

MINELINE

ABRASION RESISTANT
PE PIPING SYSTEM





The Plastics Experts.

MINELINE is currently the most advanced stage of development in the evolution of piping systems for the mining industries. Whereas other pipe materials suffer from severe erosion and corrosion, AGRU MINELINE scores with far better durability than other options.

The AGRU success story has been unfolding now for around seven decades. Founded back in 1948 by Alois Gruber senior, nowadays the company is one of the world's most important single-source suppliers for piping systems, semi-finished products, concrete protection liners and lining systems made from engineering plastics. Our ability to supply everything from a single source sets us apart. We use only top-grade thermoplastic polymers as our raw materials. When it comes to application-technical consulting, we are your best partner in the field.



Quality

At AGRU, customer satisfaction comes first. Technical consultations, training courses, welding instruction and expert supervision on site are essential parts. The AGRU quality assurance system is compliant with ISO 9001:2015 and its environmental management system fulfils ISO 14001:2015. This in turn ensures that the products comply with international norms, as monitored and evaluated on an ongoing basis by independent testing agencies standards.

The start-to-finish attention to quality ensures that the products meet and beat the strictest technical specifications, providing safe operation within gas, water and wastewater infrastructures.

MINELINE

Reduced maintenance and longer lifespan

MINELINE is an entire piping system designed and tested especially for the transport of abrasive media. The innovative multi-layer design guarantees robustness and dependability for a longer lifespan and high cost-efficiency.

Economic mining operations

Longer service life because of the abrasion-resistant layer

The inner layer offers high abrasion resistance and prevents media adhesion

- better durability than conventional metal and PE pipes
- maintenance intervals are significantly longer
- much higher productivity because of shorter downtimes

Minimal thermal expansion

White outer layer reflects sunlight

A white surface significantly reduces the pipe wall temperature

- reduced abrasion due to less snaking of the pipeline
- higher pressure rating and reliability of the installed system due to lower pipe wall temperature

Higher operational safety

Greater wall thickness due to multi-layer design

Multi-layer structure allows higher static loads for underground systems

- higher wall thickness (PE pipe + abrasion-resistant layer), so the pipes are more robust
- extra safety margin against water hammers, pressure surges and seismic activity
- offers all the advantages of PE pipes, such as high flexibility and resistance to crack propagation

Protection inside the entire piping system

All fittings have the abrasion-resistant layer

Complete product range with protective layer, so no weak points in the installed system

- MINELINE is abrasion-resistant end to end, including all branches, bends and stub flanges
- the combination of butt welding and electrofusion welding ensures a perfect welded joint every time



MINELINE system

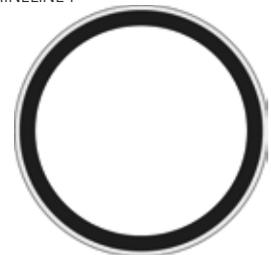
AGRU MINELINE: 2 versions - combined advantages

MINELINE I is a PE 100-RC pipe which has a white protective outside layer. The good abrasion resistant properties of PE 100-RC are given. The white outside layer reflects the sunlight, preventing this way the heating of the pipe of up to 70 °C. For this reason, the strength and pressure resistance of the pipe best possible remain under intense solar radiation.

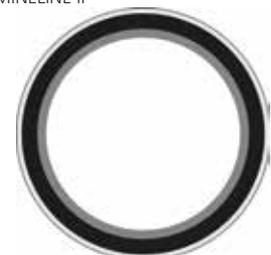
MINELINE II has an white outside protective layer and in addition to this a high abrasion resistant inside layer. Depending on the transported media, MINELINE II pipes offer a further improved life span than PE 100(-RC) and Mineline I pipes.

MINELINE II fittings are built up the same way as MINELINE II pipes with the additional, abrasive resistant layer. This is important because especially in bends and tees, the abrasion is much higher than in straight pipes.

MINELINE I



MINELINE II



Metal

HDPE

MINELINE II

The most cost-efficient solution

- The abrasion-resistant layer prolongs usable lifespan
- Better durability than conventional metal or PE pipes
- Maintenance intervals are significantly longer
- Higher productivity because of shorter downtimes

Triple dependability because of multi-layer design

- The abrasion-resistant inner layer prolongs usability enormously and prevents media adhesion
- The black core is made of PE 100-RC, offering all PE piping advantages such as flexibility, resistance to cracks, water hammers and seismic events
- The white outer layer is made of PE 100-RC and it reflects the sunbeams, reducing heat build-up and helping to minimize thermal expansion in the piping system



End-to-end protection throughout the entire piping system

- A pipeline is only as good as its weakest link. AGRU MINELINE II fittings consist of three-layers, just like the pipe itself.

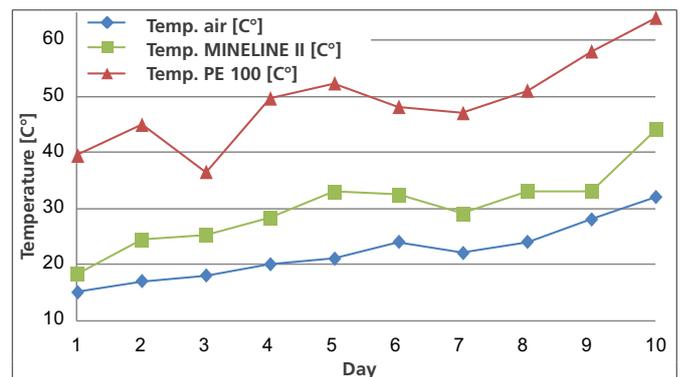


Performance facts of AGRU MINELINE pipes

- Natural weathering tests: The AGRU Mineline pipe show a significant lower temperature on the outside surface (under the same weather conditions -> less expansion of the pipe).

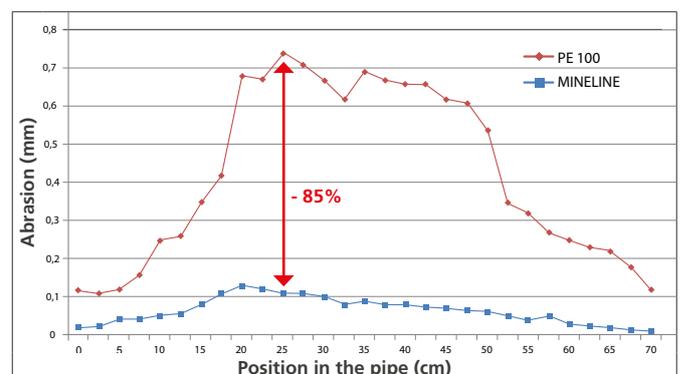


- White coextruded outside layer reduces temperature of pipe when exposed to sunlight -> less snaking, expansion and contraction



Test results from Darmstädter Kipprinne

- The test consists of repeatedly and alternately tilting a semi-circular pipe section containing a sand/gravel/water mixture in a test jig for a specific number of cycles. The resulting wear is then measured and recorded at regular intervals.
- By using the abrasion resistant inside layer of MINELINE II -> 85% less abrasion of the wall thickness during the same test period compared to PE 100, which already has a very good abrasion resistance.





MINELINE welding technology



Butt welding

Electrofusion welding

Combined welding

Combination welding, total dependability

- Combined butt and electrofusion welding in a single step means that there are no weak points in AGRU MINELINE II pipelines.
- So in conjunction with the outstanding material properties, this makes AGRU MINELINE the most cost-efficient solution.



MINELINE product range

PRODUCT RANGE OF MINELINE II PIPES (with inside layer)

Dimensions

SDR 17	OD 63 – 630 mm OD 710 – 1200 mm*
SDR 11	OD 63 – 630 mm OD 710 – 1200 mm*

*on request



Code: 3M.705.

PRODUCT RANGE OF MINELINE I PIPES (without inside layer)

Dimensions

SDR 17	OD 63 – 630 mm OD 710 – 1200 mm*
SDR 11	OD 63 – 630 mm OD 710 – 1200 mm*

*on request



Code: 2M.705.

PRODUCT RANGE OF MINELINE FITTINGS

Dimensions

Tee, reduced working pressure	63 – 500 mm*
Tee, full pressure conform	*
Stub flange	63 – 500 mm 560 – 1200 mm*
Sweep bends	63 – 630 mm
Segmented bends	63 – 1200 mm

*on request



Wide range of fittings for superb versatility

The range of AGRU MINELINE fittings is extensive. And virtually anything is possible on customer request. Sweep or segmented – our fittings afford superb versatility in the field, on any project.





MINELINE application

For underground installation of MINELINE II pipelines, the white outer layer can be omitted.

Application areas are the mining industry and the transport of highly abrasive media. In these fields, the MINELINE piping system will become indispensable due to its excellent abrasion resistance.

Areas of application

- Mining and extraction industries
 - Transport of crushed ore
 - Transport of waste products
- Quarry industries
 - Transport of sand and natural stone
 - Transport of crushed stone
- Cement industry
 - Transport of lime, stones and slurries
- Chemicals industry
 - Transport of waste products, salts
- Dredging



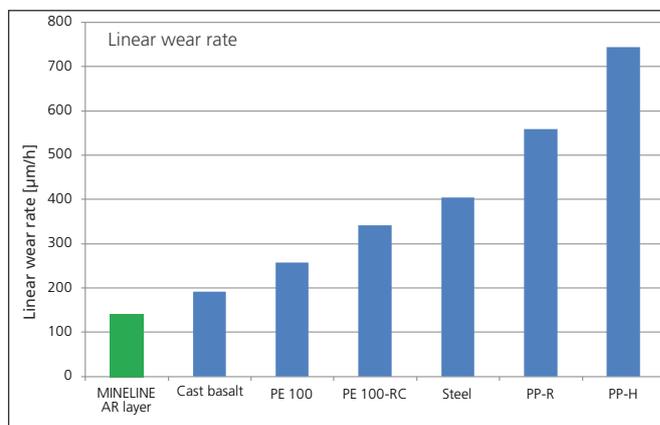
TESTS PROVE OUTSTANDING ABRASION RESISTANCE

Coriolis sliding wear test

Test conditions: Water with 26 % sand and solids, particle size 0.57 mm, test temperature 20 °C.

The Coriolis effect forces slurry from a rotating bowl through pipes in which material samples are fixed.

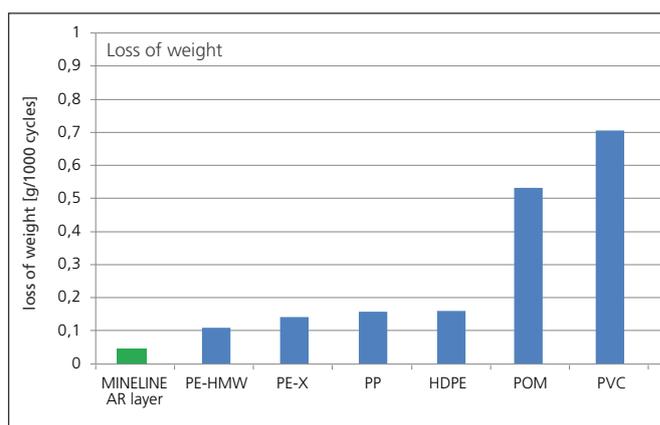
MINELINE wins this sliding wear test clearly.



Taber abrasion test (ASTM D 4060)

Test conditions: Moving wheels weighing 1000 g and an abrasive coating, test temperature 20 °C.

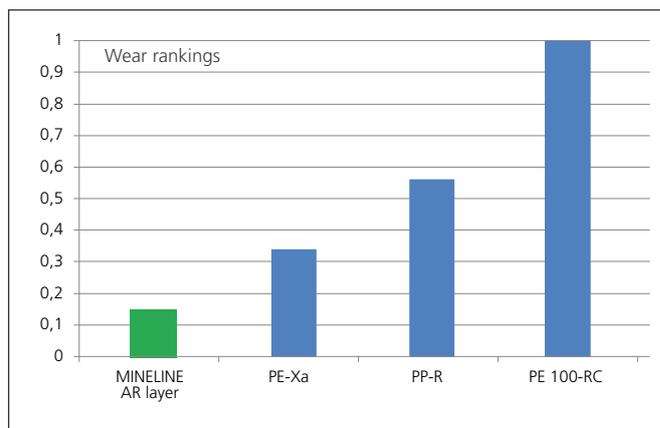
The wheels rotate against the surface of the test specimen; their weight and the abrasive surface coating cause material erosion. Weight loss after a certain number of cycles is measured. Also with this test procedure the MINELINE system shows clear advantages to the other test materials.



Accelerated wear test

Test conditions: Water with 15 % sand, particle size 0.585 mm, test duration: 74.5 h, slurry changed every 6 h. Test temperature 20 °C - 30 °C.

The slurry is pumped through a system of bends; the test specimens are affixed in the bends on the outside radius. Also in this test, which is well accepted in the mining industry, the MINELINE system has shown better performance than other tested plastics.



Copper mine in Eastern Europe

Phase 1:

Type: OD 315 - SDR 11
 Overall length: 480 m
 Operating at 25 °C, 10 bar
 Medium: 4,5 % sand,
 2 % clay, water

Phase 2:

Type: OD 315 - SDR 11
 Overall length: 720 m
 Operating at 25 °C, 10 bar
 Medium: 4,5 % sand,
 2 % clay, water



MINELINE References

Chilean mine transport pipeline

Type: PPR – white signal layer
 OD 250, OD 225 - SDR 11
 OD 280 - SDR 7.4
 Overall length: 6000 m
 Operating at 60 °C, 7,4 bar
 Medium: Abrasive slurry
 Installation: Butt welding



Kaolin plant in Germany

Type: OD 250 - SDR 7,4
Overall length: 2500 m
Operating at 25 °C, 10 bar
Medium: Kaolin/water mixture

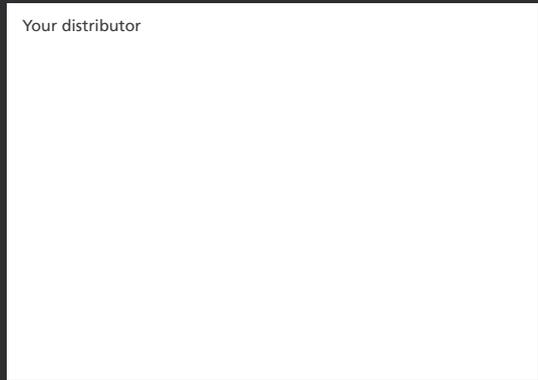
On customer request, AGRU manufactured MINELINE II pipes without the white outside layer, because the piping system was to be laid underground. Because of the high installation depth, heavy wall SDR 7,4 MINELINE II pipes were applied.



Easy handling

AGRU MINELINE is a light-weight compared to metal pipes and it scores extra points for long service life and easy installation.





Your distributor

Subject to errors of typesetting, misprints and modifications.
Illustrations are generic and for reference only.

0818

agru Kunststofftechnik Gesellschaft m.b.H.
Ing.-Pesendorfer-Strasse 31
4540 Bad Hall, Austria

T. +43 7258 7900
F. +43 7258 790 - 2850
office@agru.at

