Standard
Delivery Program

MANAGEMENTSYSTEM
CERTIFIED IQNet MANAGEMENT SYSTEM
DQS-zertifiziert nach
ISO 9001
ISO 14001

TEXTILES VERTRAUEN
Schadstoffgeprüfte Textilien
nach Öko-Tex Standard 100
Prüf-Nr. 95.0.2838 · FI Hohenstein

Asahi Kasei Spandex Europe GmbH
41519 Dormagen, Germany

DORLASTAN®

Reg. NO 3083

DORLASTAN®

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1. Introduction

Dorlastan is an elastane filament yarn that is produced by Asahi Kasei Spandex Europe GmbH and by Asahi Kasei Spandex America LLC. According to DIN ISO 2076, elastanes are high polymer synthetic fibers with a minimum share of 85% by weight of segmented polyurethane.

Dorlastan stands out by its high elasticity and good retractive force. It is combined with non-elastic yarns to produce fabrics and textile goods by standard production methods. In these products, the Dorlastan ensures stretchability and elasticity and provides for functionality, wearing comfort, a perfect fit and dimensional stability of the finished apparel.

2. Production and structure of Dorlastan

Dorlastan has been produced since 1964. Like all other elastanes, the Dorlastan fiber is rooted in the polyurethane chemistry, which was founded by Otto Bayer in 1937. Dorlastan production starts with a spinning solution that is created in a two-step process from high molecular polyesters or polyethers, a diisocyanate and a diamine as the basic chemical modules, and dimethyl acetamide as a solvent. Various additives (stabilizers, lubricants, etc.) round off this chemical system. The basic components have been known for decades, but the composition has been continuously optimized over the years.

How is the thread produced? First of all, the solvent must be eliminated. For this purpose, the highly viscous spinning solution is spun through single- or multi-hole nozzles into a heated spinning chamber. Additional hot spinning gas is fed to this chamber so that the solvent evaporates. The tension of the draw-off lapper causes the solution to form individual filaments of a defined titer. Still in viscous condition, these individual filaments are brought into contact with each other by means of a false twist and are conglutinated. The result is a quasi-monofil thread („fused monofilament“), which is then supplied with a lubricant. Finally the thread is taken off by means of godets at the end of the spinning chamber and reeled.

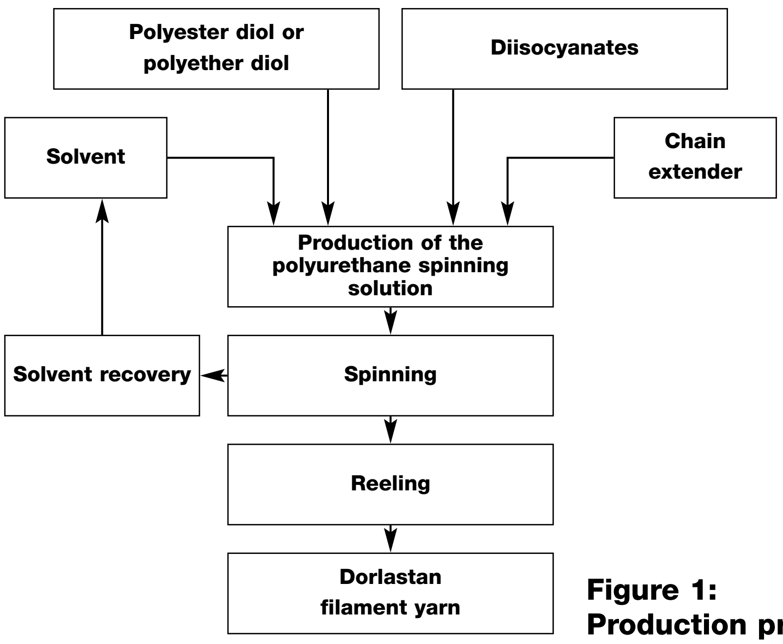

Figure 1:
Production process of Dorlastan

Figure 2 is a schematic diagram of the dry spinning process. Figure 3 shows a cross section of a 480 dtex Dorlastan filament thread consisting of 36 single filaments.

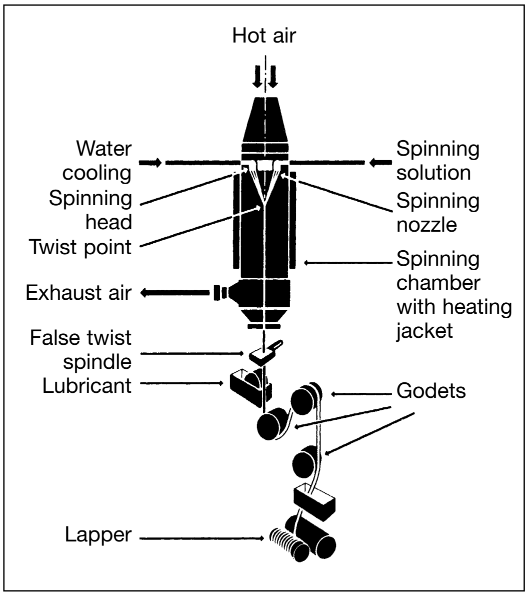

Figure 2: Dry spinning process

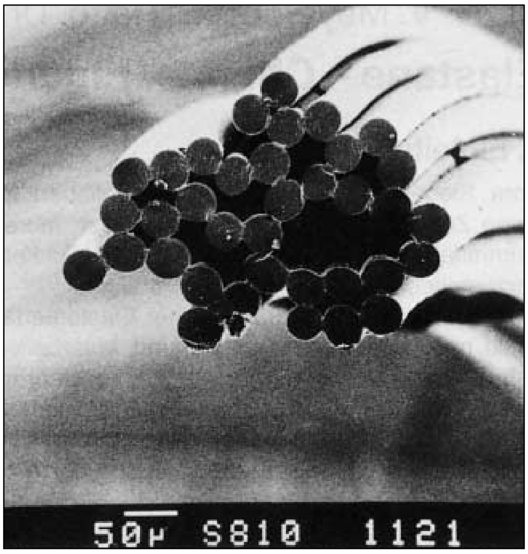

Figure 3: Cross section of a Dorlastan filament yarn of 480 dtex

The solvent is recovered. Only a small residual amount remains in the thread.

Dorlastan is a „segmented polyurethane“. This means, its molecular structure is formed by longer, flexible, soft segments that alternate with relatively short, hard segments (Figure 4). The soft segments are made either of a polyester or a polyether. At room temperature, they are nearly liquid. This state guarantees the high flexibility of the soft segments and is the reason for Dorlastan's high degree of stretchability. The hard segments consist of polyurethane. Their structure is determined by the diisocyanate and by the ethylenediamine used as chain extender. These elements may form crystalline structures and are embedded in the „liquid“ matrix of the soft segments. As a result, the entire „thread system“ is physically interlinked. The hard segments give the Dorlastan thread mechanical support. They are responsible for the solids properties and for the thread's behavior at high temperatures, i.e. for its moldability and setting properties.

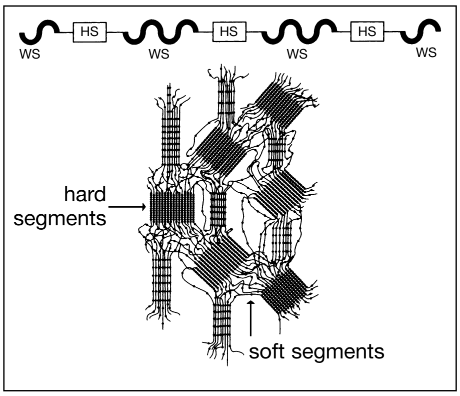

Figure 4:
Model of segmented polyurethane according to Bonart and Rinke

3. Product properties

The most important property of Dorlastan, of both the polyester (V 400, V 410, V 412, V 500) and the polyether type (V 600, V 610, V 800, V 820, V 850, V 900), is its high elasticity and stretchability combined with an optimal retractive force.

Both types are offered as a matt and as a transparent version. In addition, the polyether type is available as an opaque version (V 850). The matt type is recommended for all white articles. If that type is used, only the non-elastic yarn component must be taken into consideration when choosing the fluorescent whitener. For colored articles, the transparent or opaque type should be used. They allow choosing dyestuffs that go only on the non-elastic component, which leads to strong color brilliance and fastness in the finished article.

The polyether type offers better resistance to hydrolysis, whereas the polyether type provides of better resistance to oxidation.

An ingenious system of stabilizers protects the Dorlastan in the fabric against decomposition on exposure to light as well as against yellowing due to gas fume fading.

Special properties of the two types:

Polyster type

Good resistance to:
- chlorinated water
- influence of light
- skin fats
- dry cleaning with perchloroethylene
- effects of ageing/light, NO_x

Molding can be performed at low temperatures, i.e. low tendency to yellowing

Polyether type

Good resistance to:
- chlorinated water (only V 900)
- dry cleaning with perchloroethylene (only V 900)
- alkaline bleaching and dyeing processes
- high-temperature dyeing (blends with polyester filament yarns)

Good light fastness

Good NO_x fastness

3.1 Mechanical properties

The extensibility of Dorlastan ranges from 400–550%, whereby the polyether type is a lower-modulus fiber than the polyester type. If the thread is stretched, the force (stress) increases linearly up to an elongation (strain) of 300%, beyond that it grows super proportionally. When the breaking elongation and the pertinent breaking force are reached, the thread breaks. Figure 5 shows the typical stress-strain curve of a 44 dtex (V 850) and a 45 dtex (V 500) fiber. The breaking elongation is an important variable for processing. In the finished article, in contrast, it is of little importance because the non-elastic basic yarns limit the stretchability of the thread.

But not only the breaking elongation but also the breaking force, or if we relate to the yarn titer the tenacity, influence the processing properties of the yarn.

The consumer, however, is only interested in the retractive force of the Dorlastan thread, i.e. the force that keeps the sock up the leg. What counts is, that the sock still keeps in its place after frequent use. The retractive force is measured after the thread has been stretched and relaxed at constant speed for several times up to a defined stretching limit of 300%. This test reveals typical hysteresis properties: the force resisting the elongation always exceeds the retractive force that develops when you let go the thread. Both forces decrease when the test is repeated, whereby the difference between the two diminishes constantly. One way of measuring the elastic properties is to determine the ratio of the retractive force after five elongation cycles and the force that was necessary for the first elongation. Figure 5 compares the respective curves for the type V 500 (45 dtex) and the type V 850 (44 dtex).

For further information on the testing methods and their evaluation, please refer to the BISFA booklet „Test methods for bare elastane yarns“, paragraphs „Tensile properties“ and „Viscoelastic properties“.

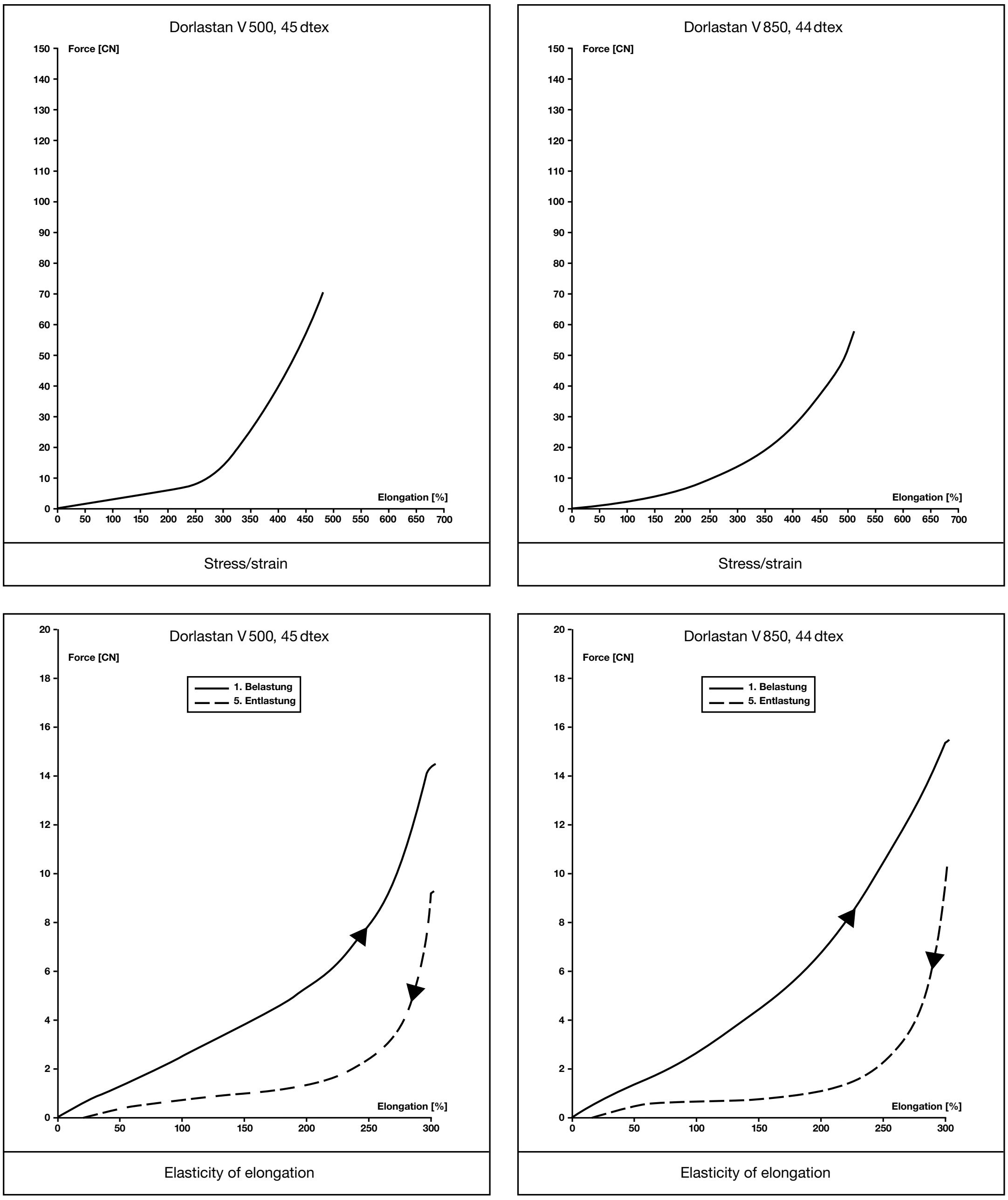

Figure 5: Force/Elongation/Elasticity of Dorlastan

3.2 Thermal properties

Fabrics for apparels are exposed to temperatures ranging from approximately 0°C to 35°C, depending on weather conditions, if they are worn next to the skin. During cleaning, e.g. if washed at the boil, or during dyeing, temperatures are even higher. The highest temperature to which Dorlastan is exposed occurs during thermal molding, the so-called thermosetting, saturated steam setting, or molding. The way Dorlastan reacts to these temperatures (thermal behavior) depends on its molecular structure, i.e. on the combination of hard and soft segments. The thermal behavior is described by the thermomechanical analysis. For this analysis, the tensionless Dorlastan threads are frozen in liquid nitrogen (-100°C). In this state, the threads are loaded with little tension (0.1 mN/tex). Temperature is increased by 10°C per minute. Figure 6 shows the resulting changes in elongation and shrinkage. If the temperature is extremely low, the soft segments are in a frozen state (threads of the polyether type at temperatures below -45°C, threads of the polyester type at temperatures below -40°C). Stretchability and elasticity have vanished. The Dorlastan is nearly rigid. When the temperature increases the soft segments start to „thaw“, i.e. the thread extends. In contrast to the ester type the polyether type starts to shrink at approximately 0°C. This is due to the fact that part of the soft segment structure of the polyether type forms crystals at deep temperatures. When these crystalline sections melt, the fiber shrinks. The polyester type does not have these crystalline soft segment sections.

Between +10 and +45°C, both types have a plateau in the TMA curve, which means that the elastic properties undergo no changes in this temperature range.

When the temperature increases further, the plateau is followed by a shrinkage, which starts at 75°C for the polyester type and at 80°C for the polyether type. This shrinkage can be considered as a sort of presoftening, which is caused by the reduction of the bonding forces between soft and hard segments. The maximum shrinkage is reached between 160 and 165°C for the polyester type and between 170 and 180°C for the polyether type. Then follows the softening range at above 190°C for the polyester type and at slightly higher temperatures for the polyether type. Finally the filaments break due to the applied tension. Table 1 shows the characteristic temperatures of the TMA.

The softening range is of special importance to the user. In this temperature range a dimensional change that was implemented at normal temperature can be fixed by heating and subsequent cooling. The setting is performed under standard conditions, e.g. in the tenter, and the effect is the more lasting the higher the setting temperature and the longer the exposure time. A molding that was fixed by such a procedure can be partially reversed by a free shrinkage at a temperature that is close to that at which the setting was made. The thermal properties of Dorlastan are technically utilized. At moderate temperatures they support the stabilization of flexible combination yarns (saturated steam setting), at high temperatures the thermosetting of elastic warp knits and the forming of bra cups (molding). These thermal and setting properties are essential additional characteristics of a good elastane.

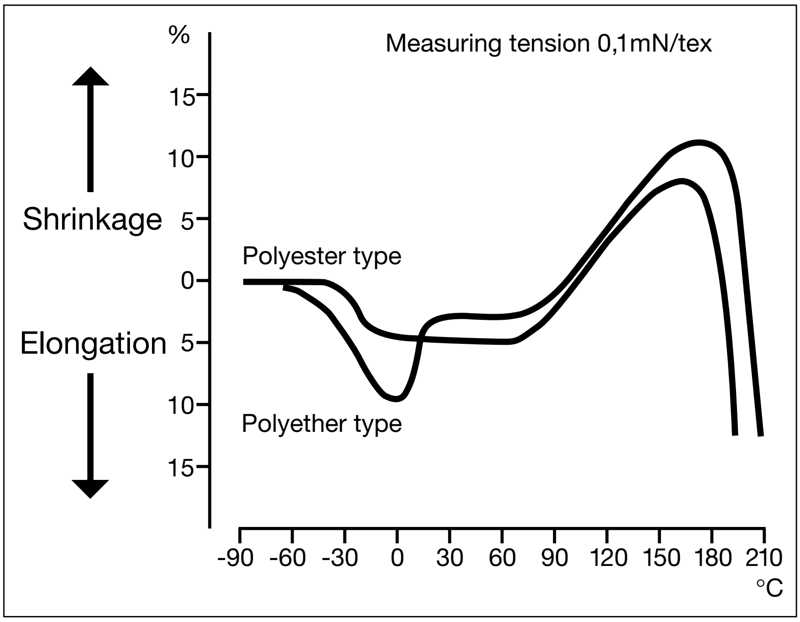

Figure 6: Thermomechanical analysis of Dorlastan

	Polyester	Polyether
Start of thermal expansion	−40 °C	−45 °C
Start of shrinkage due to melting of the crystalline sections		+10 °C
Start of shrinkage	+75 °C	+80 °C
Maximum shrinkage	160–165 °C	170–180 °C
Softening temperature	165–170 °C	190–200 °C

Table 1: Characteristic temperatures during TMA

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3.3 Resistance and fastness

It is important for the dyeing and finishing of fabrics as well as for later wearability and functionality to know which are the best treatment parameters to achieve optimal fastness values for Dorlastan. One indicator for the influence of chemicals is the loss in tenacity. Due to the different soft segments, the two types of Dorlastan react differently. Their behavior and the effects of the treatments listed below have been examined for the titers 44 and 45 dtex:

No.	Treatment	Concen-tration	Temperature	Exposure time	Effects on tenacity[1]		
					Polyester (45 dtx/V500)	Polyether (4dtex/V850)	Polyether (44dtex/V900)
1a	Chlorinated water Method A	20 mg	20–25 °C	5 x 1 h	slight	–*	slight
1b	Chlorinated water Method A	20 mg	20–25 °C	10 x 1 h	moderate	–*	slight
1c	Chlorinated water Method B	100 mg	20–25 °C	5 x 1 h	strong	–*	slight
1d	Chlorinated water Method B	100 mg	10–25 °C	10 x 1 h	strong	–*	moderate
2	Dry cleaning with perchloroethylene	100 %	60 °C	15 min.	none	–*	none
3a	Tendency to yellowing due to the effect of light		ISO 105	B 02[2]	Mark 3	Mark 3-4	Mark 3
3b	Tendency to yellowing due to the effect of NOx	1 x NOx	ISO 105	G 01[3]	Mark 3	Mark 3-4	Mark 3
		3 x NOx			Mark 2	Mark 2-3	Mark 3
4	HT resistance with PES dyeing		130°C	35–45 min	moderate/strong	slight/moderate	slight/moderate

1) Key to the effects on tenacity:
none: 0 – 5 % slight: 5 – 20 % moderate: 20 – 40 % strong: 40 – 90 %
2) Marks 1 – 8, with 8 being the top mark
3) Marks 1 – 5, with 5 being the top mark
*) It is not recommended to subject this type to the stated treatment.

Table 2: Resistance and fastness of Dorlastan

Dorlastan (i.e. the polyester type V 500 and the stabilized polyether type V 900) is not affected by the standard dry cleaning methods.

But it is not only the resistance to chemical and thermal influences that is essential. The stability to light and to nitrogen oxide from exhaust gases as well as the elastane's tendency to yellowing if exposed to these influences are also of central importance.

Stability to light and gas fume fading can be determined by means of light fastness (ISO 105/B 02) and Nox fastness (ISO 105/G 01) tests. Compared to the other elastanes on the market Dorlastan assumes a leading role in this respect.

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4. Dyeing affinity

Dorlastan does not cause any major dyeing problems in blends with polyamide. The shade of the Dorlastan may be slightly lighter than that of the polyamide, depending on the dyestuff combination that is used. With the right dyestuff, however, good tone-on-tone staining can easily be achieved. This is of particular importance for blends with a large share of visible Dorlastan. Light or medium-shade blends of that type should be dyed with acid dyestuffs, for dark shades metallic complex dyestuffs are recommended. In exceptional cases, disperse dyestuffs may be used for very light shades. The dyeing affinity of Dorlastan is similar to that of polyamide.

Acid dyestuffs form salts as they react with Dorlastan and build more stable chemical bonds with the fiber, which produces better fastness values. For this reason, acid dyestuffs are also suited for medium to semi-dark shades. When dyeing blends of Dorlastan and polyamide, the different affinity to the dyestuff of the two fiber types must be taken into consideration, and the dyestuffs and auxiliary agents must be selected carefully to ensure satisfactory staining of the Dorlastan.

Metallic complex dyestuffs are also acid dyestuffs. Particularly recommendable are those containing chromium as a molecule increasing link. Due to the increased molecule size, they offer better fastness; but at the same time, leveling is more difficult. The dyeing affinity is the same for both types of Dorlastan. If the dyeing conditions are identical, clear Dorlastan absorbs the same amount of dyestuff as matted Dorlastan. The matted Dorlastan types always look much lighter, which is due to the scattering of light caused by the matting agent. With the clear types, this disturbing effect can be avoided; the Dorlastan yarns of that type are transparent because no dulling agent is applied.

Compared to the V 850 type, the V 900 Dorlastan type assumes a darker shade; the wetfastness properties, however, are identical. Sometimes aftertreatment with wetfastness-improving products (e.g. Mesito NBS or Zetesal NR) is recommendable, especially if the Dorlastan share is large, because the wetfastness of acid and metallic complex dyestuffs can be improved considerably by such treatment.

Disperse dyestuffs are characterized by an outstanding leveling power and even dyeing. Color fastness, in contrast, is only moderate. Therefore, disperse dyestuffs are used exclusively for light pastel shades. Because of their insufficient sublimation fastness they should not be used for articles that will be subjected to thermal molding.

Articles containing cotton are preferably dyed with substantive, reactive, and sometimes vat or sulfur dyestuffs. These dyestuffs do not stain the Dorlastan in the blend. If a staining of the Dorlastan is desired, additional dyestuffs for fabrics containing polyamide must be applied.

For detailed information on the dyeing propertied please refer to the product information booklet „Dyeing and Finishing of Wovens and Knits“.

5. Types of Dorlastan, Processing, Fields of Application

Type	Specific Characteristics	Processing	Possible fields of application
V 400	dull polyester-type on cylindrical package or sectional beam	primarily by rolling off	warp knitting/raschel, narrows
V 410*	dull polyester-type on cylindrical package (without spin finish)	by rolling off	diaper/non-wovens
V 412*	dull polyester-type on biconical package (without spin finish)	overend	diaper/non-wovens
V 500	clear polyester-type on cylindrical package or sectional beam	primarily by rolling off	warp knitting/raschel, narrows, covering/core spinning, weaving
V 600	dull polyether-type on cylindrical package or sectional beam	by rolling off	warp knitting/raschel, narrows, covering/core spinning
V 610*	dull polyether-type on cylindrical package (without spin finish)	by rolling off	diaper/non-wovens
V 800	clear polyether-type on cylindrical package or sectional beam	overend and by rolling off	warp knitting/raschel, narrows, circular knitting, weaving, covering/core spinning, hosiery/seamless
V 820	clear polyether-type on biconical precision package	overend	hosiery/seamless
V 850	clear polyether-type on cylindrical package or sectional beam	overend and by rolling off	warp knitting, circular knitting, weaving, covering/core spinning, hosiery/seamless
V 900	clear polyether-type on cylindrical package or sectional beam	primarily by rolling off	warp knitting, circular knitting, weaving, covering/core spinning, hosiery/seamless

* recommended for diaper/non-wovens

6. Range of products

Polymer	Polyester			
Type	**V 400**	**V 410**	**V 412**	**V 500**
Dormagen				
dtex				
45				x
80				x
160	x			x
240	x			x
320	x			x
400	x			
480	x			x
540		x	x	
615		x	x	
640				x
680		x	x	
800		x	x	
920		x	x	
960				x
1130		x	x	
1280				x
1870				x

x = Produced in Dormagen

Polymer		Polyether					
Type		**V 600**	**V 610**	**V 800**	**V 820**	**V 850**	**V 900**
Dormagen	**Bushy Park**						
dtex	**den**						
	10			●			
17	15			●		x	
22	20			●		x	x ●
33	30			●		x	x ●
44	40			●			x ●
	55			●			●
78	70			●			x ●
	105			●			●
133	120			●			
150	135			●	x		
156	140	●		x ●			●
195	175			●	x		
235	210	●		●	x		
270					x		
	280	●		●			
400	360			●			
	420			●			
	560		●	●			
680	610		●				
	675						
800	720		●	●			
	830		●				
	840			●			
	1020		●				
	1120			●			
	1220			●			
	1400	●	●	●			
	1680			●			

x = Produced in Dormagen ● = Produced in Bushy Park

7. Notes on occupational safety

For the production of Dorlastan, the proven solvent dimethyl acetamide (DMAC) is used.

DMAC is detrimental to health when it is inhaled or comes in contact with the skin. In the meantime it has also been classified as a matter toxic to reproduction of category 2 (published in August 2001 by the EU Commission), i.e. it may cause harm to the unborn child. But its potential toxic to reproduction is considered rather low. So the admissible workplace limit value for DMAC applicable in the European Union remains unchanged at 10 ppm = 10 ml/m^2 = 36 mg/m^2 despite the new classification. Since Dorlastan may contain little residual traces of DMAC, which may evaporate into the air, proper room ventilation and extraction devices are essential during further processing in order to ensure that the threshold limit value is not exceeded. If these instructions are followed, it can be assumed that Dorlastan does not present any risk concerning toxicity to reproduction.

Any traces of DMAC remaining in the dye bath are eliminated during the normal wastewater treatment, which is legally required for any dye liquor, since DMAC is easily biodegradable.

Dorlastan is provided with a spin finish that is necessary for processing. When handled properly, it does not present any known health risk. Dorlastan is not a hazardous freight.

For further information, please refer to our safety data sheet.

8. Notes on Storage

Dorlastan should be stored in its packing. The packing protects the Dorlastan against the effects of light. The temperature in the storage room should range between 4 and 27°C; relative air humidity should be 30% at minimum and 80% at maximum. If the room is too dry or too warm, the normally very good processing properties of Dorlastan may deteriorate. This negative effect increases proportionally to the time the yarn is stored under unfavorable conditions.

If the defined conditions (preferably 20°C/60% relative air humidity) prevail, titers up to 33dtex should be used within 3 months, titers up to 80 dtex within 6 months, and medium and coarse titers within 12 months.

The manufacturing halls in textile industry are often air-conditioned. This is not true for storage rooms. If the climatic conditions in the rooms where the Dorlastan is processed differ from those in the yarn store, we recommend a 24-hour acclimatization period in the workroom. The packing of the Dorlastan filament yarn should be open during this period. Adequate storage conditions are the prerequisite for perfect processability.

Yarns and ready-made articles containing Dorlastan should be stored in suitable packing. The climatic conditions should be the same as for the storage of the bobbins.

9. Notes on delivery

9.1 Form of supply

Sizes and weights are given in the table below. Bobbins and cartons are non-returnable packagings; Sectional beams, drums, tubular steel pallets, and wood containers must be returned. All the stated dimensions and weights are approximate values.

9.1.1 Bobbins

Produced in Germany					
Titer in dtex	**weight class in g**	**used tubes**	**length/ mm**	**tube weight in g**	**bobbins per carton**
17, 22, 33	360	narrow	57,75	48	64
44, 45, 78, 80	500 – 720	narrow	57,75	48	64/48
156, 160, 240, 320, 400, 480	1200 – 1500	normal	115,5	70	32/24
640, 960, 1280, 1870	1000 – 1200	normal	115,5	70	32
150, 195, 235, 270	1100	large	159,5	95	24
540, 615, 680, 800, 920, 1130	3000	normal	115,5	100	8*
540, 615, 680, 800, 920, 1130	1500	large	159,5	95	18**
540, 615, 680, 800, 920, 1130	3000	very large	230	284	10**

Produced in USA					
Titer in dtex	**weight class in g**	**used tubes**	**length/ mm**	**tube weight in g**	**bobbins per carton**
10, 15, 20, 30, 40, 55	225 – 500	narrow	57,75	48	64
70, 105, 120, 140	500 – 560	narrow	57,75	51	64
70, 105, 135, 140, 175, 210, 280, 360, 420, 560, 720, 840, 1120, 1220, 1400, 1680	1200 – 1500	normal	115,5	100	24
560, 610, 720, 830, 1020, 1400	3000	normal	115,5	100	8***

Inner diameter bobbins/mm	73,5
Outside dimension of cartons in mm	
Standard	602 x 502 x 508
* Diaper type V 410	597 x 330 x 508
** Diaper type V 412	602 x 502 x 508
*** Diaper type V 610	605 x 343 x 529
Dimension pallet in cm	100 x 120 x 14

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9.1.2 Sectional beams (technical data)

Dormagen

Type of sectional beam	Standard beam		
	Simple width		1¼ width
Width of sectional beam in inches	14 x 21"	21 x 21"	14 x 25"
Flange dia. in mm/inches	355/14"	532/21"	355/14"
Bore in mm/inches	70.4/2.8"	152.7/6"	70.4/2.8"
Outer distance between flanges in mm	520	530	655
Inner distance between flanges in mm	450	480	585
Flange thickness in mm	35	30	35
Shaft diameter in mm	110	200	110
Max. yarn weight in kg	40	80	52
Replacement cost in €	180	410	200

Type of sectional beam	Giant beam			
	Double width			
Width of sectional beam in inches	30 x 42"	21 x 42"	21 x 42"	21 x 50"
Flange dia. in mm/inches	762/30"	532/21"	532/21"	532/21"
Bore in mm/inches	152.7/6"	152.7/6"	152.7/6"	152.7/6"
Outer distance between flanges in mm	1066	1026	1066	1300
Inner distance between flanges in mm	977	1006	1066	1236.5
Flange thickness in mm	44.5	10	30	31.7
Shaft diameter in mm	297	298	200	200
Max. yarn weight in kg	350	140	180	215
Replacement cost in €	1150	720	720	780

Bushy Park

Type of sectional beam	Giant beam			
	Double width			
Width of sectional beam in inches	21 x 21"	30 x 21"	21 x 42"	30 x 42"
Flange dia. in mm/inches	532/21"	762 x 30"	532/21"	762/30"
Bore in mm/inches	114.4	114.4	114.4	114.4
Outer distance between flanges in mm	530	530	1066	1066
Inner distance between flanges in mm	480	480	1066	977
Flange thickness in mm	30	44.5	30	44.5
Shaft diameter in mm	200	200	200	297
Max. yarn weight in kg	80	135	180	350
Replacement cost in €	410	720	720	1150

9.1.2.1 Packing material for sectional beams

Hardboard drums/wooden container/tubular steel pallet

Dormagen

Packing material	Cardboard	Container	Container
Outer dia. in mm	420	1200 x 1390	1190 x 820
Height in mm	610	707	935
Weight in kg	9.3	110.0	130.0
For sectional beam type	085/320	351/775	030
Replacement cost in €	30	150	400

Packing material	Tubular steel pallet
Outer dia. in mm	1160 x 1120
Height in mm without sectional beam	350
Height in mm with sectional beam	790
Weight in kg	32.0
For sectional beam type	4 pcs 21 x 21" 2 pcs 21 x 42"
Replacement cost in €	200

Bushy Park

Packing material	Tubular steel pallet
Outer dia. in mm	1270 x 1092
Height in mm without sectional beam	1447
Height in mm with sectional beam	1447
Weight in kg	103
For sectional beam type	4 pcs 21 x 21" 2 pcs 21 x 42"
Replacement cost in €	480

9.1.2.2 Number of threads for sectional beams

For the titers 17, 22, 33, 44/45 and 78/80 standard thread numbers have been determined for the 42“ sectional beam:

Number of threads	17 dtex	22 dtex	33 dtex	44/45 dtex	79/80 dtex
1170	–	x	x	x	x
1340	x	x	x	x	x
1370	–	–	–	x	–
1560	–	x	–	x	–
1680	x	x	x	–	–

When placing an order, these numbers of threads should always be given.

For raschel knitting (133–1280 dtex), no standard thread numbers can be set.
In case of 42“ and 50“ sectional beams, the thread number should not be less than 1,000.

The maximum number of threads
for 21“ and 25“ is 800 threads,
for 42“ and 50“ 1824 threads.

9.1.2.3 Weights of warp sets and order weights

The order weight should be an integral multiple of the creel load weights.
The creel load weight is the product of the thread number and the weight class of the bobbins to be used.
The number of warps produced from one creel load and their weight depend on
- the weight class of the bobbins,
- the number of threads per warp beam,
- the number of beams per warp,
- the admissible sectional beam weight.

The weight of the sectional beam is limited by the loading capacity of the beam and additionally by reasons that are due to processing (with fine Dorlastan yarns up to dtex 45).

Examples for standard orders for Dorlastan warps:

Titer dtex	Weight class of bobbin [g]	Number of threads/ sectional beam	Type of sectional beam	Number of sectional beams per warp set	Net weight of sectional beam approx. kg	Net weight of warp set approx. kg	Number of warp sets	Net creel load weight approx. kg
17	360	1340	21 x 42"	3	80	240	2	480
22	360	1340	21 x 42"	3	80	240	2	480
33	360	1340	21 x 42"	3	80	240	2	480
44	500	1340	21 x 42"	3	110	330	2	660
44	500	1340	30 x 42"	3	220	660	1	660
45	560/720	1340	21 x 42"	3	125–160	375-480	2	750–960
45	560720	1340	30 x 42"	3	250–320	750-960	1	750–960
78	560	1340	21 x 42"	3	125	375	2	750
78	560	1340	30 x 42"	3	250	750	1	750
80	500	1340	21 x 42"	3	110	330	2	660
80	500	1340	30 x 42"	3	220	660	1	660
160	1200/1500	1040	21 x 42"	3	104	310/390	4	1248/1560
160	1200/1500	1200	21 x 50"	2	180	360/450	4	1440/1800
320	1200/1500	1340	21 x 42"	3	134	400/500	4	1608/2010
320	1200/1500	1340	21 x 50"	2	201	400/500	4	1608/2010
640	1200	1400	21 x 42"	3	140	420	4	1680
640	1200	1400	21 x 50"	2	210	420	4	1680

In the case that standard creel load weights are too large for an order, particularly with titers of 160 dtex and more, the order weight should be as follows:

for dtex 160 to dtex 640 75%, 50% or 25%

for dtex 960 to dtex 1280 66% or 33%

of the standard creel load weight.

9.1.2.4 Elongation and lease

The standard elongation is 50% for 17, 22 and 33 dtex, 40% for 45–80 dtex, and 25 % for 160–1280 dtex.

For processing on the automatic warp knitting machine, full lease is required for the sectional beam. The threadsheet is fixed by means of two adhesive tapes from above and from below. Sectional beams for raschel knitting machines for 160 dtex and more can also be delivered with a 1:1 lease. The even and the uneven threads are divided into two separate threadsheets, each of which is fixed by a simple (full) lease. The leases are situated on top of each other.

Note

If you have any questions, please contact our Marketing Dorlastan Department:

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