



A Summary of Tridan Lubricants for the Production of Heat Transfer Coils

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TRIDAN LUBRICANTS FOR THE COIL MANUFACTURING INDUSTRY

Tridan is pleased to announce that it now offers a complete line of lubricant to address all areas of coil manufacturing. These lubricants are formulated and manufactured utilizing state of the art technology to assure their optimum performance.

Lubricants are available in the following types:

STRAIGHT OILS
SOLUBLE OILS
EVAPORATIVE
SYNTHETIC HYDROCARBON

Product consistency is assured via a quality management program utilizing statistical process control of both incoming raw materials and outgoing finished product. Quality control tests include the following: X-Ray Fluorescent Analysis, Infrared Analysis, Viscosity, API Gravity, Flash Point, Pour Point, Floc Point Falex Lubrication Test, Moisture, Ph, Acid Number and Base Number.

Tridan's lubricants have been tested in our factory for their forming and tool life properties. Additionally they have been tested, and are compatible with down stream processing. Applicable lubricants are compatible with both the old and new generation's of refrigerants; manual, ultrasonic and vacuum brazing systems; vapor degreasing procedures; painting processes, and leak test techniques.

Look to Tridan for the lubricants to meet today's demanding processing technologies and the creativity to develop lubricants for future technologies.

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LUBRICANTS FOR THE PRODUCTION OF HEAT TRANSFER COILS

Although there are a multitude of factors that are used to determine the optimum lubricants to be used in a particular manufacturer's coil production facility. The major guideline in determining which lubricants are selected is based on the method of cleaning used. In other words,

- 1.) Will the lubricants used be removed from the coils?
- or-
- 2.) Will they remain on the coils?

Mineral or Petroleum Based Lubricants must be removed from the coil either by vapor degreasing or through the use of an aqueous cleaner. These types of lubricants provide superior fin collar drawing capabilities plus the best protection for a long tooling life.

Lubricants that do not require cleaning are generally referred to as evaporatives, because a majority of the lubricant evaporates from the fin's surface. However, there are some lubricants (primarily used for tube bending and expansion) that do not evaporate and remain on the tubing's surfaces. These Tridan Lubricants are compatible with refrigerant oils as well as both the old and new generations of refrigerants. The major disadvantage of these non-cleaning lubricants is their limited ability to drawing high fin collars.

Following this page is a summary of the Tridan Lubricants available for coil production, which do not require removal for the coils (ei. evaporative). Following this summary are the individual Technical Data Sheets for each lubricant. The next section contains a similar summary of the Tridan Lubricants that require removal from the coil's surface along with their Technical Data Sheets.

At the rear of this catalog is information regarding our HYD-AW series of Hydraulic Oils, Speciality Products, and a Cross Reference Chart for Tridan Lubricants.

If you have questions regarding any of the Tridan Lubricants and how they might apply to your coil production requirements, please do not hesitate in contacting our agent / representative or Tridan directly at the fax or phone number listed below.

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LUBRICANT CHARACTERISTICS

FIN PRODUCTION:

PRODUCT	LUBRICANT TYPE	CLEANING METHOD	COMMENTS
FL-20DE	Oil	Vapor Degrease	7 through 20+ Fins/Inch
FL-20BY	Oil	Vapor Degrease	1 through 20+ Fins/Inch
FL-60XE	Solvent	Not Required	13 through 20+ Fins/Inch
FL-80AX	Solvent	Not Required	12 through 20+ Fins/Inch
FL-80BX	Solvent	Not Required	7 through 20+ Fins/Inch
FL-85AE	Solvent	Not Required	6 through 20+ Fins/Inch

TUBE BENDING & COIL EXPANSION:

PRODUCT	LUBRICANT TYPE	CLEANING METHOD	COMMENTS
TL-5BEX	Oil	Vapor Degrease	Expansion of Ferrous Tubing
TL-6EX	Oil	Vapor Degrease	Expansion of Rifled Tubing
TL- 20HX	Oil	Vapor Degrease	Copper Tube Bending & Expansion
TL-20FEX	Oil	Vapor Degrease	Aluminum Tube Bending & Expansion
TL-80AX	Solvent	Not Required	Copper Tube Bending & Expansion
TL-80BX	Solvent	Not Required	Copper Tube Bending & Expansion
TL-45AEX	Oil	Not Required	Copper Tube Bending & Expansion
TL- 75FEX	Oil	Not Required	Copper Tube Bending & Expansion
TL-88BXM	Oil	Not Required	Aluminum Tube Bending & Expansion
TL-88EY	Oil	Not Required	Aluminum Tube Bending & Expansion
TL-419	Oil	Vapor Degrease	Stainless Steel Bending & Expansion

OTHERS:

PRODUCT	LUBRICANT TYPE	CLEANING METHOD	COMMENTS
FL-80BX	Solvent	Not Required	Tubing End Sheet Fabrication
Punch Relief			Aluminum Build-up Remover
Rust Relief			Rust Preventative

Additives: A Free Rinsing Additive can be incorporated in to most products, which will allow Alkaline Soap Cleaning of Vapor Degreased Products or provide Hydrophilic characteristics to Non-Cleaning Products.

Packaging: All products are available in 55-gallon tight-head, non-returnable, steel drums. Some are also available in 5 gallon, non-returnable pails.

Storage: All products should be protected from extreme heat and cold, and used at room temperature.

For additional information, specifications, and cross-references to other manufacturer's lubricants, or a catalog please contact Tridan Lubricants.



LUBRICANTS FOR THE PRODUCTION OF HEAT TRANSFER COILS

COIL PRODUCTION NOT UTILIZING A CLEANING PROCESS - These lubricants remain on the components and are compatible with secondary processes (ei. brazing).

A.) Fin Stock Lubricant - Aluminum

1.) Low Fin Collars Heights

- a.) **FL-60XE** (13 to 20+ FPI / 1.95mm to 1.27mm+)
- b.) **FL-80AX** (12 to 20+ FPI / 2.12mm to 1.27mm+)

2.) High Fin Collars Heights (7 to 12 FPI / 3.67mm - > 2.12mm)

- a.) **FL-80BX**

3.) Highest Fin Collars Heights (to 6 FPI / 4.23 mm)

- a.) **FL-85AE**

B.) Tube Lubricant - Copper

1.) Return & Hairpin Bending and Expanding

- a.) **TL-80AX**
- b.) **TL-80BX**

2.) Return & Hairpin Bending and Expanding

- a.) **TL-45AEX** (non-evaporative)
- b.) **TL-75FEX** (non-evaporative)

C.) Tube Lubricant - Aluminum

1.) Return & Hairpin Bending and Expanding

- a.) **TL-88BXM**

2.) Return & Hairpin Bending and Expanding

- a.) **TL-88EY** (non-evaporative)

D.) End Sheet Die Lubricant

- 1.) **FL-80BX**

* TL-45AEX and TL-75FEX are compatible with both old and new generation refrigerants.

* The 80-Series, TL-45AEX, and TL-75FEX are all Ashless and therefore do not form an ash during the coil brazing process.
Note that 85-Series will form an ash during brazing.

* Most of the above lubricants can be formulated, at an additional cost, to be Hydrophilic or Free Rinsing to allow water runoff the fin surfaces.

* Estimated Usage Rates for Evaporative Lubricants - 5 Gals/8 Hrs using a 12-Row wide x 2-Hole Feed Advance Fin Die (12 Gals/8 Hrs - 36 to 48-Row x 4-Hole).

* Estimated Usage Rates for Tube Lubricants - 1/8 the amount of fin stock lubricant.

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TECHNICAL DATA

TriLub FL-60XE

Evaporative Fin Stock Lubricant

TriLub FL-60XE is an evaporative forming lubricant. It may be used on copper, steel, and aluminum. This product is designed primarily for fin stamping and end sheet production in coil production facilities, which do not clean their coils. It is compatible with most painting and brazing operations as well as being compatible with most refrigerants.

Typical Properties

Viscosity, SUS 100°F:	32 - 35
Viscosity, CST 40°C:	1.77 - 2.70
API Gravity:	51 - 55
Specific Gravity:	0.7664
Density, lbs/gal.:	6.52
Flash Point:	130°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

Reports are available.

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TECHNICAL DATA

TriLub FL-80AX

Evaporative Fin Stock Lubricant

TriLub FL-80AX is an evaporative forming lubricant. It may be used on copper, steel, and aluminum. This product is designed primarily for fin stamping and end sheet production in coil production facilities, which do not clean their coils. It is compatible with most painting and brazing operations as well as being compatible with most refrigerants.

Typical Properties

Viscosity, SUS 100°F:	34
Viscosity, CST 40°C:	2.45
API Gravity:	49.2
Specific Gravity:	0.7831
Density, lbs/gal.:	6.52
Flash Point:	130°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub FL-85AE

Evaporative Fin Stock Lubricant

TriLub FL-84AE is an evaporative forming lubricant. It may be used on copper, steel, and aluminum. This product is designed primarily for fin stamping and end sheet production in coil production facilities, which do not clean their coils. It is compatible with most painting and brazing operations as well as being compatible with most refrigerants.

Typical Properties

Viscosity, SUS 100°F:	38 - 44
Viscosity, CST 40°C:	3.62 - 5.50
API Gravity:	44 - 49
Specific Gravity:	0.795
Density, lbs/gal.:	6.618
Flash Point:	130°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-80AX

Evaporative Tubing Lubricant

TriLub TL-80AX is an evaporative forming lubricant designed for bending and expansion of on copper tubing. It is compatible with most painting and brazing operations as well as being compatible with most refrigerants.

Typical Properties

Viscosity, SUS 100°F:	34
Viscosity, CST 40°C:	2.45
API Gravity:	49.2
Specific Gravity:	0.7831
Density, lbs/gal.:	6.52
Flash Point:	130°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

Reports are available.

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TECHNICAL DATA

TriLub TL-80BX

Evaporative Tubing Lubricant

TriLub FL-80BX is an evaporative forming lubricant. It may be used on copper, steel, and aluminum. This product is designed primarily for the bending and expansion of copper tubing in coil production facilities, which do not clean their coils. It is compatible with most painting and brazing operations as well as being compatible with most refrigerants.

Typical Properties

Viscosity, SUS 100°F:	38 - 44
Viscosity, CST 40°C:	2.45 - 5.50
API Gravity:	43 - 48
Specific Gravity:	0.800
Density, lbs/gal.:	6.646
Flash Point:	130°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-45AEX

Tubing Lubricant for Copper

TriLub TL-45AEX is a synthetic hydrocarbon lubricant designed for the bending and expansion of copper tubing. It is compatible with brazing operations without cleaning. TL-45AEX is inhibited to prevent oxidation and formicary corrosion of copper. In addition, it is compatible with both old and new generation refrigerants.

Typical Properties

Viscosity, SUS 100°F:	150
Viscosity, CS 40°C:	31.85
API Gravity @ 60°F:	37.5
Specific Gravity @ 60°F:	0.837
Density, lbs/gal.:	6.97
Flash Point:	250°F
Pour Point:	-50°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-75FEX

Tubing Lubricant for Copper

TriLub TL-75FEX is a synthetic hydrocarbon lubricant designed for the bending and expansion of copper tubing. It is compatible with brazing operations without cleaning. TL-75FEX is inhibited to prevent oxidation and formicary corrosion of copper. In addition, it is compatible with both old and new generation refrigerants and the newly developed refrigeration oils.

Typical Properties

Viscosity, SUS 100°F:	695
Viscosity, CST 40°C:	150
API Gravity @ 60°F:	24.0
Specific Gravity @ 60°F:	0.910
Density, lbs/gal.:	7.58
Flash Point:	595°F
Pour Point:	-60°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-88BXM

Tubing Lubricant for Aluminum

TriLub TL-88BXM is a lubricant designed for the bending and expansion of aluminum tubing. Its ashless properties allow downstream brazing, annealing, and welding operations to be performed without cleaning. It is compatible with both old and new generation refrigerants.

Typical Properties

Viscosity, SUS 100°F:	190 - 210
Viscosity, CST 40°C:	40.7 - 45.0
Specific Gravity @ 60°F:	0.928
Density, lbs/gal.:	7.72
Flash Point:	130°F
Pour Point:	-0°F

Manufactured under Quality Control Methods governed by Statistical Process Control. Reports are available.

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TECHNICAL DATA

TriLub TL-88EY

Tubing Lubricant for Aluminum

TriLub TL-88EY is a lubricant designed for the bending and expansion of aluminum tubing in coil facilities, which do not clean their coils. It is compatible with most painting and brazing operations. In addition, it is compatible with both old and new generation refrigerants.

Typical Properties

Viscosity, SUS 100°F:	550 - 650
Viscosity, CST 40°C:	118.8 - 140.0
API Gravity @ 60°F:	10.43
Specific Gravity:	0.9700
Density, lbs/gal.:	8.300
Flash Point:	340°F
Pour Point:	-30°F
Sulfur, Chlorine, Phosphorus, and Fatty Esters :	Each None

Manufactured under Quality Control Methods governed by Statistical Process Control.

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COIL PRODUCTION UTILIZING A CLEANING PROCESS - The cleaning process may be aqueous, using water and a soap or detergent, or vapor degreasing.

A.) Fin Stock Lubricant - Aluminum

- 1.) Low Fin Collars Heights (7 to 20+FPI / 3.5mm to 1.27mm+)
 - a.) **FL-20DE**

- 2.) High Fin Collars Heights (1 to 7FPI / 25.4mm to 3.5mm)
 - a.) **FL-20BY**

B.) Tube Lubricant - Copper

- 1.) Return & Hairpin Bending and Expanding
 - a.) **TL-20HX**

C.) Tube Lubricant - Aluminum

- 1.) Return & Hairpin Bending and Expanding
 - a.) **TL-20FEX**

- 2.) Expanding Rifled Tubing
 - a.) **TL-6EX**

D.) Tube Lubricant - Ferrous

- 1.) Expanding - Steel and Cupro Nickel
 - a.) **TL-5BEX**

- 2.) Expanding - Stainless Steel
 - a.) **TL-419**

* The above all require cleaning of the coils with either mild alkaline aqueous (water) cleaner or vapor degreasing.

* Not compatible with refrigerant oil or new refrigerants without cleaning. The above are also replacements for the 9-Series Products that Carrier uses.

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TECHNICAL DATA

TriLub FL-20DE

Fin Stock Lubricant

TriLub FL-20DE is a light viscosity straight oil. It may be used on copper, steel, and aluminum. This product is especially designed for aluminum fin stamping and copper tube bending and expanding. This lubricant may be removed via mild alkaline aqueous cleaning or vapor degreasing.

Typical Properties

Viscosity, SUS 100°F:	42 - 46
Viscosity, CST 40°C:	4.85 - 6.12
API Gravity @ 60°F:	28.6
Specific Gravity:	0.884
Density, lbs/gal.:	7.36
Flash Point:	235°F
Pour Point:	-50°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

Reports are available.

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TECHNICAL DATA

TriLub FL-20BY

Fin Stock Lubricant

TriLub FL-20BY is a straight oil. It may be used on copper, steel, and aluminum. Although this product is especially designed for use on high collar aluminum fin stamping, it may also be used for copper tube bending and expanding. This lubricant may be removed via mild alkaline aqueous cleaning or vapor degreasing.

Typical Properties

Viscosity, SUS 100°F:	200 - 215
Viscosity, CST 40°C:	42.9 - 46.2
API Gravity @ 60°F:	25.3
Specific Gravity:	0.902
Density, lbs/gal.:	7.514
Flash Point:	330°F
Pour Point:	-40°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-20HX

Tubing Lubricant for Copper

TriLub TL-20HX is a straight oil. It is used primarily for the bending and expansion of copper tubing. This lubricant may be removed via mild alkaline aqueous cleaning or vapor degreasing.

Typical Properties

Viscosity, SUS 100°F:	80 - 90
Viscosity, CST 40°C:	15.66 - 18.12
API Gravity @ 60°F:	28.6
Specific Gravity:	0.884
Density, lbs/gal.:	7.36
Flash Point:	235°F
Pour Point:	-50°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-20FEX

Tubing Lubricant for Aluminum

TriLub TL-20FEX is a straight oil for use in the bending and expansion of aluminum tubing. This lubricant may be removed via mild alkaline aqueous cleaning or vapor degreasing

Typical Properties

Viscosity, SUS 100°F:	560 - 620
Viscosity, CST 40°C:	120.8 - 133.8
API Gravity @ 60°F:	23.6
Specific Gravity @ 60°F:	0.912
Density, lbs/gal.:	7.597
Flash Point:	340°F
Pour Point:	-30°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-6EX

Tubing Lubricant for Aluminum

TriLub TL-6EX is a straight oil. It is used primarily for the bending and expansion of aluminum tubing. TL-6EX was especially designed for use in the expansion of enhanced aluminum tubing. This lubricant may be removed via mild alkaline aqueous cleaning or vapor degreasing.

Typical Properties

Viscosity, SUS 100°F:	140 - 160
Viscosity, CST 40°C:	29.65 - 34.10
API Gravity @ 60°F:	13.2
Specific Gravity:	0.9780
Density, lbs/gal.:	8.144
Flash Point:	310°F
Pour Point:	-30°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub TL-5BEX

Tubing Lubricant for Steel

TriLub TL-5BEX is a lubricant designed for the bending and expansion of ferrous and ferrous alloy tubing. It is amber in color with clear appearance, and vanilla odor.

Typical Properties

Viscosity, SUS 100°F:	235 - 279
Viscosity, CST 40°C:	50.5 - 60.0
API Gravity @ 60°F:	23.46
Specific Gravity:	0.9127
Density, lbs/gal.:	7.600
Flash Point:	330°F
Pour Point:	N/A

Manufactured under Quality Control Methods governed by Statistical Process Control.

Reports are available.

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TECHNICAL DATA

TriLub TL-419

Tubing Lubricant for Steel

TriLub TL-419 is a lubricant designed for the bending and expansion of steel and stainless steel tubing. It is amber in color with bright clear appearance, and pleasant aroma.

Typical Properties

Viscosity, SUS 100°F:	925 - 1025
Viscosity, CST 40°C:	200 - 221
API Gravity @ 60°F:	N/A
Density, lbs/gal.:	9.445
Flash Point:	+240°F
Pour Point:	0°F

Manufactured under Quality Control Methods governed by Statistical Process Control.

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TECHNICAL DATA

TriLub PUNCH RELIEF

Aluminum Build-up Remover

TriLub PUNCH RELIEF is a unique chemical solution designed for the remove of aluminum deposits and build-up from Pierce Punches, Pierce Bushings, and other parts used in Fin Dies made from A-2, D-2, or CPM tool steels. *Not recommended for use on carbide tooling.*

The aluminum is removed by submerging the parts in full strength PUNCH RELIEF for a period of four (4) to ten (10) hours. Upon removal the parts are rinsed in water, and then dipped in RUST RELIEF, which displaces the water and leave a light rust inhibiting film.

Typical Properties

Specific Gravity:	1.131
Density, lbs/gal.:	9.42
Color:	Yellow
pH 10% Solution	12.7

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TECHNICAL DATA

TriLub RUST RELIEF

Rust Preventative

TriLub RUST RELIEF is a solvent based, water displacing rust preventative, which may be used as received or further diluted with a petroleum solvent.

RUST RELIEF is formulated to dry and leave a thin oily film on parts.

RUST RELIEF is designed to prevent flash rust from appearing on steel die parts after utilizing PUNCH RELIEF.

Typical Properties

Viscosity, SUS 100°F:	35
Viscosity, CST 40°C:	2.65
API Gravity @ 60°F:	42.9
Specific Gravity:	0.8112
Density, lbs/gal.:	6.755
Flash Point:	130°F
Pour Point:	< 0°F
pH 10:1 w/tap water 17 grain hardness:	insoluble in water

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TECHNICAL DATA

TriLub HYD-AW

Hydraulic Oils

TriLub HYD-AW series hydraulic oils are available in ISO 32, 46, and 68 grade ranges, allowing for selection of the correct viscosity for most hydraulic systems and climates. They contain both rust and oxidations inhibitors as well as anti-wear additives. An effective foam inhibitor is Present, which allows entrained air to be quickly released in service. All TriLub HYD-AW series hydraulic oils are designed to maintain system cleanliness and smooth functioning, even under the most severe operating conditions.

Typical Properties

	HYD 32AW	HYD 46AW	HYD 68AW
Appearance	Pale Yellow	Pale Yellow	Pale Yellow
API Gravity	32.0	30.0	28.0
Viscosity			
cst @ 40°C	31.0	43.0	62.0
cst @ 100°C	5.5	6.5	8.2
sus @ 100°F	158.0	220.0	325.0
sus @ 210°F	44.0	48.0	54.0
Pour Point (°F)	-30.0	-25.0	-20.0
Flash Point (°F)	360.0	380.0	400.0
Oxidation Stability	1500 Hrs-min	1500 Hrs-min	1500 Hrs-min

(ASTM D943)

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LUBRICANT CROSS REFERENCE CHART

The following is a cross reference between Tridan Lubricants and Oak Lubricants:

TRIDAN	OAK
FL-20BY	7E-series
FL-20DE	7A-series
FL-60XE	70-1, 90-1, 60-1
FL-80AX	50-5, 50-5(FR)
FL-80BX	50-20(FR)
FL-85AE	HC
TL-5BEX	<i>None</i>
TL-6EX	EEE
TL-20FEX	15-A1
TL-20HX	7B1
TL-45AEX	15CT/11B
TL-75FEX	<i>None</i>
TL-80AX	50-5
TL-80BX	50-20
TL-88BXM	<i>None</i>
TL-88EY	<i>None</i>
TL-419	ST500

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