



**Etchants**

**Revision:** November 29<sup>th</sup>, 2019

PRODUCT NAME	ITEM NO.	SUPPLEMENTARY DETAILS
<b>Etchant Visipro I.</b>	95014346 95014347	500 ml 1 l

<b>Description</b>	Etchant for visualization of prior austenite grain boundaries in heat treated steels with bainitic and martensitic microstructures.
<b>Material</b>	Aqueous solution of picric acid. Surfactants and additional components can be considered non-critical additives: 2,4,6-trinitrophenol 1-2%
<b>Properties</b>	Transparent, yellowish liquid with low viscosity (0,950 mPas). Characteristic, acidic smell. After several applications the etchant changes its color to a reddish-brown. This does not influence the functionality of the etchant. pH value at 20°C between 1,9-3 (according to age of the etchant).
<b>Application</b>	<p>Visipro I. comes as a ready to use product. Etching dishes based on polyolefines or borosilicate glass may be used. Even though the solution changes its color to a reddish-brown, the functionality is not influenced. A scratch free polished specimen surface is mandatory for a successful application of the etchant (The sample surface should at least be polished with 3 µm diamond suspension). Visipro I. is only suited for micro-etching. The sample is dipped into the etchant and stirred to guarantee a homogeneous contact with Visipro I. After the initial phase the sample can be positioned on the bottom of the etching dish. The total immersion time ranges between 10 to 40 min according to alloy composition.</p> <p>The etched sample is rinsed with water. In the case of C-steel a dark layer of etching residues forms on the sample surface. This layer is removed trough hand-polishing the sample on a wet polishing-cloth. After cleaning the sample with water and ethanol a microscopic analysis (DIC-techniques are to be preferred) is possible. If the prior grain boundaries are not visible properly the etching procedure can be repeated until a satisfying result is obtained.</p>
<b>Health and Safety</b>	Visipro I. is strongly acidic. The Etchant should only be handled inside a suitable fume cupboard or while wearing a respiratory protective device (filter class E). The time frame of exposition should be considered for choosing a respiratory device. Protective clothing, close fitting safety glasses and protective gloves (Nitrile rubber) should be worn.
<b>Environmental precautions</b>	Visipro I. can not be disposed directly into sewers, surface- or phreatic waters. The disposal must be handled according to local legislation. Visipro I. needs to be treated as acidic aqueous waste. A neutralization of the used etchant should be conducted before disposal. Therefore, solutions of strong bases like NaOH can be used.
<b>Storage</b>	The storage must fulfill the requirements of storage class 8B (TGRS 510). Visipro I. should always be stored at a cool (3-30°C) and dry place. The containers should always be tightly closed.