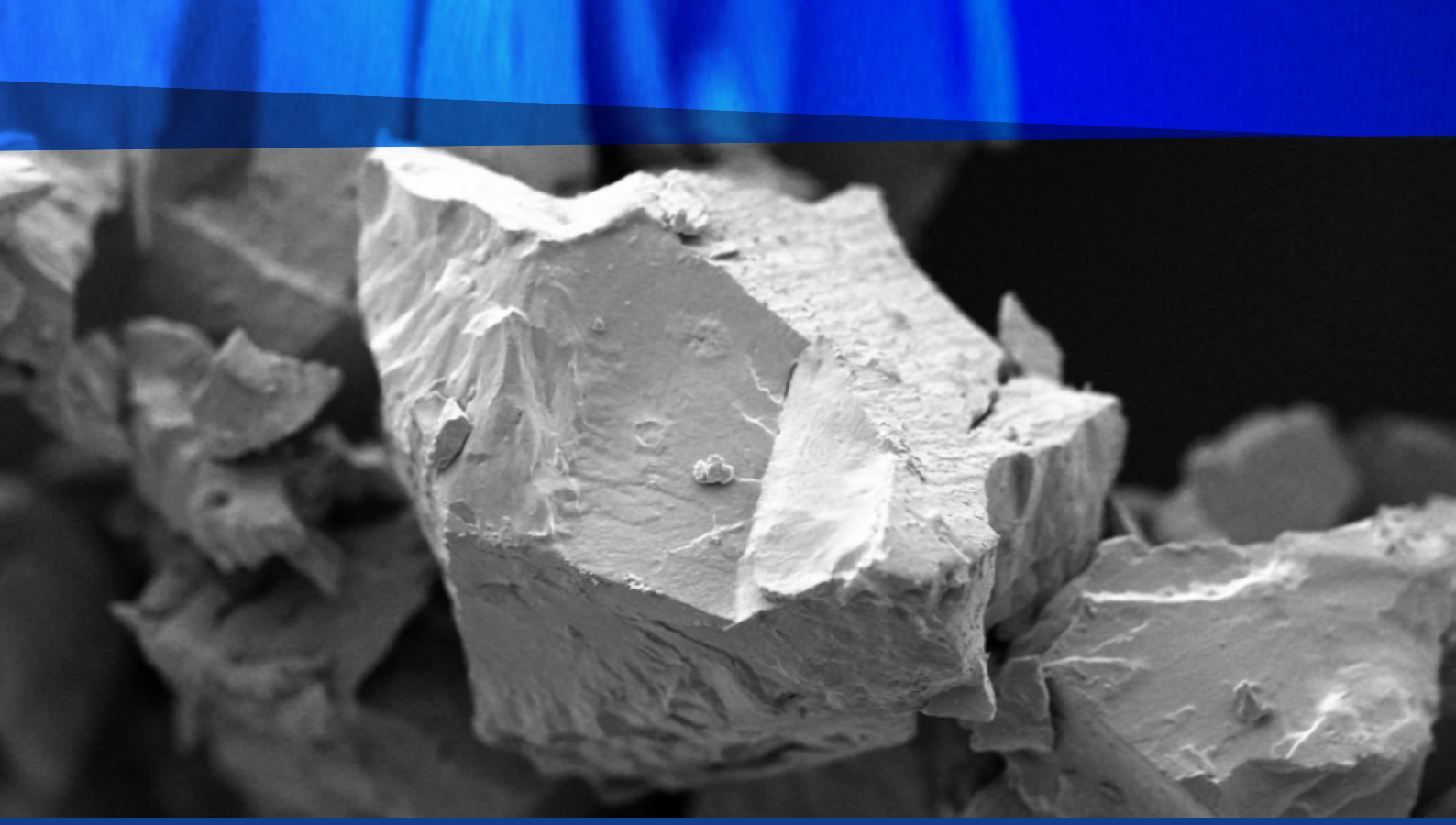
ECONOMICALLY EFFICIENT GRINDING OF RUBBER

Two different solutions for one material

HOSOKAWA MICRON

HOSOKAWA ALPINE

Process technologies for tomorrow.

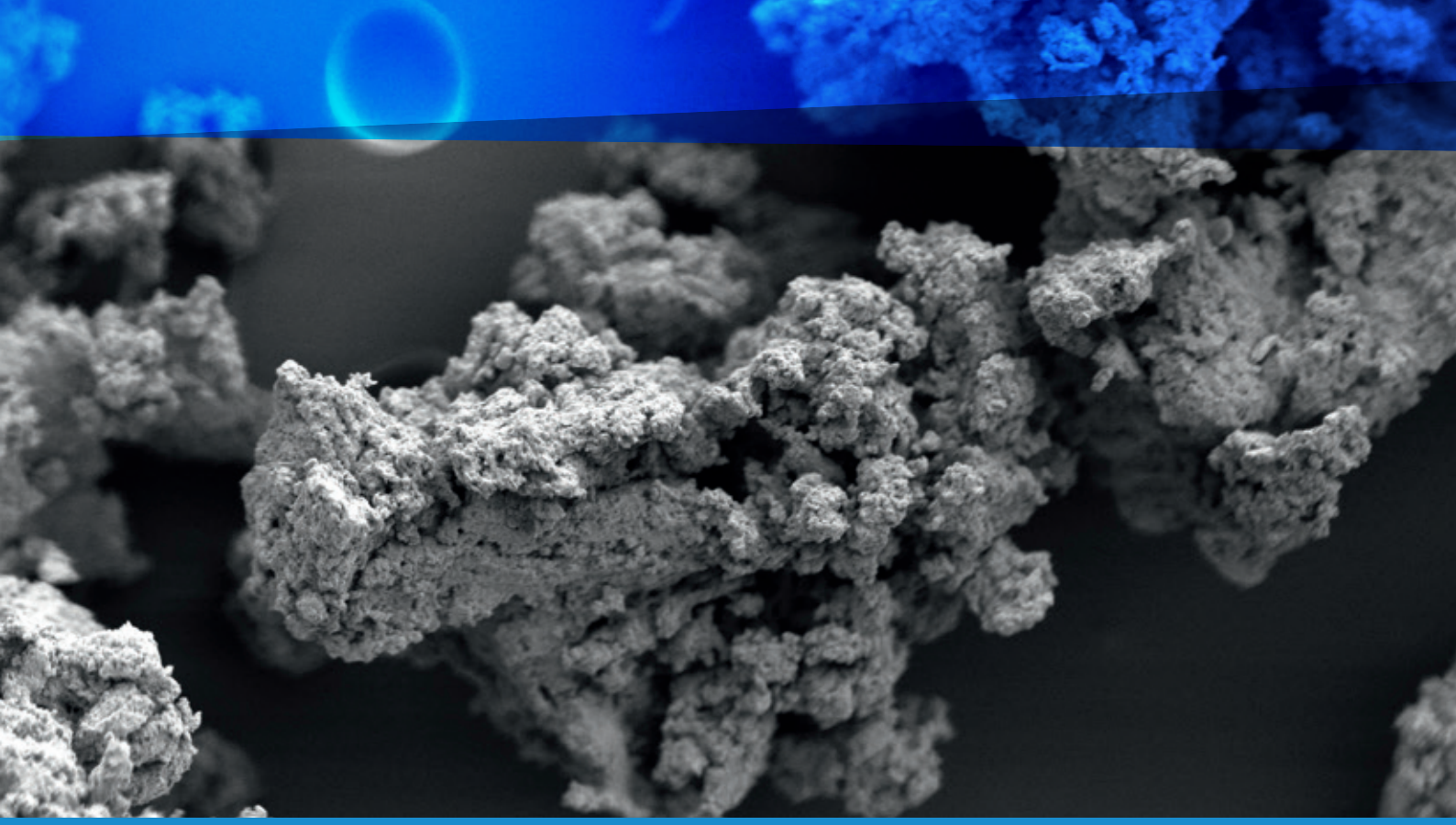


CRYOGENIC GRINDING

The feed material is cooled down to the "glass transition temperature" by liquid nitrogen. With the specially designed Hosokawa Alpine Contraplex pin mill – in combination with our Stratoplex classifier – we guarantee innovative technology from one single source for highest quality in grinding of rubber.

Features and benefits of cryogenic grinding:

- **FRACTIONS BELOW 125 µm AT HIGH YIELD AND VERY LOW "OVERSIZE" CONTENT**
- **FINE POWDER WITH VERY GOOD FLOWABILITY**
- **SEPARATION OF DIFFERENT FRACTIONS WITH ALPINE STRATOPLEX CLASSIFIER**
- **FINE POWDER IN CUBIC FORM WITH A SMOOTH SURFACE**



AMBIENT GRINDING

The feed material is ground by means of pressure and shear stress.

We can now deliver the highest-quality machines for your plant and product safety in the ambient grinding of rubber. We have combined our know-how to offer you customised process technologies for optimum solutions.

Features and benefits of ambient grinding:

- **END FINENESS EASILY ACHIEVABLE BY USING AN IN-LINE SCREENING MACHINE**
- **NO OVERSIZED PRODUCT DUE TO CLOSED-LOOP PROCESS**
- **FINE POWDER WITH VERY GOOD FLOWABILITY AND A HIGH SURFACE QUALITY**

TECHNICAL SPECIFICATIONS

	RP 500	*RP 600*
Throughput capacity (kg/h)	up to 300	up to 400
Process temperature	60 – 85°C	60 – 85°C

TYPICAL PARTICLE SIZES

after the ambient process (using a 630-µm screen)

< 100 µm	12 %	< 400 µm	67 %
< 160 µm	24 %	< 500 µm	82 %
< 250 µm	40 %	< 630 µm	98 %
< 315 µm	52 %		

START WITH NEW TECHNOLOGIES

Ambient grinding solutions by Hosokawa Alpine

The Hosokawa Alpine Rubber Powder Mill (RP) works continuously in grinding and classifying. It can handle all rubber types with more than 45 Shore. Due to grinding technology, a very low energy consumption without cooling (process temperature 60 – 85°C) is possible. The grinding tools have slowly rotating tips and are silent in operation. The grinding and classifying process is performed in a closed loop without oversize particles. The classifying step uses a specially designed screen which is interchangeable for different applications/requirements.

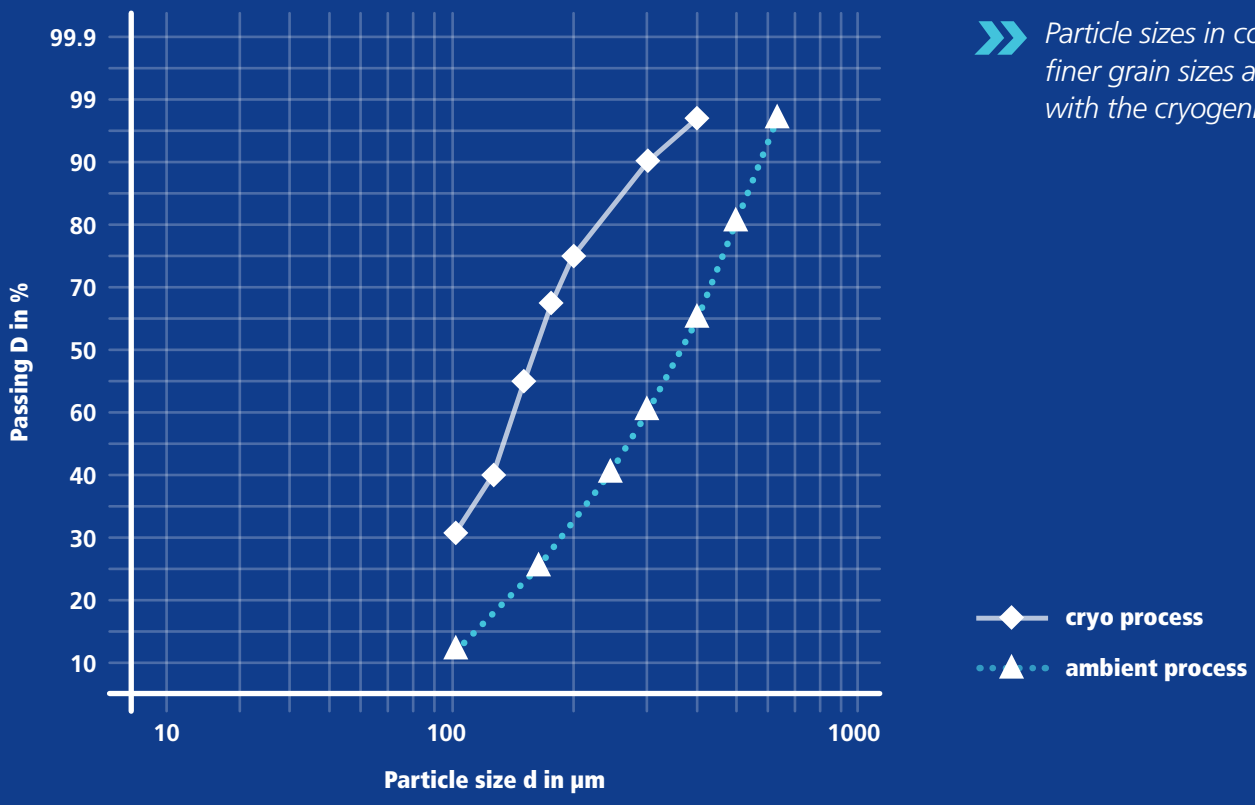
Your process – our solution:

- Active rubber powder from 10 – 1000µm with very large surface energy
- Reduced material costs
- Great mixing ability of the active rubber powder
- Time-reduced vulcanisation
- Mixing up to 80 % in the production of TPE

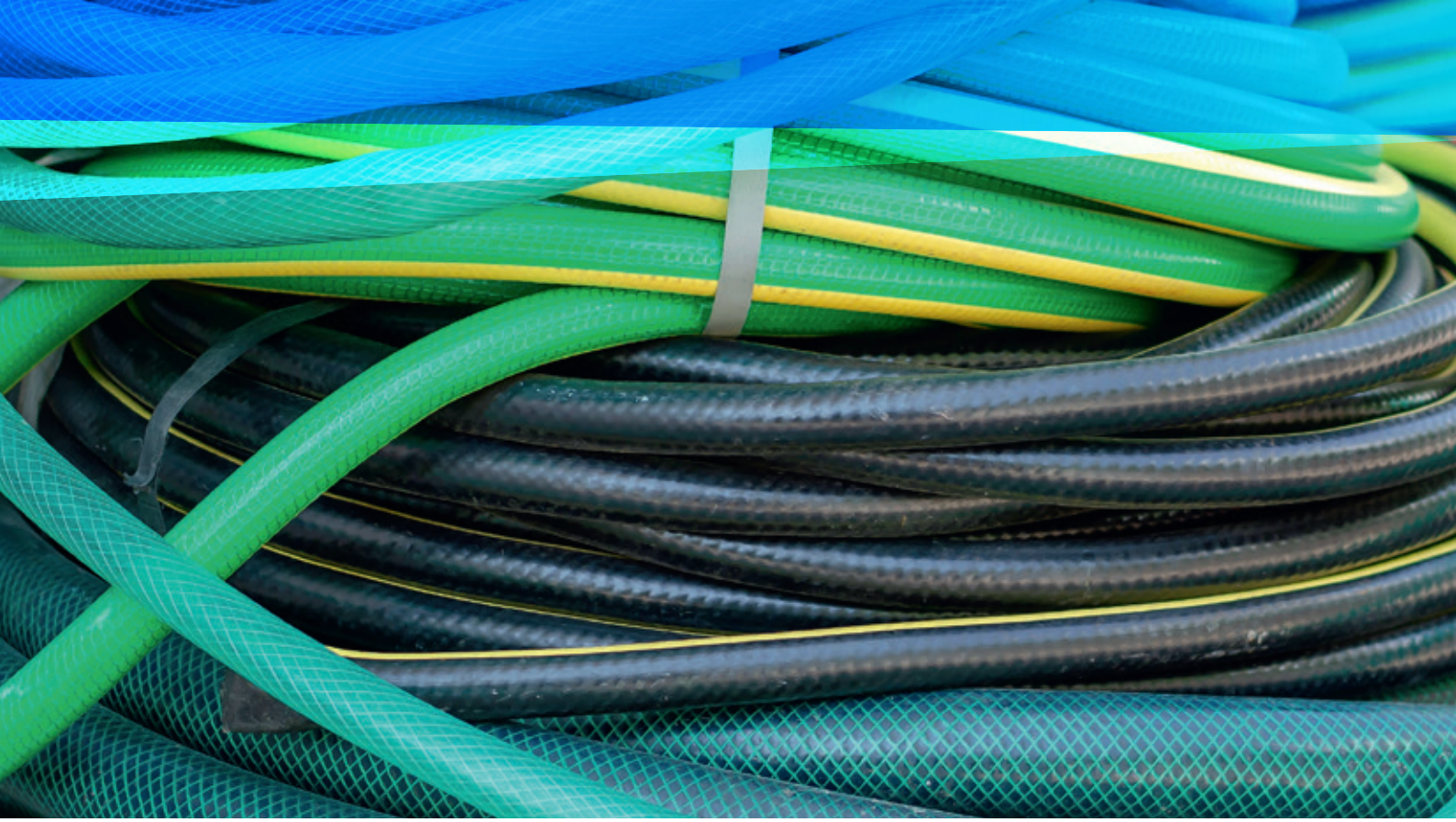
Alpine Rubber Powder

DISCOVER THE DIFFERENCE

Two processes in focus



Particle sizes in comparison: finer grain sizes are possible with the cryogenic solution.

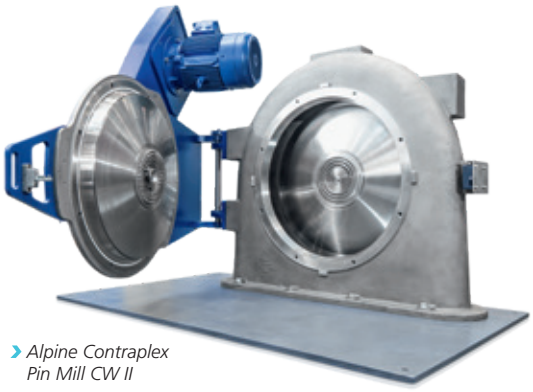


FIND YOUR OPTIMUM SOLUTION

Cryogenic grinding

The Hosokawa Alpine Contraplex pin mill is a fine impact mill with two driven pin discs. In counter-rotating mode, much higher relative speeds are possible. The highest relative speed develops at the outermost pin rows and can be up to 250 m/s. The fineness can be adjusted by altering the speed of the pin discs.

- Wide grinding chamber allows continuous production with sticky products
- High relative speeds for grinding to a high fineness
- Self-cleaning effect due to two contra-rotating pin discs



Alpine Contraplex Pin Mill CW II

Depending on the application and market, finer fractions (e. g. <180µm, <125µm) are sometimes required. Due to the fact that it is not possible to grind rubber granules any finer in an economical way, it becomes necessary to separate a finer product (fraction) from the cryogenic process downstream. For such applications, the Alpine Stratoplex turned out to be the ideal machine with regard to yield, efficiency and investment costs.

- Standard air classifier for high throughputs in the fine to medium-fine separation range of d_{97} = 15 to 150 µm
- High fines yield at high precision of cut and high loading
- Wearproof design
- Low energy consumption

Alpine Stratoplex

TECHNICAL SPECIFICATIONS

	CW 250	CW 400	C 630	C 800	ASP 315	ASP 400
Throughput capacity (kg/h)	200	500	900	1400	800	1500
Process temperature	at glass transition point	at glass transition point	at glass transition point	at glass transition point	ambient	ambient

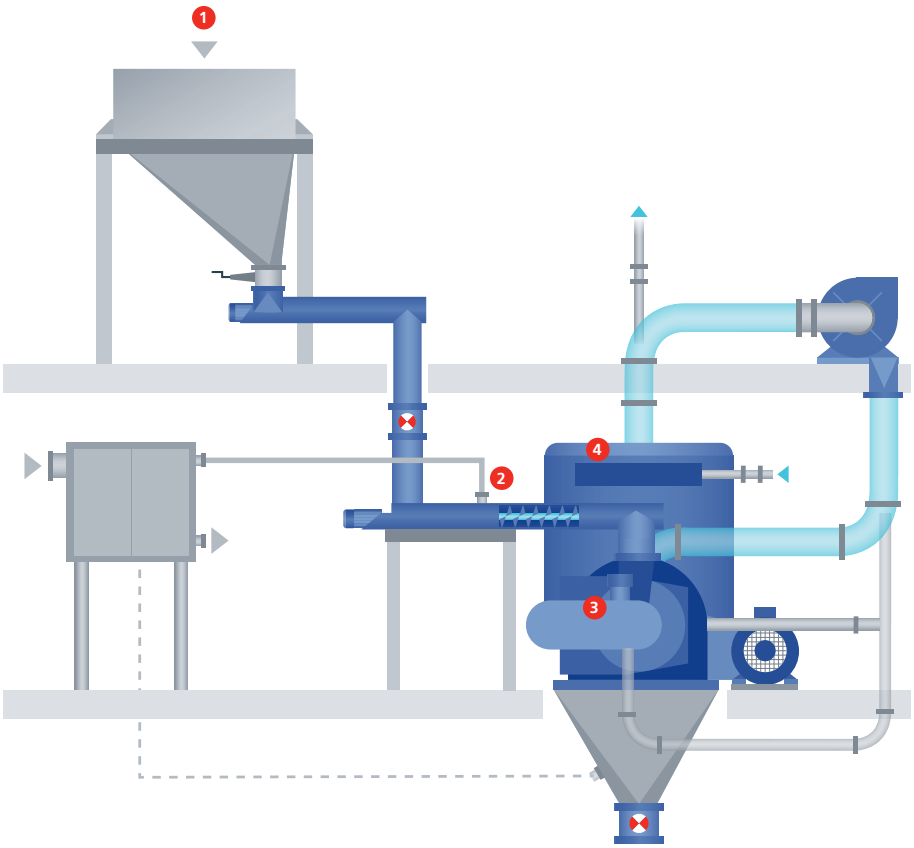
TYPICAL PARTICLE SIZES

After the cryogenic process

< 100 µm	31%	< 200 µm	76%
< 125 µm (120 mesh)	41%	< 300 µm	91%
< 160 µm	60%	< 425 µm (40 mesh)	96%
< 180 µm (80 mesh)	68%		

DEFINE YOUR PROCESS

Cryogenic grinding



1. Dosing unit
2. Cooling screw
3. Alpine Contraplex mill
4. Filter system

› *Schematic diagram of cryogenic grinding*

HOSOKAWA ALPINE

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Any questions? Just call – we are happy to help.

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