

## Annex 1

**Table 1 – MFL Detection and sizing accuracy for metal loss in body of seam welded pipe (DN1400/56")**

	Certainty	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%		5%	8%	8%	5%
Depth sizing accuracy	80%	+/-10%	+/-10%	-15%/+10%	-10%/+15%
	90%	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy	80%	+/-20%	+/-20%	+/-20%	+/-20%
	90%	+/-25%	+/-25%	+/-25%	+/-25%
Length sizing accuracy	80%	+/-15mm	+/-10mm	+/-20mm	+/-20mm
	90%	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 2 – MFL Detection and sizing accuracy for metal loss in weld or HAZ (DN1400/56")**

	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%	9%	13%	13%	9%
Depth sizing accuracy at 80% certainty	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy at 80% certainty	+/-25mm	+/-25mm	+/-25mm	+/-25mm
Length sizing accuracy at 80% certainty	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 3 - Inspection tools specification for MFL (DN1400/56")**

		DN1400/56"
Wall thickness range for full specification	(mm)	14 - 22,6mm
Velocity range	(m.s <sup>-1</sup> )	1 – 5m/s
Temperature range	(°C)	0 – 40°C
Pressure range	(bar)	40 – 220bar
Minimum bend radius	(D)	3D
Minimum internal diameter	(mm)	1274mm
Min. full bore adjacent tees – centreline separation	(mm)	3551mm
Ball valve min. bore	(mm)	1274mm
Tool length	(m)	5547mm
Tool weight	(kg)	5674kg
No. of modules		2
Axial position accuracy for location of features	(%)	+/-1%
Circumferential accuracy for location of features	(°)	+/-5°
Minimum length for launcher	(mm)	4790mm

**Table 4 – MFL Detection and sizing accuracy for metal loss in body of seam welded pipe (DN800/32’’) (Higher accuracy – SHR/SHR<sup>plus</sup> – available see Attachments MFL4)**

	Certainty	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%		5%	8%	8%	5%
Depth sizing accuracy	80%	+/-10%	+/-10%	-15%/+10%	-10%/+15%
	90%	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy	80%	+/-20%	+/-20%	+/-20%	+/-20%
	90%	+/-25%	+/-25%	+/-25%	+/-25%
Length sizing accuracy	80%	+/-15mm	+/-10mm	+/-20mm	+/-20mm
	90%	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 5 – MFL Detection and sizing accuracy for metal loss in weld or HAZ (DN800/32’’) (Higher accuracy – SHR/SHR<sup>plus</sup> – available see Attachments MFL4)**

	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%	9%	13%	13%	9%
Depth sizing accuracy at 80% certainty	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy at 80% certainty	+/-25mm	+/-25mm	+/-25mm	+/-25mm
Length sizing accuracy at 80% certainty	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 6 - Inspection tools specification for MFL (DN800/32’')**

		DN 800/32’’
Wall thickness range for full specification	(mm)	9,5mm – 20,5mm
Velocity range	(m.s <sup>-1</sup> )	0,3 m/s – 5m/s
Temperature range	(°C)	0 -60°C
Pressure range	(bar)	30 – 220bar
Minimum bend radius	(D)	3D
Minimum internal diameter	(mm)	751mm
Min. full bore adjacent tees – centreline separation	(mm)	2093mm
Ball valve min. bore	(mm)	714mm
Tool length	(m)	3896mm
Tool weight	(kg)	2116kg
No. of modules		2
Axial position accuracy for location of features	(%)	1%
Circumferential accuracy for location of features	(°)	5°
Minimum length for launcher	(mm)	6330mm

**Table 7 – MFL Detection and sizing accuracy for metal loss in body of seam welded pipe (DN700/28")** (Higher accuracy – SHR/SHR<sup>plus</sup> – available see Attachments MFL4)

	Certainty	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%		5%	8%	8%	5%
Depth sizing accuracy	80%	+/-10%	+/-10%	-15%/+10%	-10%/+15%
	90%	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy	80%	+/-20%	+/-20%	+/-20%	+/-20%
	90%	+/-25%	+/-25%	+/-25%	+/-25%
Length sizing accuracy	80%	+/-15mm	+/-10mm	+/-20mm	+/-20mm
	90%	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 8 – MFL Detection and sizing accuracy for metal loss in weld or HAZ (DN700/28")** (Higher accuracy – SHR/SHR<sup>plus</sup> – available see Attachments MFL4)

	General metal loss	Pitting	Axial grooving	Circumf. grooving
Depth at POD=90%	9%	13%	13%	9%
Depth sizing accuracy at 80% certainty	+/-15%	+/-15%	-20%/+15%	-15%/+20%
Width sizing accuracy at 80% certainty	+/-25mm	+/-25mm	+/-25mm	+/-25mm
Length sizing accuracy at 80% certainty	+/-20mm	+/-15mm	+/-25mm	+/-25mm

**Table 9 - Inspection tools specification for MFL (DN700/28")**

		DN 700/28"
Wall thickness range for full specification	(mm)	6,3mm – 24,4mm @0,3m/s
Velocity range	(m.s <sup>-1</sup> )	0,3m/s – 5m/s
Temperature range	(°C)	-20 - +70°C
Pressure range	(bar)	30 – 220Bar
Minimum bend radius	(D)	1.5D
Minimum internal diameter	(mm)	645mm
Min. full bore adjacent tees – centreline separation	(mm)	1682mm
Ball valve min. bore	(mm)	613mm
Tool length	(m)	3272mm
Tool weight	(kg)	1451kg
No. of modules		2
Axial position accuracy for location of features	(%)	1%
Circumferential accuracy for location of features	(°)	5°
Minimum length for launcher	(mm)	5500mm