



上帝说，要有光：
就有了光

--Genesis *The Old Testament*

一、光纤与铜缆对比

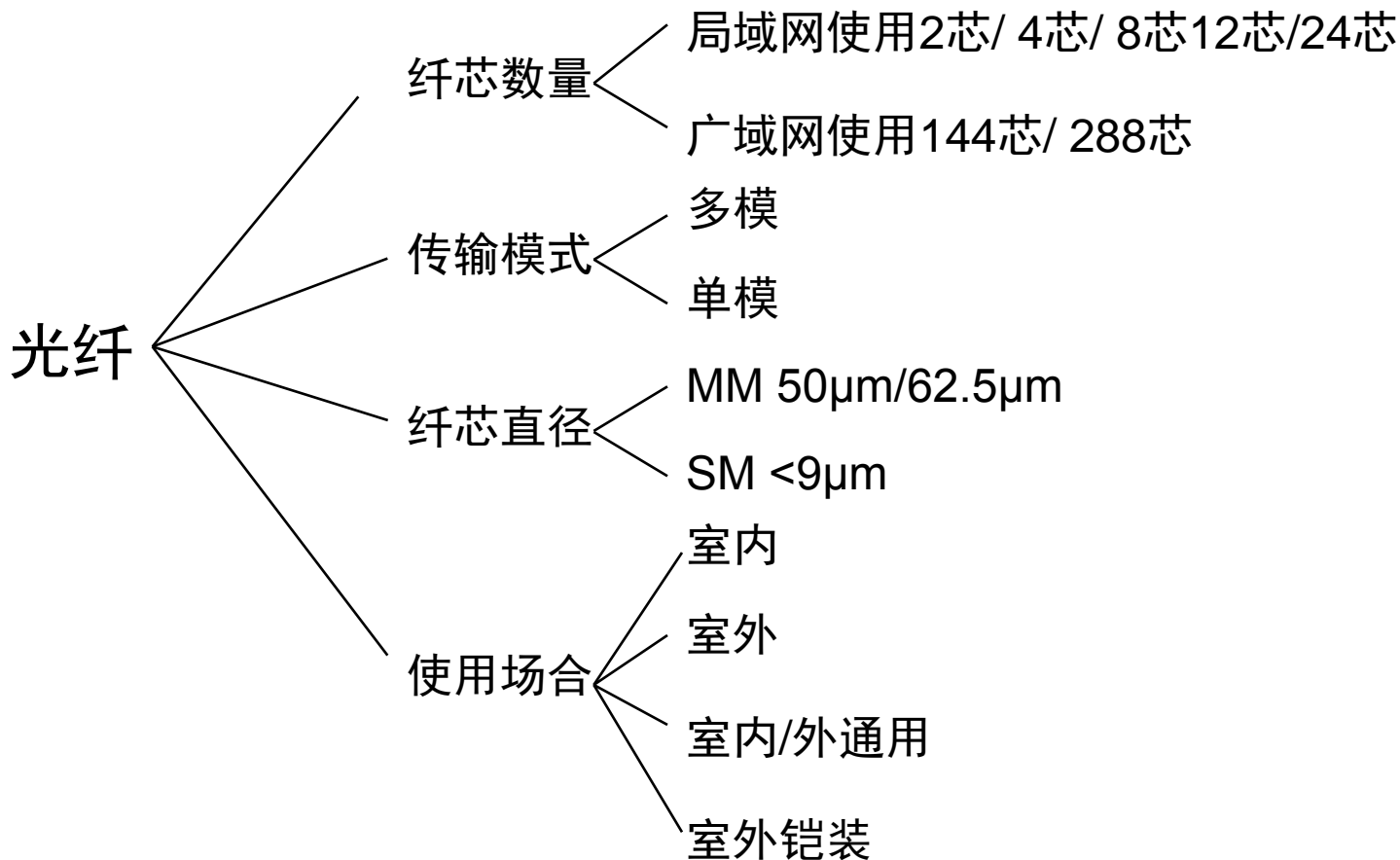
光纤

- 高带宽
- 低损耗
- 电磁抗扰度好(无RFI/EMI)
- 尺寸小& 重量轻: **3/8” @ 每公里为160lbs.**
- 不导电
- 安全性高

铜缆

- 低-中带宽
- 高损耗
- 易受射频干扰、电磁干扰和串扰
- 尺寸大& 重量重: **3” @ 每公里为16000lbs.**
- 导电
- 安全性高低

二、光纤种类



三、光纤的施工和加工过程

• 布放→剪切→剥取



清洁→终端处理



检查→验证



验收认证



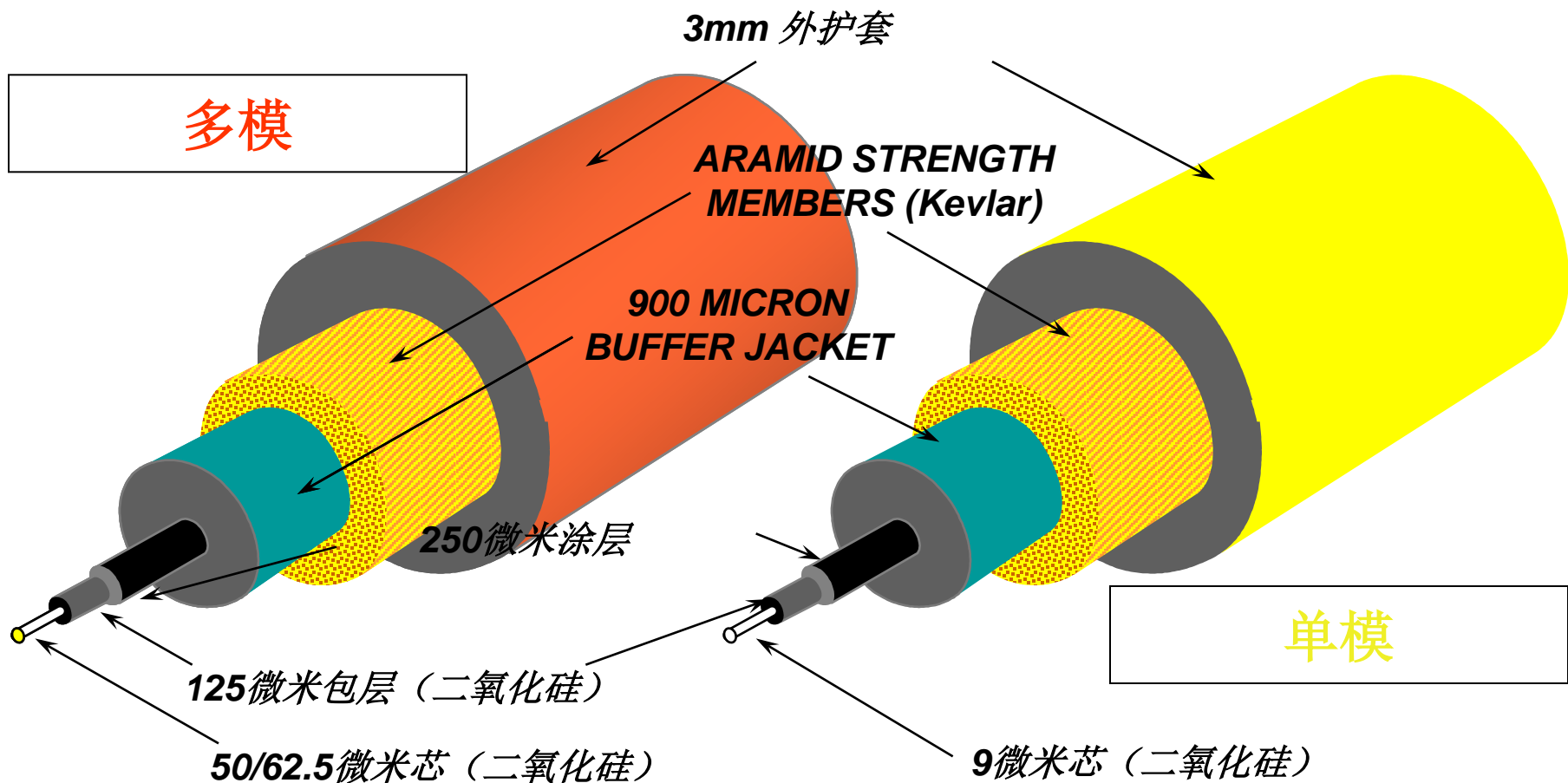
使用的工具& 耗材的OEM厂商

- Tyco / AMP
- 3M
- Corning Cable Sys.
- Corvis
- Panduit
- JDS Uniphase
- NORDX
- Lucent / AVAYA
- Verizon
- US Conec
- Sumitomo
- SBC
- Molex
- AFL Telecom
- Amphenol
- Leviton

光缆的布放与双绞线类似

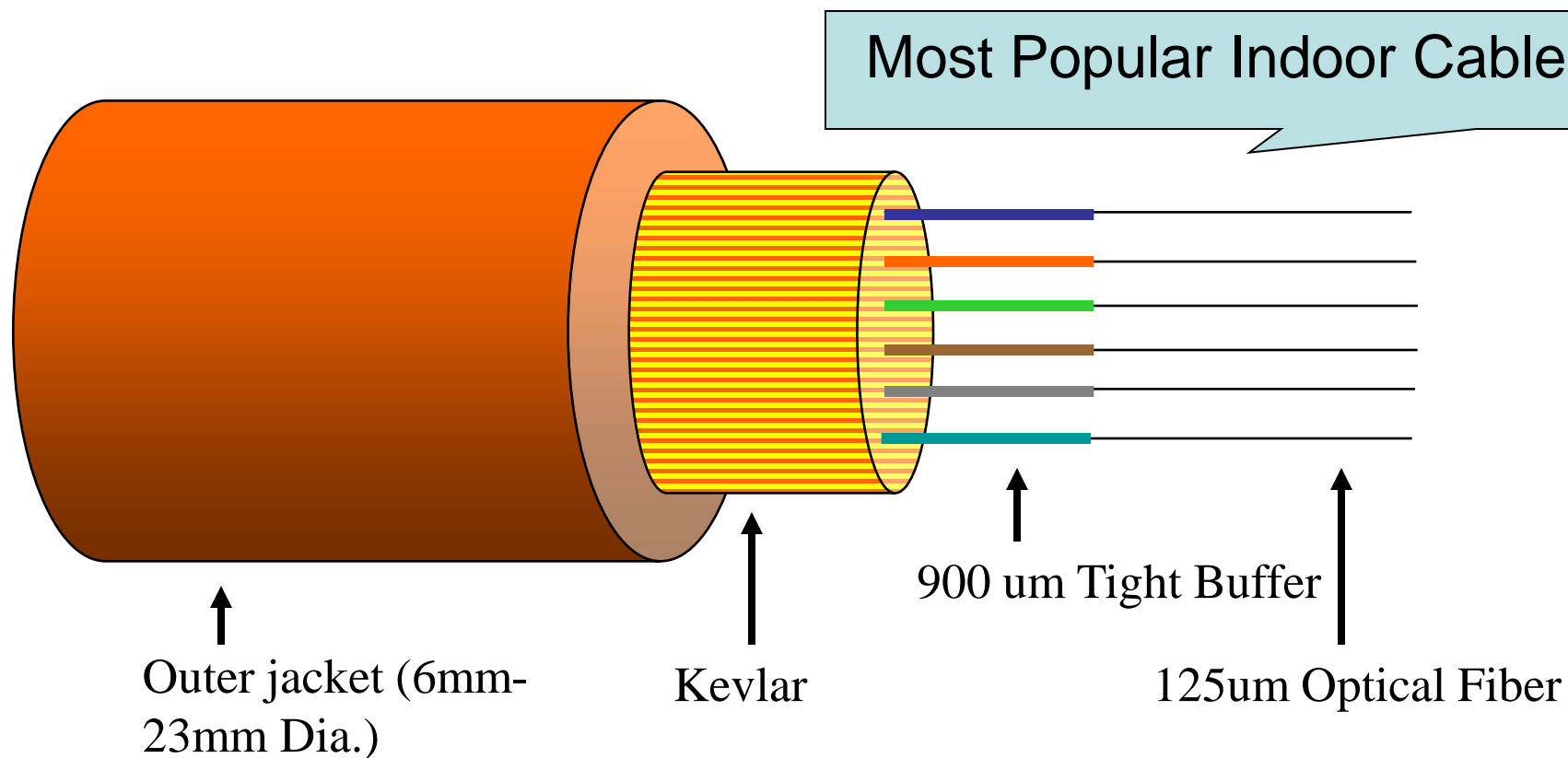
- 建筑与建筑群综合布线系统工程设计与验收规范（GB/T50311,GB/T50312）要求：
-
- “光缆的弯曲半径应至少为光缆外径的15倍”

1、光纤施工工具——剪切



- 剪切工具要适合光纤结构

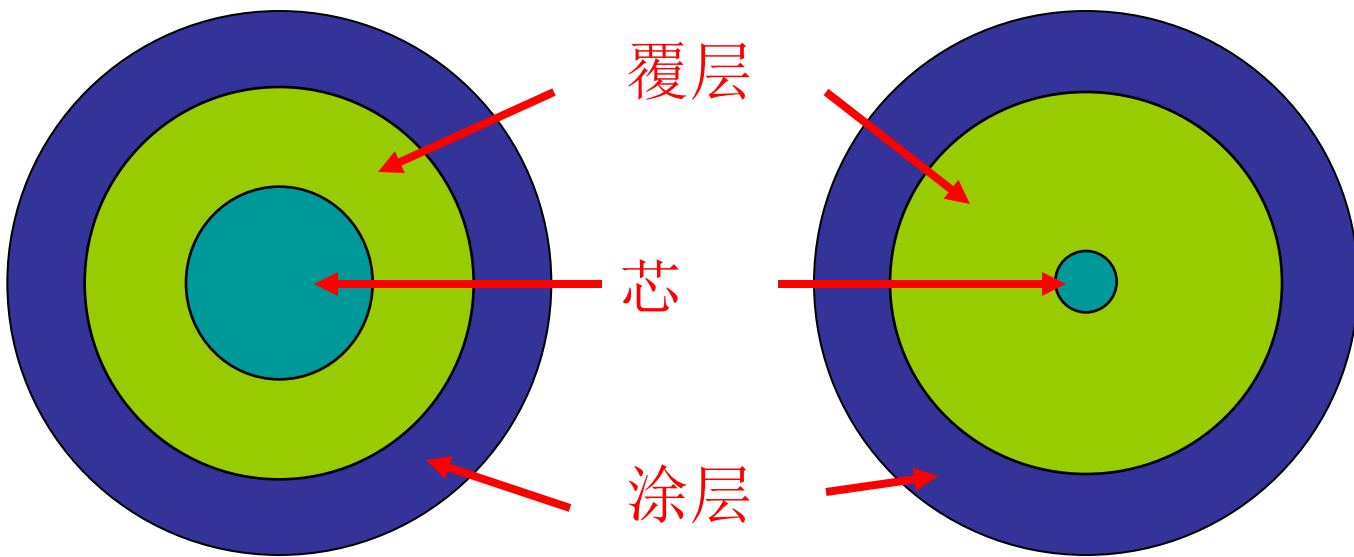
Tight Buffered Distribution



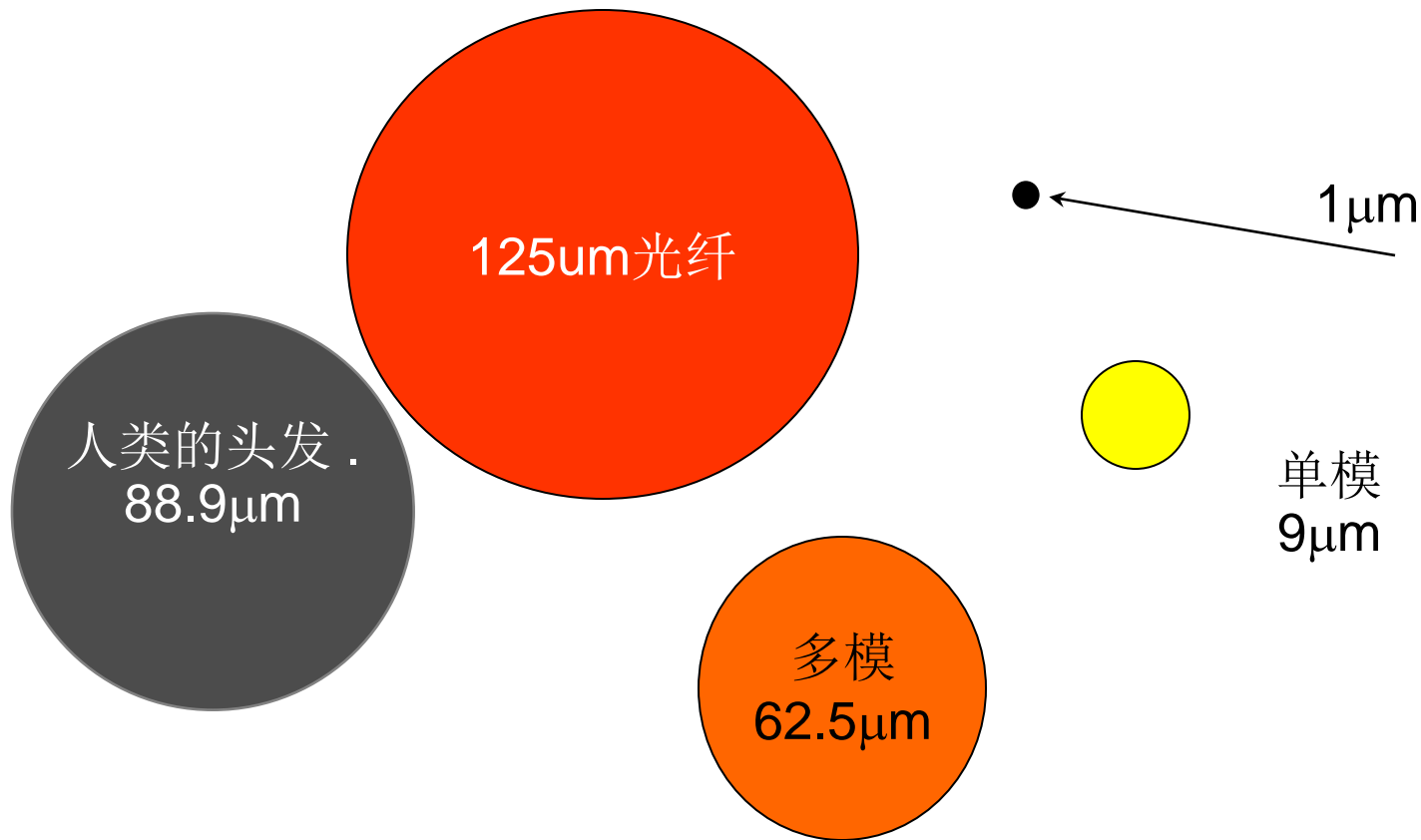
多模 - 单模

多模光纤：体积大、短
距离 < 2 km

单模光纤：体积小、长距离
2km~100km



微米有多大?



光纤施工工具——剪切

45-344

Breaker
Notch



- Superior Quality-Blade Hardness = HRC60-62
- Pat. Pending “Breaker Notch” is used to cut the jacket and break the glass fiber. **This feature increases the life of the tool.**
- The Serrated Blades are used to trim the Kevlar
- Used By ALL Installers, Contractors, OEMs and Technicians

光纤施工工具——剪切



IDEAL



IDEAL



Competitor



Competitor

- Cost Effective, Premium Quality, Double Ended Ruby, Sapphire & Carbide Blades
- 30 Degree Single Bevel Edges
- Color Coded, Non-slip Grip W/Anti-Roll Nut

2、光纤施工工具——剥取

MiniLite-Strip 45-352



- 2 Jacket Strip Notches
– For 3mm & 1.6mm dia.
- 3 Fiber Buffer Strip Stations
- Precision-Ground Replaceable Blades
- 5 Tools in One

- New & Improved Round Jacket Strip Notch– Cut the Jacket and Remove the Slug with Your Fingers
- Self-Centering Buffer Strip Notch – For Best Results its Best to Strip off Short sections of buffer coating
- Soft, Textured, Non-Slip Grips
- 2 Tools in One



Lite-Strip Fiber Optic Stripper 45-350

3、光纤施工工具——清洁

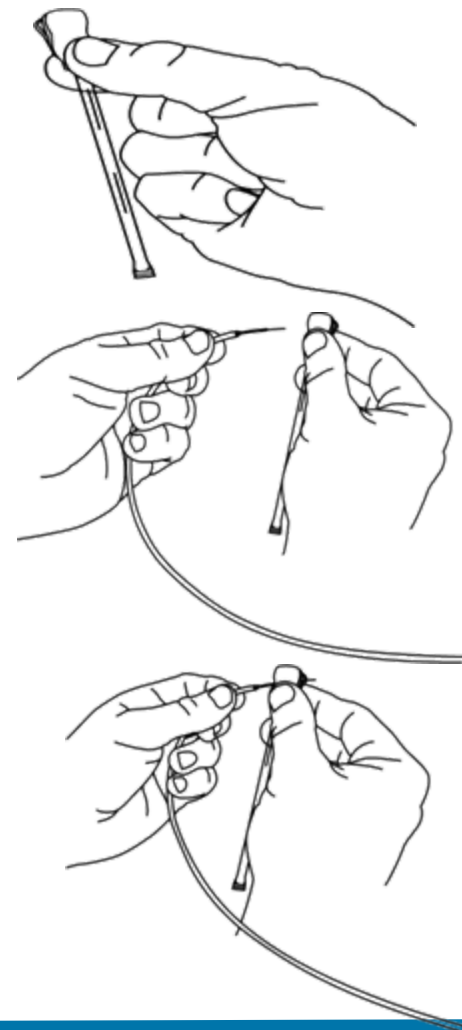


**Split-Tip Alcohol Swab
45-360**

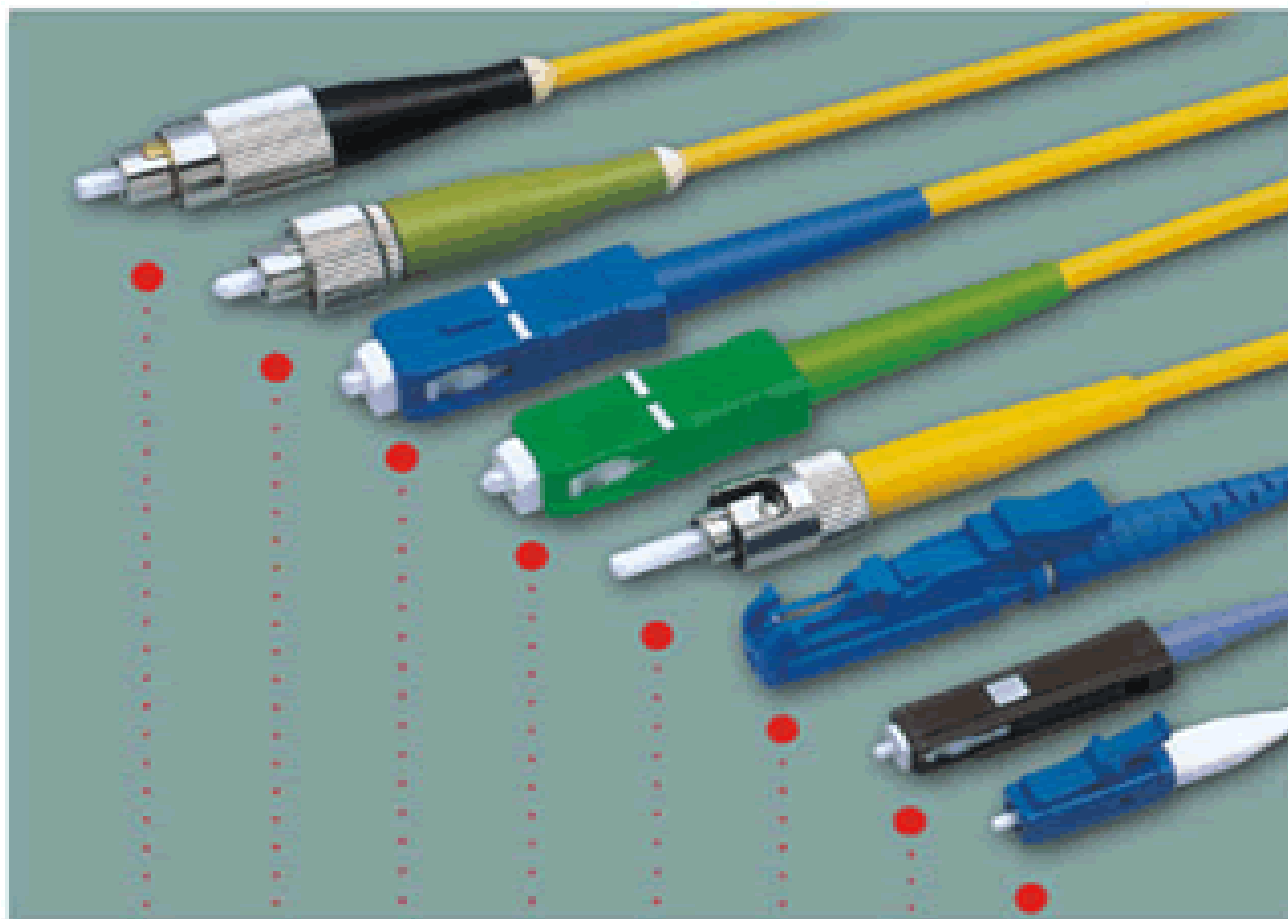
- For Cleaning Bare Fiber
- Tube/Handle Pre-Loaded with 99% Isopropyl Alcohol
- Cost Effective
- User Friendly – Does Not Break Fiber When Cleaning

光纤施工工具——清洁

1. Squeeze Tube Just Below Foam Tip To Release Alcohol
2. Gently Pull Fiber Through The Split-tip While Applying Light Pressure To The Foam Tip



4、光纤施工工具——终端处理



FC/PC FC/APC SC/PC SC/APC ST E2000 MU LC

Connector Termination Methods

- epoxy
- crimp
- adhesive
- UV cure
- anaerobic

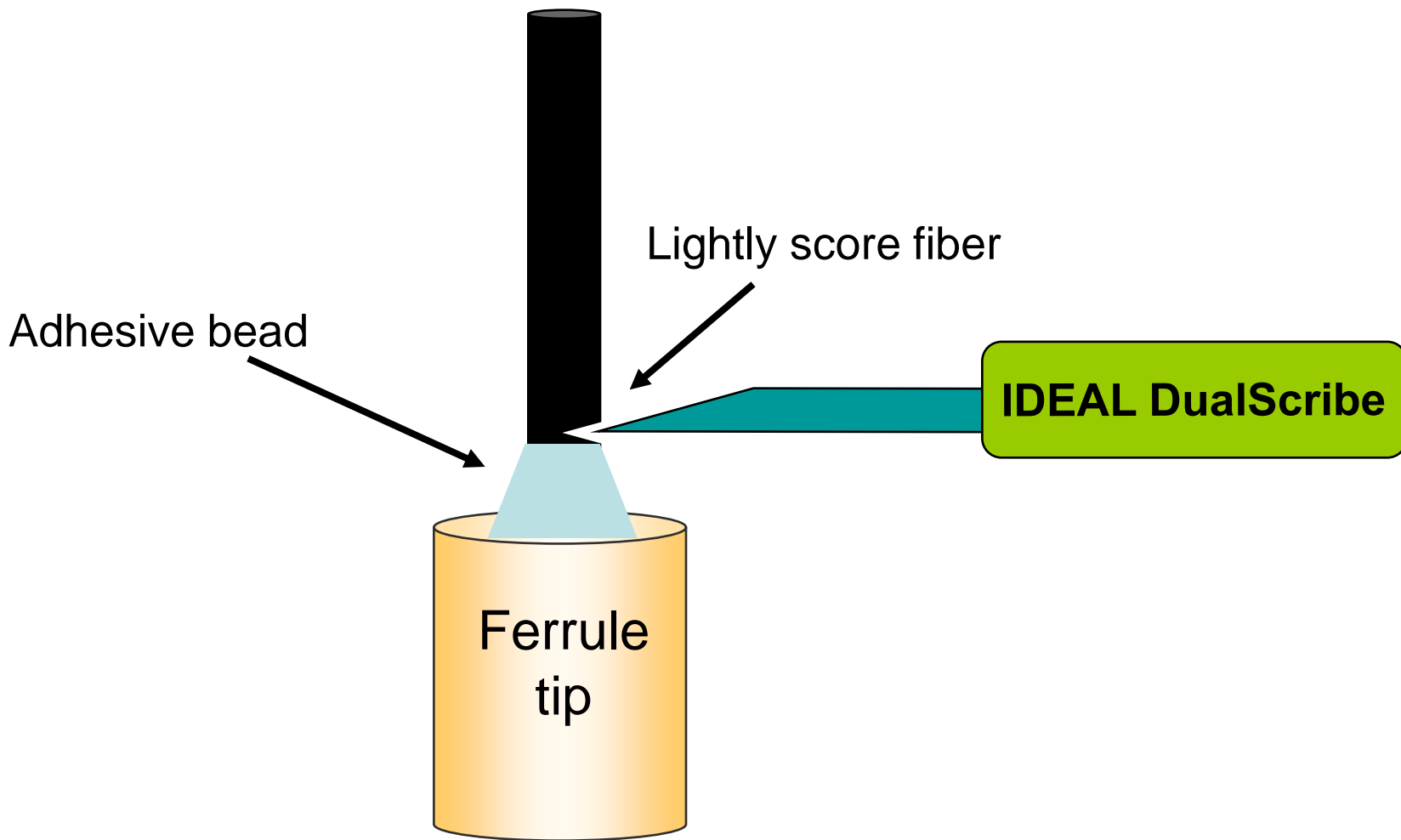
Note: Every connector Manufacturer has their own specific process for installing their connectors. Most of these companies offer certification training for the installation of their connectors.

45-489



- Note: Always Make Sure the Die Set Used Meets the Connector Manufacturers Crimp Die Specifications

插图：适当划线



5、光纤施工工具——研磨

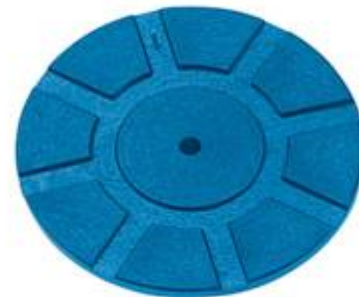
Stainless Steel Polishing Puck 45-341



- Stepped Surface Reduces Drag
- Fits All ST and SC Connectors
- Stainless Steel Resists Uneven Wear
- Competitively Priced

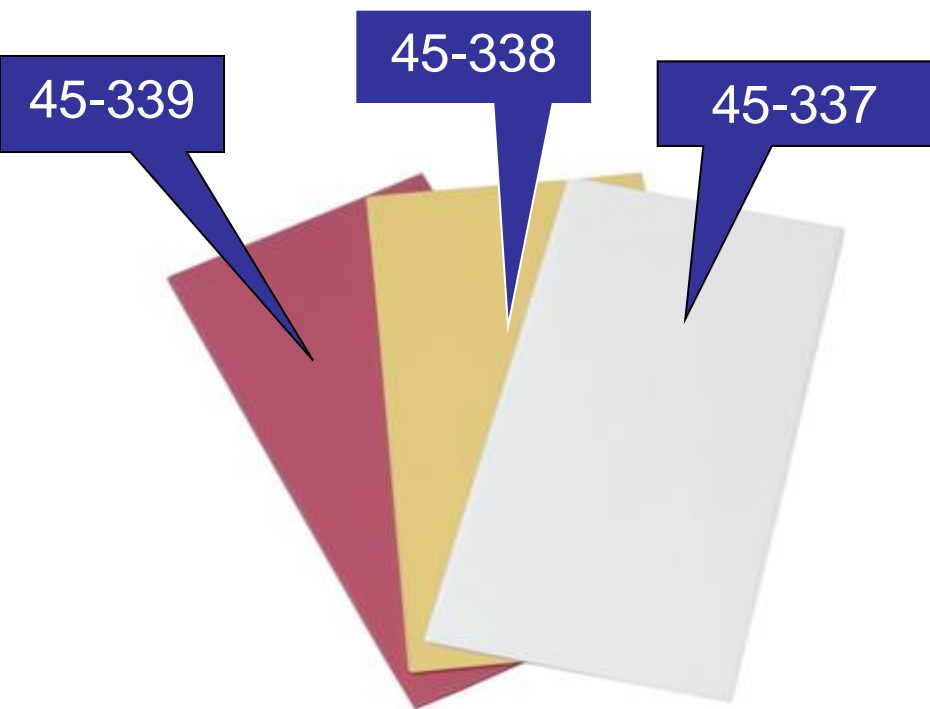
- Made From Durable Crastin Plastic
- Universal Adapter Fits All ST, SC, and FC Connectors
- Grooved Polishing Surface
- Lowest Price in the Market for a Plastic Puck

Plastic Polishing Puck 45-342



光纤施工工具——研磨

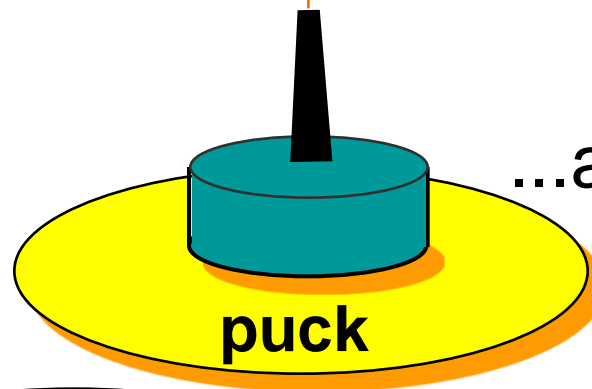
0.5, 3.0, & 12.0 Micron Polishing Film



- 3 Most Popular Sizes Used With Multimode
- Convenient 20 Sheet “Stay Clean” Package
- Lot-to-Lot Consistency Means Our Films Are More Consistent Than Most of The Competition

光纤施工工具——研磨

Scribe/Remove Glass



puck

12 micron

3 micron

.5 micron

3-Step Polishing Procedure

6、光纤施工工具——检查

100x Fiber Inspection Microscope 45-332



- Used to Inspect Multimode Fiber
- White LED illumination
- Built-in Laser Filter
- Universal 2.5mm Connector Adapter
- Compact, Rugged, Rubberized Metal Housing

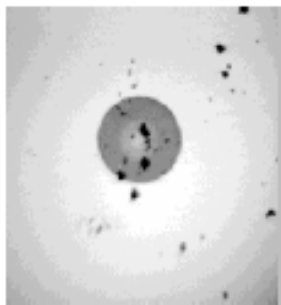


MTRJ Connector Adapter 45-335

- Used to Examine End-Face Quality of All MTRJ Style Fiber Connectors
- Threaded Fitting For Precise Positioning on Microscope

光纤施工工具——检查

• 通过显微镜的检查结



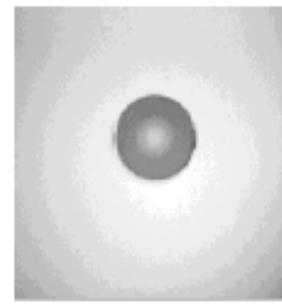
未清洁的
连接头



用手指“清洁”
的连接头



用衣服袖子“清
洁”的连接头



使用IDEAL清洁工
具清洁后的连接头



**200x Conversion
Eyepiece 45-336**

- For Inspecting/Viewing Singlemode Connectors
- Threaded Fitting Allows for Quick and Easy Changeover

7、光纤施工工具——验证

VFF5型光纤故障可视探查器，是一种用于定位光纤断裂和错接的激光光源。它可用于局域网、光数据链路和环路、电话、转接板和其他线路，以及那些以光纤代替铜缆后要求进行安全确认的场合。

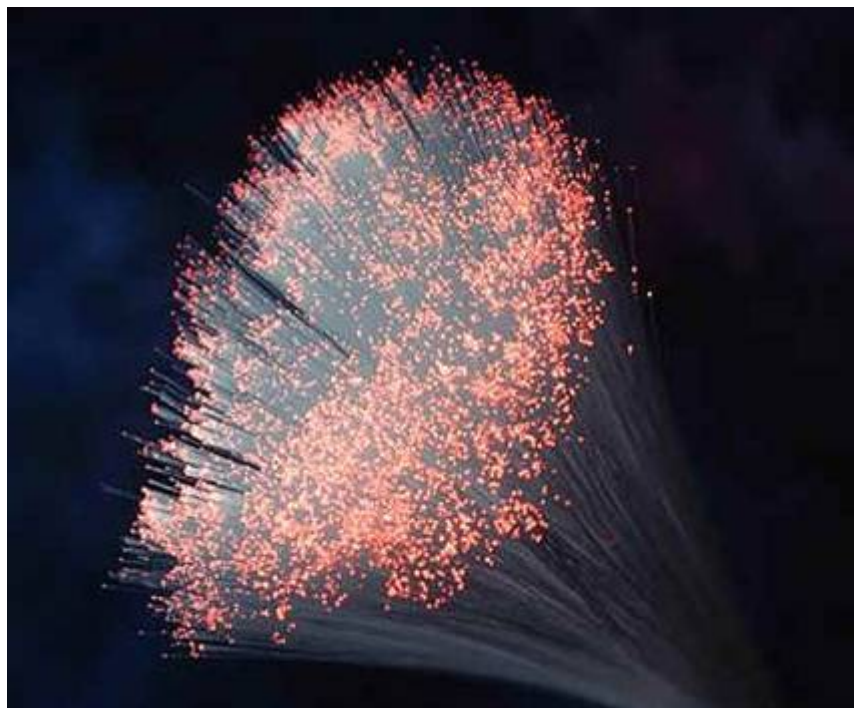


Visual Fault Finder

VFF5

- 价格低廉的光纤基础检测工具
- 发现断裂、异常接合和卷曲、品质下降的器件和连接器
- 有效验证距离5Km (3Miles)
- 适用于单模和多模光纤
- 2节AA电池可连续工作30小时
- 小巧防滑金属外壳
- 配置标准ST适配器
- 提供便携软包

光纤施工工具——验证



VFF5是一种电池供电的手持工具，它可将高功率可视红色激光注入光纤，操作者通过沿光纤长度方向简单地观察，发现何处有红光透出，及可知道此处有断裂。VFF5配备有高功率、超长寿命、670nm激光二极管，既可以连续发光（CW模式），也可以调制（1Hz脉冲）方式发光。用户通过一个滑动开关选择上述发光模式。光纤的任何断裂均可通过明显的发光或闪光而被看到。外壳上的一个红色发光二极管，显示当前发光模式的状态。

- 检查光纤熔接后的对应关系，快速查找光纤终端
- 快速检查光纤跳线
- 快速检查尾纤