ZSCHIMMER & SCHWARZ
MOHSDORF GmbH & Co KG

Textile Auxiliaries Division
Chemnitztalstraße 1 09217 MOHSDORF / GERMANY Fon: +49 (0) 37 24/67-0 Fax: +49 (0) 37 24/67-209
textil@zschimmer-schwarz.com www.zsm.de

Warp waxing - Cold sizing

For which kind of woven fabrics warp waxes or cold sizing agents are used?

- outerwear
- clothes for children
- fashionable woven fabrics
- furnishing fabrics
- towels
- blankets
- geotextiles
- canvas

Which effects are reached?

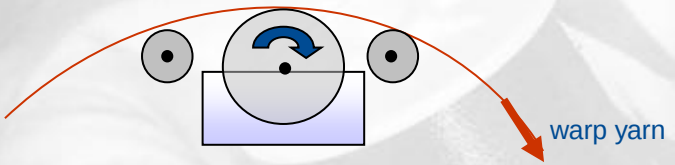
- high smoothness of yarn
- antistatic
- reduces the yarn brake rate
- reduces the tendency of the threads to hook to each other
- increasing of quality
- less dust during weaving
- increasing of weaving efficiency

Warp waxing increases the weaving efficiency and the quality of woven fabrics.

Warp waxing - Cold sizing

How to applied warp waxing and cold sizing agents?

Lick-roller-prinzip:



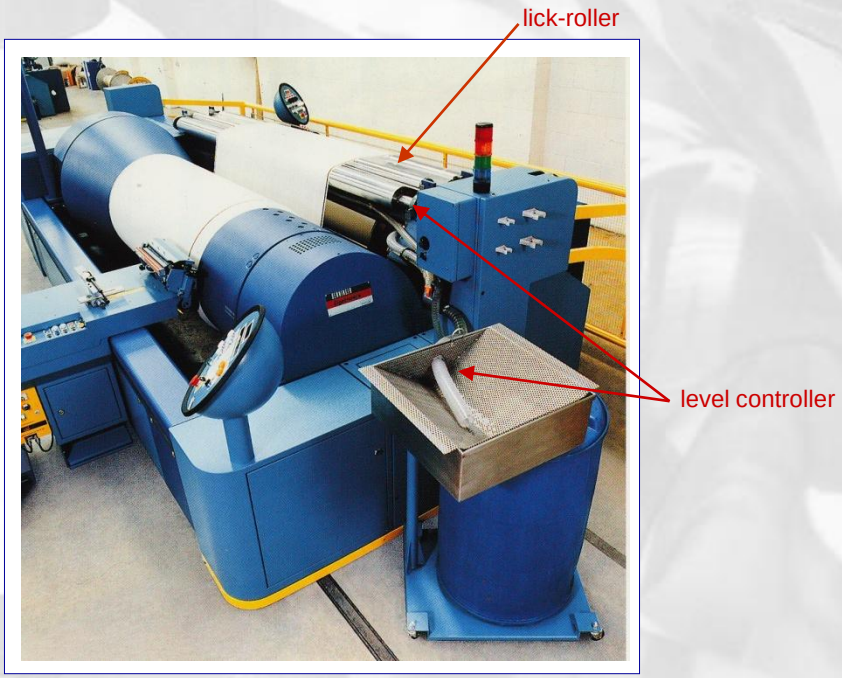
A powered roller dips into the waxing agent and wets the warp threads.

The speed of the roller can be adjusted variable. The higher the roller speed the higher is the amount of warp waxing agent applied.

Usually, the running direction of the warp and the roller should be the same.

If the roller rotates in the opposite direction, the amount of warp waxing agent will be increased but the hairiness of the warp yarn also.

Warp waxing unit of beaming machine (Benninger)**:**



• Warp waxing or cold sizing products are applied by lick roller during rewinding of the warp on the warp beam.

• Usually, drying of the warp is not necessary. If a high amount of cold sizing agents as ENSIMOL ML are applied (more than 5% product on warp) drying is useful.

• A level controller on the waxing unit gives a guarantee for an even product application.

Warp waxing and cold sizing agents

Kind of products:

Kind of products	ZSM-Product	Properties / advantages	Wash off
Film-forming products	**ENSIMOL ML**	• Increasing of tensile strength of yarn, • Reduces the tendency of yarn to hook each to other • difficult qualities are able to produce	• Wash off by using of a nonionic detergent (TISSOCYL CSB, TISSOCYL RLB oder TISSOCYL DLF) • 40 – 70°C, 20 min, (dwelling time required) • pH max 8,5 sensitive to alkali!
Wax-like products (After drying on yarn)	**ENSIMOL FWA** (ENSIMOL B 60) - only as additive -	• high smoothness of warp, • reduces the tendency of threads to hook each to other, increases • lower hairiness of yarn • good dust binding • very good antistatic • optimal for spun yarn	• Wash off by using of a nonionic detergent (TISSOCYL CSB, TISSOCYL RLB oder TISSOCYL DLF) • pH 8-9 (soda ash) • 40 – 70°C
Liquid products (after drying on yarn)	**ENSIMOL KW conc** **TORSINOL ZSB***	• high smoothness of warp, • reduces the tendency of threads to hook each to other, increases • very god dust binding • good antistatic • optimal for filaments	

* The twisting oil TORSINOL ZSB can also be used as warp wax for some kinds of yarn.

Field of application of warp waxes and cold sizing agents

Which product for which kind of fabric?

Warp waxes

Product	wool / wool mixtures	PES/CO PES/CV synthetic staple fibres	Linen, linen/viscose	Staple fibres: viscose, acetate	Filaments: PES viscose, acetate	Additive for classic sizing agents (starch, CMC)
ENSIMOL KW conc	+	++	++	+++	++	-
ENSIMOL FWA	+++	+++	+	-	-	-
ENSIMOL B 60	-	-	-	-	-	+++
TORSINOL ZSB	+	-	+	-	+++	-

Cold sizing agent

ENSIMOL ML	++ siro-spun yarn	+++ single yarn	++ single yarn	++ single yarn	-	-

+++	very good
++	good
+	possible
-	not recommended

Technical parameters of warp waxing and cold sizing agents

Technical parameters of ENSIMOL types:

Warp waxes

Product	active matter [%]	appearance of product	ionic character	viscosity 20°C [mPa s]	appearance of product on fibre	pH value	chemistry
ENSIMOL KW conc	50	clear, colourless	non-ionic	60	liquid	7.5 – 8.5	polyglycol ether, fatty alcohol ethoxylate
ENSIMOL FWA	35	clear, yellow	non-ionic	500	wax-like, soft	7 - 8	fatty acid ethoxylate, anti-static agent
ENSIMOL B 60	60	high viscous, yellow	non-ionic	10 000	wax-like, soft	5 - 7	fatty acid polyglycol ester
TORSINOL ZSB	100	clear, yellowish	non-ionic	30	liquid	5.5 - 7	mineral oil

Cold sizing agent

ENSIMOL ML	20	turbid, colourless	non-ionic / cationic	35	closed film	5-6.5	polyvinyl alcohol, polyglycol ether

This information and our advice are given in good faith but without warranty. Our advise does not release you from the obligation to check its validity and to test our products as to their suitability for the intended process and uses.

Comparison: Conventional sizing - Cold sizing - Warp waxing

	Conventional sizing:	Cold sizing	Warp waxing
Process:	• sizing agent = film forming • dipping the warp into a hot sizing bath • squeezing and drying • application of a high amount of sizing agent	• sizing agent = film forming • applicable by lick-roller on warping frame during rewinding • smaller amount of cold sizing liquor • drying of warp not necessary (but possible)	• sizing agent = not film forming, but good lubricity • applicable by lick-roller on warping frame during rewinding • no drying necessary
Pick-up: (size liquor)	**10 – 50%**	**2 – 8%**	**1 – 3%**
Effect:	• film-forming substances of sizing agent penetrate into the inner of yarn and stick the fibres together • very high strength of yarn results • higher weaving efficiency	• film-forming substances applied only on the surface of yarn • cold sizing increases the strength of yarn • lower warp end break rate, higher quality, higher weaving efficiency	• gliding substances applied on surface of yarn • no increasing of strength of yarn • lower warp end break rate, higher quality, higher weaving efficiency
Process costs:	• very expensive • high investment costs (special sizing unit necessary) • high running costs (costs for staff, energy and product) • desizing process necessary	• very low running costs • removable by washing	• very low running costs • easy to remove by washing
Material:	• thin cotton / polycotton yarn (Nm 50 – Nm 130) • thin, zero-twist filament yarn	• single yarns of medium count (Nm 8 - Nm 40) • difficult qualities	• twisted yarns • yarn with enough strength for weaving
ZSM products:	Only as additive for conventional sizing liquors: **ENSIMOL B 60**	**ENSIMOL ML**	**ENSIMOL FWA** **ENSIMOL KW conc**