

SHELL PROCESS OILS

INNOVATING TO STAY AHEAD

How Shanghai Honghui Optics Communication Tech. Co. Ltd applied Shell Risella X, a high-quality process oil based on Shell's gas-to-liquids (GTL) technology, to develop breakthrough optical-fibre fill gels and strengthen its market leadership position



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“Our new Shell Risella X based formulations have excellent characteristics that are really helping to add value to our customers’ businesses. They have also enhanced our brand image: our customers recognise that we have created differentiated products and this has strengthened their perception of Shanghai Honghui Optics Communication as a technology leader.”

Shen Jiangbo, Vice President and Technical Expert, Shanghai Honghui Optics Communication Tech. Co. Ltd

Scientific advances have been key to Shanghai Honghui Optics Communication Tech. Co. Ltd becoming a market leader in optical-fibre fill gels. The organisation emphasises innovation and regularly introduces new, breakthrough products.

So, when Shell launched the Shell Risella X top-tier process oils based on GTL technology, Shanghai Honghui Optics Communication was keen to explore whether they could help to unlock performance improvements in any of its products.

Some of the products’ physical characteristics were particularly interesting to Shanghai Honghui Optics Communication, especially their low viscosity, high and low temperature performance, and low density.

The company also saw an opportunity to resolve an issue that had been causing operational problems. In optical-fibre fill gels, the process oil makes up more than 90% of the product by weight (the remainder is polymers and other additives), so quality variations between the process oil batches used can cause finished gel production problems. However, Shell Risella X oils, which are manufactured from natural gas, have much less variation in chemical composition and performance between batches than process oils made from crude oil.

“As soon as I saw the technical specifications for Shell Risella X oils, I took steps to evaluate introducing them into our products,” says Shen Jiangbo, Vice President and Technical Expert, Shanghai Honghui Optics Communication Tech. Co. Ltd. “It was clear that they had potentially great benefits for the quality of our products and for our customers’ operations. So, we requested samples and launched some fast-track research and development to investigate what they could do for us.”

As these tests confirmed that Shell Risella X could help to improve the quality of its optical-fibre fill gels (see page 3), Shanghai Honghui Optics Communication approved the oils and soon launched several products using them.

Having pioneered the use of Shell Risella X oils in the Chinese cable-fill sector, Shanghai Honghui Optics Communication is now



evaluating using them in other products and has recently launched joint research and development programmes with Shell Technology Centre Shanghai.

Jiangbo confirms that the quality of the new process oil has remained consistent from one batch to the next, which has been a major advantage for Shanghai Honghui Optics Communication’s operations.

Moreover, Shanghai Honghui Optics Communication’s new Shell Risella X based products have been exceptionally well received by its customers. “The new products have excellent characteristics and these are really helping to add value to our customers’ businesses,” says Jiangbo. “Consequently, they have also enhanced our brand image: our customers recognise that we have created differentiated products and this has strengthened their perception of our company as a technology leader.”



THE DATA THAT CONFIRMED BREAKTHROUGH PERFORMANCE

As shown in Table 1, Shanghai Honghui Optics Communication's performance comparison tests concluded that optical-fibre fill gels based on Shell Risella X are superior to those based on conventional process oils in terms of their

- **LOW-TEMPERATURE PERFORMANCE** – They can be applied in a wider range of environments and climatic conditions
- **THIXOTROPY** – their high thixotropic index means that they flow easily into place under shear but become viscous once in place to protect the optical fibres
- **DENSITY** – owing to their low density, the same mass of gel can fill 2–3% more length of optical cable
- **VISCOSITY** – their low viscosity helps to ensure an effective filling process.

Item	Conformance criteria	Shell Risella X based gel	Group III based gel	Polyalphaolefin based gel
Dropping point, °C	≥200	220	205	230
Density at 20°C, g/cm ³	–	0.819	0.851	0.833
Cone penetration	at 25°C, 1/10 mm	≥360	459	451
	at -40°C, 1/10 mm	≥230	330	250
	at -50°C, 1/10 mm	–	250	120
	at -60°C, 1/10 mm	–	158	60
Viscosity at 25°C (US Brookfield HBDV-II+CP)	D = 50 s ⁻¹ , mPa.s	–	3,986	5,475
	D = 200 s ⁻¹ , mPa.s	–	1,760	2,380
	D = 6 s ⁻¹ , mPa.s	–	23,751	18,890
Thixotropic index (25°C, D=6 s ⁻¹ /D=200 s ⁻¹)	≥8	13.5	7.9	10.1

TABLE 1: Technical parameters of optical-fibre-fill gels based on different process oils.

Shanghai Honghui Optics Communication's tests also showed that Shell Risella X based gels deliver more stable thixotropy and dynamic viscosity than gels based on conventional process oils and are better positioned for the trend towards small loose tubes, as shown in Figure 1.

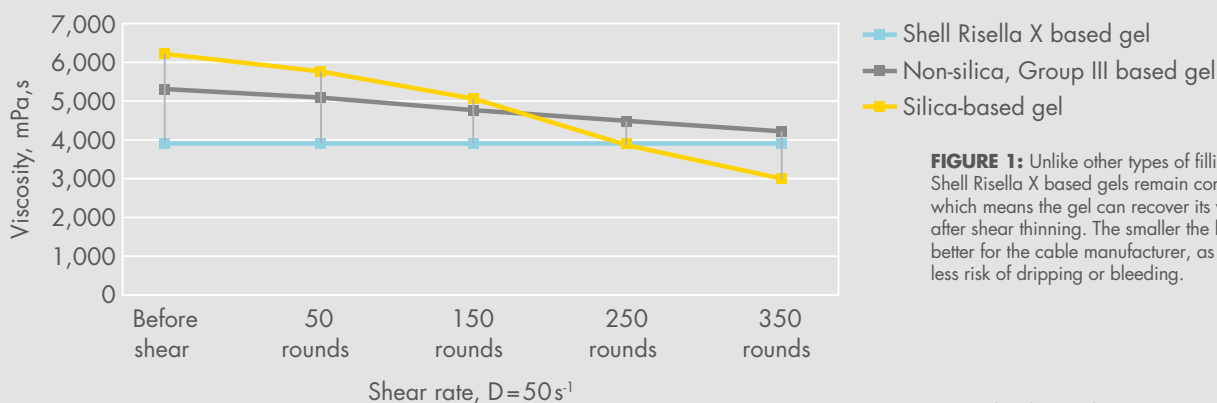


FIGURE 1: Unlike other types of filling gels, Shell Risella X based gels remain consistent, which means the gel can recover its viscosity after shear thinning. The smaller the loss, the better for the cable manufacturer, as there is less risk of dripping or bleeding.

Source: Shanghai Honghui Optics Communication

SHELL RISELLA X: NEXT-GENERATION PROCESS OILS

Shell Risella X oils are manufactured at Shell's world-class Pearl GTL plant in Qatar, which is the culmination of about 40 years of research and development. It is also the world's largest source of GTL products.

Extra purity

Shell Risella X oils provide key qualities for many applications, thanks to their high paraffinic hydrocarbon content and exceptional purity. For instance, they

- are colourless
- are almost odourless
- contain virtually no sulphur, nitrogen or aromatics
- have an extremely narrow hydrocarbon distribution range.

Excellent performance

Shell Risella X synthetic process oils can enhance the performance of the applications in which they are used by offering an outstanding combination of characteristics, including

- low volatility
- low pour point
- high flash point
- high viscosity index
- outstanding UV and thermal colour stability.

ABOUT SHANGHAI HONGHUI OPTICS COMMUNICATION

Shanghai Honghui Optics Communication is a leader in the optical communications industry.

Headquartered in Jiading District, Shanghai, China, its product portfolio includes filling gels for optical fibres, optical cables and city cables.

The company focuses intensely on research and development, and leverages advanced production technology to create innovative, high-quality products.

The company's products have wide application in the domestic telecommunications sector and high penetration in other markets worldwide.

ABOUT SHELL PROCESS OILS

Shell is one of the leading process oil manufacturers and has more than 25 years' experience in the process oils business. We recognise the crucial role that process oils play in your products and operations.

We also understand that the quality of these vital oils is paramount and that using a process oil that has a highly consistent quality can have a major bearing on the success of your business.

Whatever your needs and applications, Shell can provide a full range of process oils. Customers in a wide range of industries have unlocked value by using Shell process oils. We also offer expert consultation and technical advice to support your business needs.



FIND OUT MORE: TALK TO SHELL PROCESS OILS

If you are interested in unlocking valuable performance advantages, talk to us about the benefits that Shell Risella X could have for your business.



HAVING PIONEERED THE USE OF SHELL RISELLA X OILS IN THE CABLE-FILL SECTOR, SHANGHAI HONGHUI OPTICS COMMUNICATION IS NOW EVALUATING USING THEM IN OTHER PRODUCTS AND HAS RECENTLY LAUNCHED JOINT RESEARCH AND DEVELOPMENT PROGRAMMES WITH SHELL TECHNOLOGY CENTRE SHANGHAI.



www.shell.com/processoils

www.chinahonghui.net