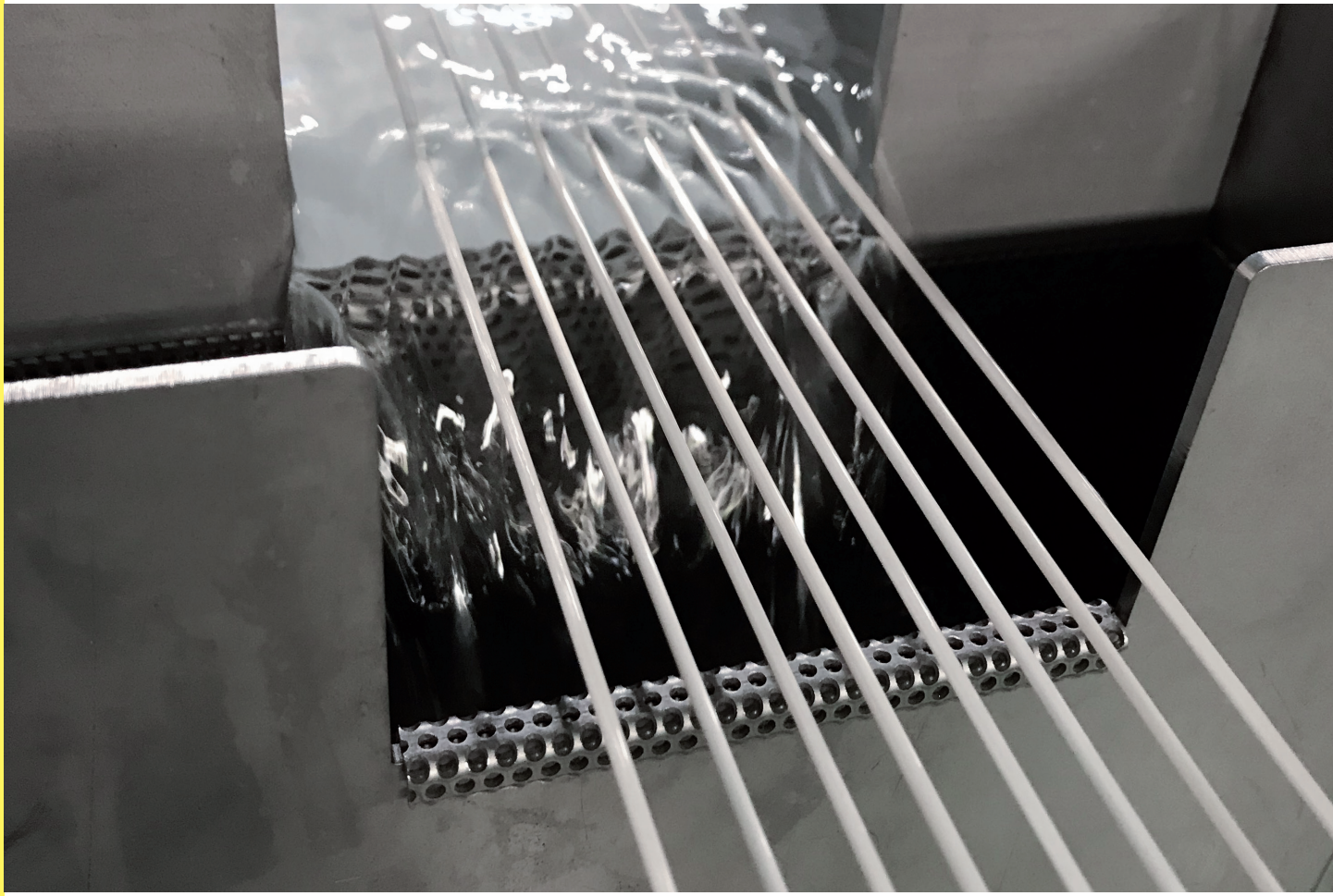
Complete system for the production of
long-fibre reinforced thermoplastics (LFT)

ips intelligent pelletizing solutions

ips-LFT HP



Gentle on material. Efficient. Resource-saving.

- Simple operation with high system safety
- Variable cooling section for the polymer strands before cutting
- High production yield thanks to short set-up time and downtime
- Minimum personnel required
- Central control of the entire line
- Controlled spreading process goes easy on the fibres
- Improved degree of impregnation at increased process speeds
- Monitoring of heating zones with indication of where defective heating elements are located
- Simple replacement of the die plates

www.pelletizing.de

Intelligent system concepts for the production of long-fibre reinforced thermoplastics

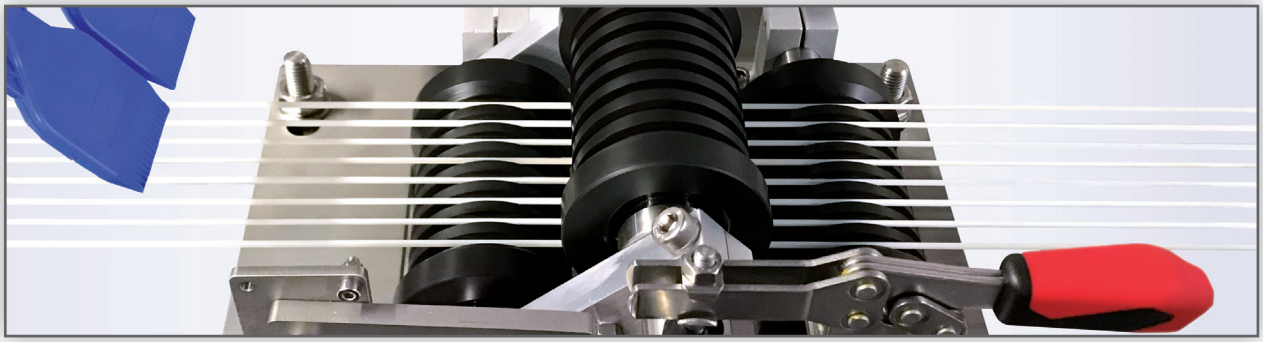
Long-fibre reinforced thermoplastics offer a wide range of processing and design possibilities for the lightweight engineering of materials and structures in particular. Applications for which metals have mainly been used before can now be realised at lower cost and with less impact on resources by long-fibre reinforced thermoplastics.

Production using the pultrusion method

LFT are a special kind of polymer pellets. They are produced using the so-called pultrusion or strand pulling method and are used especially in the automotive industry, in aviation and electronics, as well as in plant construction or for sports equipment.

For LFT production
– the endless fibres are wound off a coil in a controlled way,
– preheated and spread,
– impregnated with polymer melt and moulded,
– cooled and pelletized.

The cut length of the strands varies between 6 – 25 mm. The fibre lengths contained corre-spond exactly to the cutting length of the LFT pellets.



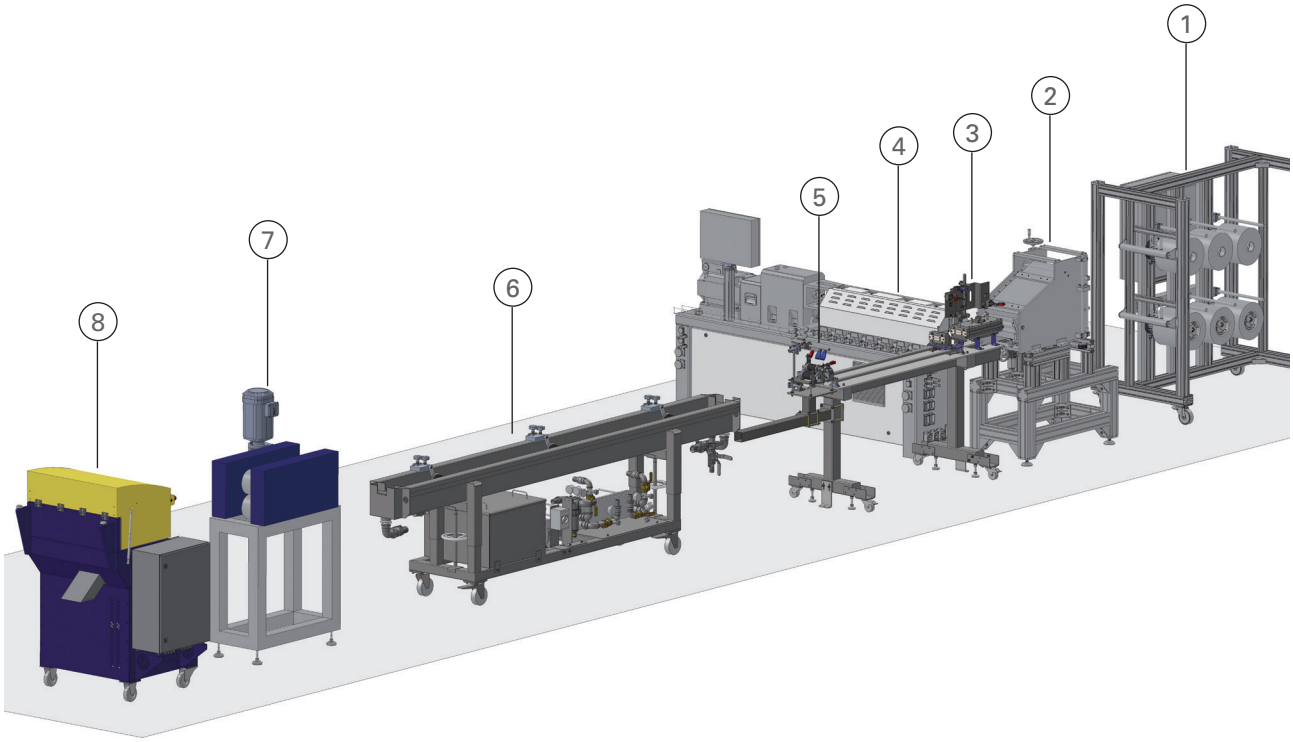
Uses and benefits of LFT

Compared with short-fibre reinforced plastics, components made of long-fibre reinforced thermoplastics have a much greater im-pact/notched bar impact strength, significantly higher material strength and outstanding rigidi-ty with less material used.

When LFT products are processed, a “fibre skeleton” is formed within the component with significantly improved thermo-mechanical properties. Thanks to the direct transfer of tension from fibre to fibre, changes in the ma-terial caused by humidity, temperature or de-formation speed are reduced.

This so-called “LFT effect” opens up a wide range of application possibilities for long-fibre reinforced thermoplastics. Heavy-duty structur-al components can be produced using LFT pellets within very short cycle times, particularly using the injection moulding method.

System set-up



1 Unwinding module
2 Preheating/spreading module
3 Impregnation/calibration module
4 Extruder + Diverter valve
5 Forming roller module
6 Strand cooling trough incl. process water system
7 Belt draw-off
8 Strand pelletizer

Process description

The polymer melt is provided by an extruder (4) and is transported into the impregnation/calibration module (3) by a diverter valve. The belt draw-off (7) draws the rovings or strands through the entire system, through all machine modules, at constant speed.

First, the rovings are unwound in a controlled way from the unwinding creel and pass through a preheating and spreading module (2) before they reach the impregnation/calibration module (3). Here the flat, spread rovings meet the polymer melts in which the individual fibres are saturated or impregnated.

At the outlet of the impregnation/calibration module, the fibres are formed into a strand and calibrated to the required fibre content (3). The forming roller or forming roller module (5) post-forms the strands as well as smoothing and cooling them. An optional strand cooling trough (6) can supplement the system as a post-cooling section. Then the strand pelletizer (8) cuts the strands to the required pellet length.

ips intelligent pelletizing solutions

Complete system for the production of long-fibre reinforced thermoplastics (LFT)

100% ips QUALITY

ips – We set great store by the highest quality
German mechanical engineering to ensure your success!

ips intelligent pelletizing solutions

Technical data

The ips system type

Sizes	ips-LFT 20 HP	ips-LFT 40 HP	ips-LFT 60 HP
Throughput rate* (max) *[kg/h]*	360	720	1080
Number of strands	20	40	60
Process speed (max) *[m/min]*	50	50	50
Pellet length *[mm]*	6 – 25	6 – 25	6 – 25
Pellet diameter** *[mm]*	1,5 – 3,5	1,5 – 3,5	1,5 – 3,5

** Throughflow depends on fibre type, fibre content and draw-off speed*
*** Pellet diameter depends on fibre type, fibre content and polymer*

Overview of common fibre-polymer-combinations

Polymer	Fibre type	Fibre content *[wt.-%]*
Technical polymers	Glass Carbon Aramid Hybrid-combination	30 – 60