estimate value:	not applicable	
insurance:	no	
requirements on the owner's part:	none	
parts to be analysed/where to shoot with the beam:	structure: iron band and bronze back- and top plates	
	Bronze 'spoke-wheel' coated with leaf gold (gold detectable ?) Garnet inlays, chemical composition and nature	
	elemental composition of the cement used as filling material between the plates and top plate and spoke-wheel, respectively	
	the bead in the center of the wheel , chemical composition and nature	
archaeological question to be solved	modelling the dimensions and form of the original; designing sample holder and possible measurements analyses of structural and material properties of replica imitating the expected properties of the original	
analyses done:		
Literature:		
Appendices (if attached)	<p>Documentation of the production</p> <p>This fibula replica was manufactured by the workshop of the Mineralogical Institute. Featuring similar dimensions as the original it consists of 4 parts: the steel ring (Fe), top- and bottom bronze plates (Cu86Sn14), the tilted bronze 'spoke wheel' with garnet (almandine) inlays and a bead in the center.</p> <p>After production of the 'spoke-wheel', it was coated with leaf gold. The inlays between the spokes were prepared from a polished slice of a natural garnet single crystal (mainly almandine). Putting them into position was followed by coating the rear of the assembly with leaf gold and fixing the synthetic bead in the center by some two-component glue.</p> <p>Finally, all parts were put together in the order: bottom plate with soldered fastening, iron ring, top plate and spoke wheel. All empty space between these parts were filled with cement (RACOFIX, mainly calcite and quartz plus some complex mixture of Ca-oxide-carbonate and CaMgAl-silicates).</p> <p>All materials used were characterized by X-ray diffraction as documented.</p>	

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Object name:	Belt mount /Gegenbeschlag with glass and metal inlays	
Owner/institute /museum:	REPLICA made by the Hungarian National Museum	
inventory number:	-	
Site:	imitation of Környe, Grave 66	
date:	imitation of the middle third 7 th c. original	
quantity:	1	
size:	D: 6,1 cm; W: 5,1 cm; Th: 0,3 cm; W: 29,49 g	
material(s):	copper; galvanoplast, enamel, guilt, silvered	
accessories:	no	
estimate value:	Not applicable	
insurance:	no	
requirements on the owner's part:	none	
parts to be analysed/where to shoot with the beam:	modelling the exact dimensions and form of the original for the sample holder and other measurement possibilities very few things could be seen about the structure: the glass inlays modelled with email (same thickness) and the metal inlays by very thin layer of giulding and silvering	
archaeological question to be solved	mostly for modelling the dimensions and the exact form the original; to modell the sample holder and the measurement possibilities	
analyses done:		
archaeological results:		
Literature:		
Appendices (if attached)	documentation of the production	

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Object name:	Belt mount /Gegenbeschlag with glass and metal inlays	
Owner/institute /museum:	REPLICA made by the University of Bonn	
inventory number:	no	
Site:	imitation of the Környe, Grave 66	
date:	imitation of the middle third 7 th c. original	
quantity:	1	
size:	D: 6,1 cm; W: 5,1 cm; Th: 0,3 cm; W: 29,49 g	
material(s):	Fe; Ag; copper; brass; coloured glass	
accessories:	none	
estimate value:	Not applicable	
insurance:	no	
requirements on the owner's part:	none	
parts to be analysed/where to shoot with the beam:	structure: are there the expected 2 iron plates soldered together ?, filling material between plates ?	
	Forms, depths and materials of the incrustations: Ag, Cu, brass, +glass detectable ?	
archaeological question to be solved	modelling form and dimensions of the original; to design sample holder and possible measurements analyses of structural and material properties of replica imitating the expected properties of the original	
analyses done:		
archaeological results:		
Literature:		
Appendices (if attached)	documentation of the production This belt mount replica was manufactured by the workshop of the Mineralogical Institute (UNIBONN). It consists of two iron plates, the upper decorated one with bent edges closely following the roughly triangular shape of the original and the flat bottom plate tightly fitting into the upper plate's rim. These plates are held together by three silver rivets close to the triangle corners. Most probably contrary to the original, the space between the iron plates was left empty. The decorations on the top plate are inlays, pieces of silver wire in the decoration bands as well as differently shaped platelets made of silver, brass and green colored glass, where those of the latter two materials were lined with copper. All materials used were characterized by X-ray diffraction as documented.	