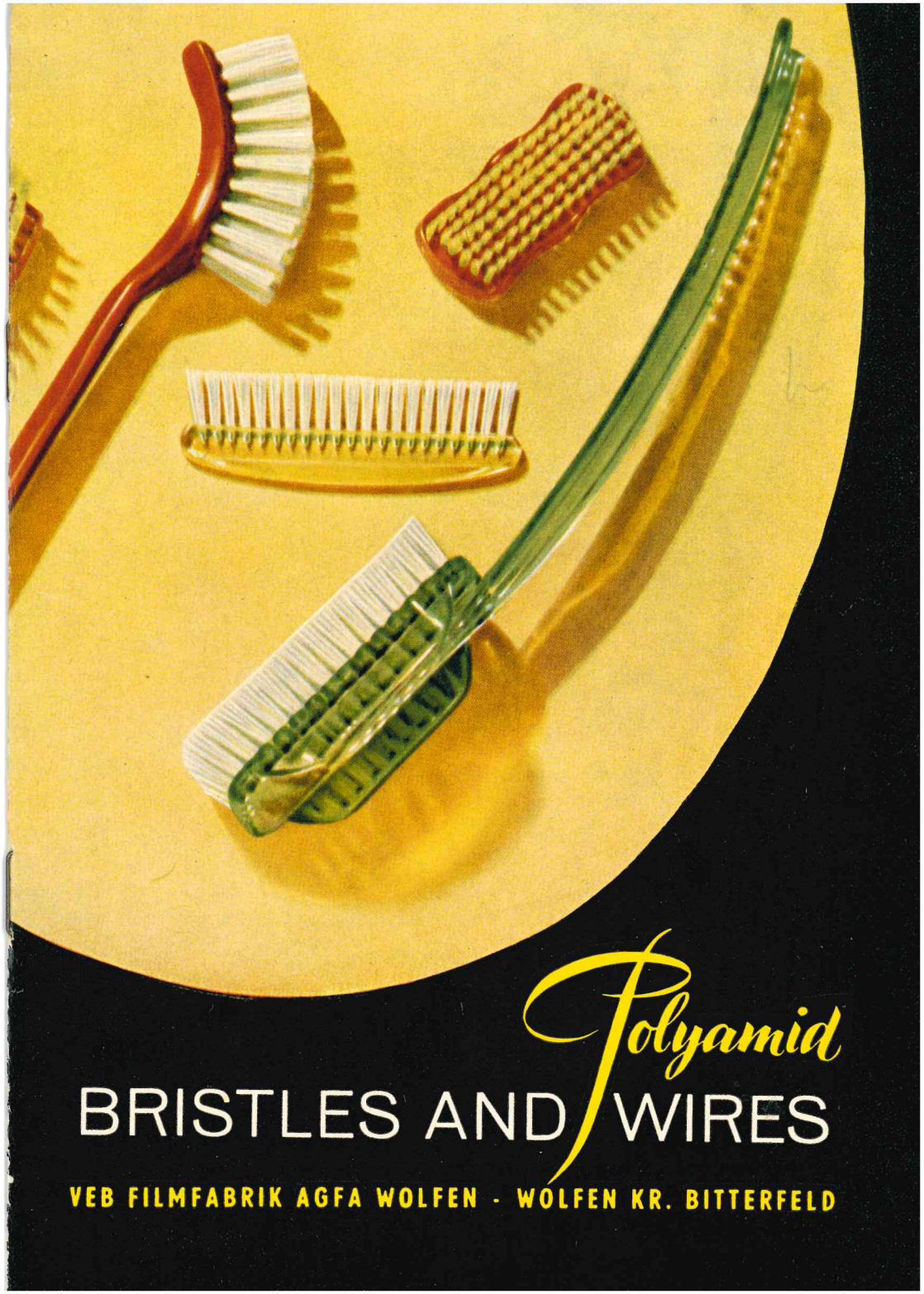
Polyamid
BRISTLES AND WIRES
VEB FILMFABRIK AGFA WOLFEN · WOLFEN KR. BITTERFELD

At all times we have made it our study to develop products of a very high quality. These endeavours also resulted in the development of polyamide bristles and wires.

The present booklet will furnish you some information and hints for the proper use and utilization of synthetic bristles and wires.

We are, of course, always gladly disposed to give you advice with regard to all special problems that are not mentioned in the present prospectus.

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GENERAL:

The basic material for the manufacture of polyamide bristles and wires is the E-caprolactame, abridged "lactame", which is extracted from the phenole as the final product of a great number of phases of production. This phenole has its origin in the coal.

The scheme of the process of manufacturing will furnish you a survey of the different phases of fabrication which lead from the lactame to the polyamide bristles and wires ready for dispatch.

PROPERTIES:

The bristles and wires made from polyamide have a series of remarkable properties, the most outstanding of which being the high elasticity and shearing strength.

The specific gravity of 1.14 is low as compared to that of other products.

The wet strength is about 80–90% and not much inferior to the dry strength.

The melting point of this polyamide lies between 214 and 215° C.

RESISTIBILITY TO CHEMICALS:

Kind of chemicals	Remarks
Alkali	resistant
Acids	at high temperatures and high concentrations poor resistivity
Conc. sulphuric acid	
Conc. nitric acid	
Hydrochloric acid	where the polyamide even can dissolve
Formic acid	
Hot acetic acid	
Acids (dilute)	restrictedly resistant
Matters of the phenolic hydroxyl groups	only restrictedly resistant
Hydrocarbon	resistant
Halogenized hydrogens	
Alcohols	
Fats	
Oils	

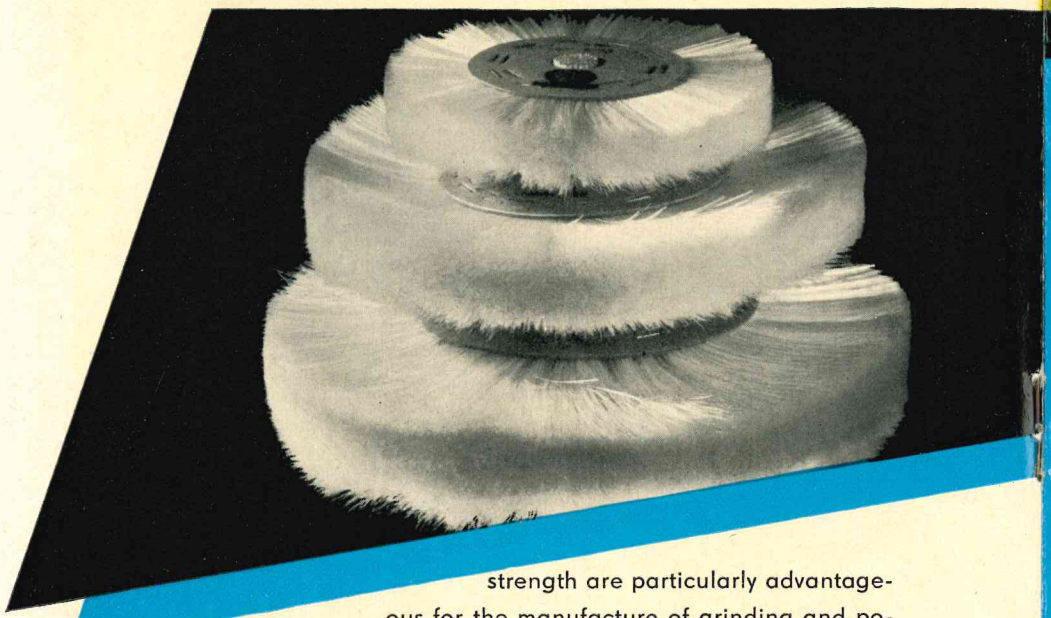
This survey shows that, in doubtful cases, it will be wise to make a trial before the bristles and wires are used.

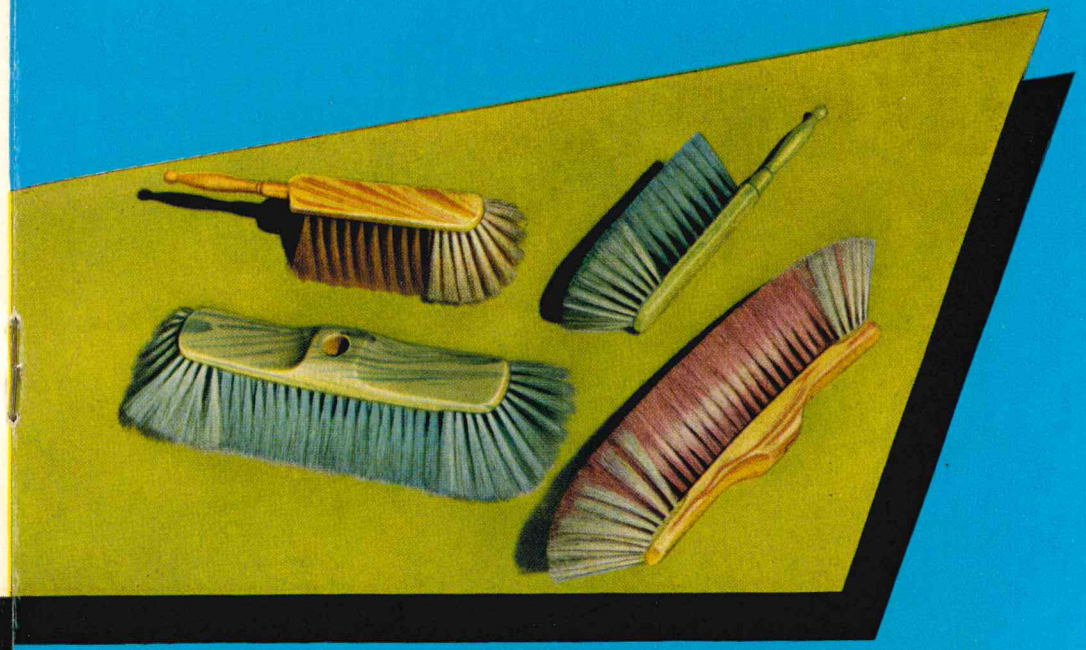
POLYAMIDE BRISTLES

After having mentioned the properties in general it may be pointed out in particular that the stiffness in dry state of the bristles is very good as compared to that of natural bristles. In special cases the stiffness can moreover be easily varied by varying the diameters, which is impossible with natural bristles.
The bristles are irreprochable and unobjectionable from a hygienic point of view, and they can easily be cleaned.

Fields of application:

The above mentioned advantages over natural bristles or other synthetic bristles make them particularly fit for being used for industrial purposes. The high elasticity, impact resistance, bending strength and shearing strength are particularly advantageous for the manufacture of grinding and polishing brushes, round brushes and porcupines for the textile machine industry. For hygienic reasons and taking account of the fact that polyamide bristles do not rot even when being continously exposed to moisture, they can be highly recommended for brushes for cleaning bottles as well as for other brushes used in dairies.





Since quite a while brushes with polyamide bristles are preferred for household use. There they have become quite indispensable on account of their excellent properties and the great advantages they offer. To illustrate the ample field of applicction we here may mention the following examples: tooth-brushes, hand- and nail-brushes, hair-brushes and curling brushes, clothes-brushes, bathing-brushes, brooms, hand-brooms.

Delivery ex factory in the following thicknesses: 0.15, 0.20, 0.25, 0.28, 0.30, 0.35, 0.40, 0.50 up to 1.0 mm in diam.

On demand also thicker for special purposes.

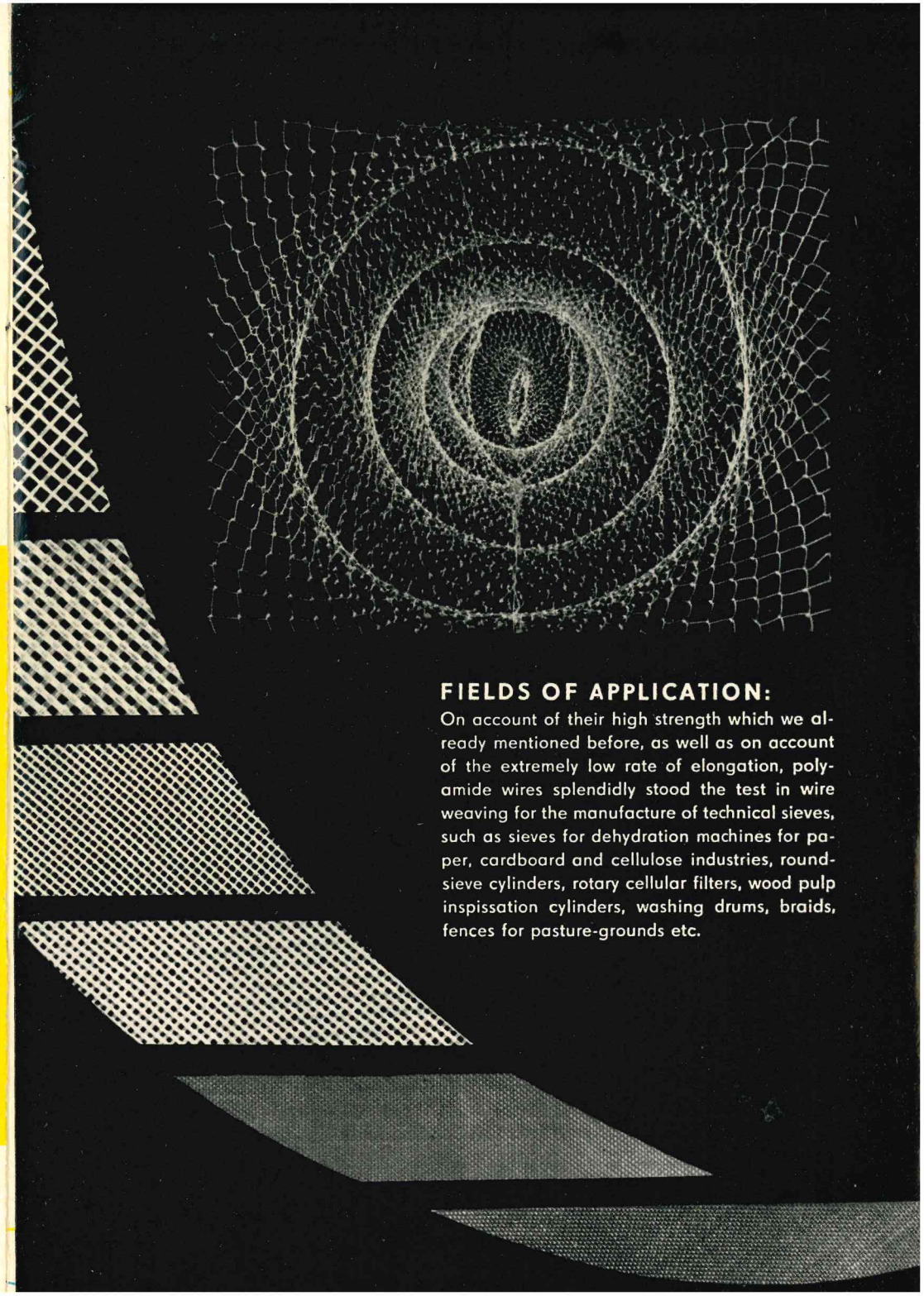
POLYAMIDE WIRE

The high bending and shearing strength in combination with the other properties open an ample field of application to this product. In addition we may mention the possibility of substituting polyamide wires for metal wires. Polyamide wire is no make-shift material as is often wrongly supposed, but is even superior to other material for many purposes.

We supply polyamide wires in strands and in the following thicknesses:

Diameter mm	Breaking load about per kg	Length about per kg
0,15 mm	0,85 kg	38 665 m
0,20 mm	1,57 kg	23 087 m
0,25 mm	2,15 kg	14 523 m
0,30 mm	2,76 kg	10 261 m
0,35 mm	3,65 kg	7 346 m
0,40 mm	4,71 kg	5 772 m
0,45 mm	6,20 kg	4 654 m
0,50 mm	7,50 kg	3 694 m
0,60 mm	11,80 kg	2 565 m
0,70 mm	15,40 kg	1 885 m
0,80 mm	18,10 kg	1 443 m
0,90 mm	21,20 kg	1 440 m
1,00 mm	30,00 kg	923 m
1,20 mm	40,00 kg	641 m
1,30 mm	45,00 kg	546 m
1,50 mm	58,00 kg	410 m
1,60 mm	65,00 kg	361 m
1,70 mm	70,00 kg	320 m
1,90 mm	77,00 kg	256 m
2,00 mm	80,00 kg	230 m

Tolerances in diameter $\pm$ 10% as usual

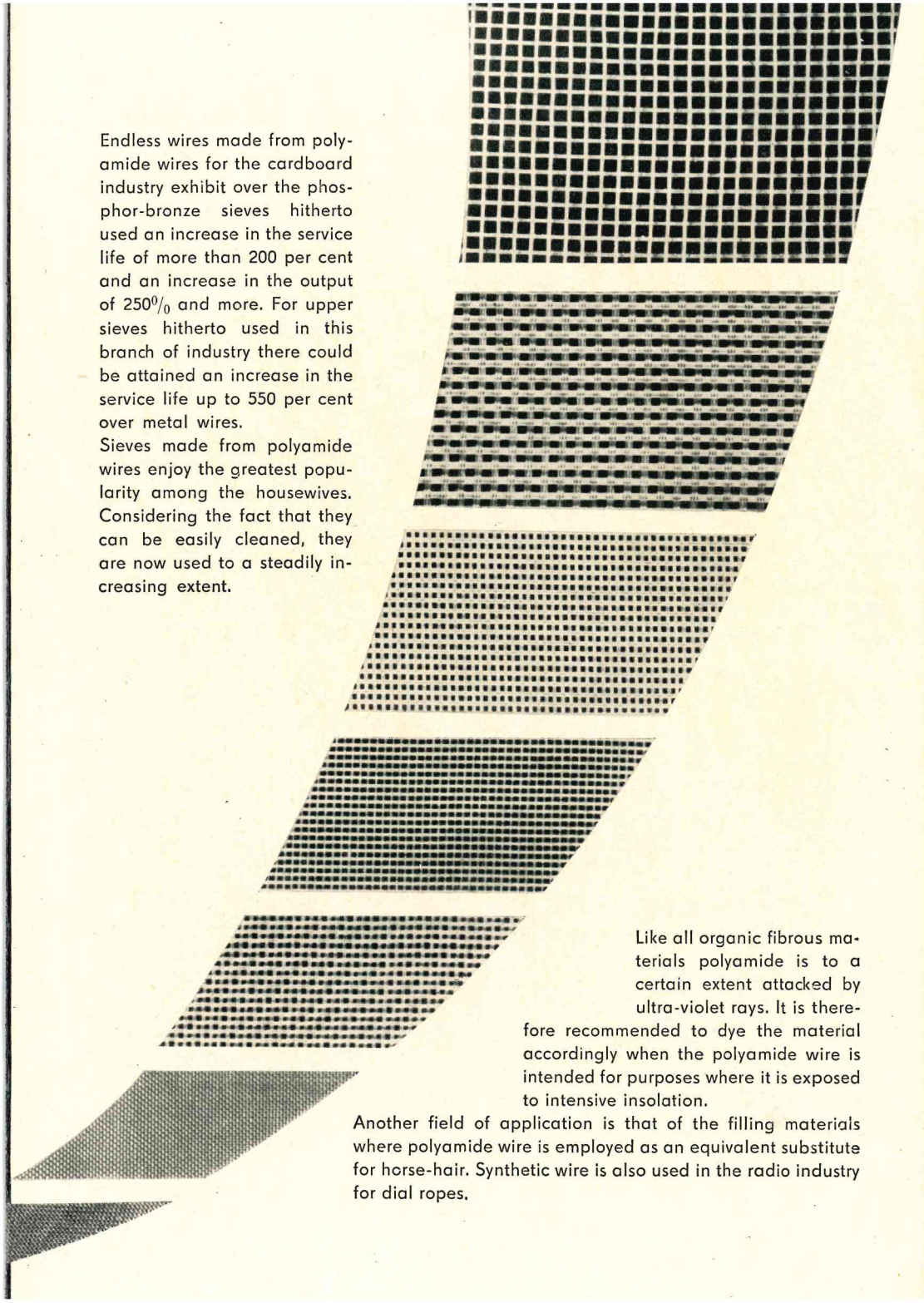


FIELDS OF APPLICATION:

On account of their high strength which we already mentioned before, as well as on account of the extremely low rate of elongation, polyamide wires splendidly stood the test in wire weaving for the manufacture of technical sieves, such as sieves for dehydration machines for paper, cardboard and cellulose industries, round-sieve cylinders, rotary cellular filters, wood pulp inspissation cylinders, washing drums, braids, fences for pasture-grounds etc.

Endless wires made from polyamide wires for the cardboard industry exhibit over the phosphor-bronze sieves hitherto used an increase in the service life of more than 200 per cent and an increase in the output of 250% and more. For upper sieves hitherto used in this branch of industry there could be attained an increase in the service life up to 550 per cent over metal wires.

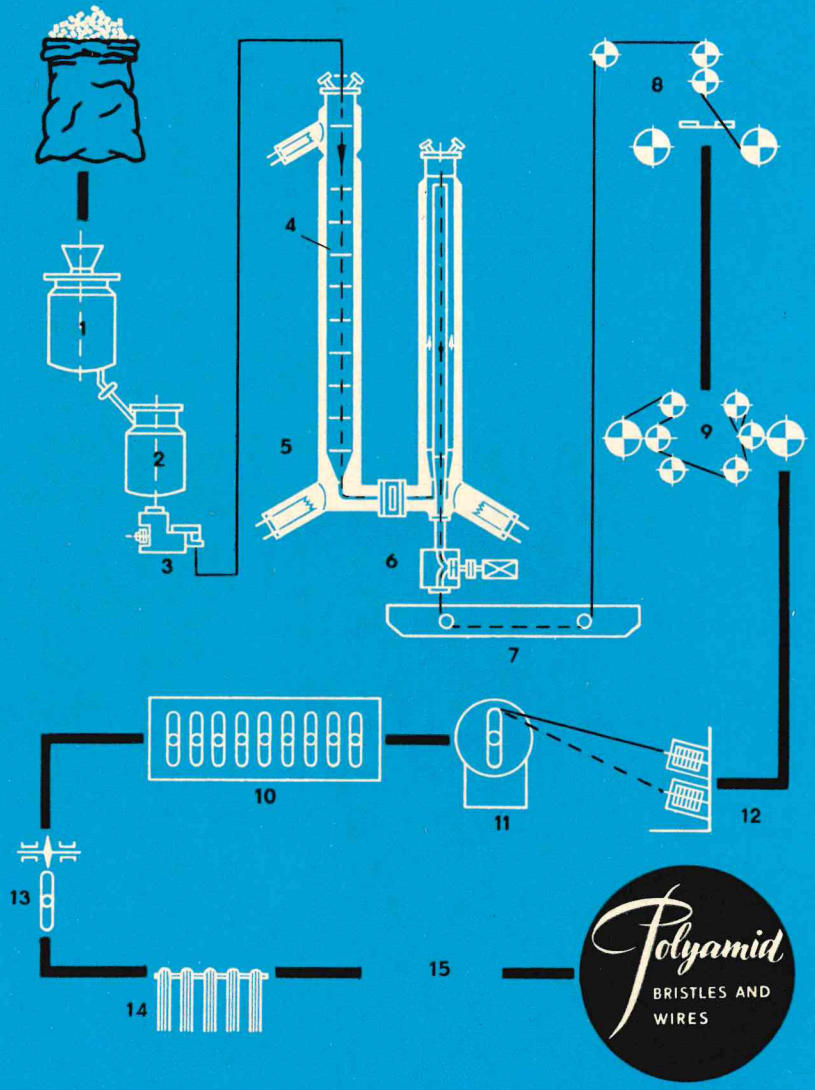
Sieves made from polyamide wires enjoy the greatest popularity among the housewives. Considering the fact that they can be easily cleaned, they are now used to a steadily increasing extent.



Like all organic fibrous materials polyamide is to a certain extent attacked by ultra-violet rays. It is therefore recommended to dye the material accordingly when the polyamide wire is intended for purposes where it is exposed to intensive insolation.

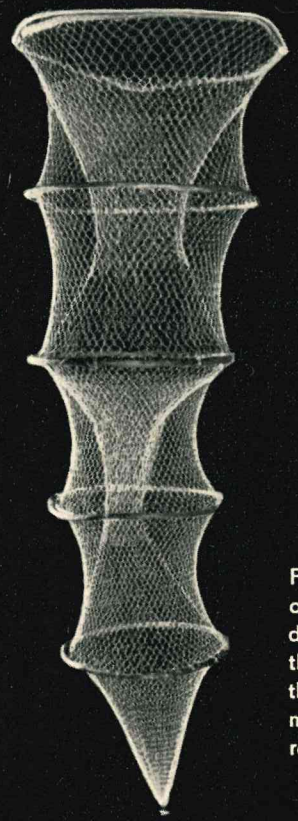
Another field of application is that of the filling materials where polyamide wire is employed as an equivalent substitute for horse-hair. Synthetic wire is also used in the radio industry for dial ropes.

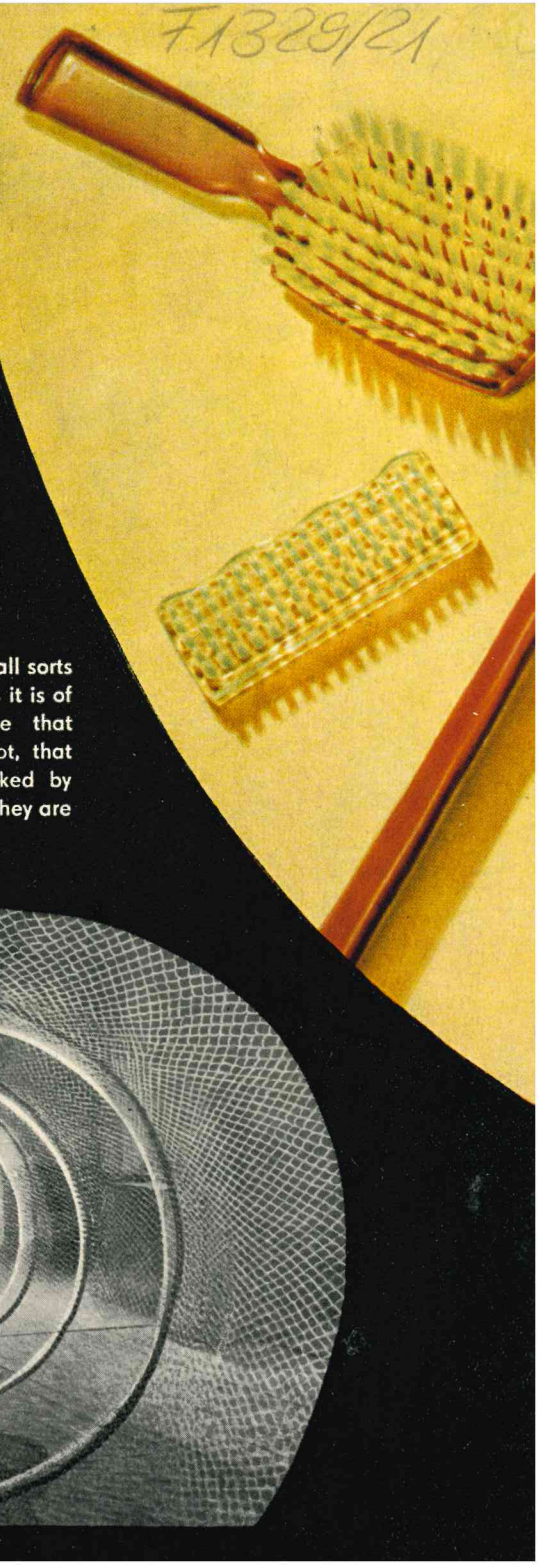
The progress of manufacturing polyamide bristles and wires



1 Basin for dissolving lactame
2 Mixing container
3 Pump block
4 Inserted plates
5 Polymerization tube
6 Spinning head with dosing pump and nozzle
7 Spinning vat
8 Winding-on machine
9 Drawing frame
10 Boiling-out vat
11 Reel
12 Running-off stand
13 Bristle cutter
14 Sorting
15 Drying and packing

Annotation: For the manufacture of polyamide wires the cutting machine is replaced by a reel





For nets, bow-nets, all sorts of ropes and strings it is of decisive importance that the wires do not rot, that they are not attacked by microbes, and that they are resistant to water.