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EXCELLENCE IN TRIBOPHYSICS SINCE 1951

PROUDLY 100% AUSTRALIAN DEVELOPED, MADE, OWNED & DISTRIBUTED

TRANZ Electrical Energy Control

From the Energy Transfer & Control series



**TRANZ LUBRICANTS is a Division of
FIELD PERFORMANCE AUSTRALIA**

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Q40 Series ELECTRICAL INSULATING FLUIDS

TRANZ Q 40-1 to Q40-4

Electrical Energy Insulating Fluids, Low - Medium Viscosity

The range of TRANZ Q Series Energy Control compounds covers a wide range of fluid, semi-fluid and compound forms developed to enable the engineering influence of Light, Electrical, Thermal, Acoustical and Mechanical energy, within the capacity of the film thickness applicable.

A wide range of TRANZ Q 40 series for Electrical Insulation, is available. These oils are synthetic polymeric fluids developed with differing molecular weights which account for the range in viscosity. They are polar, lipophilic, extremely hydrophobic media, for electrical insulating use alone and / or, in combination with transfer of thermal and mechanical energy, in, to or from, positive and negative heat sources, under both aerobic and anaerobic conditions in electrical equipment.

The inherent characteristics of some of the TRANZ Q 40 Fluids series include compressibility, a very low rate of thermal expansion and low vapour pressure, enabling secure containment in suitably designed, closed, but not pressure sealed, reservoir systems of appropriate strength and temperature tolerance, but avoiding any metals of construction which are catalytic in their pure form, like copper, tin or zinc.

The Heat-life of the TRANZ Q 40 Series in closed systems that have been purged of air and placed under nitrogen blanket is more than 200 % of that in systems totally open to the air. The compressibility characteristic indicates that power is absorbed when these fluids are pumped by means of centrifugal impellers. Positive displacement pumps give best results.

ELECTRICAL ENERGY INSULATING FLUIDS

Low to Medium viscosity

TRANZ Grade	Q 40-1	Q 40-2	Q 40-3	Q 40-4
Molecular characterization.	25	60	170	280
Viscosity mm ² s ⁻¹ @25 °C	40	100	300	1000
Flash Point, °C	162	185	250	250
Thermal Exp. 25 to 100 C.	1.04 x 10 ⁻³	0.955 x 10 ⁻³	0.955 x 10 ⁻³	0.955 x 10 ⁻³
	PROPERTIES IN COMMON			
Appearance	Transparent, water white.			
Working Temp Range	-60 °C to + 180 °C			
Viscosity. / Temp. Coefficient	0.62			
Specific Gravity, @ 25 °C	0.96			
Vapour Pressure, @ 200 C, mBar,	1.35 x 10 ⁻²			
Specific Heat, J/gm.K.	1.46			
Dielectric Strength	35 kV			
Dissipation Factor	0.0001			
Dielectric Constant	2.75			
Vol. Resistivity, Ohm/cm	1 x 10 ¹⁴			

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TRANZ Q 40-5 to Q40-8

Electrical Energy Insulating Fluids, Medium to Medium-High Viscosities

The range of TRANZ Q Series Energy Control compounds covers a wide range of fluid, semi-fluid and compound forms developed to enable the engineering influence of Light, Electrical, Thermal, Acoustical and Mechanical energy, within the capacity of the film thickness applicable.

A wide range of TRANZ Q40 Series Fluids for Electrical Insulation, is available. These oils are synthetic polymeric fluids developed with differing molecular weights which account for the range in viscosities. They are polar, lipophilic media, for electrical insulating use alone and / or, in combination with transfer of thermal and mechanical energy, in, to or from, positive and negative heat sources, under both aerobic and anaerobic conditions in electrical equipment.

The inherent characteristics of some of the TRANZ Q40 Series Fluids series include compressibility, a very low rate of thermal expansion and low vapour pressure, enabling secure containment in suitably designed, closed, but not pressure sealed, reservoir systems of appropriate strength and temperature tolerance, but avoiding any metals of construction which are catalytic in their pure form, like copper, tin or zinc.

The Heat-life of the TRANZ Q 40 Series in closed systems that have been purged of air and placed under nitrogen blanket is more than 200 % of that in systems totally open to the air. The compressibility characteristic indicates that power is absorbed when these fluids are pumped by means of centrifugal impellers. Positive displacement pumps give best results.

ELECTRICAL ENERGY INSULATING FLUIDS

Medium to High viscosity

TRANZ Grade	Q 40-5	Q 40-6	Q 40-7	Q 40-8
Molecular characterization.	85	160	550	980
Viscosity, ISO @ 40 °C	550	1100	2200	5000
mm ² s ⁻¹ @25°C.	1000	2000	10 000	25 000
Flash Point, °C	272	305	310	320
Thermal Exp. 25 to 100 °C	1.04 x 10 ⁻³	0.955 x 10 ⁻³	0.955 x 10 ⁻³	0.955 x 10 ⁻³
PROPERTIES IN COMMON				
Appearance,	Transparent, water white.			
Working Temp Range,	-40°C to + 200 °C			
Viscosity. / Temp. Coefficient,	0.62			
Specific Gravity, @ 25°C.,	0.96 – 0.97			
Vapour Pressure, @ 200°C, mBar	1.35 x 10 ⁻²			
Specific Heat, J/gm.K	1.46			
Dielectric Strength	35 kV			
Dissipation Factor	0.0001			
Dielectric Constant	2.75			
Vol.Resistivity, Ohm/cm	1 x 10 ¹⁴			
PACKAGING	1 L. Bottles, 5 L. lined cans, 20, 60 & 200 L. lined steel.			

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TRANZ Q41 to Q44

Electrical Insulating Compounds

TRANZ Q41	Protected Service - The Ambient Internal & Semi-protected Outside uses -25°C to +80 °C
TRANZ Q42, Q44 & Q44SP	Full Outside Exposure -25°C to +80 °C
TRANZ Q43	Protected Service -50°C to +200°C

PERFORMANCE AREA

Rapidly hand applicable, high insulation value auxiliary di-electrics.

TRANZ Performance Lubricants has specialized in providing Functional Compounds, or, Chemical Tools, as we describe them, to electric power generation and distribution Authorities, Electrical Trades Appliance and component manufacturers since 1951. These have included many original developments which have contributed to problem solving and efficiency in Australia's extensive power distribution networks. The achievement of developing world firsts in live line spraying solutions to eliminate high tension powerline insulator pollution flashover, together with the production a unique series of A full service range HT electrical conducting compounds, are examples.

The TRANZ Q Series, ENERGY TRANSFER AND CONTROL Compounds, described in this data includes the TRANZ Q41 to Q44 Subseries range of highly water repellent, electrical insulating & lubricating compounds for service as rapidly applicable, supplemental dielectrics equally suitable for low and high tension and electronics applications. The Dielectric strength of the TRANZ Q44 & Q44SP variation place these as the highest insulation from soft film lubricating compounds available to Industry from any source.

TRANZ Q43, in this subseries, is specifically designed to meet DEF (AUST) Silicone Compound S-736 / XG250 against the International MIL-S-8660 Specification, as amended (A,B & C). Also known as DEF STAN 68-69, in the UK & NZ.

NOTE

There are also the TRANZ Q10 to Q19 Sub Series which are Biphasic Functional, exhibiting equal additional performance characteristics in respect of, such as, thermal conduction, copper corrosion protection, etc.

APPLICATIONS

The TRANZ Q 41- Q44 Series are a versatile group of pure grease like compounds of varying consistencies that can be very rapidly dispensed to provide an immediate and very high degree of auxiliary insulation value to any electrically energized assembly.

Some notable applications are:

- Total elimination of current leakage paths on glass, porcelain and plastic insulators in power and communication insulators, thus preventing any possible flashover, conserving current and eliminating destructive RF 'noise'.
- Provision of high dielectric strength, water repellency and lubricity to connectors, switchgear, terminals, ignition systems and potted components.
- Prevents AC or DC current tracking, inc. high voltage, especially under moisture condensing conditions, such as in the enclosures of domestic appliances, in aircraft ignition and power distribution boards and systems, electronic assemblies, etc.

CAUTION

Whilst these compounds have been proven safe with engineering elastomers and plastics, since plasticizer migration will always produce change in polymer properties, critical applications with unusual materials may require careful compatibility testing under service in real time. We have noted the periodic occurrence of environmental stress cracking uniquely in threaded low density polyethylene at the base of threads exposed to destructively high shearing forces from over-tightening.

The synthetic polymer bases can cause temporary irritation in the eyes if accidentally introduced. Applicators must wear eye protection and gloves before opening packages - handle carefully and work cleanly. Immediately re-cover opened containers. Spills or surplus removed easily with hand cleaners, or soap and water. Very slippery on floor and stairs - Collect spills immediately.

Table over....

Electrical Insulating Compounds

Synthetic, High Voltage Electrical Grade Polymer lubricant

TRANZ GRADE		Q412	Q413	Q42	Q43	Q44	Q44SP
Dielectric Strength, kV/mm		23.4	24	19	20.3	29.8	31.6
Dielectric Constant, 25°C.		3.0	2.9	2.9	2.9	3.8	4.0
Volume Resistivity, Ohm/cm X 10 to15th.		1.10	1.10	1.10	1.10	1.40	1.52
Dissipation Factor, 25°C.@ 100 kHz		<----- 1 x 10 -4 ----->			<-----1.44 x 10 -4----->		
MIL Compliance				MIL8660			
Appearance					< Opaque white>		
Consistency, NLGI		2	3	2	3	3	4
Service Temp. Range, °C		20 to +100	20 to +100	-50 to +200	-50 to +200	-60 to + 230	-60 to + 230
Service Environment, Limits		Protect	None	None	Protect	None	None
Density, 25°C		9.0	9.0	1.15	1.18	1.7	1.9
Speed Factor Rating		Medium	Medium	Low	Low	Medium High	Medium High
Protect from weather		Yes	No	No	Yes	No	No
Weather service life (min years)		No	5	5	no	7	7
PACKAGING	450 G grease cartridge, 500 G, & 5 kG. cans, 20* open head steel pails, 60 & 200 kG. open head steel drums * 20 Kg pails are normally supplied tapered but on special request can be supplied with parallel sides to enable use of pumping / dispensing equipment with wall-sweeping eductor plates.						

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TRANZ Q412 Dielectric Copper Protecting Gel

Electrically Insulating

TRANZ Q412 is a grease-like electrical insulating compound designed to afford a very high degree of corrosion protection to copper surfaces.

TRANZ Q412 retains essentially the same consistency from -50°C to 200°C does not melt at high temperature, is highly water repellent and readily adheres to dry surfaces of metals, ceramics, rubber and other insulating materials. It provides a high degree of surface resistivity, resistance to tracking and to the effects of corona discharge (even under moisture condensing conditions) is basically inert non-volatile and does not react with or chemically affect materials to which it is applied.

TYPICAL PROPERTIES

Consistencies	NLGI 2 standard, but other NLGI grades can be made to order.
Bleed (30 hrs at 200°C)	Maximum 10%
Weight Loss (24 hrs at 200°C)	Maximum 2%
Dielectric Strength	Minimum 16KV/mm

CHEMICAL RESISTANCE

Dilute acids and alkalis have little effect on TRANZ Q41-2 but it is dissolved by concentrated sulphuric acid, hydrofluoric acid and alcoholic-caustic solutions.

OTHER PROPERTIES

Working Temperature Range, °C	- 50 to +200
Service Life	Limited only by contamination and wipe off.
Shelf Life	Unlimited. On very prolonged storage some bleeding may occur but the original consistency can be restored by stirring.

SAFETY

TRANZ Q412 is non-volatile, practically inert physiologically and does not cause skin irritation. It is non-toxic if accidentally swallowed. Temporary irritation may result if the compound is introduced into eyes

SOME TYPICAL APPLICATIONS OF TRANZ Q412:

- o **Transmission and Power Equipment**
TRANZ Q412 is a useful and versatile maintenance material for bus bars, lead, terminals and switches, for equipment in wet and corrosive conditions, for protecting woven copper pig tails on drop out fuses and for potting cable plugs and sockets.
- o **Mining Switchgear**
A thin film of TRANZ Q412 is effective in preventing corrosion and flashover on copper components of switchgear operating under damp conditions.

APPLICATION OF TRANZ Q412

TRANZ Q412 can be applied with a grease gun or by brushing or wiping. It is readily dispersed in aromatic solvents and chlorinated hydrocarbons and can then be applied by spraying or dipping - a dispersion of one part of TRANZ Q412 to four parts of solvent by weight has been found suitable for many applications. Components only require a light, but complete, coating. A glass bristle brush fitted to the end of a live-line stick enables live application dabbing of pigtails from the pole or from an elevating bucket. Contrived ultra-low surface tension of Q412 ensures compound creep into woven structures.

PACKAGING

400gm cartridges, 500gm jars, 5kg & 20kg steel lined containers.

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TRANZ Q 414

Lamp Globe & Illumination Element Mount Release Gel

TRANZ Q 414 is a non-melting corrosion-inhibiting dielectric compound that enables immediate disconnection, separation and withdrawal of lamp globe bases and other illumination element mounts from their retention sockets including screw and socket fit types after prolonged service. In corrosive environments, or simply following a very long service period, it is frequently found that globes cannot be withdrawn from their sockets for replacement or service without the use of pressures/forces that may lead to hazardous destruction of the glass component, and the consequent time waste and hazard of removal by force.

The performance of TRANZ Q 414 will be of vital interest to:

- o **All domestic and commercial lighting installations**
- o **Municipal street lighting**
- o **All high intensity lighting especially sealed units**
- o **Manufacturing plants, especially steel, petroleum, chemical,**
- o **metallurgical etc**
- o **Private, commercial, marine and shipping.**

TRANZ Q 414 retains the same consistency from temperature of -75°C to +215°C. It is non-inflammable, and meets all requirements under MIL Spec. 8660-C. It is an odourless, white opaque compound which is non-toxic and physiologically inert to humans and animals. It may cause temporary irritation if accidentally introduced into the eyes.

PACKING

400Gm cartridges. 500 Gm jars, 1 Kg and 5Kg and 20Kg pails..

METHOD OF USE

TRANZ Q 414 is simply smeared by finger-tip or cloth on the entire surfaces where release is required. For 240 V and higher Q414 can be applied to both the mount and the element base as long as the actual contact points are wiped. For 6 and 12 Volt systems of low amperage, the actual contact point should be very carefully cleaned to prevent current interruption. It is harmless to metals, plastics and rubber, and its high dielectric strength (minimum 6 Kv / mm) would not interfere with normal insulation values.

It is valuable to note that if sparking should ever occur through TRANZ Q414, the breakdown products themselves are still non-conducting.

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Among the Electrical Energy control compounds are a range of the ETC TRANZ Electrical Conducting Compounds, the information on this sheet is solely about this range, the TRANZ Q45 through Q48 Subseries are characterized by inherent control transfer of both high voltage and amperage.

TRANZ Q45 - Q49 SERIES

High Performance Electrical Conducting Compounds

As a part of the entire TRANZ Q Series Range, TRANZ Q45 Sub-Series Electrical Conducting Compounds are characterized by inherent conductivity of AC, DC & Static electricity without resort to the inclusion of any metal grits.

Thus they are suitable for any application where, depending on the specific grade chosen, excellent mechanical lubricity in rotating or sliding contact is an equal performance parameter with their electrical conductivity.

Where Gritted Compounds are required to perforate the insulating effects of surface oxide films, choose from the related TRANZ ETC Q46 & 47 Sub-Series.

Table over...

HIGH PERFORMANCE ELECTRICAL CONDUCTING COMPOUNDS SMOOTH –NON GRITTED

Performance Area Non Melting, Mechanical lubrication, rotating or sliding switchgear contact

Q45-1	Smooth Grit-free	Non-melting	-25°C to 80°C	NLGI 1 - 2	- General Purpose Mechanical, Lubricating Grease - Non arcing service inherent control capacity of both high voltage and amperage - Mechanical lubrication, rotating or sliding switchgear contact.
Q45-2	Smooth Grit-free	Non-melting	-60°C to 235°C	NLGI 1 - 2	- Special Fluoride Resistant, for Electro. Smelting Lubricating grease - inherent control capacity of both high voltage and amperage - Mechanical lubrication, rotating or sliding switchgear contact.
Q45-3	Smooth Grit-free	Non-melting	-60°C to 235°C	NLGI 1 - 2	- High Temperature. but only non arcing service. - inherent control capacity of both high voltage and amperage - Mechanical lubrication, rotating or sliding switchgear contact.
Q45-4	Smooth Grit-free	Non-melting	-60°C to 235°C	NLGI 1 - 2	- Mechanical lubrication, rotating or sliding switchgear contact. - High Tension (132 kV & over) only non arcing service - inherent control capacity of both high voltage and amperage
Q45-5 FireSafe®	Smooth Grit-free	Non-melting	-25°C to 80°C	NLGI 1 - 2	- FireSafe®, mechanical lubrication, rotating or sliding switchgear contact - Fire resistant compound for arcing conditions in switchgear - inherent control capacity of both high voltage and amperage
Q45-6	Smooth Grit-free	Non-melting	-25°C to 80°C	NLGI 1 - 2	- Specific for Continuous elastomer contact except silicones - Mechanical lubrication, rotating or sliding switchgear contact.

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TRANZ Q46 & Q47 Subseries

Gritted, Electrical Point-Conducting Compounds

Electrical industry - Conductor Bolt-up & Compression Jointing Aids

TRANZ Performance Lubricants established in 1951 has specialized in providing functional compounds (or, Chemical Tools, as we describe them) to electric power generation and distribution authorities, for more than 50 years.

These have included many original developments which have contributed to problem solving and efficiency in Australia's extensive power distribution networks these tens of thousands of power lines, supported by their hundreds of high tec glass and ceramic insulators are exposed to virtually every kind of surface pollution that exists. achievement of developing Field Performance in developing world firsts sprayable compounds to eliminate pollution flashover, together with the production a unique series of electrical conducting lubricants are examples.

This TRANZ Q46 & Q47 Subseries covers our range of so-called "gritted" compounds, electrical energy conducting compounds into which are milled with discrete metal particles. Individual products incorporating grits of varying composition and profiles for differing applications to enable maximum current conduction through spaces of the surface films of oxides and corrosion layers enable maximum current conduction.

Q46-1 & Q46-2 with aluminium grit are made for aluminium / steel combination, especially ACSR conductors. Q47-1 & Q47-2 with finely dispersed metallic Zinc are made for copper, brass and galvanized steel jointing. Both series contain specific corrosion inhibitors for their related metals combinations.

All members of this series are NON-MELTING having no dropping point, verified at the test limit of >250°C
Q46-1 & 47-1 are also available in FireSafe grades (XF grades)

In applications where it is known 'galvanic' corrosion will occur, it is recommended not to use metal gritted compounds, instead use Q48 Holistic Conducting compound, which is a functional lubricant.

ELECTRICAL CONDUCTING GREASY GELS (COMPOUNDS) - GRITTED AND NON GRITTED				
TRANZ Q46 & Q47 Gritted	Gritted Compounds are weatherproof compounds for jointing up line hardware and conductors, by compression or bolted fittings, where the metal grit edges in the compound, strike through the adherent oxide films on components to greatly increase the current flow. TRANZ Lubricants have been supplied to the Dept. of Defence and their contractors since 1959. Since then, more than 80 different DEFSTAN greases and compounds have been developed for supply to them to the Australian Government Joint Fuels and Lubricants Agency, including conducting compounds for aircraft NATO, CG357, JSD Code XG273 and Spec. DTD 900/4914 with NATO/JSD XG-220 and DefStan 91-8 Conducting Lubricant for the Turret races on AFVs.			
	TRANZ #	Grit Detail	Service temp	General information
	Q46-1	Coarse, very sharp	-25°C to 80°C	- HT Line jointing, ACSR - Hi amps, aluminum / steel hardware - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q46-1XF	Coarse, very sharp	-10°C to 85°C	- The XF grades are FireSafe® Brand of fire resistant compounds - HT Line jointing, ACSR - Hi amps, aluminum / steel hardware - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q46-2	Coarse, very sharp	-60°C to 235°C	- High Temperature, Hi amps, aluminum / steel hardware / copper / brass /gal. / steel - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q47-1	Medium, granular	-10°C to 80°C	- Smaller fittings, copper /brass /gal. / steel - Especially for galvanized steel. - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q47-1XF	Medium, granular	-10°C to 85°C	- The XF grades are FireSafe® Brand of fire resistant compounds - Switch gear - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q47-2	Medium, granular	-60°C to 235°C	- Especially for galvanized steel - For transformers - Non Lubricant Warning: Grit content precludes use in mechanical application such as pumps etc.
	Q47-3	Fine, plate like	-60°C to 235°C	- Mechanical Lubricant for Low speed factor equipment - Switch gear - Aluminum / steel hardware / copper / brass /gal. / steel
	Q47-5	Fine	-60°C to 235°C	Specific for Aluminium - includes oxidation inhibitor
	Q47-8	Medium - Fine	-50°C to 200°C	- Full conductance across copper - includes oxidation inhibitor
TRANZ Q48 & 49 No Grit	Q48	No Grit	-60°C to 235°C	- Mechanical Lubrication 100% conductive for all metals
	Q49XF	No Grit	-10°C to 85°C	- The XF grades are FireSafe® Brand of fire resistant compounds Mechanical Lubrication 100% conductive for all metals
PACKAGING	450 Gm. Cartridges, 500gm jars, 5Kg tins, 20Kg open head pails * 20 Kg pails are normally tapered but on special request can be supplied with parallel sides to enable use of pumping / dispensing equipment with wall-sweeping eductor plates.			

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TRANZ Q48 & Q49 FireSafe

TRANZ Q48 & Q49 Holistic Electrical Conducting Compounds

TRANZ Q48 & Q49 are unique high performance holistic electrical conducting compounds which also inhibits corrosion, prevents oxidation and repel moisture. The compounds are described as "holistic", in that the whole mass is conductive, as opposed to products which simply incorporate a percentage of conductive fillers.

TRANZ Q48 is the high temperate grade has no dropping points, so will not flow, or dry out and is particularly suited for -25°C +200°C.

TRANZ Q49 FireSafe has no dropping point and serves from -25°C +190°C

FEATURES

- Very highly conductive – a low 18.5 ohms/cm resistance.
- Will not flow or dry out
- Inhibits corrosion
- prevents oxidation
- Excellent thermal stability
- Ensures electrical connection on components subject to vibration, corrosion & moisture.

- Lubricates switches, hinges, contact plugs and sockets.
- Highly water repellent and adheres to elastomers, plastics and metals.
- Ensures positive conductivity across electrical joints such as conductor joints, earth strap connections.
- Lubricates marine electrical conducting components to eliminate salt induced shorting.
- Silences RF interference from corroded HT transmission line and insulator hardware.

TRANZ Q48 & 49 No Grit	Q48	No Grit	-60°C to 235°C	• Mechanical Lubrication • 100% conductive for all metals
	Q49XF	No Grit	-10°C to 85°C	• The XF grades are FireSafe® Brand of fire resistant compounds Mechanical Lubrication • 100% conductive for all metals

HANDLING

The material may be dispensed direct from the containers or brushed onto surfaces as required. Surfaces must be free of other greases, moisture or dust before application.

NOTE

The material is non irritating except to the eyes. If such contamination should occur, bathe with water until smarting ceases. Also, it is intensely black – wear gloves and practice clean working!

WARNING

This are highly conductive materials which must be used carefully to avoid accidentally bridging of adjacent electrical contacts.

ELECTRICAL CONDUCTING TRANZ Q48				
Q48	A unique, wholly-conductive, SOLIDS FREE AND GRIT FREE, non-melting compound for high temperature or long-life service under weathering conditions at any ambient and high leakage current temperatures. Originally developed to eliminate HT "RF Fry" emanating from leakage-sparking across the metal joints of power line insulator fittings by enabling conduction across degraded galvanic corrosion. This is a highly conductive material which must be used carefully and <u>MUST NOT</u> be allowed to accidentally bridge adjacent electrical contacts			
	Grit-free	Non-melting, all-conducting, (black colour)	- 50°C to 200°C	• inherent control capacity of both high voltage and amperage • Very highly conductive – a low 18.5 ohms/cm resistance. • Will not flow or dry out • inhibits corrosion • prevents oxidation • Excellent thermal stability, has no drop point and serves between -50°C. and +200°C • Ensures electrical connection on components subject to vibration, corrosion & moisture. • Lubricates switches, hinges, contact plugs and sockets. • Highly water repellent and adheres to elastomers, plastics and metals. • Ensures positive conductivity across electrical joints such as earth strap connections. • Lubricates marine electrical conducting components to eliminate salt induced shorting. • Silences RF interference from corroded HT transmission line hardware.
	TYPICAL PROPERTIES			
Colour	Black			
Specific Gravity (25°C)	1.2 – 1.25			
Consistencies	NLGI 00, 0,1 & 2. Others available to order			
Evaporation (24 hr at 200°C)	1.5%			
Bleed (24 hr at 200°C)	5% maximum			
Electrical Resistivity	18.5 ohm / cm at 6 cm. gap			
Flash Point	Greater than 300°C.			
Flame Resistance	Burns when ignited by persistent open flame.			
Chemical Resistivity	Very good, but will be affected by concentrated acid, and concentrated caustic solutions.			
PACKAGING	400gm cartridges, 500gm jars & 5 Kg tins, 20 Kg lined steel pails.			

ELECTRICAL CONDUCTING TRANZ FireSafe Q49				
FireSafe Q49	A unique, wholly-conductive, SOLIDS FREE AND GRIT FREE , non-melting compound for high temperature or long-life service under weathering conditions at any ambient and high leakage current temperatures. Originally developed to eliminate HT "RF Fry" emanating from leakage-sparking across the metal joints of power line insulator fittings by enabling conduction across degraded galvanic corrosion.			
	This is a highly conductive material which must be used carefully and <u>MUST NOT</u> be allowed to accidentally bridge adjacent electrical contacts			
	Grit-free	Non-melting, all-conducting, (black colour)	- 30°C to 120°C	• inherent control capacity of both high voltage and amperage • Very highly conductive – a low 18.5 ohms/cm resistance. • Will not flow or dry out • Inhibits corrosion • Prevents oxidation • Excellent thermal stability, has no drop point and serves between - 30°C to 120°C • Ensures electrical connection on components subject to vibration, corrosion & moisture. • Lubricates switches, hinges, contact plugs and sockets. • Water repellent and adheres to elastomers, plastics and metals. • Ensures positive conductivity across electrical joints such as earth strap connections. • Lubricates marine electrical conducting components to eliminate salt induced shorting. • Silences RF interference from corroded HT transmission line hardware.
TYPICAL PROPERTIES				
Colour	Black			
Specific Gravity (25°C)	1.3			
Consistencies	NLGI 1 & 2. Others available to order			
Evaporation (24 hr at 100°C)	1.5%			
Bleed (24 hr at 100°C)	3% maximum			
Electrical Resistivity	18.5 ohm / cm at 6 cm. gap			
Flash Point	Greater than 300°C.			
Flame Resistance	Fire Safe substantially fire resistant grade			
Chemical Resistivity	Very good, but will be affected by concentrated acid, and concentrated caustic solutions.			
PACKAGING	400gm cartridges, 500gm jars & 5 Kg tins, 20 Kg lined steel pails.			

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TRANZ Q51 to Q57

Hot/Live Line Sprayable Electrical Insulating Compounds

PERFORMANCE AREA

Prevention of Pollution Flashover, Auxiliary Resistance on HT Insulators

Including the World's first live-line pollution flash-over control materials, the TRANZ Q51 – Q57 Series are unique grease-like silicone compound dispersions specifically developed to combat insulation degradation under the widest range of severe service conditions it is possible to encounter, and have a proven durability of years of service in these differing environments.

The TRANZ Q51 - 57 Series are the basis of a flashover protection system, designed with economics of application in mind, are easily applied by spraying techniques and require minimum maintenance. Each can be sprayed on insulators whilst the conductor is energised and complete live-line spraying techniques have been evolved. Of course they can also be used when the line is 'dead'. They are suitable for use on power-line insulators, transformer bushings, hardware and switchgear.

PRODUCT DEVELOPMENT

When all relevant costs are considered the TRANZ Q51-Q57 Series are a far less expensive way of maintaining supply under pollution conditions than either over-insulation or frequent live-line washing. Electricity authorities have to contend with numerous pollutants which include heavy industrial fallout, earth-salt from salt flats and basins, "smogs", fly-ash from thermal power stations, coastal salt spray, salt fog, water vapour, wind borne water and aerial crop spraying of agricultural fertilizers and pesticides etc. In many areas these pollutants occur in combination. Fall-out as high as 3 tons of electrolyte over 1 square mile per day was measured at tower 5-15 of the Yallourn plant of SEC Victoria in the 1960's.

The TRANZ Q51-57 Series is the outcome of many years of intensive (and continuing) product development with governmental and private electricity distribution authorities to increase insulation values of line insulators under all the conditions described above. These TRANZ Chemical Tools are well proven eminently reliable service aids that save time, trouble and money for men of Power and the communities dependent on them.

Pollutants are a major source of power transmission problems. Pollutants are usually:

- 1 Natural Salts which form an electrolytic conductor when wet.
- 2 Granular porous particles & dusts which are non-conducting when dry but electrolytes when wet.
- 3 Char particles and fly ash which are conductors.

Pollution leakage results in:

- 1 Current surges,
- 2 Communication, Radio & television, and telemetry interference,
- 3 Cross arm and pole top fires
- 4 Flashover, thence service disruption.

Flashover - can be costly in terms of:

- 1 Revenue losses from service disruption,
- 2 Damage to insulators and poles,
- 3 Line crew and vehicle time,
- 4 Stand-down time,
5. Damage to public property (e.g. from consequent bush fires).

This Series give effective protection and are proven in over forty years of field service under the most severe flashover potential conditions encountered in Australia and Canada.

TRANZ Q51	Q51 is the product to use for all types of pollution other than salt. Depending on the pollution intensity, as shown in the table, different film thicknesses are applied.
TRANZ Q52	Q52 is the product to use for normal, sea coast and inland salt basin contamination, except where there is a prevailing wind that blows at average speeds in excess of 35 knots for more than 50% of the time.
TRANZ Q54	Q54 is the product to use for salt coast conditions, where there is a sufficient prevailing wind to cause salt over-impaction Laboratory tests showed that the borderline between the two compounds Q52 and Q54 is where a prevailing wind blows at velocities in excess of 45-60 kph. for 50% of the time. Under this influence the chemical mechanism of the Q52 compound cannot maintain the resistivity in the presence of the moist electrolyte. This has brought about the need for this specific product, TRANZ Q 54, which is able to maintain resistivity under the impaction conditions)
TRANZ Q56	Q56 the latest in the general series has the highest film build and the most impact resistance. This is the single product which copes with all applications except the special needs of aluminium smelter and other fluoride evolving process environs for which TRANZ Q57 has been specifically developed.
TRANZ Q57	Q56 resists high fluoride salt deposition This plagues switch yard, transformer and transmission tower insulator strings within the wind arc, of and around, smelter, fertilizer mfr., cement works and all other chemicals operations capable of generating fluoride fume which seriously degrades electrical insulation values of all types of insulators.

MECHANISM OF TRANZ Q SERIES PROTECTION

An examination of the literature of the normal range of silicone compounds for this application shows that the principal emphasis in description of use of the compounds is placed on the fact that solid pollutants falling on the surface are drawn into the compound mass by surface tension effects driven by the siloxane fluid constituent.

By this means surface electrical resistivity is maintained, together with a high surface repellency to continuous moisture films.

It is thus seen that as the degree of pollution increases, the life of the compound is decreased in direct proportion. It is inevitable that a point will be reached where no further fluid is available from the compound mass to carry out the dirt encapsulation, and by then it is probable that the surface will have become a semi-porous sponge of electrolyte through which leakage current will find a path

The principle of operation of the TRANZ Q51-Q57 Series does not result in this self-defeating cycle. A completely new line of thought has been initiated which has resulted in the development of novel materials enabling pollution to be excluded from the compound mass in such a way that both surface resistivity and the maintenance of a high surface water repellency are achieved simultaneously.

The service life of TRANZ Q51- Q57 Series is, therefore, very considerably extended and the film thickness required to give protection is reduced. Naturally, solid particles adhere more readily to a compound treated surface, and therefore, a treated insulator can look much dirtier than an untreated one under the same conditions. It's insulating properties, however, are superior to untreated the tightly adherent pollution film from the insulators.

Where there is heavy pollution of a fine powdery nature, e.g. cement dust, in time a crust will form on the insulating compound surface. This crust does not necessarily become a conductor owing to the eventual encapsulation effect of the highly water repellent polymer fluid base of the compound which maintains electrical resistivity.

The cleaning of insulators treated with TRANZ compound and the renewal of the compound is extremely easy. In contrast maintenance and washing of untreated insulators is particularly difficult.

The TRANZ Q 54 product specifically developed to prevent salt impaction from high prevailing wind borne salt on sea coasts and inland salt basins, operates by excluding the salt layer to a surface crust which is both dry and rendered hydrophobic by the extremely repellent underlying layer of compound.

PHYSICAL PROPERTIES	TRANZ Q54 & Q56	
	Solution	Dried Film
Specific Gravity at 25 ⁰ , gms /cc	1.35 - 1.6	1.10 - 1.33
Volume resistivity, up to 200 °C, Ohm/cm		Min.1 X 10 ¹⁴
Dielectric constant @25°C		Max. 2.900
Power Factor (between 100Hz & 10Mz)		0.0025
Dielectric strength KV		Min. 35
Dissipation Factor		0.0001
Encapsulation Indices G. per M ² per day		<1 to >25
Resistance to tracking and effects of corona		Extreme discharge
Working temperature range		-50°C to +200°C
Solvent	Non-flammable	Non-flammable
Coverage		Solids contained in 1 kilo cover 3.0-5.2 x10 ³ sq. mm to a depth of 1 mm.

APPLICATION

TRANZ Q 51 - Q57 Series are applied by standard compressed-air driven airless spray equipment.

A complete Application Manual on handling and spraying methods is available for users of these TRANZ materials.

Insulators are given several 'applications' in order that the desirable film thickness is achieved, as described per the recommendations in this Manual. An 'application' is a single pass of the spray gun back and forth around the entire circumference of the insulator and then allowing approximately 1 minute (for solvent detachment) before making the next application.

PACKING

Standard Packing of all TRANZ Q 51- Q57 Series is a 20 L open head, lined steel pail.

	RECOMMENDED FILM THICKNESS (Table 1)					
	Desirable Film Thickness	Number of Spray applications (complete single gun passes to achieve thickness)	No. Of Insulators covered by 100Lbs TRANZ compound at desired thickness (1)		No. of Insulators covered by 50kilosTRANZ compound at the desired thickness (2)	
			8" Diameter	10" diameter	20cm diameter	25cm diameter
TRANZ Q51 MEDIUM TO LIGHT POLLUTION as for example outside three kM of thermal power stations, general industrial areas, etc	0.75m.m.	5	190	120	210	130
TRANZ Q52 HEAVY POLLUTION as within two miles of thermal power stations, cement works etc	1.5 m.m.	8	95	60	105	65
TRANZ Q54 Contamination SOLELY FROM EXTREME WIND & IMPACTED SEA SALT INCLUDING INLAND SALT	0.75 m.m.	5	190	120	210	130
TRANZ Q56 MULTIPLE PURPOSE WHERE ALL POLLUTANTS APPLY, BAR FLUORIDE	1.0 mm	5	140	100	150	90

(1) The solids in 1 kg of TRANZ Q51, Q52 & Q54, cover 5,100 sq.cm. to a depth of 1mm
(2) The solids in 1 kg of TRANZ Q56 & Q57(DP) cover 2,800 - 2,900 sq. cms. to a depth of 1mm.