HIPRO

HIGHLY PROFESSIONAL SOLUTIONS for carpet manufacturing

UNIQUE IDEAS. UNIQUE SOLUTIONS.
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HIGHLY PROFESSIONAL SOLUTIONS WITH CHT / BEZEMA – YOUR PARTNER FOR CARPET MANUFACTURING

For thousands of years, people have used carpets and rugs to feel at home. Carpets give us a cosy feeling and create a distinctive, stylish atmosphere.

Nowadays plenty of technological possibilities can be used to create, design and produce fascinating, durable, stain-resistant carpets and rugs with many extraordinary properties.

We are not in the position to give you a recipe to produce a magic flying carpet, but we would like to roll out the red carpet for you and invite you into our world of carpet manufacturing know-how. A team of experts in all fields of carpet manufacturing and finishing allows the elaboration of tailor-made, innovative solutions for your carpet manufacturing.

The strength of the CHT / BEZEMA Group is its comprehensive competence as system provider of textile auxiliaries and textile colours for product solutions along the whole textile process chain. For the topic of carpets CHT / BEZEMA offers a large product range and innovative process approaches, starting from fibre production to pretreatment / dyeing, printing, finishing and coating of carpets.

In this brochure we present you our efficient product range with our entire system solutions.
OPTIMAL PROPERTIES WITH HIPRO SOLUTIONS

SPINNING, BUT CORRECTLY
Safety in production throughout the spinning process and further processing steps from the fibre to the carpet. Guaranteed through the right frictional profile and accomplished with our DURON products.

LEVEL DYEINGS
Unevenness in dyeing can occur due to the different kinetic properties and saturation values of polyamide fibres. This problem can be minimized through special auxiliaries and selection of the right dyestuffs. Moreover, with the right auxiliary combination the dyeing results of dyestuffs with different absorption speeds will be better.

PRINTS WITH SHARP OUTLINES
Optimal printing results with selected PRISULON and TUBIVIS thickener as well as our auxiliaries from the RAPIDOPRINT® range. No matter if conventional or jet printing, frosting is minimized, fixation is optimised and the outlines are very sharp.

IMPRESSING EFFECTS
Differential dyeing is the playground for colour creation. By using BEMACID and BEMAPLEX dyestuffs in combination with SARABID IPD and SARABID IPF you have endless possibilities. No matter if resist technology in printing or gum layer, safety in production is very important. The wide range of PRISULON thickeners and RAPIDOPRINT® auxiliaries enables this.

BETTER FASTNESSES
Better chlorine fastnesses or less soiling of the printing background when cleaning carpets. There are many requirements – special auxiliaries produce solutions.

LESS SOILING
Stain blockers prevent that anionic soil, e.g. food colours, stain the carpet like a dyestuff would.

EASIER CLEANING OF CARPETs
Soil release is the term that describes how easy normal soil such as coffee, tea or soft drinks can be removed from the carpet. TUBIGUARD® products accelerate removal of this soil and decrease the tendency of carpet soiling beforehand.

PROTECTION AGAINST MOTHS
Wool has many advantages. The most severe disadvantage is that moth larvae eat their way into the wool fibres. In order to avoid this, the carpet has to be finished with a product such as BEMATIN 988.

GOOD LIGHT FASTNESSES
This is a very important aspect for rugs and fitted carpets. Selection of the right dyestuffs from the BEMACID/BEMAPLEX range guarantee the required light fastness.

GOOD WASH FASTNESSES
Selecting the right dyestuffs is the basis for good wash fastness properties. Stain blockers increase the wash fastness properties.
**FIBRE AUXILIARIES**
Spin finishes are indispensable processing aids for manufacturing carpet yarns. Whether pile-forming filament and staple fibre yarns, needle felt or tapes and spunbonded nonwovens for carpet backings – CHT / BEZEMA spin finishes provide the correct cohesive profile in all spinning processes and further processing steps and prevent static charging and tribothermal damage of the fibre material. High spinning speeds with high yields, excellent master batch compatibility, voluminous and soft yarn handle in addition to process-oriented thermostability are only some of the outstanding features of our DURON products. CHT / BEZEMA fibre auxiliaries – always ahead by a carpet length.

**PRETREATMENT / DYEING**
The product range of the application field “Pretreatment / Dyeing” comprises a wide range of surfactants, dyeing auxiliaries and products for aftertreating carpets which are marketed under the names FELOSAN, COLORCONTIN, SARABID, REWIN, NEUTRACID and MEROPAN. Our portfolio includes special products for the continuous and discontinuous prewashing and dyeing of polyamide and wool carpets. Whether single dyeings, crossdyeings or differential dyeings are to be carried out, for dyeing with acid and metal complex dyestuffs on polyamide and wool we have wetting agents, levelling agents, contrast accentuating products and antifrosting products at our disposal. A wide range of acid donors and buffers complete the range. CHT / BEZEMA offers a selection of special auxiliaries with fibre affinity for the improvement of water fastnesses, fastnesses to chlorine and soil release behaviour.

**DYESTUFFS**
Colours give carpets their particular charisma and heighten impulses, making them unique. A complete dyestuff range facilitates individual colouring. CHT / BEZEMA offers dyestuffs for the discontinuous and continuous carpet dyeing focusing on carpets made of polyamide and wool. Acid dyestuffs of the BEMACID E range contain the special carpet trichromat BEMACID E-TL which gives the highest process safety. The low electrolyte special finish of the dyestuffs guarantees the application on spray printing lines. The excellent combination behaviour, in addition to the rapid pick-up, even at lower temperatures, facilitates a tone-in-tone bath exhaustion, setting the standard for discontinuous dyeing. The excellent light fastnesses meet the high demands of the carpet industry. For washable carpets a variety of dyestuffs are available, namely the acid BEMACID F dyestuffs with a high wet fastness and the 1:2 metal complex BEMAPLEX dyestuffs. A suitable dyestuff selection also facilitates the resist printing process.

**PRINTING**
A wide range of different thickeners and printing auxiliaries are necessary to meet the demands of modern carpet printing. We offer solutions for all carpet printing fields, whether synthetic thickeners for digital spray printing under the name TUBIVIS, biopolymers for Milliton® printing or natural thickeners for classic printing under the name PRISULON. We have the optimal solution for various demands in all fields. A complete range of antifoams, penetration auxiliaries, antifrosting and resisting agents under the name RAPIDOPRINT® allows for the adjustment of the print pastes to individual production requirements and all carpet qualities. Whether for carpet printing on polyamide or wool, with acid or metal complex dyestuffs or polyacrylic with basic dyestuffs – CHT / BEZEMA is the right partner for you.

**FINISHING**
Today, carpets must be aesthetically pleasing, functional and durable. For individual fields, including automotive, different properties are demanded which are achieved through the corresponding finish. A carpet should have an agreeable touch, should not cause static charging and should have a good stain release behaviour. Since staining cannot be avoided in daily use, the protection of carpets together with efficient and easy cleaning are most important for a lasting appearance. CHT / BEZEMA offers suitable products for all the different fields and, as a reliable partner, CHT / BEZEMA faces the demands made on a functional carpet finish.

AVISTAT® – for efficient antistatics I BEMATIN® – digestible insecticide for wool carpets I TUBINGAL® – different softeners with various handle effects I TUBIGUARD® – for stain protection with a distinct water and oil repellency I DIAMOND® PROTECTION-SYSTEM – for an expanded stain protection.

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**PRODUCTION AND FINISHING OF CARPETS**
FIBRES USED IN CARPET PRODUCTION

Wool
Natural product

Polyamide 6.6
Trivial name Nylon
Polycondensation of adipic acid with 1,6-Hexamethylenediamine found by W. H. Carothers (DuPont) in 1934

Polyamide 6
Trivial name Perlon
Polymerisation of ε-Caprolactam found by P. Schlack (I.G. Farben) in 1938

Polyester
Polycondensation of terephthalic acid with ethylene glycol with the example PET (Whinfield / Dickson)

Polyacrylonitrile
Polymerisation of acrylonitrile

Polypropylene
Polymerisation of propylene

Adipic acid 1.6-Hexamethylenediamine
Polyamide 6.6

ε-Caprolactam
6-Aminohexanoic acid
Polyamide 6

Terephthalic acid
Ethylene glycol
Polyethylene terephthalate

Acrylonitrile
Polyacrylonitrile

H₂C – CH = CH₂
Polypropylene
Filaments, yarns and fibres used in carpet production have varying properties. This is to match the manifold needs of the carpet industry. A part of the demanded properties are obtained by the right choice of spin finish. As a process aid in spinning it adjusts the fibre/metal- and fibre/fibre-friction and avoid the static load of fibres in high speed spinning processes. Special additives protect the fibres against mechanical stress encountered in the crimper box of BCF plants. Excellent spreading and low migration properties support smooth production and downstream processing of carpet yarn like weaving or tufting. The right choice of raw materials used guarantee the thermal stability of the spin finish in different heat set processes like Suessen-, Superba- or Power-Heat Set.

Taking all these aspects into consideration a high performance spin finish contributes beneficially to the economic aspects in carpet production like machinery efficiency, waste rate and yarn quality. Above all, spin finishes are able to impart functionality. The wide range of CHT’s PP-BCF spin finishes enables the carpet producer to vary the handle of the pile from extremely crunchy to supersoft. Spin Finishes are not commodities but highly sophisticated process aids with considerable influence on the quality of the final carpet!

In the following the CHT’s spin finishes are categorised by the type of polymer.
As polyamide being the most frequently used fibre for carpet dyeing and carpet printing, this fibre will be our main focus on the following pages.

SATURATION VALUE OF A PA FIBRE
The saturation group gives information on the number of possible dyestuff addition points.

- Dyestuff saturation I  high number of amino end groups:
  high amount of dye can be fixed  |  darker shades possible
- Dyestuff saturation III  low number of amino end groups:
  low amount of dye can be fixed  |  dyes with high K-value are absorbed prior to dyes with low K-value

<table>
<thead>
<tr>
<th>Dyeing conditions</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 g PA Substrate</td>
<td>Fibre saturation group</td>
</tr>
<tr>
<td>0.8 % C.I. Acid Yellow 19</td>
<td>Deep/High</td>
</tr>
<tr>
<td>0.6 % C.I. Acid Blue 40</td>
<td>Regular</td>
</tr>
<tr>
<td>pH 8</td>
<td>Low</td>
</tr>
<tr>
<td>LR 1 : 40</td>
<td></td>
</tr>
<tr>
<td>30 min at 98 °C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Low fibre saturation</th>
<th>High fibre saturation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymerisation degree</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Number of amino end groups</td>
<td>low</td>
<td>high</td>
</tr>
</tbody>
</table>

KINETIC PROPERTY OF PA FIBRES
The fibre kinetic specifies how easy a PA fibre can absorb dyestuff

- Class 1  dyestuff fixation starting already at 30 °C
  very quick absorption of the dyestuff
- Class 5  maximum dyestuff fixation not until 80 – 90 °C
  slow absorption of the dyestuff

<table>
<thead>
<tr>
<th>Kinetic Classification of PA</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 – 98 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 – 90 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 – 80 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 – 70 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 – 60 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 – 50 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 – 40 °C</td>
<td>10 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard recipe: 1.5 % BEMACID BLUE N-TF  |  pH 6.0  |  LR 1 : 20

<table>
<thead>
<tr>
<th></th>
<th>Fibre kinetics slow (e.g. class 5)</th>
<th>Fibre kinetics quick (e.g. class 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stretching</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Degree of crystallisation</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Setting condition</td>
<td>dry</td>
<td>wet</td>
</tr>
<tr>
<td>Setting</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
CLASSIFICATION OF BEZEMA ACID/1:2 METAL-COMPLEX DYES

<table>
<thead>
<tr>
<th>Dyestuff-Type</th>
<th>Trade name</th>
<th>Molecular-size</th>
<th>Degree of Sulphonisation</th>
<th>Charge Wetfastness</th>
<th>Migrationpower</th>
<th>Coverage of streakiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid</td>
<td>BEMACID E</td>
<td>small</td>
<td>mono-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acid</td>
<td>BEMACID N</td>
<td>medium</td>
<td>mono-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acid</td>
<td>BEMACID F</td>
<td>large</td>
<td>di-</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:2 Metal Complex</td>
<td>BEMAPLEX N</td>
<td>large</td>
<td>none/masked</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:2 Metal Complex</td>
<td>BEMAPLEX M</td>
<td>large</td>
<td>mono-</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:2 Metal Complex</td>
<td>BEMAPLEX D</td>
<td>large</td>
<td>di-</td>
<td>---</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Dura Flooring Systems GmbH, Fulda
**BEMACID E**

**Properties**
- Very good migration
- Very good coverage of streakiness/barriness on PA
- Very good coverage of differences between wool root and tip
- Good combinability with all other BEMACID E dyes
- Easy dyeing with the tri-chromate E-TL
- Moderate wet fastness
- Very high light fastness

**Fields of application**
- Pale to medium shades on outerwear garments
- Stockings, socks, underwear
- Technical textiles
- Carpets
- Decoration articles
- Piece dyeing wool
- Carbonized wool
- Pale shades on wool carpet yarn

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**BEMACID E – Tri-chromate comparison of the lightfastness**

<table>
<thead>
<tr>
<th>1/1 SD</th>
<th>lightfastness B02</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1/1 SD</td>
</tr>
<tr>
<td>0.65%</td>
<td>Yellow E-TL 6</td>
</tr>
<tr>
<td>0.75%</td>
<td>Red E-TL 6</td>
</tr>
<tr>
<td>1.20%</td>
<td>Blue E-TL 6</td>
</tr>
<tr>
<td>0.70%</td>
<td>Yellow E-T3R 6</td>
</tr>
<tr>
<td>0.75%</td>
<td>Red E-T2B 6</td>
</tr>
<tr>
<td>1.10%</td>
<td>Blue E-T4R 6</td>
</tr>
</tbody>
</table>

---

**BEMACID E**

<table>
<thead>
<tr>
<th>Tri-chromate</th>
<th>Additonal elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEMACID Yellow E-TL</td>
<td>BEMACID Yellow E-4G</td>
</tr>
<tr>
<td>BEMACID Red E-TL</td>
<td>Red E-KRL</td>
</tr>
<tr>
<td>BEMACID Blue E-TL</td>
<td>Blue E-2R</td>
</tr>
<tr>
<td></td>
<td>Blue E-G</td>
</tr>
<tr>
<td></td>
<td>Blue E-3GC</td>
</tr>
</tbody>
</table>
## DYESTUFFS

### BEMACID N

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fields of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Moderate dependence on pH</td>
<td>• Medium to dark shades on outer garments</td>
</tr>
<tr>
<td>• High exhaust at neutral pH</td>
<td>• Sportswear, swimwear, stockings, socks and lingerie</td>
</tr>
<tr>
<td>• Good migration in presence of a pseudo cationic levelling agent</td>
<td>• Combed top-, yarn-, hank-, piece dyeing</td>
</tr>
<tr>
<td>• Good coverage of streakiness / barriness</td>
<td>• Carpet yarn (WO and WO/PA)</td>
</tr>
<tr>
<td>• Good WO/PA distribution</td>
<td>• WO/PA-Blends</td>
</tr>
<tr>
<td>• Gentle wool dyeing at pH 4.5 (isoelectric range)</td>
<td></td>
</tr>
<tr>
<td>• Good to very good wet fastness</td>
<td></td>
</tr>
<tr>
<td>• Good light fastness</td>
<td></td>
</tr>
</tbody>
</table>

### BEMACID N

<table>
<thead>
<tr>
<th>Tri-chromate</th>
<th>Additonal elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEMACID Yellow N-TF</td>
<td>BEMACID Yellow N-2G</td>
</tr>
<tr>
<td></td>
<td>Orange N-BG</td>
</tr>
<tr>
<td>BEMACID Red N-TF</td>
<td>Rubine N-5B</td>
</tr>
<tr>
<td>BEMACID Blue N-TF</td>
<td>Bordeaux N-BL</td>
</tr>
<tr>
<td></td>
<td>Blue N-5GL</td>
</tr>
<tr>
<td></td>
<td>Navy N-5R</td>
</tr>
<tr>
<td></td>
<td>Black N-TMF</td>
</tr>
</tbody>
</table>

### BEMACID F

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fields of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong pH dependence</td>
<td>• As single shade or shading component for wet-fast PA articles such as swimwear,</td>
</tr>
<tr>
<td>• Low migration</td>
<td>sportswear or technical textiles</td>
</tr>
<tr>
<td>• Moderate coverage of streakiness / barriness</td>
<td>• For medium to dark shades</td>
</tr>
<tr>
<td>• Moderate coverage of differences between wool root and tip</td>
<td>• Printing</td>
</tr>
<tr>
<td>• Good to very good light fastness</td>
<td>• Flock-, combed top-, piece- yarn dyeing on wool</td>
</tr>
<tr>
<td>• Excellent wet fastness</td>
<td></td>
</tr>
<tr>
<td>• High brilliancy</td>
<td></td>
</tr>
<tr>
<td>• Limited combinability</td>
<td></td>
</tr>
</tbody>
</table>

### BEMAPLEX N

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fields of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Water-insoluble or less water-soluble</td>
<td>• Automotive PA and WO</td>
</tr>
<tr>
<td>• Lower dependence on the pH value</td>
<td>• Flock-, combed top-, yarn dyeing of wool and WO-Blends</td>
</tr>
<tr>
<td>• Good build up on PA</td>
<td>• For deep shades on PA micro fibre (note the wet fastness)</td>
</tr>
<tr>
<td>• Good to low migration</td>
<td>• PA/Elastan</td>
</tr>
<tr>
<td>• Good coverage of streakiness / barriness on PA</td>
<td></td>
</tr>
<tr>
<td>• Good coverage of differences between wool root and tip</td>
<td></td>
</tr>
<tr>
<td>• Good to very good staining of elastane</td>
<td></td>
</tr>
<tr>
<td>• Good wet fastness</td>
<td></td>
</tr>
<tr>
<td>• High light fastness</td>
<td></td>
</tr>
</tbody>
</table>
### BEMAPLEX M

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fields of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Moderate pH dependence</td>
<td>• Medium to dark shades on sportswear, swimwear and outerwear garments</td>
</tr>
<tr>
<td>• Low migration</td>
<td>• Combed top-, yarn-, hank-, piece dyeing</td>
</tr>
<tr>
<td>• Good coverage of streakiness / barriness on PA</td>
<td>• Carpet yarn (WO and WO/PA)</td>
</tr>
<tr>
<td>• Good coverage of differences between wool root and tip</td>
<td>• WO/PA-Blends</td>
</tr>
<tr>
<td>• Good wet fastness</td>
<td>• Printing and carpet resist printing</td>
</tr>
<tr>
<td>• High light fastness</td>
<td>• Good combinability within the range and with selected BEMACID F dyestuffs</td>
</tr>
<tr>
<td>• Good combinability within the range and with selected BEMACID F dyestuffs</td>
<td></td>
</tr>
</tbody>
</table>

**BEMAPLEX M**

<table>
<thead>
<tr>
<th>Tri-chromate</th>
<th>Additional elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEMAPLEX Yellow M-T</td>
<td>BEMACID Yellow F-G</td>
</tr>
<tr>
<td></td>
<td>Orange F-GR</td>
</tr>
<tr>
<td></td>
<td>Red F-LE</td>
</tr>
<tr>
<td></td>
<td>Violet F-B</td>
</tr>
<tr>
<td></td>
<td>Blue F-2R</td>
</tr>
<tr>
<td></td>
<td>Blue F-2G</td>
</tr>
<tr>
<td></td>
<td>Blue F-BL</td>
</tr>
<tr>
<td></td>
<td>Blue N-5GL</td>
</tr>
<tr>
<td></td>
<td>Green F-2B</td>
</tr>
<tr>
<td>BEMAPLEX Red M-T</td>
<td>BEMAPLEX Navy D-RD</td>
</tr>
<tr>
<td></td>
<td>Black M-2B</td>
</tr>
<tr>
<td></td>
<td>Black D-R</td>
</tr>
<tr>
<td></td>
<td>Black D-TR*</td>
</tr>
</tbody>
</table>

* special black for Chromojet printing

### BEMAPLEX D

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fields of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong pH dependence</td>
<td>• Field of application</td>
</tr>
<tr>
<td>• Low migration</td>
<td>• Preferred as a single shade or in combination of two dyestuffs</td>
</tr>
<tr>
<td>• Moderate coverage of streakiness / barriness on PA</td>
<td>• Medium to dark shades for wet-fast PA articles such as outerwear, sportswear or technical textiles</td>
</tr>
<tr>
<td>• Moderate coverage of differences between wool root and tip</td>
<td>• Combed top-, yarn-, hank-, piece dyeing</td>
</tr>
<tr>
<td>• Good to very good light fastness</td>
<td>• Printing and carpet resist printing</td>
</tr>
<tr>
<td>• Excellent wet fastness</td>
<td>• Little to no staining on elastane</td>
</tr>
<tr>
<td>• Limited combinability</td>
<td></td>
</tr>
</tbody>
</table>
PRODUCT RECOMMENDATIONS

General recipe recommendations to remove common fibre preparations on PA carpets

<table>
<thead>
<tr>
<th>Auxiliaries</th>
<th>Discontinuous</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEPTOL NWS</td>
<td>0.5 – 1.0 ml/l</td>
<td>–</td>
</tr>
<tr>
<td>FELOSAN NFG</td>
<td>0.5 – 2.0 ml/l</td>
<td>–</td>
</tr>
<tr>
<td>FELOSAN OT</td>
<td>–</td>
<td>1.0 – 3.0 ml/l</td>
</tr>
<tr>
<td>KOLLASOL CDS</td>
<td>0.2 – 0.4 ml/l</td>
<td>–</td>
</tr>
<tr>
<td>pH value</td>
<td>6 – 7</td>
<td>–</td>
</tr>
<tr>
<td>Temperature</td>
<td>60 °C</td>
<td>Cold to 50 °C</td>
</tr>
<tr>
<td>Time (min)</td>
<td>20 – 30</td>
<td>–</td>
</tr>
</tbody>
</table>

PRODUCT RECOMMENDATIONS FOR DISCONTINUOUS PA CARPET DYEING

<table>
<thead>
<tr>
<th>Auxiliaries</th>
<th>PA Standard dyeing</th>
<th>Differential dyeing</th>
<th>Cross dyeing</th>
<th>Low temperature dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARABID IPD</td>
<td>x %</td>
<td>x %</td>
<td>x %</td>
<td>x %</td>
</tr>
<tr>
<td>SARABID IPF</td>
<td>y %</td>
<td>y %</td>
<td>y %</td>
<td>y %</td>
</tr>
<tr>
<td>KOLLASOL CDS</td>
<td>0.10 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
</tr>
<tr>
<td>MEROPAN EF 200</td>
<td>0.25 – 1.0 ml/l</td>
<td>–</td>
<td>–</td>
<td>0.25 – 1.0 ml/l</td>
</tr>
<tr>
<td>MEROPAN KP *</td>
<td>–</td>
<td>0.5 – 2.0 ml/l</td>
<td>2.0 – 3.0 ml/l</td>
<td>–</td>
</tr>
<tr>
<td>pH</td>
<td>9.0 – 5.5</td>
<td>4.5 – 6.5</td>
<td>4.0 – 6.0</td>
<td>9.0 – 7.5</td>
</tr>
<tr>
<td>BEMACID DYKES **</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

* The indicated application quantities of the buffer have to be regarded as guideline, because auxiliaries and chemicals in the dye liquors, the kind of steam and the water quality have a strong influence on the final pH.

** For special fastness requests selected dyes of the BEMACID N and BEMACID F as well as BEMAPLEX range are applied.

DYEING CURVE: EXAMPLE FOR A SOLID DYEING

[Diagram of dyeing curve with temperature and time]
PREWASHING AND DYEING

- The combination of **SARABID IPD** and **SARABID IPF** in PA carpet dyeing gives all desired effects and differentiations.

- **SARABID IPD** is the levelling agent with affinity to the dyestuff, improves the contrasts and acts as dispersing agent in single bath dyeing on normal and differential PA dyeing with acid and cationic dyestuffs.

- **SARABID IPF** is the levelling agent with affinity to the fibre, levels on single coloured dyeing and decreases the contrast due to its anionic activity.

- Recommended application amount of **SARABID IPD** and **SARABID IPF**.

### STANDARD PA FIBRE CARPET WITH BEMACID E-TL DYESTUFFS

<table>
<thead>
<tr>
<th></th>
<th>PA standard dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARABID IPD</td>
<td>0.5 – 2.0%</td>
</tr>
<tr>
<td>SARABID IPF</td>
<td>solid shades</td>
</tr>
<tr>
<td>Light shades</td>
<td>2.0 – 1.50%</td>
</tr>
<tr>
<td>Medium shades</td>
<td>1.0 – 0.75%</td>
</tr>
<tr>
<td>Dark shades</td>
<td>0.5 – 0.20%</td>
</tr>
</tbody>
</table>

### CARPET QUALITIES WITH DIFFERENTIAL DYEING PA PART (acid dyes only)

<table>
<thead>
<tr>
<th></th>
<th>Differential dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SARABID IPD</strong></td>
<td>more contrast</td>
</tr>
<tr>
<td>Contrast low</td>
<td>0.0 – 0.5%</td>
</tr>
<tr>
<td>Contrast medium</td>
<td>0.5 – 1.5%</td>
</tr>
<tr>
<td>Contrast high</td>
<td>1.5 – 2.0%</td>
</tr>
<tr>
<td><strong>SARABID IPF</strong></td>
<td>less contrast</td>
</tr>
<tr>
<td>Contrast low</td>
<td>2.0 – 0.5%</td>
</tr>
<tr>
<td>Contrast medium</td>
<td>1.0 – 0.5%</td>
</tr>
<tr>
<td>Contrast high</td>
<td>0.5 – 0.0%</td>
</tr>
</tbody>
</table>

### CARPET QUALITIES WITH BASIC AND ACID DYEABLE PA
(possibly **SARABID IPD** in combination with **SARABID IPF**) *

<table>
<thead>
<tr>
<th></th>
<th>Differential dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SARABID IPD</strong></td>
<td></td>
</tr>
<tr>
<td>Light shades</td>
<td>1.0%*</td>
</tr>
<tr>
<td>Medium shades</td>
<td>2.0%*</td>
</tr>
<tr>
<td>Dark shades</td>
<td>3.0%*</td>
</tr>
<tr>
<td><strong>SARABID IPF</strong></td>
<td></td>
</tr>
<tr>
<td>Light shades</td>
<td>0.2%*</td>
</tr>
<tr>
<td>Medium shades</td>
<td>0.5%*</td>
</tr>
<tr>
<td>Dark shades</td>
<td>1.0%*</td>
</tr>
</tbody>
</table>
PREWASHING AND DYEING

PRODUCT RECOMMENDATIONS FOR CONTINUOUS PA CARPET DYEING

<table>
<thead>
<tr>
<th>Auxiliaries</th>
<th>Solid shades</th>
<th>Differential dyeing</th>
<th>Cross dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISULON E25 LS 2%</td>
<td>100 – 200 g/l</td>
<td>100 – 200 g/l</td>
<td>100 – 200 g/l</td>
</tr>
<tr>
<td>COLORCONTIN BDF</td>
<td>2.0 – 4.0 g/l</td>
<td>2.0 – 4.0 g/l</td>
<td>2.0 – 4.0 g/l</td>
</tr>
<tr>
<td>SARABID IPD</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>SARABID IPF</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>SARABID OL</td>
<td>0 – 2.0 g/l</td>
<td>0 – 4.0 g/l</td>
<td>0 – 4.0 g/l</td>
</tr>
<tr>
<td>MEROPAN KP</td>
<td>1.0 – 2.0 ml/l</td>
<td>1.0 – 3.0 ml/l</td>
<td>2.0 – 3.0 ml/l</td>
</tr>
<tr>
<td>pH</td>
<td>5.0 – 6.5</td>
<td>4.0 – 7.0</td>
<td>4.0 – 6.0</td>
</tr>
<tr>
<td>BEMACID DYES**</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>BEZACRYL DYES</td>
<td>–</td>
<td>–</td>
<td>+</td>
</tr>
</tbody>
</table>

* Amount depends on requirements.
** For special fastness requests selected dyes of the BEMACID N and BEMACID F as well as BEMAPLEX range are applied.

EXAMPLE CONTINUOUS DYEING RECIPE

- **SARABID IPD** excellently increases the contrasts on DD carpet fabric with anionically dyeable part.

Prewash
Temperature 40 °C | Residual humidity 40 – 60 %

| FELOSAN OT | 1 g/l |

Dye pad

| PRISULON E25 LS (2 % stock solution) | 120 g/l |
| MEROPAN KP pH 5.5 | x g/l |
| COLORCONTIN BDF | 2 g/l |
| SARABID IPD | 2 g/l |
| BEMACID E-TL dyestuff | x g/l |
| Pick-up | ~ 200 – 300 % * |

* depending on carpet quality
GUM LAYER

- Different pile heights can be coloured differently
- Interesting effects
- Same products/ground recipes as in the displace technique
- Selected dyestuff from the BEMACID and BEMAPLEX range possible

Advantages
- Coloured effects without printing machine
- Three-dimensional effects

COMMON APPLICATION TECHNIQUES

One step application
- Gum layer application, dye application, steaming, washing and drying in one step

Two step application
- In the first step gum layer application, steaming, washing, drying
- In the second step carpet dyeing, e.g. in a carpet winch

ONE STEP APPLICATION TECHNIQUE
Gum application and dyeing of deep parts in one step

RECIPE RECOMMENDATION GUM LAYER

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th>g/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x</td>
</tr>
<tr>
<td>PRISULON* thickener</td>
<td>y</td>
</tr>
<tr>
<td>Gum layer white</td>
<td></td>
</tr>
<tr>
<td>PRISULON thickener stock</td>
<td>X</td>
</tr>
<tr>
<td>RAPIDOPRINT® TB 2 (pH &gt; 7)</td>
<td>5 – 10</td>
</tr>
<tr>
<td>RAPIDOPRINT® CPA</td>
<td>0 – 5</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2</td>
</tr>
<tr>
<td>pH 6 – 9</td>
<td></td>
</tr>
<tr>
<td>Gum layer coloured</td>
<td></td>
</tr>
<tr>
<td>PRISULON thickener stock</td>
<td>X</td>
</tr>
<tr>
<td>RAPIDOPRINT® CPA</td>
<td>0 – 5</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2</td>
</tr>
<tr>
<td>Selected BEMACID** dyestuffs</td>
<td>y</td>
</tr>
<tr>
<td>pH 5 – 6</td>
<td></td>
</tr>
</tbody>
</table>

Pick-up 100 – 150%

The pH value of the gum layer as well as the resisting agent quantity depend on the dyestuff, shades and carpets in use.

* As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for the gum layer technique are available.

** or other selected acid dyestuff
# GUM LAYER

## RECIPE RECOMMENDATION DYE LIQUOR

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th>g / kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x</td>
</tr>
<tr>
<td>PRISULON thickener*</td>
<td>y</td>
</tr>
<tr>
<td>Dye liquor</td>
<td></td>
</tr>
<tr>
<td>PRISULON thickener stock</td>
<td>x</td>
</tr>
<tr>
<td>RAPIDOPRINT® STRETCH (only overflow)</td>
<td>0 – 4</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2</td>
</tr>
<tr>
<td>Selected BEMACID/BEMAPLEX dyestuff**</td>
<td>y</td>
</tr>
<tr>
<td>pH 5 – 6</td>
<td></td>
</tr>
</tbody>
</table>

Pick-up: 300 – 400 %
Steaming: 5 – 10 min saturated steam

* As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for the gum layer technique are available.
** or other selected acid or metal complex dyestuff

---

Gum application  Dye application  Steaming  Washing off  Drying

---

Source: Dura Flooring Systems GmbH, Fulda
### TWO STEP APPLICATION TECHNIQUE

**RECIPE RECOMMENDATION GUM LAYER**

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th>g/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x</td>
</tr>
<tr>
<td>PRISULON* thickener</td>
<td>y</td>
</tr>
<tr>
<td>Gum layer coloured</td>
<td></td>
</tr>
<tr>
<td>PRISULON thickener stock</td>
<td>y</td>
</tr>
<tr>
<td>RAPIDOPRINT® GKBL</td>
<td>10 – 30</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2</td>
</tr>
<tr>
<td>Selected BEMACID dyestuff**</td>
<td>y</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>15</td>
</tr>
</tbody>
</table>

**Pick-up** 100 – 150%

**Fixation** 5 – 10 min saturated steam

The pH value of the gum layer as well as the resisting agent quantity depend on the dyestuff, shades and carpets in use.

* As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for the gum layer technique are available.

** or other selected acid dyestuff

### PRODUCT RECOMMENDATIONS FOR DISCONTINUOUS PA CARPET DYEING

<table>
<thead>
<tr>
<th>Auxiliaries</th>
<th>PA Standard dyeing</th>
<th>Differential dyeing</th>
<th>Cross dyeing</th>
<th>Low temperature dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARABID IPD</td>
<td>x %</td>
<td>x %</td>
<td>x %</td>
<td>x %</td>
</tr>
<tr>
<td>SARABID IPF</td>
<td>y %</td>
<td>y %</td>
<td>y %</td>
<td>y %</td>
</tr>
<tr>
<td>KOLLASOL CDS</td>
<td>0.10 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
<td>0.1 – 0.5 g/l</td>
</tr>
<tr>
<td>MEROPAN EF 200</td>
<td>0.25 – 1.0 ml/l</td>
<td>–</td>
<td>–</td>
<td>0.25 – 1.0 ml/l</td>
</tr>
<tr>
<td>MEROPAN KP*</td>
<td>–</td>
<td>0.5 – 2.0 ml/l</td>
<td>2.0 – 3.0 ml/l</td>
<td>–</td>
</tr>
<tr>
<td>pH</td>
<td>9.0 – 5.5</td>
<td>4.5 – 6.5</td>
<td>4.0 – 6.0</td>
<td>9.0 – 7.5</td>
</tr>
<tr>
<td>BEMACID DYES**</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

* The indicated application quantities of the buffer have to be regarded as guideline, because auxiliaries and chemicals in the dye liquors, the kind of steam and the water quality have a strong influence on the final pH.

** For special fastness requests selected dyes of the BEMACID N and BEMACID F as well as BEMAPLEX range are applied.
DIGITAL SPRAY PRINTING

- Worldwide application
- Suitable for PA, PES, WOOL, ACRYL
- Ink application through jets
- Synthetic thickeners with particular rheological properties

Advantages
- Quick change of pattern
- No repeat borders
- Ideal for short yardages
- No screen cost

RECIPE RECOMMENDATION FOR DIGITAL SPRAY PRINTING

Printing of polyamide or wool

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th>x g/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td></td>
</tr>
<tr>
<td>TUBIVIS UNIQUE 431*</td>
<td>7 – 15 g/kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Print paste</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBIVIS UNIQUE 431* stock</td>
<td>300 – 900 g/kg</td>
</tr>
<tr>
<td>DYESTUFF**</td>
<td>x g/kg</td>
</tr>
<tr>
<td>Soft water</td>
<td>y g/kg</td>
</tr>
</tbody>
</table>

Fixation 5 – 10 min saturated steam

* Different types for special demands are on the market.
** Acid dyes, metal complex dyes

TUBIVIS UNIQUE 431 is also excellently suitable for polyester and acrylic printing.
Additional products see Product Overview.
SCREEN PRINTING

CLASSIC PRINTING

• Direct, resist or displace printing possible
• Most common application worldwide
• Usually polyamide and wool
• Thickener mostly based on guar

Advantages
• High production speed
• Low thickener cost

RECIPE RECOMMENDATION FOR CLASSIC CARPET PRINTING

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x g/kg</td>
</tr>
<tr>
<td>PRISULON thickener*</td>
<td>y g/kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Print paste</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISULON thickener stock</td>
<td>x g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® S 50</td>
<td>5 – 15 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2.0 g/kg</td>
</tr>
<tr>
<td>Acid donor</td>
<td>y g/kg</td>
</tr>
<tr>
<td>e.g. BEMACID/BEMAPLEX dyestuff**</td>
<td>z g/kg</td>
</tr>
</tbody>
</table>

Fixation 5 – 10 min saturated steam

* As PRISULON thickeners high viscosity guar thickeners as well as thickeners with special properties are available. Thickeners such as PRISULON E 25 LS can be very easily dispersed in water and swell very quickly by adding acid. To do so, an acid donor must be added to the stock.

** or other acid or metal complex dyestuff

DISPLACE TECHNIQUE | RESIST TECHNIQUE IN PRINTING

• Coloured-, half-tone- or white- resists
• Displace effects
• Resist effects
• Coloured resist effects

Preprint resist
• Print first a print paste with dyestuffs being able to fix though a special resisting agent is used in this print paste. Overdye afterwards with dyestuff which will not fix in presence of this resist agent at the preprinted parts.

Overprint resist
• Apply first the resistible dyestuff by means of an applicator, paddler or a screen. Overprint then with a print paste containing non resistible dyestuff and a special resisting agent.
SCREEN PRINTING

**Displace method**
- Prevents selected resistible ground dyestuff from fixing through special resisting agents in the print paste. Other selected dyestuff in the print paste fix during steaming despite a resisting agent being present in the print paste (one step process).

**Resist technique**
- Printing with special resisting agent and non resistible dyestuffs. After a steaming process overdyeing can be effected with special dyestuffs (one step or two step process). The preprinted areas will not be dyed. With this method the resisting agent will fix on the carpet.

**Conditions**
- The pH value of the print paste and dyeing liquor as well as the amount and type of resisting agent depends on the dyestuff, shades and carpets in use.

### DISPLACE TECHNIQUE RECIPE RECOMMENDATION PRINT PASTE

| Thickener stock |  
| --- | --- |
| **Soft water** |  
| **PRISULON thickener** | x g/kg |
| **Print paste white** |  
| **PRISULON thickener stock** | x g/kg |
| **RAPIDOPRINT® CPA** | 20 – 30 g/kg |
| **RAPIDOPRINT® S 50** | 5 – 15 g/kg |
| **RAPIDOPRINT® PRT** | 0.5 – 2.0 g/kg |
| **pH 6 – 9** |  
| **Print paste coloured** |  
| **PRISULON thickener stock** | x g/kg |
| **RAPIDOPRINT® CPA** | 5 – 20 g/kg |
| **RAPIDOPRINT® S 50** | 5 – 15 g/kg |
| **RAPIDOPRINT® PRT** | 0.5 – 2.0 g/kg |
| **Acid donor** | y g/kg |
| **Selected BEMACID dyestuff*** | z g/kg |
| **pH 5 – 6** |  

**Fixation**
- 5 – 10 min saturated steam

*The pH value of the print paste as well as the resisting agent quantity depend on the dyestuff, shades and carpets in use.

* As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for displace printing are available. Thickeners such as PRISULON E 25 LS can be very easily dispersed in water and swell very quickly by adding acid. To do so, an acid donor must be added to the stock.

** RAPIDOPRINT® TB 2 to be used with acid swelling thickener types. Thickeners such as PRISULON E 25 LS can be very easily dispersed in water and swell very quickly by adding acid. To do so, an acid donor must be added to the stock.

*** or other selected acid dyestuff
SCREEN PRINTING

RECIPE RECOMMENDATION GROUND COLOUR

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x g/kg</td>
</tr>
<tr>
<td>PRISULON* thickener</td>
<td>y g/kg</td>
</tr>
<tr>
<td>Ground colour</td>
<td></td>
</tr>
<tr>
<td>PRISULON thickener stock</td>
<td>x g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® S 50</td>
<td>5 – 15 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® STRETCH (only overflow)</td>
<td>0 – 4 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2.0 g/kg</td>
</tr>
<tr>
<td>SARABID IPF (only overflow)</td>
<td>0 – 2.0 g/kg</td>
</tr>
<tr>
<td>Acid donor</td>
<td>y g/kg</td>
</tr>
<tr>
<td>Selected BEMACID/ BEMAPLEX dyestuff **</td>
<td>z g/kg</td>
</tr>
<tr>
<td>pH 5 – 6</td>
<td></td>
</tr>
</tbody>
</table>

* Thickeners such as PRISULON E 25 LS can be very easily dispersed in water and swell very quickly by adding acid. To do so, an acid donor must be added to the stock. As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for displace printing are available.

** or other selected acid or metal complex dyestuff

CROSSPRINT

Ground application  Printing  Steaming  Washing  Drying

PREPRINT

Printing  Ground application  Steaming  Washing  Drying
SCREEN PRINTING

RESIST TECHNIQUE

RECIPE RECOMMENDATION PRINT PASTE

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x g/kg</td>
</tr>
<tr>
<td>PRISULON * thickener</td>
<td>y g/kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Print paste white resist</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISULON thickener stock</td>
<td>x g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® GKBL</td>
<td>20 – 40 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® S 50</td>
<td>5 – 15 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2.0 g/kg</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>15 g/kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Print paste coloured resist</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISULON thickener stock</td>
<td>x g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® GKBL</td>
<td>10 – 30 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® S 50</td>
<td>5 – 15 g/kg</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2.0 g/kg</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>15 g/kg</td>
</tr>
<tr>
<td>Selected BEMACID dyestuff **</td>
<td>y g/kg</td>
</tr>
</tbody>
</table>

Fixation: 5 – 10 min saturated steam

* As PRISULON thickeners high viscosity guar thickeners as well as special thickeners for displace printing are available. Thickeners such as PRISULON E 25 LS can be very easily dispersed in water and swell very quickly by adding acid. To do so, an acid donor must be added to the stock.

** or other selected acid dyestuff

The pH value of the print paste as well as the resisting agent quantity depend on the dyestuff, shades and carpets in use.

RECIPE RECOMMENDATION GROUND DYEING

<table>
<thead>
<tr>
<th>Discontinuous dyeing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MEROPAN EF 200</td>
<td>0.2 – 1 g/l</td>
</tr>
<tr>
<td>Selected BEMACID or BEMAPLEX dyestuff *</td>
<td>x %</td>
</tr>
<tr>
<td>SARABID IPF</td>
<td>0 – 2 %</td>
</tr>
</tbody>
</table>

Max. temperature 50 – 60 °C
pH value at the end of the dyeing process about 4.5 – 5.5

* or other selected acid or metal complex dyestuff
SCREEN PRINTING AND MILLITRON® TECHNIQUE

OVERDYEING TECHNIQUES

DISCONTINUOUS

<table>
<thead>
<tr>
<th>First step</th>
<th>Second step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing</td>
<td>Steaming</td>
</tr>
<tr>
<td>Washing</td>
<td>Dyeing (exhaust process)</td>
</tr>
<tr>
<td>Drying</td>
<td>Drying</td>
</tr>
<tr>
<td>Printing</td>
<td>Steaming (cold pad batch process)</td>
</tr>
<tr>
<td>Dyeing</td>
<td>Washing</td>
</tr>
<tr>
<td>Drying</td>
<td>Drying</td>
</tr>
<tr>
<td>Printing</td>
<td>Steaming (overflow)</td>
</tr>
<tr>
<td>Dyeing</td>
<td>Steaming</td>
</tr>
<tr>
<td>Drying</td>
<td>Washing</td>
</tr>
<tr>
<td>Drying</td>
<td></td>
</tr>
</tbody>
</table>

CONTINUOUS

<table>
<thead>
<tr>
<th>Restriction: small overdyed parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing</td>
</tr>
<tr>
<td>Steaming</td>
</tr>
<tr>
<td>Dye application (overflow)</td>
</tr>
<tr>
<td>Steaming</td>
</tr>
<tr>
<td>Washing</td>
</tr>
<tr>
<td>Drying</td>
</tr>
</tbody>
</table>

MILLITRON® TECHNIQUE

- Metal complex or acid dyestuff applicable
- Usually polyamide and wool
- Dye application is accomplished by switching a high-pressure dye stream on and off
- Thickeners based on biopolymer with particular rheological properties

Advantages
- Short setup times
- No repeat borders

RECIPE RECOMMENDATION FOR MILLITRON® PRINTING

<table>
<thead>
<tr>
<th>Thickener stock</th>
<th>g/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft water</td>
<td>x</td>
</tr>
<tr>
<td>PRISULON GT 2003 M</td>
<td>10 – 30</td>
</tr>
<tr>
<td>Print paste</td>
<td></td>
</tr>
<tr>
<td>PRISULON GT 2003 M thickener stock</td>
<td>300 – 900</td>
</tr>
<tr>
<td>RAPIDOPRINT® PRT</td>
<td>0.5 – 2.0</td>
</tr>
<tr>
<td>Acid donor</td>
<td>0.5 – 2.0</td>
</tr>
<tr>
<td>e.g. BEMAPLEX/BEMACID dyestuff*</td>
<td>y</td>
</tr>
</tbody>
</table>

Fixation 5 – 10 min saturated steam

* or other selected acid or metal complex dyestuff
SOFTENERS

Softeners are used to improve the surface smoothness and to obtain a bulky handle along with improved pile recovery. Moreover a regular appearance of the pile is supported. The softener should not impair the dry soiling properties of the finished goods.

RECIPE PROPOSALS FOR PADDING PROCESS

<table>
<thead>
<tr>
<th></th>
<th>g/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLYAVIN PEN or</td>
<td>10 – 30</td>
</tr>
<tr>
<td>TUBINGAL GFC or</td>
<td>20 – 40</td>
</tr>
<tr>
<td>TUBINGAL KRE</td>
<td>20 – 40</td>
</tr>
</tbody>
</table>

Liquor pick up 60 – 80%
Drying as usual

RECIPE PROPOSALS FOR EXHAUST PROCESS

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBINGAL GFC or</td>
<td>2 – 4</td>
</tr>
<tr>
<td>TUBINGAL KRE</td>
<td>2 – 4</td>
</tr>
</tbody>
</table>

In the last rinsing step
Exposure time 30 min at 40 – 50 °C
pH value 6.5 – 7.0
Drying as usual

RECIPE PROPOSALS FOR SPRAYING PROCESS

<table>
<thead>
<tr>
<th></th>
<th>g/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLYAVIN PEN</td>
<td>40 – 180</td>
</tr>
<tr>
<td>TUBINGAL GFC</td>
<td>80 – 240</td>
</tr>
</tbody>
</table>

Liquor pick up 10 – 20%
Drying as usual

Remark
Further application methods like lick roller or foam coating process could be worked out on request depending on the available machinery equipment.
ANTI-STATIC AGENTS

To avoid static charging the application of anti-static agents may be necessary.

RECIPE PROPOSALS FOR PADDING PROCESS

<table>
<thead>
<tr>
<th></th>
<th>g/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVISTAT 3 P or</td>
<td>4 – 10</td>
</tr>
<tr>
<td>AVISTAT AZ or</td>
<td>5 – 10</td>
</tr>
<tr>
<td>AVISTAT GPA</td>
<td>5 – 30</td>
</tr>
</tbody>
</table>

Liquor pick up: 60 – 80%
Drying: as usual
Curing: requested for AVISTAT GPA only | 30 – 60 sec at 150 – 160 °C

RECIPE PROPOSALS FOR EXHAUST PROCESS

<table>
<thead>
<tr>
<th>AVISTAT AZ</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – 2</td>
</tr>
</tbody>
</table>

In the last rinsing step
Exposure time: 30 min at 40 – 50 °C
pH value: 6.5 – 7.0
Drying: as usual

RECIPE PROPOSALS FOR SPRAYING PROCESS

<table>
<thead>
<tr>
<th>AVISTAT 3 P</th>
<th>g/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 – 50</td>
</tr>
</tbody>
</table>

Liquor pick up: 10 – 20%
Drying: as usual
STAIN PROTECTION

PRODUCTS FOR THE WATER-, OIL- AND STAIN REPELLENCY

DIAMOND® PROTECTION SYSTEM

<table>
<thead>
<tr>
<th>Basic version</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBIGUARD® SR 2001</td>
<td>(FC + stainblocker + softener)</td>
</tr>
<tr>
<td>TUBICOAT ELS</td>
<td>(foaming agent)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flexible version</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBIGUARD® FCC</td>
<td>(FC)</td>
</tr>
<tr>
<td>TUBICOAT SB CONC.</td>
<td>(stainblocker + softener)</td>
</tr>
<tr>
<td>TUBICOAT ELS</td>
<td>(foaming agent)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ready-to-use version</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBIGUARD® SR-D</td>
<td>(FC + stainblocker + softener)</td>
</tr>
</tbody>
</table>

FURTHER CARPET PRODUCTS

<table>
<thead>
<tr>
<th>FC-Finishing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBIGUARD® FC-F</td>
<td>(FC + foaming agent)</td>
</tr>
<tr>
<td>TUBIGUARD® FCC</td>
<td>(FC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stainblocker</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBICOAT SB CONC.</td>
<td></td>
</tr>
<tr>
<td>TUBICOAT KF</td>
<td>(for exhaust method)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Softener</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBICOAT SI 55</td>
<td>(polysiloxane)</td>
</tr>
<tr>
<td>TUBICOAT SOFT-FAM</td>
<td>(aminosiloxane, microemulsion)</td>
</tr>
</tbody>
</table>

FOAMING

FOAM APPLICATORS FOR CARPETS

Closed system:
- Magnojet (Zimmer)
- Autofoamer (Datacolor)
- Hansa

Open system:
- Variopress (Zimmer)

Source: J. Zimmer Maschinenbau GmbH Klagenfurt
THE MOST IMPORTANT TEST METHODS APPLIED AT CHT:

- **Colour fastness to artificial light**
  DIN EN ISO 105-B02

- **Colour fastness and ageing to artificial light at high temperatures**
  DIN EN ISO 105-B06

- **Colour fastness to water**
  DIN EN ISO 105-E01

- **Colour fastness to spotting: Water**
  DIN EN ISO 105-E07

- **Colour fastness to rubbing**
  DIN EN ISO 105-X12

- **Colour fastness to chlorinated water**
  DIN EN ISO 105-E03

- **Determination of formaldehyde**
  DIN EN ISO 14184-1
  (LAW 112 according to Öko-Tex Standard 100)
  - Free and hydrolyzed formaldehyde (water extraction method)

  DIN EN ISO 14184-2
  - Released formaldehyde (water vapour absorption method)

- **Fire tests for floorings**
  DIN EN ISO 9239-1
  - Determination of the burning behaviour using a radiant heat source

- **Fire behaviour of building materials and elements**
  DIN 4102-14
  - Determination of the burning behaviour of floor covering systems using a radiant heat source

- **Kool Aid test**
  AATCC 175

- **Soil release**
  Coffee – CHT standard test
  Tea – CHT standard test
  Red wine – CHT standard test

- **Dry soil**
  CHT standard test

PUTTING TOP QUALITY TO THE TEST
Fibre auxiliaries

**DURON® 14**
- Lubricant for PES and PA staple fibre
- Increases in case of PES fibres the static fibre / fibre cohesion and reduces the dynamic coefficient of friction fibre / fibre and fibre / metal
- Imparts in case of PA fibres slightly increased fibre / fibre fricion and medium fibre / metal friction
- Improves the antistatic performance of phosphoric acid esters
- Low volatility and low tendency to form deposits during heat setting
- Low sensitivity against variation in climatic conditions during textile processing

**DURON® 1105 PE**
- Antistat
- Imparts well balanced dynamic coefficient of fibre / fibre and fibre / metal friction
- Very good antistatic properties
- High yields in drawing especially with HM-fibre types
- Low volatility and tendency to form deposits during heat setting
- Excellent fibre separation in blending
- Neutral odour, easily removed in scouring

**DURON® 7024/50 %**
- Antistat
- Excellent antistatic properties
- Reduces fibre / fibre and fibre / metal friction
- Non yellowing, neutral odour
- Easily removed in scouring

**DURON® AF 2170**
- PA-BCF spin finish
- Low fibre / metal friction
- Moderate fibre / fibre friction
- Highly antistatic
- Very low migration propensity
- Suitable for high production speed
- Supports in high speed cabling
- May be applied "neat" or from emulsion

**DURON® ES 3176**
- Spin finish for PES staple fibre
- Imparts very good fibre cohesion to tow
- Highly antistatic
- Imparts medium fibre / fibre- and fibre / metal friction
- Non yellowing, neutral odour
- Crunchy handle

**DURON® NV 7**
- Lubricant for needle punching
- Inherently low fogging
- Enables trouble-free carding and cross laying
- Good fibre protection during processing
- Assists loop needling effectively

**DURON® NV 12**
- Lubricant for needle punching
- Excellent antistatic properties
- Imparts trouble-free processing on cards, cross laying and needling
- Medium coefficient of friction fibre / fibre and low coefficient of friction fibre / metal
- Enables effective condensing and reduces fibre damage during needling
- Especially suitable for structured surfaces (loop)

**DURON® OF 1510**
- Spin finish for PP staple fibre
- Imparts good fibre cohesion to tow
- Good antistatic properties
- Imparts medium fibre / fibre- and fibre / metal friction
- Easily removed by scouring

**DURON® OF 1812/80**
- PP-BCF spin finish
- Excellent package built-up (filament cohesion)
- Soft, textile-like handle
- No migration of dyestuffs
- No cracking deposits
- Easily removed by washing
- Excellent antistatic properties

**DURON® OF 2148**
- PP-BCF spin finish
- Imparts medium fibre / metal friction
- Good antistatic properties
- Crunchy handle
- Excellent spreading behaviour on polyolefin surfaces

**DURON® OF 2168**
- PP-BCF spin finish
- Excellent package built-up (filament cohesion)
- Medium soft, textile-like handle
- No migration of dyestuffs
- No cracking deposits
- Easily removed by washing
- Excellent antistatic properties

**DURON® OF 2173**
- PP-Spin finish
- Excellent package built-up (filament cohesion)
- Soft, textile-like handle
- No migration of dyestuffs
- No cracking deposits
- Easily removed by washing
- Excellent antistatic properties
- Ideal spreading properties on the polypropylene surface

**DURON® OF 2204**
- PP-BCF spin finish
- Imparts medium fibre / metal friction
- Good antistatic properties
- Excellent filament protection
- Outstanding spreading behaviour
- Very soft handle

**DURON® OF 4044**
- PES-BCF spin finish
- Medium fibre / fibre- and low fibre / metal friction
- Excellent package build up
- Protective against tribothermal damage
- High thermostability
- Biodegradable

- Reduces stitching forces of needles and allows far higher stroke frequency of the needling loom
- Good surface active properties assist penetration of bonding resins
CARPET FINISHING – PRODUCT OVERVIEW

DURON® OS 3034
• Enables high crimp level
• Facilitates bale opening
• Even film forming on fibre surface
• Protection against tribothermal damage

DURON® OS 3176
• Spin finish for PP staple fibre
• Imparts very good fibre cohesion to tow
• Highly antistatic
• Imparts medium fibre/fibre- and fibre/metal friction
• Non yellowing, neutral odour
• Crunchy handle

DURON® OS 3184
• Spin for PP staple fibre
• Imparts good fibre cohesion to tow
• Good antistatic properties
• Imparts medium fibre/fibre- and fibre/metal friction
• Extremely crunchy handle

DURON® OS 4022
• Spin finish for PP staple fibre
• Imparts good fibre cohesion to tow
• Excellent antistatic properties
• Imparts medium fibre/fibre- and fibre/metal friction
• Easily removed by scouring

Dyeing products

COLORCONTIN BDF *
• Anti-frosting agent for continuous dyeing of PA carpets
• Combination of non ionic and anionic substances, slightly anionic
• Forms at the beginning of the steaming process an intensive, stable foam with very fine bubbles
• This foam layer guarantees an even dyeing of fibre tips and fibres within the fabric
• A faster wetting of the fabric is obtained by COLORCONTIN BDF
• Fixing of the dyes with a higher colour yield is reached
• High contrasts in shade in the differential dyeing procedure
• Recommended application quantity: 1 – 4 g/l

* an additional wetting agent is not necessary for the pad dye preparation, if all qualities are prewashed with e.g. FELOSAN OT

Dyestuffs

BEMACID E
• Very good migration behaviour
• Very good coverage of differences in the material on PA
• Very good trichromaticity with the other BEMACID E-TL dyestuffs
• Very high light fastnesses
• Excellently suited for carpet printing

BEMACID F
• Strong pH dependence
• Low migration capacity
• Moderate coverage of streakiness/barriness
• Good to very good light fastness
• Excellent wet fastness
• High brilliance
• Limited combinability
• For (washable) carpet printing

BEMACID N
• Medium pH value dependency
• Good pick up capacity with a neutral pH value
• Good coverage of streakiness on PA
• Excellently suited for dyeing wool and WO/PA blends in the carpet yarn
• Good to very good care fastnesses
• Very good trichromaticity with the BEMACID N-TF dyestuffs

BEZACRYL
• Basic dyes for dyeing acrylic fibres
•Colour strength dyestuffs
• Good build up properties and high saturation limit
• Great number of dyestuffs which can be combined with one another
• Well-balanced tri-chromate for a large field of application
• Good dye solubility

BEMAPLEX D
• Strong pH dependency
• Low migration capacity
• Good to very good light fastnesses
• Excellent wet fastnesses
• Limited combination possibilities
• For resist printing

BEMAPLEX M
• Medium pH dependency
• Low migration capacity
• Good to very good light fastnesses
• Excellent wet fastnesses
• Good trichromaticity with the BEMAPLEX M-T dyestuffs
• For carpet direct printing and resist printing

BEMAPLEX N
• Lower dependence on the pH value
• Good to low migration
• Good coverage of streakiness/barriness on PA
• Moderate to good wet fastness
• High light fastness
• Good build up on PA

FELOSAN NFG
• Low-foaming washing and wetting agent
• Synergetic surfactant mix, non ionic
• High wash and cleaning power together with high wetting capacity
• Low-foaming, therefore highly suitable for discontinuous processes

FELOSAN OT
• Washing and wetting agent
• Synergetic surfactant mix, non ionic
• Excellent emulsifying and dispersing power
• Product consists of surfactants with a high turbidity point and therefore tends to foaming
• Highly suitable for continuous prewashing of PA carpets, during dyeing it supports an even foam formation in the steamer in combination with an antifrosting agent (COLORCONTIN BDF)
• Special product for washing off silicone oil preparations

HEPTOL NWS
• Sequestering agent with dispersing properties
• Based on polyphosphate, anionic
• Binds alkaline earth and heavy metal ions
• High soil suspending properties by its excellent dispersing effect
• Increases the washing power of wash-active substances
• Supports washing off and rinsing process
CARPET FINISHING – PRODUCT OVERVIEW

KOLLASOL CDS
- Deaerating agent and penetration accelerator based on hydrophilic silicone surfactants, non ionic
- Excellent and lasting anti-foaming effect
- Particularly suited for polyamide dyeing

MEROPAN EF 200
- Acid donor for discontinuous dyeing of polyamide
- Carboxylic acid ester with nonionic character
- Slow and even decomposition during the dyeing process
- Gradually releases acid and shifts the pH value during dyeing to higher acidity
- pH control is an important parameter for achieving level dyeings and is enhanced by adding a suitable levelling agent such as SARABID IPD or SARABID IPF
- Not suitable for dyeing with 1:1 metal complex dyestuffs
- Neither impairs light nor wet and rubbing fastnesses
- O.25 – 2.0 ml/l MEROPAN EF 200 (depending on the desired final pH value)

MEROPAN KP
- pH buffer for acid dyeing processes
- Preferably for PA carpet dyeing
- Applicable in discontinuous and continuous processes
- Organic/inorganic buffer mix
- The pH value is adjusted stable and it does not change with an increase of temperature
- MEROPAN KP is normally applied to adjust the pH between 3.5 and 7.0. The application quantities depend on the water quality and on other additions to the dye baths

SARABID IPD
- Levelling agent with affinity to the dyestuff for dyeing PA carpets on winch becks or continuous lines
- Fatty amine polyglycol ether, pseudo-cationic
- Highly effective, low-foaming levelling agent for dyeing polyamide fibres with acid and metal complex dyestuffs
- Controls the absorption power of the dyestuffs during the heating up phase
- Promotes an even distribution of the dyestuffs at the boil during the migration phase
- Dyestuffs are easier to combine
- Improves the polo levelness
- Wet and light fastnesses are not affected
- Very suitable for differential dyeing of polyamide carpet fibres for higher contrasts
- Recommended application amount: 0.5 – 3.0% (depending on the PA pol fibre and carpet structure)

SARABID IPF
- Low-foaming levelling agent with affinity to the fibre
- Aromatic sulphonate, anionic
- Levels very well when dyeing PA with acid and 1:2 metal complex dyestuffs
- SARABID IPF has a good levelling effect on solid shades with acid levelling dyestuffs
- Reduces or minimises contrasts for PA DD-carpets with acid dyes
- On differentially dyed polyamide carpet fibres with basic dyeable parts, the product acts as anionic retarder and promotes the levelness by retarding the quickly absorbing basic dyestuffs on the basic fibre part
- No negative influence on the colour and light fastnesses
- Recommended application amount: 0.2 – 3.0% (depending on the depth of shade and carpet structure)

REWIN KF
- Stain blocker, after-treatment agent and resisting agent
- Aromatic sulphonate, anionic
- Affinity to fibres
- Improves wet fastness properties like fastness to water, water drops, shampoo treatment and of dyeings and printings with acid dyes on PA
- Excellently suitable as stain blocker
- Recommended application quantity: 1.0 – 4.0%

SARABID OL
- Dispersing and emulsifying effect
- Special alkyl polyglykol ether, non ionic
- Excellent dispersing properties
- Levelling properties on anionic dyes
- Recommended application quantity: 1 – 4 g/l

Printing products

CHT-PRESERVATIVE TDM
- Preservative for print pastes
- Non ionic, yellowish liquid
- Prevents bacterial attacks
- Only applied if necessary

PRISULON® CD 45
- Low viscosity thickener (0.4 – 1 g/l) for the space dyeing process and continuous carpet dyeing
- Special blend of thickener
- Anionic
- Very good to filter and to wash off

PRISULON® E 25 LS
- High viscosity thickener (~2.5 % stock) for carpet printing, the space dyeing process, gum layer and continuous carpet dyeing
- Polygalactomannan derivate, non ionic
- Dust-free product with a very high purity, good to filter and to wash off
- Dispersible adjustment, swells only through addition of acid, pH < 7.0
- Easily biodegradable

PRISULON® GT 2003 M
- Special thickener for the Millitron® printing machine
- Biopolymer, anionic
- Produces pseudoplastie pastes
- Constant viscosities and break of ink jet rays under mechanical strain
- Biodegradable

PRISULON® GTS 851
- Special thickener – mixture for displacement printing
- Good mechanical reservation from printed parts
- High purity, good to filter and to wash off
- Easily biodegradable

PRISULON® L 100 S
- Extremely viscous thickener (~2 – 2.5 % stock) for carpet printing, the space dyeing process, gum layer and continuous carpet dyeing
- Polygalactomannan derivate, non ionic
- Dust-free product with a very high purity, good to filter and to wash off
- Dispersible adjustment, swells only through addition of acid, pH < 7.0
- Easily biodegradable according to OECD 301
RAPIDOPRINT® COMP
- Auxiliary for printing cationic and disperse dyestuffs with synthetic thickeners
- Prevents dyestuff precipitations printing PAN with cationic dyestuffs
- Applicable as rheological additive
- Easily biodegradable

RAPIDOPRINT® CPA
- For displace printing and the gum layer technology
- Organic ammonium compound
- Application field: displace carpet printing technology
- Has a high affinity to selected acid dyestuffs, even in the slightly alkaline range, which may result in distinct resist printing patterns

RAPIDOPRINT® CSP
- Low foaming product
- Non ionic, clear liquid
- Penetration agent
- Low foaming product
- Easily biodegradable according to OECD 302

RAPIDOPRINT® CSR
- Cleaning agent for carpet spray printing machines
- Not corrosive
- Not self-igniting
- Easily biodegradable

RAPIDOPRINT® FIX
- Auxiliary for printing PES and Acrylic
- Colour deepening effect when printing disperse dyestuffs
- Highly concentrated

RAPIDOPRINT® GKB
- For resist printing and special gum layer effects
- Condensation product of aromatic sulphonic acids
- Application in the resist carpet printing technology
- Applicable in the pre-printing process
- Maintains its resisting capacity after having washed off the carpet and facilitates a resisting in the subsequent carpet dyeing process
- Aftertreatment agent for improving the wet fastness of carpet dyeings and prints

RAPIDOPRINT® LM
- Dyestuff solubilizing agent for all water-soluble dyestuffs
- Aliphatic ether, non ionic
- Prevents formation of specks, dyestuff gelings and lacquers in the print pastes
- Improves the levelness
- Easily biodegradable according to OECD 301

RAPIDOPRINT® PRT
- Antifoam for carpet printing in general and digital spray printing
- Antifoaming effect in all temperature ranges
- Very good antifoaming properties even in low concentrations
- Biodegradable according to OECD 301

RAPIDOPRINT® S 50
- Frosting-prevent agent and fixation accelerator
- Combination of surface-active ethoxylation products
- Slightly anionic

Efficiently prevents the formation of frosting
- Improves the solubility of the dyestuffs in use, which leads to their complete pick-up to the fibre
- Improves the levelness of the prints and has no foaming tendency
- Easily biodegradable according to OECD 301

RAPIDOPRINT® TB 2
- Auxiliary for resist printing and gum layer
- Non ionic polyol
- Prevents the coagulation of boraxed guar at pH > 7
- Facilitates working in the alkaline range with guar which swells in an acid medium
- Improved resisting effects are achieved with many dyestuffs in the alkaline range

RAPIDOPRINT® STRETCH
- Rheological additive for dye liquors applied in overflow
- Non ionic

TUBIVIS® UNIQUE 431
- Liquid synthetic thickeners for digital spray printing
- Acrylate formulations in biodegradable carrier media
- Anionic
- High purity
- Stable to electrolytes
- Economical working
- Deep colour yield and sharp outlines
- High penetration speed

TUBIVIS® UNIQUE 432
- Liquid synthetic thickeners for digital spray printing
- Acrylate formulations in biodegradable carrier media
- Anionic
- High purity
- Stable to electrolytes
- Economical working
- Deep colour yield and sharp outlines
- Less Jet Lines
- Best penetration speed

Others
- Further special thickeners for resist printing, the space dyeing process and continuous carpet dyeing are available upon request

Finishing/resin finishing products

AVISTAT 3 P
- Antistatic agent for pad and spray application
- Phosphoric acid ester, anionic
- Suitable for all kinds of fibres
- Excellent heating resistance
- No influence on the shade and fastness level

AVISTAT AZ
- Antistatic agent for pad and exhaust application
- Fatty acid condensation product, cationic
- Excellent effects on PA 6.6
- Good sublimation fastness, not steam volatile
CARPET FINISHING – PRODUCT OVERVIEW

**AVISTAT GPA**
- Durable antistatic agent for all kinds of fibres
- Formulation of modified polyether and phosphoric acid ester, weakly anionic
- Suitable for pad application
- Good resistance against abrasion

**BEMATIN® 988**
- Moth protection, protection against carpet beetles
- Treatment in the exhaust process is possible
- Non ionic, slightly anionic
- “Woolmark Specification E 10”
- Tested according to “Test Method TM 27”

**POLYAVIN PEN**
- Softener and lubricant for pad and spray application
- Polyethylene dispersion, non ionic
- Bulky and even pile, suitable for all kinds of fibres
- Good abrasion resistance
- Non yellowing

**TUBICOAT® ELS**
- Foaming auxiliary
- Anionic
- For producing foams with fine pores
- Slightly stabilized foams

**TUBICOAT® SB CONC.**
- Stain blocker, softener
- Good protection against soiling through food
- Due to the combination with TUBIGUARD® FCC “flexible” adjustment of the finishing effects to customers’ demands
- Anionic

**TUBINGAL FAM**
- Softener for pad, spray or foam application
- Organomodified silicone micro emulsion, non ionic
- Suitable for all kinds of fibres
- Soft and silky handle, good pile recovery
- Excellent shearing stability, pH-stable between pH 1 to 9

**TUBINGAL GFC**
- Softener for pad, exhaust and spray application
- Fatty acid condensation product, weakly cationic
- Suitable for all kinds of fibres
- Soft and bulky handle, improved pile recovery
- Very good shearing stability, low foaming properties
- Good sublimation fastness, not steam volatile

**TUBINGAL KRE**
- Softener for pad and exhaust application
- Fatty acid condensation product, cationic
- Suitable for all PA, PAN and WO and its blends
- Soft and bulky handle, improved and even pile appearance
- Good sublimation fastness, not steam volatile
- No influence on the dry soiling properties

**TUBINGAL WES**
- Softener for pad and lick roller application
- Silicone compound, non ionic
- Soft and silky handle, improved bulkiness and pile recovery
- Suitable for WO and its blends with synthetics
- No colour shade change
- Non yellowing

**TUBIGUARD® FCC**
- Special fluorocarbon
- Very good protection against dry soiling
- Water and oil repellency
- Due to the combination with TUBICOAT SB CONC. “flexible” adjustment of the finishing effects to customers’ demands
- Anionic

**TUBIGUARD® SR 2001**
- Combination of fluorocarbon, stain blocker, softener
- Ready for use “basic” compound without foaming agent
- For simple handling
- Water and oil repellency and soil release
- Anionic
- Pile stabilising

**TUBIGUARD® SR-D**
- Combination of fluorocarbon, stain blocker, softener, foaming agent
- Ready for use compound with foaming agent
- For simple handling
- Water and oil repellency, soil release
- Anionic
- Pile stabilising
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