

Mine-Line

ABRASION RESISTANT
PE PIPING SYSTEM





The Plastics Experts.

Mine-Line® 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 Mine-Line 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.

Mine-Line

Reduced maintenance and longer lifespan

Mine-Line® 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

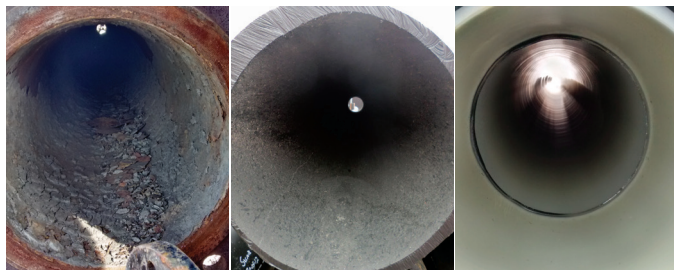
All fittings have the abrasion-resistant layer

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

- Mine-Line 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



Mine-Line system



Metal

HDPE

Mine-Line® 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

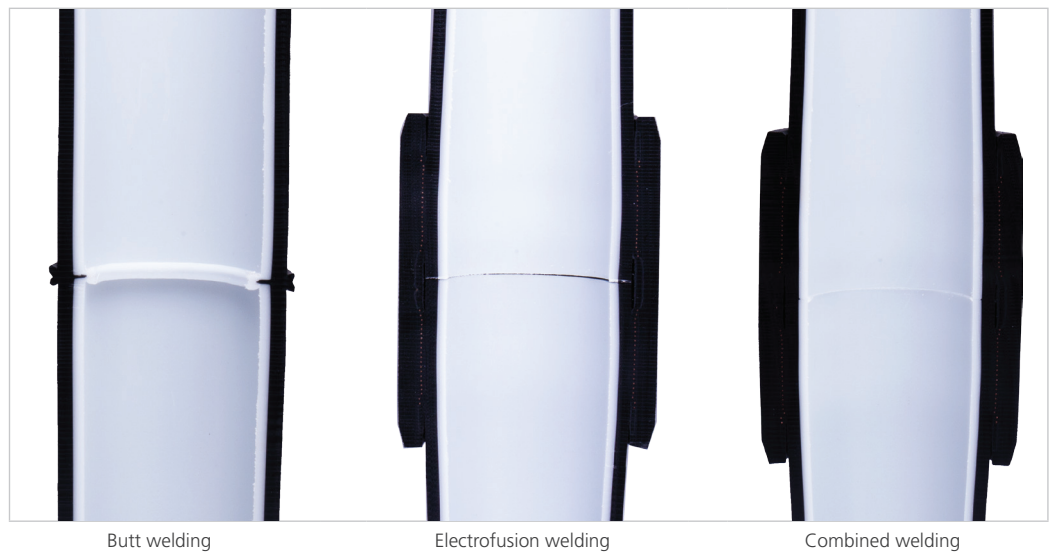
End-to-end protection throughout the entire piping system

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



Combination welding, total dependability

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





Mine-Line application

For underground installation of Mine-Line 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 Mine-Line® 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



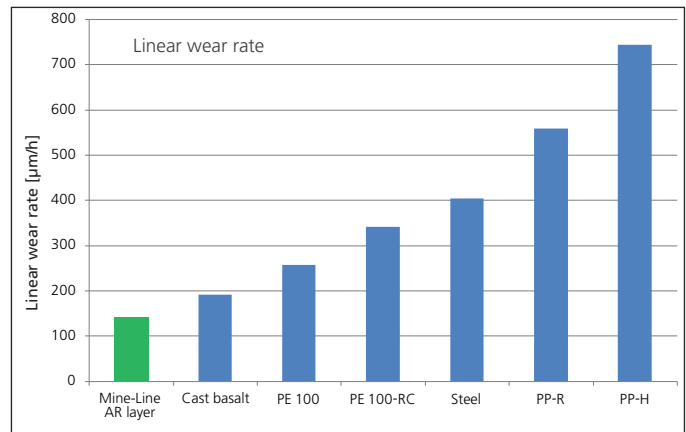
TESTS PROVE OUTSTANDING ABRASION RESISTANCE

Coriolis sliding wear test

Test conditions: Water with 26% sand and solids, particle size 0.57 mm (0.022 in.), test temperature 20 °C (68 °F).

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

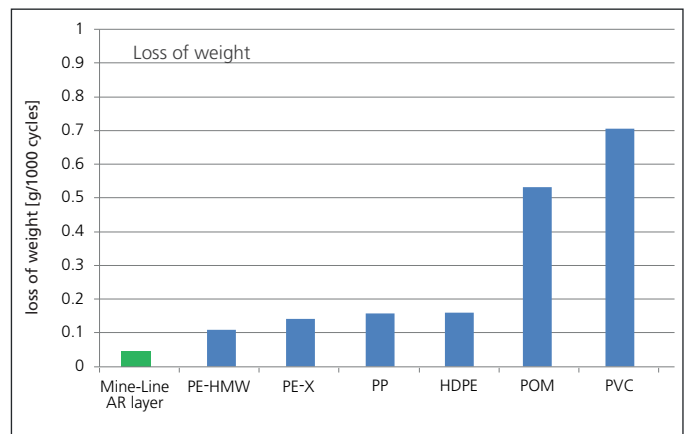
Mine-Line® wins this sliding wear test clearly.



Taber abrasion test (ASTM D 4060)

Test conditions: Moving wheels weighing 1000 g (2.2 lb.) and an abrasive coating, test temperature 20 °C (68 °F).

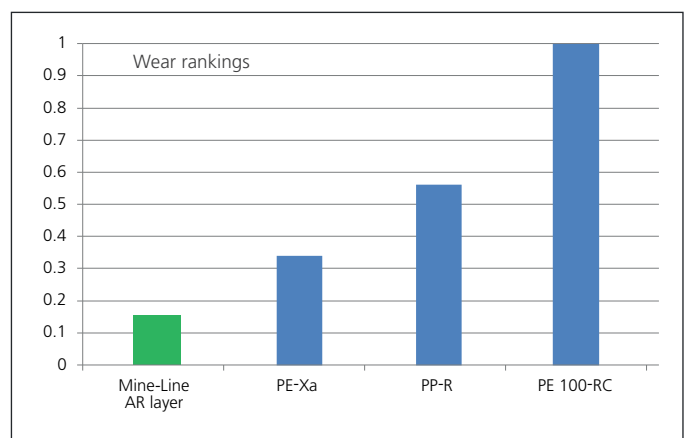
The wheels rotate against the surface of the test specimen; their weight and the abrasive surface coating cause material erosion. Weight loss after a certain number of cycles is measured. Also with this test procedure the Mine-Line system shows clear advantages to the other test materials.



Accelerated wear test

Test conditions: Water with 15% sand, particle size 0.585 mm (0.023 in.), test duration: 74.5 h, slurry changed every 6 h. Test temperature 20 °C - 30 °C (68 - 86 °F).

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 Mine-Line system has shown better performance than other tested plastics.



Mine-Line product range



The Mine-Line supply range differentiates between 2 pipe types, which have been optimized for aboveground installation.

Mine-Line® I pipes have a white protective layer outside but have no extra abrasion resistant layer inside. They have the good abrasion resistance of HDPE. The white outer protective layer reflects the sunlight, preventing this way the heating of the pipe of up to 158 °F. For this reason, the strength and pressure resistance of the pipe remain even under intensive solar radiation.

Mine-Line II features the same white outside protective layer and also has an extreme abrasion resistant inner layer. Depending on the transported media, Mine-Line II pipes offer a further improved life span than Mine-Line I pipes.

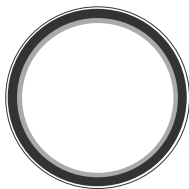
Mine-Line fittings are built up the same way as Mine-Line II pipes with the additional, abrasive resistant layer. This is important because especially in bends and tees, the abrasion is much higher than in straight pipes.

PRODUCT RANGE OF MINELINE II PIPES (with inside layer)

Dimensions

SDR 17	OD 2" – 25" OD 28" – 48"*
SDR 11	OD 2" – 25" OD 28" – 48"*

*on request



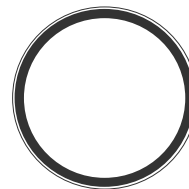
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PRODUCT RANGE OF MINELINE I PIPES (without inside layer)

Dimensions

SDR 17	OD 2" – 25" OD 28" – 48"*
SDR 11	OD 2" – 25" OD 28" – 48"*

*on request



Code: 2M.705.

PRODUCT RANGE OF MINELINE FITTINGS

Dimensions

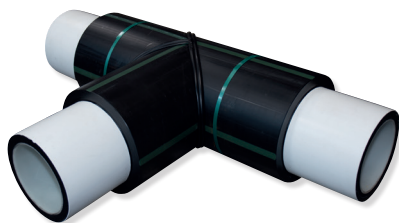
Tee, reduced working pressure	2" – 20" *
Tee, full pressure conform	*
Stub flange	2" – 20" 22" – 48"*
Sweep bends	2" – 25"
Segmented bends	2" – 48"

*on request



Wide range of fittings for superb versatility

The range of AGRU Mine-Line® 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.



Copper mine in Eastern Europe

Phase 1:

Type: OD 12" - SDR 11
Overall length: 1,570 ft.
Operating at 77 °F, 145 psi
Medium: 4.5 % sand,
2% clay, water

Phase 2:

Type: OD 12" - SDR 11
Overall length: 2,360 ft.
Operating at 77 °F, 145 psi.
Medium: 4.5% sand,
2% clay, water



Mine-Line References



Chilean mine transport pipeline

Type: PPR – white signal layer
OD 9", OD 10" - SDR 11
OD 11" - SDR 7.4
Overall length: 19.685 ft.
Operating at 140 °F, 107 psi.
Medium: Abrasive slurry
Installation: Butt welding



Kaolin plant in Germany

Type: OD 10" - SDR 7.4
Overall length: 8,200 ft.
Operating at 77 °F, 145 psi.
Medium: Kaolin/water mixture

On customer request, AGRU manufactured Mine-Line® 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 Mine-Line II pipes were applied.



Easy handling

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





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